

Program on International Financial Systems

International Review of Equity Market Structure Regulation

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In addition, PIFS assembled a global advisory committee on equity market structure regulation, the members of which assisted in the preparation of this report by reviewing drafts and providing commentary and insight to our team. The members of the global advisory committee are listed on the next page.

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1 Comparative Analysis of Equity Market Structure Regulation

The research staff of the Program on International Financial Systems (“**PIFS**”) has reviewed and summarized the regulation of equity market structure in the People’s Republic of China (including both the Mainland market and the Hong Kong Special Administrative Region),¹ the European Union, Japan and the United States. The purpose of our study is to inform the public as to key similarities and differences among the regulatory regimes in these five jurisdictions that collectively represent approximately 90% of global stock trading.² A review of our key findings as to the following regulatory issues is below: (1) regulation of trading venues; (2) pre- and post-trade transparency; (3) regulation of broker dealers; (4) regulation of exchange fees; (5) tick-size regimes; (6) algorithmic and high-frequency trading; and (7) volatility controls. Chapters two through six go into further detail on these topics for each jurisdiction.

a. Regulation of trading venues

There are three types of trading venues for stocks.³ First, there are stock exchanges that match buyers and sellers of stock and are self-regulatory organizations that are the primary listing venue for public companies. Second, there are multilateral trading venues that also match buyers and sellers but are *not* self-regulatory organizations and cannot be the primary listing venue for public companies. And third, there are broker-dealer internalizers that do *not* match buyers and sellers, but instead act as principals and execute customer orders against a broker-dealer’s own inventory of stocks. Each is subject to its own regulatory requirements.

In Mainland China, exchanges are the only type of trading venue for publicly-listed stocks, as off-exchange trading in these stocks is prohibited.⁴ Publicly-listed stocks can only trade on the primary listing exchange, so there is no competition among stock exchanges for trading volume.⁵ The Shanghai Stock Exchange (“**SSE**”) and the Shenzhen Stock Exchange (“**SZSE**”) are the only national stock exchanges approved by the China Securities Regulatory Commission (“**CSRC**”).⁶ In July 2019, the SSE launched a Science and Technology Innovation Board (“**STAR Board**”) with

¹ For ease of reference, this report refers to (i) the People’s Republic of China as “China”; (ii) the Hong Kong Special Administrative Region of the People’s Republic of China as “Hong Kong”; and (iii) the rest of China as “Mainland China.”

² World Federation of Exchanges, Annual Statistics Guide (2017), available at <http://w.world-exchanges.org/home/index.php/statistics/annual-statistics>.

³ For purposes of this summary, we use broadly applicable definitions such as trading venues and broker-dealers as each jurisdiction that we reviewed has different terminology to refer to these entities. Our detailed outlines include glossaries with specific definitions.

⁴ Securities Law of the People’s Republic of China, Article 39 (2005) <https://www.accaglobal.com/content/dam/acca/global/pdf/ChinaSecuritiesLaw2006.pdf>. Brokers are required to route orders to exchanges and cannot internalize them. China Securities Law Article 39 and Article 145. See also Article 111-112. See English version here: <https://www.accaglobal.com/content/dam/acca/global/pdf/ChinaSecuritiesLaw2006.pdf> (p. 28).

⁵ WORLD BANK, *People’s Republic of China: Financial Sector Assessment Program* 279 (October 2017) <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf>.

⁶ James Chen, *Shanghai Stock Exchange* (May 4, 2018) <https://www.investopedia.com/terms/s/shanghai-stock-exchange.asp> (“The Shanghai Stock Exchange (SSE) is... a nonprofit organization run by the China Securities Regulatory Commission (CSRC).”); SHENZHEN STOCK EXCHANGE, *About: Overview* (last visited Apr. 12, 2019) <http://www.szse.cn/English/about/overview/index.html> (“Shenzhen Stock Exchange (SZSE), established on 1st December, 1990, is a self-regulated legal entity under the supervision of China Securities Regulatory Commission (CSRC).”).

more lenient trading regulations but restricted investor access.⁷ We note that there are other trading venues for stocks that are *not* publicly listed, including: (i) the National Equities Exchange and Quotations (“**NEEQ**”),⁸ and (ii) regional trading platforms for non-public companies,⁹ both of which are restricted to qualified investors.¹⁰ However, in our report, we focus on the trading of publicly-listed stocks, because they represent the vast majority of global stock market capitalization and trading volume.

In Hong Kong and Japan, off-exchange trading is permitted on multilateral trading facilities and through broker-dealer internalization.¹¹ In Hong Kong, the Hong Kong Stock Exchange (“**HKEX**”) is the only exchange group approved by the Securities and Futures Commission of Hong Kong (“**SFC**”);¹² and in Japan, the Tokyo Stock Exchange (“**TSE**”) is the only non-regional exchange approved by the Financial Services Authority (“**FSA**”).¹³

⁷ See *infra* notes 134-140 and accompanying text. Only investors with over 500,000 RMB in investible assets and more than two years of trading experiences are allowed to buy or sell stocks listed on SSE’s STAR Board. See *infra* notes 139-140 and accompanying text.

⁸ NATIONAL EQUITIES EXCHANGE & QUOTATIONS, *Introduction* (last accessed Sept. 26, 2019), http://www.neeq.com.cn/en/services/investors_home/brief_intro.html (“Companies thereon are non-listed public companies whose shareholders may be more than 200 people and shares can be transferred openly.”); WORLD BANK, *People’s Republic of China, Financial Sector Assessment Program: Detailed Assessment of Observance* 12 (Oct. 2017), <http://documents.worldbank.org/curated/en/860161518601604502/pdf/DAR-Securities.pdf>.

⁹ WORLD BANK, *People’s Republic of China, Financial Sector Assessment Program: Detailed Assessment of Observance* 12-13 (Oct. 2017), <http://documents.worldbank.org/curated/en/860161518601604502/pdf/DAR-Securities.pdf>; Weiping He, *The Regulation of Securities Markets in China* 227, SPRINGER (2018).

¹⁰ See *Bloomberg, China’s Third Stock Exchange Readies for Shanghai-Style Trading* (January 2018) (explaining that “[u]nlike the Shanghai and Shenzhen stock exchanges, NEEQ has an investor threshold of two years’ experience in securities investing and 5 million yuan worth of securities in assets”), <https://www.bloomberg.com/news/articles/2018-01-09/china-s-third-stock-exchange-readies-for-shanghai-style-trading>.

¹¹ In Hong Kong, multilateral trading facilities are regulated as “automated trading services.” SECURITIES AND FUTURES COMMISSION, *Consultation Paper Concerning the Regulation of Alternative Liquidity Pools*, 4 (Feb. 27, 2014) <https://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=14CP3>. In Japan, they are regulated as “proprietary trading systems.” *Agenda for competition among trading venues and alternative trading platforms*, FINANCIAL MARKETS DIVISION, FINANCIAL SERVICES AGENCY (JAPAN) (June 15, 2016), available at <https://www.fsa.go.jp/en/news/2016/20160513-1/03.pdf>.

¹² SECURITIES AND FUTURES ORDINANCE, A1241, <https://www.sfc.hk/web/EN/pdf/laws/sfo/1/Ordinance/5%20of%202002.pdf>.

¹³ As of April 2019, there were 3,665 companies listed on the TSE versus 292 on the Nagoya Stock Exchange (of which only 66 were listed exclusively), 109 on the Fukuoka Stock Exchange (of which 26 were listed exclusively), and 57 on the Sapporo Securities Exchange (of which 16 were listed exclusively). Japan Exchange Group (JPX), *Number of Listed Companies/Shares* (Apr. 12, 2019), available at <https://www.jpjx.co.jp/english/listing/co/index.html> (TSE); Nagoya Stock Exchange, *Listed Companies* (Apr. 16, 2019), available at <http://www.nse.or.jp/e/meigara/stockcount/>; Fukuoka Stock Exchange, *About Us: Introduction*, <https://www.fse.or.jp/english/about/index.php>; Sapporo Securities Exchange, *About Sapporo Securities Exchange* (January 1, 2019), available at <https://www.sse.or.jp/about>.

In the European Union¹⁴ and United States,¹⁵ off-exchange trading is permitted on multilateral trading facilities and through broker-dealer internalization. There are also multiple stock exchanges that have been approved by the competent authorities in the European Union¹⁶ and by the Securities and Exchange Commission (“SEC”) in the United States.¹⁷ A stock exchange in the United States and European Union can trade stocks that are listed on another exchange, so these stock exchanges compete with each other for trading volume.

We note that the jurisdictions that permit off-exchange trading require that the operator of such trading venues be registered with regulators and subject to certain risk controls and disclosure requirements.¹⁸

Trading Venues: Summary Chart

Jurisdiction	Exchanges	Other Trading Venues	Broker-Dealer Internalization
European Union	Multiple Exchanges (including LSE, Euronext, etc.)	Regulated as Multilateral Trading Facilities	Permitted
Hong Kong	One Exchange (HKEx)	Regulated as Automated Trading Services	Permitted
Japan	One National Exchange (TSE), Three Regional Exchanges	Regulated as Proprietary Trading Systems	Permitted
Mainland China	Two Exchanges (SSE, SZSE)	Prohibited	Prohibited
United States	Multiple Exchanges (including NYSE, NASDAQ, etc.)	Regulated as Alternative Trading Systems	Permitted

¹⁴ See the definition of ‘execution venue’ in RTS 27, Recital 2. (The full details and citations of all the European Union sources can be found in the summaries accompanying this outline.)

¹⁵ In the United States, multilateral trading facilities are regulated as “alternative trading systems.” *Regulation of Exchanges and Alternative Trading Systems*, Exchange Act Release No. 40760, File No. S7-12-98 (Dec. 8, 1998) <https://www.sec.gov/rules/final/34-40760.txt>.

¹⁶ MiFID 2 Directive, Article 44.

¹⁷ 15 U.S.C. § 78f (2010). United States stock exchanges include the New York Stock Exchange, Nasdaq, Bats Global Markets, the Chicago Stock Exchange, and the National Stock Exchange, among others. FINANCIAL INDUSTRY REGULATORY AUTHORITY, *NYSE, Nasdaq and...? Get to Know the U.S.'s Stock Exchanges* (Aug. 17, 2016) <http://www.finra.org/investors/nyse-nasdaq-and-get-know-uss-stock-exchanges-part-1>.

¹⁸ In the United States, alternative trading systems must be operated by a registered broker-dealer. *Regulation of Exchanges and Alternative Trading Systems*, Exchange Act Release No. 40760, File No. S7-12-98 (Dec. 8, 1998) <https://www.sec.gov/rules/final/34-40760.txt>. In Japan, proprietary trading systems must be operated by financial instruments business operators regulated by the Financial Services Agency and the Securities Exchange and Surveillance Commission. INTERNATIONAL MONETARY FUND, MONETARY AND CAPITAL MARKETS DEPARTMENT (IMF), *Japan: IOSCO Objectives and Principles of Securities Regulation— Detailed Assessment of Implementation*, IMF Country Report No. 12/230, 7 (August 2012). In Hong Kong, only licensed corporations can operate automated trading services. SECURITIES AND FUTURES COMMISSION, *Do you need a licence or registration?* (Feb. 11, 2019) <https://www.sfc.hk/web/EN/regulatory-functions/intermediaries/licensing/do-you-need-a-licence-or-registration.html#1>. For the EU provisions on the need for ‘investment firms’ authorization, see MiFID 2 Directive, Recital 37; Articles 5 and 6; Annex I, Section A; Article 16.

b. Pre- and post-trade transparency: dark vs lit trading

“Lit” trades are executed on venues with pre-trade transparency, meaning that orders to buy and sell a stock (including size and price information) are publicly displayed *before* execution of the trade. Trades that take place in the “dark” are simply trades that are executed on venues *without* pre-trade transparency. We note that *all* five jurisdictions that we reviewed require post-trade transparency, meaning that once a trade is executed the size and price information of the trade must be publicly reported.¹⁹

Dark trading is prohibited in Mainland China.²⁰ In Hong Kong, the HKEx prohibits dark trading on the exchange,²¹ but multilateral trading venues and broker-dealer internalizers may engage in dark trading.²² In Japan, the FSA prohibits dark trading on the Tokyo Stock Exchange (“TSE”), but multilateral trading venues and broker-dealer internalizers may engage in dark trading.²³ In the European Union, exchanges and multilateral trading venues may engage in dark trading, however dark trading on both venues is subject to limits. These limits are based on the total amount of dark trading in a stock *per venue* and the total amount of dark trading in a stock across *all trading venues*.²⁴ For quotes up to and including the standard market size, broker-dealer internalizers (“systematic internalisers” in the EU) must: (i) publicly publish pre-trade quotes for shares with a liquid market and (ii) make pre-trade quotes for shares without a liquid market available to clients upon request.²⁵ Finally, in the United States, exchanges, multilateral trading venues and broker-dealer internalizers may engage in dark trading.²⁶ However, multilateral trading venues in the United States must publicly display orders in a specific stock if they display orders to participants

¹⁹ U.S. SEC. & EXCH. COMM’N, *Concept Release on Equity Market Structure*, Exchange Act Release No. 61358, File No. S7-02-10, 75 FED. REG. 3594, 3600 (proposed Jan. 21, 2010); International Monetary Fund. Monetary and Capital Markets Department, *People’s Republic of China–Hong Kong Special Administrative Region : Financial Sector Assessment Program-IOSCO Objectives and Principles of Securities Regulation-Detailed Assessment of Observance*, Country Report No. 14/205, 212 (July 16, 2014) <https://www.imf.org/en/Publications/Publications-By-Author?author=International+Monetary+Fund.+Monetary+and+Capital+Markets+Department&name=International%20Monetary%20Fund.%20Monetary%20and%20Capital%20Markets%20Department>; Japan Cabinet Office Ordinance on Financial Instruments Business Table 1, Articles 74-75. In China, as noted earlier, all trading takes places on exchanges. For the EU, see MiFIR, Articles 6 and 20; RTS 1.

²⁰ During the continuous auction, the Exchanges must disclose to Exchange members in real-time the five lowest offer prices and five highest bid prices (and respective quantities) for listed securities. Exchange Trading Rules Chapter V, 5.2.

²¹ International Monetary Fund. Monetary and Capital Markets Department, *People’s Republic of China–Hong Kong Special Administrative Region : Financial Sector Assessment Program-IOSCO Objectives and Principles of Securities Regulation-Detailed Assessment of Observance*, Country Report No. 14/205, 212 (July 16, 2014).

²² IMF, Hong Kong: IOSCO Objectives and Principles of Securities Regulation at 214.

²³ INTERNATIONAL MONETARY FUND, MONETARY AND CAPITAL MARKETS DEPARTMENT (IMF), *Japan: IOSCO Objectives and Principles of Securities Regulation— Detailed Assessment of Implementation*, IMF Country Report No. 12/230, 7 (August 2012).

²⁴ MiFID 2 Regulation, Article 5.

²⁵ MiFIR 1, Article 14. See also Ulrich Nogel, *‘MiFID 2 double volume caps – the end of dark trading?’*, 44 Automated Trader Magazine (2018) available at http://www.automatedtrader.net/articles/strategies/158441/mifid-2-double-volume-caps_-the-end-of-dark-trading.

²⁶ OECD, *Changing business models of stock exchanges and stock market fragmentation*, in OECD Business and Finance Outlook 2016, 127, 130-31 (2016), available at <https://www.oecd.org/daf/ca/BFO-2016-Ch4-Stock-Exchanges.pdf>.

on their trading venues *and* execute more than 5% of total trading volume across all trading venues in that stock – though in practice, no trading venues exceed that threshold.²⁷

Dark Trading: Summary Chart

Jurisdiction	Dark Trading		
	Exchanges	Other Trading Venues	Broker-Dealer Internalizers
European Union	Permitted with Limits	Permitted with Limits	Permitted above SMS
Hong Kong	Prohibited	Permitted	Permitted
Japan	Prohibited	Permitted	Permitted
Mainland China	Prohibited	Prohibited	Prohibited
United States	Permitted	Permitted with Limits	Permitted

c. Regulation of broker-dealers

Broker-dealers stand at the heart of the equity market structure of each of the five jurisdictions, as they are responsible for routing investor orders to trading venues for execution. Although each jurisdiction requires that broker-dealers register with a regulatory agency,²⁸ each jurisdiction has different requirements as to how broker-dealers should handle client orders--the duty of best execution--and the related disclosures that they must provide their clients as to order routing decisions and execution quality. These requirements are critical for an efficient equity market structure, as they enable investors to identify the broker-dealers that are most likely to provide them with the best terms of execution (such as best price, largest size, fastest execution).

In Mainland China and Japan, there is limited regulatory guidance as to the duty of best execution. The CSRC requires that broker-dealers treat their clients fairly and route client orders to the relevant exchange according to the instruction of the clients.²⁹ In Japan, broker-dealers must adopt a policy and method for executing orders from customers under the *best terms and conditions*, but

²⁷ Requirements for Alternative Trading Systems, 17 C.F.R. § 242.301(b)(3).

²⁸ In the United States, most broker-dealers must register with the SEC. U.S. SEC. & EXCH. COMM'N, *Guide to Broker-Dealer Registration* (April 2008) <https://www.sec.gov/reportspubs/investor-publications/divisionsmarketreg-bdguidehtm.html#1>. In Japan, a firm seeking to provide securities services must register as a "financial instruments business operator." INTERNATIONAL MONETARY FUND, *Japan: Financial Sector Assessment Program: Technical Note – Regulation and Supervision of Securities Firms* (Sept. 2017) <https://www.imf.org/~media/Files/Publications/CR/2017/cr17284.ashx>. In Hong Kong, firms that deal in or advise on securities must become "licensed corporations" under the Securities and Futures Ordinance. SECURITIES AND FUTURES COMMISSION, *Do you need a license or registration?* (Feb. 11, 2019) <https://www.sfc.hk/web/EN/regulatory-functions/intermediaries/licensing/do-you-need-a-licence-or-registration.html#1>. In the People's Republic of China, securities companies are regulated by the China Securities Regulatory Commission (CSRC). CHINA SECURITIES REGULATORY COMMISSION, *About CSRC: Introducing the CSRC* (Nov. 30, 2008) http://www.csrc.gov.cn/pub/csrfc_en//about/intro/200811/t20081130_67718.html. In the EU, investment firms must be authorized in their Member States for the investment activity they are performing, MiFID 2 Directive Articles 5 and 6; Annex I, Section A; Article 16.

²⁹ China Securities Law Article 39 and Article 145. See also Article 111-112. http://www.csrfc.gov.cn/pub/newsite/flb/flfg/flxzf/201312/t20131205_239325.html. See English version here: <https://www.accaglobal.com/content/dam/acca/global/pdf/ChinaSecuritiesLaw2006.pdf> (p. 28).

no further guidance is provided as to what is meant by best terms and conditions.³⁰ As a result, execution quality is primarily ensured by customer monitoring and selection of their broker-dealer.

The duty of best execution is more detailed in Hong Kong, the European Union and the United States. In Hong Kong, the SFC requires that broker-dealers execute client orders on the best available terms, which include (1) price, (2) cost, (3) speed of execution, (4) likelihood of execution, (5) speed of settlement, (6) likelihood of settlement, and (7) the size and nature of an order.³¹ In the E.U., broker-dealers must take “all sufficient steps” to obtain the best possible results for their clients,³² taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order.³³ In the U.S., the Financial Industry Regulatory Association (“**FINRA**”), the self-regulatory authority for U.S. broker-dealers, requires broker-dealers to “use reasonable diligence to ascertain the best market for the subject security and buy or sell in such market so that the resultant *price* to the customer is as favorable as possible under prevailing market conditions.”³⁴

As noted earlier, each of the five jurisdictions requires *post-trade transparency*. Post-trade transparency is relevant to the duty of best execution as it provides investors the ability to assess whether the price and terms of execution received for their orders is generally consistent with their expectations when they submitted their orders to the broker-dealer.³⁵ Each of the five jurisdictions that we reviewed also has additional requirements as to record-keeping and disclosure requirements for broker-dealer order routing decisions and execution quality that provides investors with further insight as to their broker-dealer’s duty of best execution.

In Mainland China, these requirements are limited, as broker-dealers are solely required to “keep under safe custody the records of their clients’ orders and their order routing activities.”³⁶ In Japan, broker-dealers must disclose their best execution policy to clients; however there are not specific requirements as to order routing decisions (how a broker-dealer chooses among trading venues) or execution quality achieved on a specific trading venue or across all trading venues.³⁷ In Hong Kong, broker-dealers are required to adopt policies and procedures that address disclosure to

³⁰ See FIEA Article 40-2. We note that our analysis focuses on the regulations and guidance in place for broker-dealers duty of best execution. We do not focus on the enforcement practices of the regulatory agencies.

³¹ SECURITIES AND FUTURES COMMISSION, *Circular to Licensed Corporations on Best Execution* (Jan. 30, 2018) <https://www.sfc.hk/edistributionWeb/gateway/EN/circular/doc?refNo=18EC7>.

³² MiFID 2 Directive, Article 27.

³³ This is subject to any specific instruction from the client to execute in accordance with that instruction.

³⁴ FINRA Rule 5310.

³⁵ In the European Union, post-trade transaction reporting is considered also relevant to preventing market abuse, Explanatory Memorandum to the Data Reporting Services Regulation 2017 (SI 699/2017), paragraph 7.7.

³⁶ Trading Rules, Chapter III, 3.1.3

³⁷ See Shohei Kuga, *The Growing Significance of TCA in Japan*, Fidessa (June 2017), available at <https://www.fidessa.com/jp/newsletter/issue010/the-growing-significance-of-tca-in-japan>; *Where does Asia stand on compliance, best execution and TCA in 2019?*, Bloomberg Professional Services (January 20, 2019), available at <https://www.bloomberg.com/professional/blog/asia-stand-compliance-best-execution-tca-2019/>

clients of best execution arrangements including carve outs and the exclusive use of affiliates, connected parties and third parties,³⁸ including any payments for order flow.³⁹

The disclosure requirements related to best execution in the European Union⁴⁰ and United States⁴¹ go significantly further than the other jurisdictions, as broker-dealers must disclose the trading venues that they route to and how they make such routing decisions, including quantitative execution quality considerations.⁴² In the United States, payment for order flow arrangements must be disclosed.⁴³ In the European Union, payment for order flow arrangements are prohibited.⁴⁴ Finally, in the European Union⁴⁵ and the United States,⁴⁶ trading venues are required to disclose quantitative metrics as to their execution quality (e.g. execution prices on the trading venue as compared to the best price available across all trading venues) that further facilitate investors' ability to assess the execution quality achieved by their broker-dealers.

d. Regulation of exchange fees

In each of the five jurisdictions that we reviewed, the majority of stock trades are executed on exchanges, particularly in Asian jurisdictions where more than 90% of stock trades are executed on exchanges.⁴⁷ We therefore focus our attention on the regulation of the fees that exchanges may charge broker-dealers for accessing an exchange, executing client orders or for market data that can only be accessed from an exchange. We generally find that the regulatory authority in each jurisdiction must approve exchange fees but have varying standards of review.

In Mainland China, the CSRC together with the National Development and Reform Commission have the express authority to set fees at stock exchanges.⁴⁸ Regarding criteria used to determine

³⁸ SECURITIES AND FUTURES COMMISSION, *Code of Conduct for Persons Licensed by or Registered with the Securities and Futures Commission*, General Principle 1 and sections 10.1 and 13.1 (Nov. 25, 2018) <https://www.sfc.hk/web/EN/assets/components/codes/files-current/web/codes/code-of-conduct-for-persons-licensed-by-or-registered-with-the-securities-and-futures-commission/code-of-conduct-for-persons-licensed-by-or-registered-with-the-securities-and-futures-commission.pdf> ("**HK Code of Conduct**"); SECURITIES AND FUTURES COMMISSION, *Circular to licensed corporations on best execution* (Jan. 30, 2018) <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180209e1a1.pdf>.

³⁹ HK Code of Conduct, 13.1

⁴⁰ RTS 27 and RTS 28.

⁴¹ 17 C.F.R. § 242.606(a)(1)(iii) (2005); U.S. SEC. & EXCH. COMM'N, *SEC Adopts Rules That Increase Information Brokers Must Provide to Investors on Order Handling* (Nov. 2, 2018) <https://www.sec.gov/news/press-release/2018-253>.

⁴² RTS 28.

⁴³ 17 C.F.R. § 242.606(a)(1)(iii) (2005).

⁴⁴ MiFID 2 Directive, Article 27(2).

⁴⁵ RTS 27.

⁴⁶ See generally 17 C.F.R. § 242.605 (2005).

⁴⁷ See, e.g., SECURITIES AND FUTURES COMMISSION, *Report on the Thematic Review of Alternative Liquidity Pools in Hong Kong*, 4 (Apr. 9, 2018) [https://www.sfc.hk/web/EN/files/IS/publications/ALP%20Report%20\(EN\).pdf](https://www.sfc.hk/web/EN/files/IS/publications/ALP%20Report%20(EN).pdf); FINANCIAL MARKETS DIVISION, FINANCIAL SERVICES AGENCY (JAPAN), *Agenda for competition among trading venues and alternative trading platforms*, (June 15, 2016), available at <https://www.fsa.go.jp/en/news/2016/20160513-1/03.pdf> (as of 2016, approximately 90% of trading in listed stocks occurred on the TSE and 5% of trading occurred on PTS).

⁴⁸ IOSCO, *Trading Fee Models and their Impact on Trading Behaviour* (Dec. 2013) http://www.csrc.gov.cn/pub/csrc_en/affairs/AffairsIOSCO/201402/P020140213529122654245.pdf.

fee levels, the CSRC has stated that “market size and environment” have been factors.⁴⁹ In Hong Kong, exchange fees must be specified in rules approved by the SFC.⁵⁰ In making its decision on fee rules, the SFC must take into account the level of competition, if any, in Hong Kong for the matter for which the fee is to be imposed and the fees, if any, imposed by another recognized exchange controller or recognized exchange company or any similar entity outside Hong Kong for equivalent matters.⁵¹

In Japan, exchanges are required to obtain FSA approval for the fees that they charge.⁵² Exchanges are also required to perform benchmarking analysis and/or impact analysis, and the FSA must determine whether the structure of the model or the fee charge is fair or unduly discriminatory.⁵³ The FSA evaluates the reasonableness of exchange fees by considering service provided vs. fees charged, operational cost, value added, comparable fees of other trading venues and competition factors.⁵⁴

In the European Union, exchange fees must be transparent, fair and non-discriminatory as determined by the competent authority in the E.U. Member State.⁵⁵ Generally, exchanges must charge broker-dealers similar fees for similar services.⁵⁶ With respect to market data fees, exchanges must provide market data on a “reasonable commercial basis.”⁵⁷ As a result, market data prices must be: (i) based on costs of producing and disseminating such data, including a reasonable margin; (ii) offered on a non-discriminatory basis to all clients; (iii) charged according to the individual end-user’s use; and (iv) available without being bundled with other services.⁵⁸

In the United States, exchange rules must provide for the *equitable allocation of reasonable fees* and other charges among its broker-dealer members, not permit unfair discrimination and not impose any unnecessary burden on competition.⁵⁹ Exchange fees do not require pre-approval and are effective upon filing with the SEC,⁶⁰ but the SEC may immediately temporarily suspend proposed fees if they appear inconsistent with the requirements of the Exchange Act and institute

⁴⁹ CHINA SECURITIES AND REGULATORY COMMISSION, *Substantial Decrease on A-share Transaction-related Fees* (April 30, 2012) http://www.csrc.gov.cn/pub/csrc_en/newsfacts/release/201205/t20120508_209698.html

⁵⁰ Hong Kong Securities and Futures Ordinance, Section 76.

⁵¹ Hong Kong Securities and Futures Ordinance, Section 76.

⁵² IOSCO, *Trading Fee Models and their Impact on Trading Behaviour: Final Report*, FR12/13 (December 2013).

⁵³ IOSCO, *Trading Fee Models and their Impact on Trading Behaviour: Final Report*, FR12/13 (December 2013).

⁵⁴ IOSCO, *Trading Fee Models and their Impact on Trading Behaviour: Final Report*, FR12/13 (December 2013).

⁵⁵ MiFID 2 Directive, Article 48(9)

⁵⁶ RTS 10, 330.

⁵⁷ EUROPEAN SECURITIES AND MARKETS AUTHORITY, *Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments*, 15 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

⁵⁸ *Id.*

⁵⁹ Section 6 of the Securities Exchange Act of 1934.

⁶⁰ In October 2019, the SEC proposed a rule rescinding the current exception that allows exchange fee changes to become immediately effective upon filing. U.S. SEC. & EXCH. COMM’N, *Rescission of Effective-Upon Filing Procedure for NMS Plan Fee Amendments*, Exchange Act Release No. 34-87193 (Oct. 1, 2019), <https://www.sec.gov/rules/proposed/2019/34-87193.pdf>.

proceedings to determine whether the fee should be approved.⁶¹ In addition, the consolidated market data fees charged by exchanges must be *fair and reasonable*.⁶² Further, there is an explicit cap on “access” fees (30 cents/100 shares) that exchanges can charge for publicly displayed orders.⁶³ In April 2019, the SEC launched a transaction fee pilot to explore further reducing the cap on access fees.⁶⁴ Although the pilot remains on hold pending the resolution of legal challenges raised by exchanges,⁶⁵ the data collection associated with it has commenced.

e. Tick-size regimes

A minimum tick-size refers to the smallest pricing increment at which a trading venue can display (quote) order interest to buy or sell a stock. Regulators and/or trading venues impose minimum tick sizes to encourage displayed liquidity at specific minimum spreads between the price bid and offered for stocks. Minimum tick sizes may be based on the fundamental supply and demand for a stock, on a stock’s price, or on a commonly used price measurement such as 1/100th of a U.S. dollar.

In Mainland China, the CSRC must approve tick-size rules on the Chinese exchanges.⁶⁶ On the Shanghai and Shenzhen Stock Exchanges, the minimum tick sizes are RMB 0.01.⁶⁷ In Hong Kong, the SFC must approve the tick-size rules on the HKEx.⁶⁸ Tick sizes on the HKEx vary based on share price, with lower-priced stocks having smaller tick sizes.⁶⁹ Operators of multilateral trading venues in Hong Kong can determine their own tick-sizes,⁷⁰ but they remain subject to the SFC’s general

⁶¹ Section 19(b)(3) of the Securities Exchange Act of 1934; 15 U.S.C. § 78s(b)(3)(A), (C) (setting forth how fee-related rules are effective immediately upon filing, but the SEC can summarily suspend the rule in order to institute proceedings to determine whether it should be approved).

⁶² See generally 15 U.S.C. § 78k-1 (2012). See also Regulation NMS, Exchange Act Release No. 51808, 70 Fed. Reg. 37496, 37560, 37567 (Jun. 29, 2005) <https://www.sec.gov/rules/final/34-51808fr.pdf>.

⁶³ Access to Quotations, 17 C.F.R. § 242.610.

⁶⁴ U.S. SEC. & EXCH. COMM’N, *SEC Adopts Transaction Fee Pilot for NMS Stocks* (Dec. 2018) <https://www.sec.gov/news/press-release/2018-298>. See also U.S. SEC. & EXCH. COMM’N, *Transaction Fee Pilot for NMS Stocks*, Exchange Act Release No. 34-84875 (effective April 22, 2019) <https://www.sec.gov/rules/final/2018/34-84875.pdf>.

⁶⁵ Hazel Bradford, *SEC puts transaction fee pilot on hold during court challenges*, PENSIONS & INVESTMENTS (Mar. 29, 2019), <https://www.pionline.com/article/20190329/ONLINE/190329881/sec-puts-transaction-fee-pilot-on-hold-during-court-challenges>.

⁶⁶ Articles 103 and 118 of the Securities Law, Article 15 of the Measures, and Articles 15 to 19 of the Interim Measures for the Administration of National Equities Exchange and Quotations Co., Ltd. (NEEQ Interim Measures) See <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf> (p. 279) (“Stock exchanges... must obtain the CSRC’s approval to formulate or amend their constitutions or rules and regulations on listing, trading, and member management”).

⁶⁷ Trading Rules Chapter III, 3.3.13 (Shenzhen) and 3.4.11 (Shanghai).

⁶⁸ Rules of recognized exchange companies are only effective upon approval by the SFC. Securities and Futures Ordinance, Section 24.

⁶⁹ DEUTSCHE BANK, *Global Market Structure: Guide to Global Equity Exchanges* (Feb. 2019) <https://www.auto-bahn.db.com/equity-market-guide/mktgd/exchanges.html>.

⁷⁰ See, e.g., CREDIT SUISSE, *Asia Pacific Crossfinder User Guidelines* (2018) <https://www.credit-suisse.com/media/ib/docs/investment-banking/client-offering/crossfinder-user-guidelines-2018.pdf> (“Crossfinder internal Tick Size: Half of HKEx tick size”); MORGAN STANLEY HONG KONG SECURITIES LIMITED, *ALP Guidelines for MS POOL for the Hong Kong*

regulatory authority and ability to impose conditions on their licenses.⁷¹ In Japan, the FSA must approve the tick-size rules on Japanese exchanges.⁷² Tick sizes on the TSE vary based on share price, with lower-priced stocks having smaller tick sizes.⁷³ Operators of multilateral trading venues can determine their own tick-sizes subject to the approval of the regulatory authority.⁷⁴

In the European Union, tick sizes must be based on the liquidity of a stock as determined by the average daily number of transactions in that stock on the most relevant market.⁷⁵ In the United States, the SEC requires that stock exchanges and multilateral trading venues adopt a minimum tick size of \$0.01 for all stocks with a price above \$1.00.⁷⁶

f. Algorithmic and high-frequency trading

In modern equity markets, aspects of the trading process that were traditionally done manually, such as execution and order-routing, are now automated. Algorithmic trading—trading in which computers are involved in making trading decisions with limited human involvement—has become increasingly common.⁷⁷ High frequency trading (“HFT”) refers to a subset of algorithmic trading that relies on processing information from trading venues and entering orders at trading venues at high speed. Accordingly, HFT is characterized by the use of special infrastructure to minimize latencies—the time it takes to send data to a particular end point (and potentially back again).⁷⁸

HFT strategies fall into three basic categories that have always existed in equity markets: First, market making which involves providing liquidity to the market by maintaining limit orders on both sides of trades. Market makers must be able to quickly assess changes in supply and demand for stocks and promptly update the prices at which they are willing to buy and sell. Second, HFT strategies also include arbitrage strategies, whereby arbitrageurs identify price discrepancies that arise between portfolios of assets or the same assets on different trading venues and conduct trades that bring those prices back in line. Third, directional HFT strategies involve trading rapidly as new information enters the market, which helps make the price discovery process more efficient

Market (Mar. 2018) <https://www.morganstanley.com/institutional-sales/hkdp-guidelines-mspool-mar2018.pdf> (“MS POOL accepts orders at full or half the SEHK standard tick sizes.”).

⁷¹ SECURITIES AND FUTURES COMMISSION, *Consultation Paper concerning the Regulation of Alternative Liquidity Pools* (Feb. 27, 2014) https://www.hksfa.org/upload/menu_content_detail/original/369866376630.pdf (“The current policy of the SFC is to impose conditions on the licenses of ALP operators pursuant to section 116(6) of the SFO[.]”).

⁷² An exchange cannot change its operational rules without the approval of the FSA. See FIEA Article 149.

⁷³ Japan Exchange Group (JPX), *Trading Rules of Domestic Stocks: Tick Size* (December 1, 2015), available at <https://www.jpx.co.jp/english/equities/trading/domestic/07.html>.

⁷⁴ To obtain authorization to operate a proprietary trading system, a firm must, among other things, adopt a price formation method ensuring “that public interest and investor protection are maintained.” INTERNATIONAL MONETARY FUND, *Japan: Financial Sector Assessment Program: Technical Note – Regulation and Supervision of Securities Firms* 30 (Sept. 2017) <https://www.imf.org/en/Publications/CR/Issues/2017/09/18/Japan-Financial-Sector-Assessment-Program-Technical-Note-Regulation-and-Supervision-of-45262>.

⁷⁵ RTS 1 (as amended) and RTS 11. The tick size regime also applies to broker-dealer internalizers (Commission Delegated Regulation (EU) 2019/442 of 12 December 2018).

⁷⁶ 17 C.F.R. § 242.612(a) (2005).

⁷⁷ See Terrence Hendershott, Charles M. Jones, and Albert J. Menkveld, *Does Algorithmic Trading Improve Liquidity?*, 66:1 J. of Fin. 1, 2 (February 2011).

⁷⁸ See Maureen O’Hara, *High frequency market microstructure*, 116:2 J. of Fin. Econ. 257, 258-60 (2015).

and improves the accuracy of stock prices.⁷⁹ HFT strategies typically feature a high volume of orders (which, in line with the strategies described, may be revised or cancelled shortly after submission) and very low average profits per trade. They also usually involve ending the trading day with as relatively neutral or flat risk a position as possible (that is, not carrying significant, unhedged positions overnight).⁸⁰

The prevalence of HFT strategies varies cross jurisdictions. HFT is common in the United States, accounting for approximately 50% of equity trading volume.⁸¹ Similarly, approximately 40-50% of trades on the Tokyo Stock Exchange, Japan's primary equity trading venue, are placed through servers co-located with the exchange's trading system.⁸² Estimates of trading volumes in the European Union and Hong Kong are less reliable but generally show that HFT strategies constitute a significant percentage of overall trading volume.⁸³ In Mainland China, by contrast, investors employ various forms of algorithmic trading, but the use of standard HFT strategies is limited by certain market structure barriers. The cost of trading in Mainland China is relatively high and network connection latency levels on Chinese exchanges are not conducive to rapid trading. In addition, equity trading in Mainland China is subject to settlement regulations that forbid selling securities until they are settled—typically on a T+1 basis.⁸⁴

The jurisdictions reviewed in this report also differ with respect to how they regulate algorithmic trading and HFT. Mainland China, for example, does not directly regulate either.⁸⁵

Hong Kong regulates all electronic trading of securities and futures, including algorithmic trading, but it does not specifically regulate HFT; however, the regulatory requirements that apply generally to algorithmic traders apply to investors that employ HFT strategies. The SFC requires that firms engaged in electronic trading, or firms that provide electronic trading platforms, adopt risk controls and provide clients with adequate disclosure regarding the risks of electronic trading.⁸⁶ The SFC also imposes specific testing and recordkeeping requirements on algorithmic traders.⁸⁷

⁷⁹ See STAFF OF THE DIVISION OF TRADING AND MARKETS, S. SEC. & EXCH. COMM'N, *Equity Market Structure Literature Review – Part II: High Frequency Trading*, 7-8 (March 18, 2014), available at https://www.sec.gov/marketstructure/research/hft_lit_review_march_2014.pdf.

⁸⁰ See id at 4.

⁸¹ NASDAQ, *High Frequency Trading* (last accessed April 30, 2019) <https://www.nasdaq.com/investing/glossary/h/high-frequency-trading> (“It is estimated that 50 percent of stock trading volume in the U.S. is currently being driven by computer-backed high frequency trading.”); Gregory Meyer, Nicole Bullock and Joe Rennison, *How high frequency trading hit a speed bump*, Financial Times (January 1, 2018), available at <https://www.ft.com/content/d81f96ea-d43c-11e7-a303-9060cb1e5f44>.

⁸² See FINANCIAL SERVICES AGENCY, *Report by the Working Group on Financial Markets under the Financial System Council*, 14 (December 22, 2016), available at https://www.fsa.go.jp/en/refer/councils/singie_kinyu/20170509/03.pdf.

⁸³ See EUROPEAN SECURITIES AND MARKETS AUTHORITY, *High-frequency trading activity in EU equity markets*, ESMA Economic Report, Number 1 (2014) (reporting that HFT accounted for between 30-49% of all trades and 58-76% of all orders on EU equity markets in May 2013); Robert J. Kauffman, Yuzhou Hu and Dan Ma, *Will high-frequency trading practices transform the financial markets in the Asia Pacific Region?*, 1 Financial Innovations 1, 9 (2015) (citing an SFC report that roughly 20% of all equity trading volume in 2012 was represented by HFT).

⁸⁴ See Section 2.e.

⁸⁵ See id.

⁸⁶ HK Code of Conduct, 18.1-18.6.

⁸⁷ See Section 3.e.

In the European Union, algorithmic traders must notify regulators, must put in place extensive risk controls, and must comply with comprehensive recordkeeping requirements. Firms that employ market making algorithms must also agree to do so on a continuous basis. HFT, defined as a subset of algorithmic trading that is intended to minimize latency and involves high-message rates, such as orders, quotes and cancellations, is subject to additional regulations.⁸⁸

Japan has adopted regulations that apply specifically to HFT. Whether an investor is considered to engage in HFT depends on whether their trading system is located close to a trading venue. HFT firms are required to register with the FSA, provide the FSA with trading information and adopt risk controls specified in supervisory guidelines.⁸⁹

In the United States, firms engaged in algorithmic trading or HFT are either regulated as broker-dealers or, in the case of a trader obtaining “sponsored access” to trade on an exchange through a broker-dealer, subject to supervision by the broker-dealer providing sponsored access. In either case, they are subject to stringent risk controls and disclosure requirements to prevent erroneously disruptive trading activity.⁹⁰

g. Volatility controls

Volatility controls are intended to minimize extreme price volatility in stocks that can be disruptive to an orderly trading environment. Volatility controls include (i) market-wide trading halts or “circuit breakers” or (ii) circuit breakers for individual stocks that trigger when there is significant price volatility during a specified period of time. Another type of volatility control is a “kill switch” whereby a broker-dealer is required to adopt a mechanism to automatically halt their own trading based on potentially erroneous trading activity.

In Mainland China, there is no regulatory requirement that exchanges adopt market-wide circuit breakers and none presently exist.⁹¹ Exchanges in Mainland China have adopted individual stock circuit breakers that trigger when a stock’s price fluctuates by 10% over a specified period of time.⁹² In Hong Kong, there is also no regulatory requirement imposing a market-wide circuit breaker and none presently exist. However, the HKEx has adopted individual stock circuit breakers that trigger when a stock’s price fluctuates by 10% over a pre-specified period of time.⁹³ The HKEx also mandates that electronic traders adopt kill switches to immediately halt trading, but does not specify when kill switches must be executed.⁹⁴ In Japan, there is also no regulatory requirement imposing a market-wide circuit breaker and none presently exist. The TSE imposes individual stock

⁸⁸ See Section 4.g.

⁸⁹ See Section 5.f.

⁹⁰ See Section 6.f.

⁹¹ In 2016, Shanghai/Shenzhen *market-wide* circuit breakers linked to the CSI 300 Index were removed. BLOOMBERG, *China Official Wants to Scrap First-Day Trading Cap for IPOs* (Jan. 13, 2019) <https://www.bloomberg.com/news/articles/2019-01-14/china-official-wants-to-scrap-first-day-trading-cap-for-ipo>.

⁹² Trading Rules, Chapter III, 3.4.13-14 (Shanghai) / 3.3.15-16 (Shenzhen).

⁹³ MARKETS MEDIA, *HKEX to Roll Out Volatility Control Mechanism for its Securities Market* (Aug. 19, 2016) <https://www.marketsmedia.com/hkex-roll-volatility-control-mechanism-securities-market/>; HKEx, *Trading Mechanism of Volatility Control (VCM) in the Securities Market* (Aug. 12, 2016) https://www.hkex.com.hk/eng/market/sec_trading/vcm_cas/Documents/Trading%20Mechanism%20for%20VCM%20Eng.pdf.

⁹⁴ HK Code of Conduct, Schedule 7, 1.2.1.

circuit breakers that vary based on the absolute price of a stock.⁹⁵ Neither the FSA nor the TSE require that broker-dealers adopt kill switches.

In the European Union, there is no regulatory requirement for market-wide circuit breakers, and neither the London Stock Exchange, Euronext, nor Deutsche Bourse have adopted any.⁹⁶ Exchanges and multilateral trading venues are required to adopt circuit breakers for individual stocks when there is significant price movement during a short period.⁹⁷ A pre-defined statistically supported method must be used.⁹⁸ Broker-dealers engaged in algorithmic trading are also required to adopt kill switches allowing them to cancel all of their unexecuted orders with immediate effect, when the broker-dealer determines that doing so is necessary.⁹⁹

The United States, through a rule proposed by the US exchanges and approved by the SEC, is the only jurisdiction we reviewed that imposes market-wide circuit breakers at price declines of 7% (Level 1), 13% (Level 2) and 20% (Level 3) in the S&P 500.¹⁰⁰ There can be only one 15-minute trading halt per day for a Level 1 or Level 2 market decline. A Level 3 market decline halts trading for the remainder of the trading day.¹⁰¹ The SEC also approved a rule proposed by the US exchanges and FINRA introducing individual stock circuit breakers that apply when a stock's price fluctuates from 5-20% depending on the price and liquidity of the stock.¹⁰² Neither the SEC nor the exchanges impose mandatory kill switches on broker-dealers.

⁹⁵ INTERNATIONAL MONETARY FUND, MONETARY AND CAPITAL MARKETS DEPARTMENT (IMF), *Japan: IOSCO Objectives and Principles of Securities Regulation— Detailed Assessment of Implementation*, IMF Country Report No. 12/230 (August 2012).

⁹⁶ Jamres Brugler, Oliver Linton, Joseph Noss and Lucas Pedace, *Staff Working Paper No. 759: The cross-sectional spillovers of single stock circuit breakers*, BANK OF ENGLAND, 8 (Oct. 2018), <https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2018/the-cross-sectional-spillovers-of-single-stock-circuit-breakers.pdf> (listing LSE, Euronext and Deutsche Bourse as having only stock-specific circuit-breakers).

⁹⁷ MiFID 2 Directive, Recital 64 and Article 48(5).

⁹⁸ ESMA Guidelines 'Calibration of circuit breakers and publication of trading halts under MiFID II' (06/04/2017)

⁹⁹ RTS 6, Recital 9 and Article 12.

¹⁰⁰ Self-Regulatory Organizations; Notice of Filing of Amendments No. 1 and Order Granting Accelerated Approval of Proposed Rule Changes as Modified by Amendments No. 1, Relating to Trading Halts Due to Extraordinary Market Volatility, Exchange Act Release No. 67090 (May 31, 2012) <http://www.sec.gov/rules/sro/bats/2012/34-67090.pdf>.

¹⁰¹ See NYSE Rule 80B: Trading Halts Due to Extraordinary Market Volatility, available at http://wallstreet.cch.com/nyse/rules/nyse-rules/chp_1_3/chp_1_3_4/chp_1_3_4_21/default.asp; Nasdaq Rule 4121: Trading Halts Due to Extraordinary Market Volatility, available at http://nasdaq.cchwallstreet.com/NASDAQTools/TOC-Chapter.asp?print=1&manual=/nasdaq/main/nasdaq-equityrules/chp_1_1/chp_1_1_4/chp_1_1_4_1/default.asp&selectedNode=chp_1_1_4_1;

¹⁰² See Joint Industry Plan; Order Approving the Tenth Amendment to the National Market System Plan to Address Extraordinary Market Volatility, Exchange Act Release No. 77679, File No. 4-631 2 (Apr. 21, 2016) <https://www.sec.gov/rules/sro/nms/2016/34-77679.pdf>.

Volatility Controls: Summary Chart

Jurisdiction	Existing Volatility Controls		
	Market-wide Circuit-breakers	Stock-specific Circuit-breakers	Broker-dealer Kill Switches
European Union	Not required, not adopted by LSE, Euronext or Deutsche Bourse	On all exchanges and other venues, triggered by a significant price movement during a short time period as determined by the venue's predetermined methodology	Required by regulators of algorithmic traders
Hong Kong	Not required, none exist	On HKEx, triggered by 10% price fluctuations within a specified time period	Required by HKEx of electronic traders
Japan	Not required, none exist	On TSE, triggered by price fluctuations in fixed yen values that increase in rough proportion to the absolute price of a stock	Not required
Mainland China	Not required, none exist	On SSE and SZSE, triggered by 10% price fluctuations within a specified period	Not required
United States	Required, triggered by pre-set one-day price declines in the S&P 500	On all exchanges, triggered by one-day price fluctuations that vary based on the price and liquidity of the stock	Not required

2 Regulation of Equity Market Structure in China: Mainland

a. Regulatory framework

The China Securities Regulatory Commission (“**CSRC**”) regulates stock exchanges according to authorities established in the Securities Law (passed in 1998, and subsequently amended)¹⁰³ and regulations set forth in the CSRC’s Measures for the Administration of Stock Exchanges (last amended in 2017):¹⁰⁴

The establishment or dissolution of a stock exchange is a decision taken by the State Council (the chief administrative authority of the People’s Republic of China). Article 102 of the Securities Law and articles 6 and 9 of the Measures for the Administration of Stock Exchanges require applications for approval to be examined and verified by the CSRC before the State Council makes a decision.¹⁰⁵

Stock exchanges and NEEQ¹⁰⁶ must obtain the CSRC approval to propose or amend their rules and regulations on listing, trading, and member management.¹⁰⁷ Further, the CSRC can require stock exchanges and NEEQ to amend their constitutions or business rules as appropriate.¹⁰⁸

CSRC is responsible for the supervision of exchanges and NEEQ to ensure market fairness and integrity, as well as the transparent trading of securities and the protection of investors’ interests.¹⁰⁹ To that end, the general manager of a stock exchange is appointed by and dismissed by the CSRC.¹¹⁰

¹⁰³ Securities Law of the People’s Republic of China (Mar. 16, 2007) <http://english.mofcom.gov.cn/article/policyrelease/internationalpolicy/200703/20070304466356.shtml>.

¹⁰⁴ CHINA SECURITIES REGULATORY COMMISSION, *Stock Exchange Management* (Nov. 17, 2017), http://www.csrc.gov.cn/pub/newsite/flb/flfg/bmgz/scjy/201805/t20180515_338140.html (link in Chinese); <https://www.leetsai.com/capital-markets/measures-for-the-administration-of-stock-exchanges-mainland-china> (more information available in English)

¹⁰⁵ <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf> (p. 278)

¹⁰⁶ The National Equities Exchange and Quotations Co., Ltd. (NEEQ, or The New Third Board) was launched in 2012 and serves as a trading system for shares of public companies not listed on the Shanghai or Shenzhen stock exchanges. The details of the regulation of the NEEQ are described later in this report. NEEQ is not an exchange established according to the Securities Act.

¹⁰⁷ Articles 103 and 118 of the Securities Law, Article 15 of the Measures, and Articles 15 to 19 of the Interim Measures for the Administration of National Equities Exchange and Quotations Co., Ltd. (NEEQ Interim Measures) See <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf> (p. 279)

¹⁰⁸ See *id.* Section 89 of the Measures.

¹⁰⁹ Article 10 of the Measures. See *id.* at 279-280. See also CSRC, Interim Measures for the Administration of National SME Share Transfer System Co., Ltd., February 2, 2013.

¹¹⁰ *Id.* Article 107 of the Securities Law. The same is the case for the general manager of NEEQ. *Id.*

b. Trading venues

Stock exchanges and other trading systems

There are currently two stock exchanges for publicly-listed stocks in Mainland China, the Shanghai Stock Exchange and the Shenzhen Stock Exchange, each formed as membership organizations supervised by the CSRC.¹¹¹ The two stock exchanges were established in 1990 and there have been no applications to establish a new stock exchange since then.¹¹²

The Shanghai Stock Exchange has two boards, the main board and the STAR Board. On the main board, 1,464 companies are listed, including 1,457 companies with A-Shares¹¹³ and 51 with B-Shares¹¹⁴ with a total market capitalization of 33.7 trillion RMB (as of March 2019).¹¹⁵ Listing requirements for the main board require at least 3-years of profitability and profit of more than 30 million RMB in the past years.¹¹⁶ The STAR Board was launched in July 2019 and lists 29 companies (as of mid-2019).¹¹⁷ As explained in greater depth below, its listing standards allow non-profitable and low-revenue companies to be listed under certain circumstances.

The Shenzhen Stock Exchange has three boards and over 2,000 companies are listed, with total capitalization of 23.7 trillion RMB.¹¹⁸ The three boards are: 1) the main board (463 A-share companies and 48 B-share companies); 2) SME Board (931 companies); and 3) ChiNext Board (749 companies).¹¹⁹ Listing requirements for the main board and the SME Board are the same as the listing requirements of Shanghai Stock Exchange. The ChiNext Board only requires 1-2 years of profitability (and may be lowered further).¹²⁰

¹¹¹ James Chen, *Shanghai Stock Exchange* (May 4, 2018) <https://www.investopedia.com/terms/s/shanghai-stock-exchange.asp> ("The Shanghai Stock Exchange (SSE) is... a nonprofit organization run by the China Securities Regulatory Commission (CSRC)."); SHENZHEN STOCK EXCHANGE, *About: Overview* (last visited Apr. 12, 2019) <http://www.szse.cn/English/about/overview/index.html> ("Shenzhen Stock Exchange (SZSE), established on 1st December, 1990, is a self-regulated legal entity under the supervision of China Securities Regulatory Commission (CSRC).")

¹¹² Commentary from Prof. Wang.

¹¹³ A-shares trading on the Shanghai and Shenzhen Exchange are RMB-denominated. Originally, A-shares were only accessible to domestic investors. Now, A-shares are accessible to foreign investors via the QFII/RQFII programs (launched in 2002 and 2011, respectively), Hong Kong-Shanghai Stock Connect (launched in 2014), and Hong Kong-Shenzhen Stock Connect (launched in 2016). See <http://english.sse.com.cn/investors/qfii/what/>; <http://english.sse.com.cn/investors/qfii/what/>; https://www.ftse.com/products/downloads/guide_to_chinese_share_classes.pdf. Some A-shares are also now accessible to foreign investors via the Shanghai-London Stock Connect. See <http://english.sse.com.cn/products/equities/slsc/introduction/>.

¹¹⁴ B-shares of Shanghai Exchange are USD-denominated, and were exclusively accessible to foreign investors at the early stages of Chinese stock market in the 1990s. B-shares of the Shenzhen Stock Exchange are HKD-denominated, and likewise were exclusively accessible to foreign investors in the 1990s. In 2001, B-shares became accessible to domestic investors, and in 2002, new B-shares stopped being issued. See *id.*; <http://blogs.reuters.com/georgechen/2011/04/28/what-happened-to-b-shares/>; <https://www.webcitation.org/5xWv8uVXa?url=http://www.lehman-law.com/resource-centre/faqs/securities/what-are-b-shares.html>.

¹¹⁵ <http://english.sse.com.cn/indices/publications/monthly/c/4758309.pdf> (p. 4)

¹¹⁶ <http://english.sse.com.cn/overseasinvestors/introduction/publications/sseinfrastructure/c/4405461.pdf> (p. 11)

¹¹⁷ <http://star.sse.com.cn/en/marketdata/overview/>

¹¹⁸ <http://www.szse.cn/English/siteMarketData/marketStatistics/overview/index.html> (accessed Apr. 7, 2019)

¹¹⁹ <http://www.szse.cn/English/siteMarketData/marketStatistics/securities/index.html> (accessed Apr. 7, 2019)

¹²⁰ <http://www.szse.cn/English/rules/siteRule/P020181124401754468452.pdf>; <http://www.chinadaily.com.cn/a/201812/19/WS5c199e13a3107d4c3a0018c5.html>.

The National Equities Exchange and Quotations Co., Ltd.¹²¹ (“**NEEQ**,” or The New Third Board) was launched in 2012 and serves as a trading system for shares of public companies not listed on the Shanghai or Shenzhen stock exchanges.¹²² As of December 2018, the NEEQ listed 10,691 companies, with a total market capitalization of 3.45 trillion RMB.¹²³ NEEQ is directly regulated and supervised by the CSRC.

NEEQ-traded stocks are only accessible to Qualified Investors (two years of experience in securities investing and 5 million RMB worth of securities in assets¹²⁴). Companies primarily trade on the NEEQ if they have been delisted from one of the main exchanges (for violating one of the listing requirements) or if they do not satisfy them in the first place (for example, early stage companies). NEEQ is highly significant because it is a primary channel through which not-yet-profitable high-growth firms companies raise capital.¹²⁵ However, all NEEQ companies that wish to go public must first go through the same CSRC-administered registration process to be listed on the Shenzhen or Shanghai stock exchange.

In 2016,¹²⁶ the NEEQ introduced a two-tiered classification framework for the NEEQ that splits companies listed on NEEQ into two categories of companies: (1) basic level; and (2) innovation level, resulting in two tiers of NEEQ listing requirements.¹²⁷ As of September 26, 2019, there were 8,556 “basic” level companies and 686 “innovation level” companies.¹²⁸

NEEQ listing requirements for basic level companies include: (1) “be lawfully established”; (2) have a “well-defined business plan,” “good corporate governance,” “a legitimate business”, and “clear equity structure”; (3) conduct issuance and transfer of shares in accordance with the law; 4) “be

¹²¹ NEEQ is not an exchange established according to the Securities Act and does not trade securities listed on SSE or SZSE. Because we are focusing on publicly-listed securities, we will only focus the two exchanges in China (SSE and SZSE). NEEQ’s shareholders are: 1) Shanghai Stock Exchange; 2) Shenzhen Stock Exchange; 3) China Securities Depository and Clearing Corporation, 4) China Financial Futures Exchange; 5) Shanghai Futures Exchange; 6) Zhengzhou Commodity Exchange; and 7) Dalian Commodity Exchange.

¹²² NATIONAL EQUITIES EXCHANGE & QUOTATIONS, *Introduction* (last accessed Sept. 26, 2019), http://www.neeq.com.cn/en/services/investors_home/brief_intro.html (“Companies thereon are non-listed public companies whose shareholders may be more than 200 people and shares can be transferred openly.”); WORLD BANK, *People’s Republic of China, Financial Sector Assessment Program: Detailed Assessment of Observance 12* (Oct. 2017), <http://documents.worldbank.org/curated/en/860161518601604502/pdf/DAR-Securities.pdf>.

¹²³ http://www.neeq.com.cn/uploads/1/file/public/201901/20190102174019_iqq4hro9ua.docx

¹²⁴ NATIONAL EQUITIES EXCHANGE & QUOTATIONS, *Rules for Investor Suitability Management on the National Equities Exchange and Quotations* (July 1, 2017), http://www.neeq.com.cn/uploads/3/file/public/201906/20190611152558_0eifqr72i8.pdf. See also BLOOMBERG, *China’s Third Stock Exchange Readies for Shanghai-Style Trading* (Jan. 9, 2018), <https://www.bloomberg.com/news/articles/2018-01-09/china-s-third-stock-exchange-readies-for-shanghai-style-trading>

¹²⁵ Ren-En Lim, *Reviewing recent developments in China’s capital markets and assessing the relevance of the Proposed Shanghai International Board*, 12(1) CAPITAL MARKETS LAW JOURNAL 78 (Jan. 6, 2017), <https://academic.oup.com/cmlj/article/12/1/78/2856486>.

¹²⁶ SOUTH CHINA MORNING POST, *China’s ‘third board’ emerges as threat to Hong Kong’s IPO market* (June 1, 2016), <https://www.scmp.com/business/companies/article/1961549/chinas-third-board-emerges-threat-hong-kongs-ipo-market>

¹²⁷ http://www.neeq.com.cn/uploads/1/file/public/201712/20171222185359_732ofg48kx.docx

¹²⁸ NATIONAL EQUITIES & QUOTATIONS, *Regular Statistics* (last accessed September 26, 2019), <http://www.neeq.com.cn/static/statisticdata.html>.

recommended and supervised by a legitimate brokerage”; and (5) “exist for two or more years.”¹²⁹ There are not quantitative thresholds, such as minimum book value or profitability requirements. To be listed as an innovation level company requires meeting all of the criteria above, and also meeting one of three additional requirements related to profitability, liquidity, or the ability of the company to grow.¹³⁰

There are also approximately 40 regional stock trading platforms that serve as OTC markets for companies within the region of the platform. According to the World Bank:

“Companies trading on these platforms cannot engage in a public offering of securities; they are only allowed to sell their securities to qualified investors through a private placement. Thus, as per the definition of public offering, they cannot have more than 200 shareholders. Secondary market trading also is restricted to qualified investors. As per recent guidance issued by the [State Council] such investors must be institutional investors or individuals with more than 500,000 RMB in financial assets. Trading mechanisms vary; but pursuant to the [State Council] instruments no trading platform may establish a market-making system or provide a continuous auction or electronic matching capability, and a lapse of 5 days must take place between the moment that an investor buys a securities and the moment in which he/she sells it.”¹³¹

The size of these regional exchanges can be quite large – for example, Shenzhen’s regionally-administered exchange has a market cap of 416 billion RMB and has more companies listed (13,589) than NEEQ (~10,500).¹³² According to researchers at Tsinghua University, “Ventures can apply online and, if accepted, provide whatever company information they choose and can offer shares at a price they set.”

In November 2018, PRC President Xi Jinping announced Shanghai Stock Exchange plans to create a technology-focused trading board with more lenient trading regulations.¹³³ Subsequently, in July 2019, the Shanghai Stock Exchange launched its technology-focused STAR Board with 25 listed companies.¹³⁴ Notable regulatory characteristics of the STAR Board that differ from the SSE’s main board include:

¹²⁹ Jake Liddle, *The NEEQ: A Stock Market for SMEs in China*, CHINA BRIEFING (June 8, 2017), <https://www.china-briefing.com/news/neeq-chinas-new-stock-market-smes/>

¹³⁰ Administrative Measures for the Hierarchical Management of Companies Listed on the National Equities Exchange and Quotations for Trial Implementation (cited in https://www.burenlegal.com/sites/default/files/usercontent/content-files/NEEQ_Special_Buren_2017.pdf) Listing requirements of “innovation level” are elaborated in Article 6. http://www.neeq.com.cn/uploads/1/file/public/201712/20171222185359_732ofg48kx.docx

¹³¹ WORLD BANK, *People’s Republic of China, Financial Sector Assessment Program: Detailed Assessment of Observance* 12-13 (Oct. 2017), <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf>.

¹³² SHENZHEN QIANHAI EQUITY EXCHANGE, *Home Page*, <https://www.qhee.com/>.

¹³³ http://star.sse.com.cn/star/en/infodisclosure/newsrelease/c/c_20190711_4860930.shtml

¹³⁴ SHANGHAI STOCK EXCHANGE, *The First Batch of 25 Companies Debuts on the SSE STAR Market* (July 22, 2019), <http://english.sse.com.cn/aboutsse/news/newsrelease/c/4867619.shtml>; Shen Hong, *Stocks Surge on First Day for China’s Latest Answer to Nasdaq*, THE WALL STREET JOURNAL (July 22, 2019), <https://www.wsj.com/articles/stocks-surge-on-chinas-new-nasdaq-like-market-11563772327>.

- A much less stringent IPO application process that resembles a disclosure-oriented, registration-based process, although the CSRC can still intervene to reject SSE-approved listings.¹³⁵
- Allowing unprofitable companies to go public, as long as those companies exceed certain market capitalization thresholds and also meet certain revenue levels, exceed R&D investment thresholds, focus on certain government-approved businesses/products, and/or meet other SSE-set criteria.¹³⁶
- No price limit for the trading of a stock during the first five trading days it is listed on the STAR Board and a daily price up/down limit of 20% for the stock beginning on the sixth trading day after its listing¹³⁷ (compared with 44% on the first day and 10% on subsequent days for SSE and SZSE listed companies¹³⁸).
- Requiring that STAR Board market participants have at least: 1) a securities and funds account daily average balance of no less than RMB 500,000 (excluding funds and securities acquired via margin financing or securities lending) for 20 trading days prior to applying to trade STAR Board-listed securities; and 2) already participated in securities trading for over 24 months.¹³⁹ According to one report, there are approximately 3 million current A-share individual account holders who meet the 500,000 RMB threshold.¹⁴⁰

Exchange trading systems

Securities trading on the exchanges is conducted via *call auction* or *continuous auction*, two different types of order-driven markets. Call auction refers to the process of one-time centralized

¹³⁵ SHANGHAI STOCK EXCHANGE, *Rules Governing the Listing of Stocks on the Science and Technology Innovation Board of Shanghai Stock Exchange* (2019) (English version), 1.3 & 2.1.1, <http://star.sse.com.cn/star/en/regulation/c/4863743.docx>. See also SHANGHAI STOCK EXCHANGE, *SSE STAR Board stock listing rules* (revised April 2019) (上海证券交易所科创板股票上市规则(2019年4月修订)), 1.3 & 2.1.1 <http://star.sse.com.cn/star/lawandrules/lawandrules/listing/a/20190718/624fc40327d2dce4a7bd26de94ae9221.doc> (link in Chinese). The CSRC has already begun to use this authority. See Shen Hong, *Regulator Wields First IPO Veto on China's New Tech Board*, WALL STREET JOURNAL (Sept. 2, 2019), <https://www.wsj.com/articles/regulator-wields-first-ipo-veto-on-chinas-new-tech-board-11567418856>

¹³⁶ SHANGHAI STOCK EXCHANGE, *Rules Governing the Listing of Stocks on the Science and Technology Innovation Board of Shanghai Stock Exchange* (2019) (English version), 2.1.2, <http://star.sse.com.cn/star/en/regulation/c/4863743.docx>. See also SHANGHAI STOCK EXCHANGE, *SSE STAR Board stock listing rules* (revised April 2019) (上海证券交易所科创板股票上市规则(2019年4月修订)), 2.1.2 <http://star.sse.com.cn/star/lawandrules/lawandrules/listing/a/20190718/624fc40327d2dce4a7bd26de94ae9221.doc> (link in Chinese).

¹³⁷ SHANGHAI STOCK EXCHANGE, *Special Rules Governing the Trading of Stocks on the Science and Technology Innovation Board of Shanghai Stock Exchange* (2019), Article 18, <http://english.sse.com.cn/laws/framework/c/4866516.docx>. SHANGHAI STOCK EXCHANGE, Announcement of Essential SSE STAR Board Stock Trading Risk Provisions (上海证券交易所科创板股票交易风险揭示书必备条款), p. 3, <http://www.sse.com.cn/lawandrules/sserules/tib/trading/a/20190301/3519dc0272698f757db2d464c0622c0c.pdf> (link in Chinese).

¹³⁸ See *infra* notes 191-192 and accompanying text.

¹³⁹ SHANGHAI STOCK EXCHANGE, *Rules Governing the Trading of Stocks on the Science and Technology Innovation Board of Shanghai Stock Exchange*, Article 4, (last accessed Sept. 26, 2019), <http://star.sse.com.cn/star/en/regulation/c/4866547.docx>; SHANGHAI STOCK EXCHANGE, SSE STAR Board Special Regulations (上海证券交易所科创板股票交易特别规定), 1-2, <http://www.sse.com.cn/tib/marketrules/trading/a/20190302/3f9a97e01b70e73ac2325d506f4cc8a6.pdf> (link in Chinese).

¹⁴⁰ Zhang Yu and Leng Cheng, *China Speeds Final Rules For Start Of New High-Tech Board*, CAIXIN (Mar. 2, 2019) <https://www.caixinglobal.com/2019-03-02/china-speeds-final-rules-for-start-of-new-high-tech-board-101386432.html>.

matching of buy and sell orders accepted during a specified period, while continuous auction refers to the process of continuous matching of buy and sell orders on a one-by-one basis.¹⁴¹ Relevant rules and structures of the call auction and continuous auction processes are set forth below.¹⁴²

The trading systems of the two exchanges accept orders from their members between 9:15- 9:25 (opening call auction), 9:30- 11:30 and 13:00- 15:00 on each trading day.¹⁴³

- After a 9:15 to 9:25 opening call auction, the continuous auction begins, which runs from 9:30 to 11:30 and from 13:00 to 15:00, except for the securities whose trading is suspended and resumed during trading hours. The buy or sell orders which are not executed during the call auction are automatically entered into the continuous auction.
- From 14:57 to 15:00, a call auction is executed for the market closing.¹⁴⁴

During the *continuous auction*, orders are matched and executed based on the principles of *price priority* and *time priority*.¹⁴⁵ The principle of price priority means: “a priority is given to a higher [priced] buy order over a lower [priced] buy order and a priority is given to a lower [priced] sell order over a higher [priced] sell order.” The principle of time priority means: “for orders with the same bid price or offer price, a priority is given to the order placed earlier.”

The Exchanges and NEEQ have established block trading systems to facilitate large volume transactions.¹⁴⁶ Transactions above certain thresholds can be negotiated through an Exchange-administered negotiation system.

Compared with the Exchanges’ order-driven systems, the trading volume of the block trading system is very low. Across the Shenzhen and Shanghai stock markets, between February 2018 and February 2019, block trades represented less than 0.1% of the RMB volume of all trades.¹⁴⁷ Block trades are not included in the Exchange’s real-time quotations and index calculation. Upon the completion of block trades on each trading day, their trading volumes are added to the total turnover of relevant securities.¹⁴⁸ After the completion of block trades on each trading day, the Exchange will, in case of block trades of stocks or mutual funds, release the securities names, execution prices, trading volumes, and the names of brokerage branches involved.¹⁴⁹

¹⁴¹ Definitions from Shanghai Trading Rules, Chapter III, Section 5.

¹⁴² This text and sub-bullets below are largely provided by research staff and Professor Wang Xian, with citations added by R. Greene as possible.

¹⁴³ Trading Rules, Chapter II, 2.4 & Chapter III, 3.3 (Shenzhen) / Chapter III, 3.4 (Shanghai).

¹⁴⁴ SHANGHAI STOCK EXCHANGE, *Adjusted Market-closing Trading Mechanism to Come into Effect on Aug. 20* (Aug. 6, 2018), <http://2016en.sse.com.cn/aboutsse/news/newsrelease/c/4610156.shtml>.

¹⁴⁵ Trading Rules, Chapter III, 3.6 (Shanghai) / 3.5 (Shenzhen):

¹⁴⁶ Trading Rules, Section III, 3.7 (Shanghai) & 3.6 (Shenzhen); NEEQ Trading Rules, Articles 30, 73, 77, and 79, <http://www.neeq.com.cn/m/notice/200003539.html>

¹⁴⁷ Data provided via market source.

¹⁴⁸ Trading Rules, Chapter III, 3.7.6-7 (Shanghai) & 3.6.11-12 (Shenzhen).

¹⁴⁹ *Id.*

In 2012, Shanghai lowered the minimum quantity requirements for A-share block trades to 100,000 shares or 600,000 RMB from 500,000 shares or 3,000,000 RMB.¹⁵⁰ For Shenzhen, the minimum A-share block trade quantity is 300,000 shares and 2,000,000 RMB.¹⁵¹ In May 2017, the CSRC introduced rules increasing restrictions on block trading.¹⁵² According to the May 2017 rule change, “substantial shareholders are barred from selling their holdings through so-called block trades, in a manner that may ‘maliciously’ cause prices to plunge and hurt public confidence.”¹⁵³

Self-regulatory authority

The securities exchanges are self-regulatory organizations, which exercise real-time monitoring of unusual trading activities that may affect the trading price or trading volume of securities. The “**Trading Rules**”¹⁵⁴ established by the Shanghai and Shenzhen stock exchanges (the “**Exchanges**”) related to these responsibilities include:¹⁵⁵

- When an *Exchange member* or its branches discovers any investor involved in unusual trading activities -- as defined in the Exchanges’ Trading Rules – and believes such activity may seriously affect the order of the securities market, it shall “issue an alert and report to the Exchange in a timely manner.”¹⁵⁶
- In the event of unusual trading activities that have a serious effect on the price or trading volume of securities, the Exchange may conduct *on-site inspections* or *off-site inspections* and require relevant members and their involved branches to provide relevant information on involved investors.¹⁵⁷
 - Exchange members and investors shall coordinate with the Exchange in its inspections and provide relevant documents and information timely, truthfully, accurately, and completely.¹⁵⁸
 - In severe cases of unusual trading activities, the Exchange may take the following measures according to specific circumstances: (1) “oral or written warning”; (2) summoning the parties involved for a meeting; (3) “requiring relevant investors to

¹⁵⁰ *Reuters*, SHANGHAI EXCHANGE EASES BLOCK TRADE RESTRICTIONS (Mar. 13, 2012) <https://www.reuters.com/article/china-blocktrade-idUSL4E8EE0A920120314>.

¹⁵¹ <http://www.szse.cn/lawrules/index/rule/P020180605380740355263.pdf> (link in Chinese).

¹⁵² <http://www.sse.com.cn/lawandrules/regulations/csricannoun/c/4033057.pdf> (link in Chinese).

¹⁵³ <https://www.scmp.com/business/companies/article/2096004/chinese-regulator-tightens-rules-pace-substantial-sh-areholders> (citing http://www.csrc.gov.cn/pub/newsite/zjhxwfb/xwdd/201705/t20170527_317540.html (link in Chinese)); See also http://english.gov.cn/policies/latest_releases/2017/05/28/content_281475669274608.htm

¹⁵⁴ SHENZHEN STOCK EXCHANGE, *Trading Rules* (2016) <http://www.szse.cn/English/rules/siteRule/P020181124401737559498.pdf>; SHANGHAI STOCK EXCHANGE, *Trading Rules*, <http://english.sse.com.cn/tradmembership/rules/c/3977570.pdf>.

Note that throughout this document, while these English versions of the Shanghai and Shenzhen stock exchange Trading Rules are cited, the English versions of these rules may not technically reflect the most up-to-date rules (some moderate/minor changes may have not been incorporated). That said, in instances where these English versions of the relevant Trading Rules are cited, the text was generally agreed upon or provided by Prof. Wang Xian or colleagues.

¹⁵⁵ The sub-bullets below regarding the Trading Rules are provided by Professor Wang Xian, with citations added by R. Greene as possible.

¹⁵⁶ Trading Rules, Chapter VI, 6.5 (Shenzhen) / 6.2 (Shanghai):

¹⁵⁷ Trading Rules, Chapter VI, 6.6-7 (Shenzhen) / 6.3 (Shanghai)

¹⁵⁸ Trading Rules, Chapter VI, 6.7 (Shenzhen) / 6.4 (Shanghai)

provide a written commitment”; and (4) “restricting trading under relevant securities accounts”; and (5) reporting the matter to the CSRC.¹⁵⁹ Shanghai Trading Rules specifically mention the following two CSRC-related measures: (1) “applying with the CSRC for freezing relevant securities accounts or cash accounts”; and (2) “filing with the CSRC for investigation and punishment.”

- If an Exchange member violates any of the Trading Rules, the Exchange will order the member to make rectification and may, depending on seriousness of the circumstances, impose one or several of the following penalties: (1) “circulating a notice of criticism among members”; (2) “publishing a public censure in CSRC-designated media”; (3) “suspending or restricting trading”; (4) “revoking trading qualification”; or/and (5) “canceling membership.”¹⁶⁰

Alternative trading venues

According to the Securities Law, the trading of the shares of companies listed on an Exchange must take place within that Exchange. As a result, “securities traded on [Mainland] China’s stock exchanges are not cross-listed and trade on one exchange only.”¹⁶¹

Article 39 of the Securities Law provides that “Shares, corporate bonds and other securities publicly issued pursuant to law shall be listed for trading on lawfully established stock exchanges, or transferred at other securities trading sites approved by the State Council.”¹⁶² No other trading sites have been approved by the State Council.¹⁶³

As a result, there are no alternative trading venues. As reported in February 2019 IOSCO research, Mainland China does not allow dark pools¹⁶⁴ and as further confirmed by MIT and NYU economists: “there are no dark pools with hidden orders in [Mainland] China, all orders are visible.”¹⁶⁵

Trading fees

The CSRC and the National Development and Reform Commission jointly determine member trading fees at stock exchanges; Mainland China is unique in giving regulators express authority to set the trading fees to be charged by trading venues.¹⁶⁶ Brokers compete freely with each other to attract potential clients by offering competitive trading fees.

¹⁵⁹ Trading Rules, Chapter VI, 6.8 (Shenzhen) / 6.5 (Shanghai)

¹⁶⁰ Trading Rules X, 10.1 Shanghai, Shenzhen Member Management Rules 12.1

¹⁶¹ THE WORLD BANK, *People’s Republic of China: Financial Assessment Program: Detailed Assessment of Observance*, 279 (Oct. 2017), <http://documents.worldbank.org/curated/en/363291512541399092/pdf/121861-WP-P157065-PUBLIC-ADD-FSAP-SERIES-Financial-Sector-Assessment-Program-FSAP-China-FSAP-2017-DAR-IOSCO.pdf>.

¹⁶² Article 11 of the Stock Connect Rules has a parallel provision which prohibits securities trading service companies, securities companies and brokers from independently matching orders or providing transfer services outside stock exchanges for stocks traded via the stock connect.

¹⁶³ SECURITIES LAW OF THE PEOPLE’S REPUBLIC OF CHINA, 11 (Jan. 1, 2006), <https://www.accaglobal.com/content/dam/acca/global/pdf/ChinaSecuritiesLaw2006.pdf>.

¹⁶⁴ IOSCO, *IOSCO Standards Implementation Monitoring (ISIM) on Secondary and Other Market Principles*, 19 (Feb. 2019), <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD623.pdf>.

¹⁶⁵ <http://english.cqgsb.edu.cn/sites/default/files/files/Carpenter%20Lu%20Whitelaw%202015%20-%20The%20Real%20Value%20of%20China%27s%20Stock%20Market.pdf> (p. 5)

¹⁶⁶ [http://www.csrf.gov.cn/pub/csrf_en/affairs/AffairsIOSCO/201402/P020140213529122654245.pdf](http://www.csrc.gov.cn/pub/csrf_en/affairs/AffairsIOSCO/201402/P020140213529122654245.pdf).

The CSRC has stated (in connection with a cut to trading fees) that fee schedules are determined in part by reference to market size and environment, with the aim of utilizing them for the development of markets and market infrastructure.¹⁶⁷

Market data

The Exchanges “will disseminate real-time quotations, indices, public information and other trading information in respect of securities trading on each trading day.”¹⁶⁸

The Exchanges each disseminate this data through wholly-owned subsidiaries, which offer three tiers of data access: (1) Level-1 real-time market data released through the subsidiary’s broadband broadcasting satellite system or the subsidiary’s internet service; (2) Delayed Level-1 market data transferred via the subsidiary’s internet service; and (3) Real-time Level-2 market data transferred via the subsidiary’s private network.¹⁶⁹

Level-1 data includes real-time information on the top five buy and sell offers for each stock.¹⁷⁰ Level-2 data includes the best 10 buy and sell orders for each stock. Exchange members receive free access to Level-1 data. Non-members can purchase Level-1 data real-time or delayed from the Exchange at market prices set by the Exchange.

In 2006, the Shanghai Stock Exchange began to provide Level-2 market data through its subsidiary,¹⁷¹ and now charges members or third parties seeking to purchase this data an annual market price. The Shenzhen Stock Exchange also charges for Level-2 data fee service. The CSRC does not regulate the price of Level-2 market data.

c. Best execution

The brokerage businesses of securities firms are (i) regulated by the CSRC and (ii) subject to the Exchange’s Trading Rules. In accordance with applicable CSRC rules¹⁷² and Exchange Trading Rules, securities companies must treat their clients fairly.¹⁷³ Other notable rules and restrictions include:

¹⁶⁷ http://www.csrc.gov.cn/pub/csrc_en/newsfacts/release/201205/t20120508_209698.html.

¹⁶⁸ Trading Rule, Chapter V, 5.1.1:

¹⁶⁹ <http://english.sse.com.cn/indices/statistics/vendors/>; <http://www.szse.cn/English/services/dataServices/index.html>

Data Price list on SSE:

Level-1 <https://ic.sseinfo.com/doc/price/level-1-price.pdf>

Level-2 <https://ic.sseinfo.com/doc/price/level-2-price.pdf>

Data Price list on SZSE:

Level-1 <http://www.cninfo.com.cn/fwsq/hq/sfbz.htm>

Level-2 <http://www.cninfo.com.cn/fwsq/hq/sfbz-2.htm>

¹⁷⁰ See Trading Rules, Chapter V, 5.2 for other data fields available in real-time.

¹⁷¹ http://english.sse.com.cn/aboutsse/sseoverview/historical/c/c_20151201_4017781.shtml

¹⁷² http://www.csrc.gov.cn/pub/zjhpublic/zjh/200804/t20080418_14475.htm (link in Chinese)

¹⁷³ This text and sub-bullets below are largely provided by Professor Wang Xian, with citations added by R. Greene as possible.

- The brokers may not conduct internalized trades. Every order a broker receives must be routed to the relevant exchange according to the instruction of the clients.¹⁷⁴
- During the continuous auction, the Exchanges must disclose to Exchange members in real-time the five lowest offer prices and five highest bid prices (and respective quantities) for listed securities¹⁷⁵ – this disclosure requirement is for transparency and also for the clients to supervise the operation of their broker.¹⁷⁶
- If the client suspects that their order is not receiving the best available price, then they can lodge a complaint with the Exchange or the CSRC. If, after the investigation, it is determined that a broker did not route a client's order to the Exchange in a timely manner, then the Exchange will deal with the infraction in the event only its rules were broken, or if CSRC rules are broken, then the CSRC will deal with the infraction.¹⁷⁷

A securities firm cannot match the orders of its clients, and it must submit the orders of clients to an exchange in a timely manner and in the same order that a member received them from a client.¹⁷⁸ Order-routing proceeds as follows:

- Upon the acceptance of an investor's instruction, the broker shall place an order with the Exchange as instructed and "assume corresponding trading and settlement obligations."¹⁷⁹
- The broker shall route orders on a timely basis to the Exchange trading system. Client orders need to be time stamped when entering the order routing system of the securities firm, and a timestamp is also required when the order arrives at the exchange.¹⁸⁰
- After an order is matched by the trading system of the exchange, the Exchange must send a trade record to the member in real time.¹⁸¹
- Exchange participants "shall keep under safe custody the records of their clients' orders and their order routing activities."¹⁸²

d. Tick sizes

On the Shanghai and Shenzhen Stock Exchanges, the tick size for quotes and orders is RMB 0.01 for A-shares, RMB 0.001 for mutual funds shares, USD 0.001 for Shanghai-listed B shares, and HKD 0.01 for Shenzhen-listed B-shares.¹⁸³

¹⁷⁴ China Securities Law Article 39 and Article 145. See also Article 111-112. See English version here: <https://www.ac-caglobal.com/content/dam/acca/global/pdf/ChinaSecuritiesLaw2006.pdf> (p. 28) http://www.csrc.gov.cn/pub/newsite/flb/flfg/flxzsf/201312/t20131205_239325.html

¹⁷⁵ Exchange Trading Rules Chapter V, 5.2.

¹⁷⁶ Commentary from Prof. Wang (see FN 40).

¹⁷⁷ CHINA SECURITIES REGULATORY COMMISSION, *Regulations on Strengthening the Management of Securities Brokerage Business* (2010) http://www.csrc.gov.cn/pub/zjhpublic/G00306201/201004/t20100416_179385.htm?keywords. See also SHANGHAI STOCK EXCHANGE, *Trading Rules*, III, 3.6.5; SHENZHEN STOCK EXCHANGE, *Trading Rules* 3.5.4.

¹⁷⁸ Trading Rules, Chapter III, 3.1.1-2

¹⁷⁹ Trading Rules, Chapter III, 3.1.1.

¹⁸⁰ Trading Rules, Chapter III, 3.3.2 (Shenzhen) / 3.4.2 (Shanghai).

¹⁸¹ Trading Rules, Chapter III, 3.1.2

¹⁸² Trading Rules, Chapter III, 3.1.3

¹⁸³ Trading Rules Chapter III, 3.3.13 (Shenzhen) / 3.4.11 (Shanghai).

e. Algorithmic and high-frequency trading

Mainland China does not directly regulate either algorithmic trading or HFT. In the past ten years, mutual funds, securities companies and other professional investors have introduced algorithmic trading to generate and execute orders automatically. However, HFT is effectively absent from the stock market.¹⁸⁴

There are several structural barriers to HFT in Mainland China. The cost of trading in Mainland China is relatively high, which constrains HFT strategies that rely on executing a large volume of trades: trades on the Shanghai and Shenzhen Stock Exchanges incur stamp duties of 10 bps (paid by the seller) as well as other handling and regulatory fees (paid by both buyer and seller).¹⁸⁵ In addition, the latency offered by Mainland China's exchanges are also not considered fast enough for standard HFT strategies (price quotation refresh rates in Mainland China-listed securities typically range from 5 to 0.5 seconds).¹⁸⁶

Moreover, according to trading rules on both the Shanghai and Shenzhen Stock Exchanges, "[s]ecurities purchased by investors shall [generally] not be resold before settlement."¹⁸⁷ Accordingly, a stock that is bought on day T and settled the night of T, cannot be sold until day T+1. (The T+1 trading rule is the same for the NEEQ.¹⁸⁸) The T+1 rule is prohibitive to most HFT strategies, which involve high turnover and holding limited overnight inventories. Notably, the T+1 rule was not instituted to target HFT; it was implemented by the CSRC in the 1990s, well before the advent of HFT.

f. Volatility controls

The Exchanges impose a daily price limit on trading of stocks and mutual funds, with a daily price up/down limit of 10% for individual stocks and mutual funds and a daily price up/down limit of 5% for individual stocks under special treatment (ST shares or *ST shares) (generally defined as publicly listed firms that have reported negative profits for two years or more or that have a NAV below par value¹⁸⁹).¹⁹⁰

¹⁸⁴ See *China's Biggest Exchange Amps Up Trading Technology Systems*, Bloomberg News (July 19, 2016), available at <https://www.bloomberg.com/news/articles/2016-07-19/china-s-biggest-exchange-amps-up-trading-technology-systems>.

¹⁸⁵ See SHANGHAI STOCK EXCHANGE, *Fees and Taxes Charged or Collected by SSE* (2019), available at <http://english.sse.com.cn/tradmembership/tradingfees/> (accessed Sep. 19, 2019); SHENZHEN STOCK EXCHANGE, *Trading Fees* (2019), available at <http://www.szse.cn/English/services/trading/tradingFees/index.html> (accessed Sep. 19, 2019).

¹⁸⁶ See Hao Zhou and Petko S. Kalev, *Algorithmic and high frequency trading in Asia-Pacific, now and the future*, 53 *Pacific-Basin Finance Journal* 186, 193 (2019).

¹⁸⁷ Chapter III (Securities Trading), 3.1.4.

¹⁸⁸ NEEQ Trading Rules, Article 36.

¹⁸⁹ As explained by researchers examining the extent to which daily price limit rules may induce large investors to pursue a destructive trading strategy of pushing prices and then selling the next day, "While the ST status is announced by the exchange only after a firm formally releases its annual financial report, the market can well anticipate the ST assignment immediately after the firm reports its eighth consecutive negative quarterly earnings or a low net asset value, which is usually two or three months ahead of its annual report. During this interim period, the market anticipate that the firm will be eventually labeled as ST but its stock is still trading under the regular 10% price limits." <https://www.princeton.edu/~wxiong/papers/PriceLimit.pdf>

¹⁹⁰ Trading Rules, Chapter III, 3.4.13-14 (Shanghai) / 3.3.15-16 (Shenzhen)

The price limit does not apply to any of the following cases on the first trading day: (1) IPO shares or closed-end funds; (2) secondary issuances; (3) shares whose listing is resumed after suspension; or (4) other cases as recognized by the Exchange. With CSRC approval, Exchanges may adjust the daily price up/down limit.

For IPOs and listing resumptions, a stock's price may change by no more than +44% on its first day of trading relative to its offering price.¹⁹¹ In January 2019, Fang Xinghai, vice chairman of the CSRC was quoted saying that the CSRC "should review the first day trading cap for initial public offerings," and that "he personally [thinks] it should be removed."¹⁹²

In 2016, Shanghai/Shenzhen *market-wide* circuit breakers linked to the CSI 300 Index were removed.¹⁹³ The circuit breakers were intended to control dramatic fluctuations in the overall market, but the consensus is that they had the opposite effect: the circuit breakers triggered more panic-induced selling, as investors wanted to sell shares before the circuit breaker was triggered.¹⁹⁴

¹⁹¹ ASIFMA, *China's Capital Markets: Navigating the Road Ahead*, 23 (March 2017), <https://www.asifma.org/wp-content/uploads/2018/07/china-capital-markets-final-english-version.pdf>. See also SHANGHAI STOCK EXCHANGE, *Shanghai Stock Exchange adjusts the first day trading mechanism of new shares and related regulatory measures* (June 16, 2014), http://www.sse.com.cn/aboutus/mediacenter/hotandd/c/c_20150912_3988762.shtml. See also SHENZHEN STOCK EXCHANGE, *关于完善首次公开发行股票上市首日交易机制有关事项的通知* (June 13, 2014), http://www.szse.cn/lawrules/rule/tradetype/stock/t20140613_565183.html.

¹⁹² BLOOMBERG, *China Official Wants to Scrap First-Day Trading Cap for IPOs* (Jan. 13, 2019), <https://www.bloomberg.com/news/articles/2019-01-14/china-official-wants-to-scrap-first-day-trading-cap-for-ipos>.

¹⁹³ REUTERS, *China suspends market circuit breaker mechanism after stock market rout* (Jan. 7, 2016), <https://www.reuters.com/article/us-china-stocks/china-suspends-market-circuit-breaker-mechanism-after-stock-market-rout-idUSKBN0UL1RC20160107>.

¹⁹⁴ See Winston W. Chang, *Inner Workings of the Chinese Economy* (May 1, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2752030.

3 Regulation of Equity Market Structure in China: Hong Kong Special Administrative Region

a. Regulatory framework

The legal framework for securities trading in Hong Kong is set forth in the Securities and Futures Ordinance (“**SFO**”).¹⁹⁵ The SFO designates the Securities and Futures Commission (“**SFC**”) as the main authority responsible for the regulation and supervision of securities markets, and charges it with the development and the regulation of the securities and futures markets, as well as the management of systemic risk in such markets. The SFC is a statutory body, with a board of directors appointed by the Chief Executive of Hong Kong (“**CEHK**”) or by the Financial Secretary (“**FS**”) under delegated authority.¹⁹⁶

Under the SFO, the SFC has direct responsibility for: (a) licensing of all market participants; (b) monitoring market participants’ compliance with the SFO and subsidiary legislation, and SFC codes, and acting on non-compliance; (c) monitoring the market and acting on suspected market abuse and insider dealing; (d) monitoring issuers’ compliance with the obligation to disclose inside information and certain substantial shareholding and short positions and acting on non-compliance; (e) approving new exchange products through the rule approval process; and (f) monitoring exchanges’ compliance with obligations under the SFO.¹⁹⁷

Hong Kong Exchanges and Clearing Limited (“**HKEx**”) currently has a legal monopoly on operating a stock exchange in Hong Kong, though the SFC can authorize the operation of other stock exchanges. The HKEx also exercises regulatory responsibilities in connection with primary and secondary equity markets. The HKEx approves offering documents for equity issuers that seek to make a public offering, as well as for structured products (though the SFC has the power to object to HKEx’s decision). The HKEx also conducts market surveillance for purposes of ensuring fair and orderly trading, while the SFC monitors for market abuse and other unfair trading practices.¹⁹⁸

HKEx and its exchanges are responsible for: (a) evaluating applications for admission as an exchange participant; (b) monitoring compliance by market participants with exchange rules and acting on non-compliance; (c) admitting issuers to listing; (d) under delegated authority from the SFC, approving prospectuses and offer documents for listed equity securities; (e) monitoring compliance by issuers with listing rules and acting on noncompliance; (f) monitoring the market to ensure that trading is orderly.¹⁹⁹

¹⁹⁵ See Laws of Hong Kong, Chap. 571.

¹⁹⁶ See International Monetary Fund, Monetary and Capital Markets Department (IMF), People’s Republic of China—Hong Kong Special Administrative Region: IOSCO Objectives and Principles of Securities Regulation—Detailed Assessment of Observance, IMF Country Report No. 14/205, 9 (July 2014).

¹⁹⁷ See *id.* at 70.

¹⁹⁸ See *id.* at 9.

¹⁹⁹ See *id.* at 70-71.

Key definitions

<i>Algorithmic trading</i>	computer generated trading activities created by a predetermined set of rules aimed at delivering specific execution outcomes. ²⁰⁰
<i>Alternative liquidity pools or ALP</i>	electronic systems operated by a licensed or registered person through which the crossing/matching of orders involving listed or exchange traded securities is conducted with no pre-trade transparency, including systems designed and developed in-house or by a third-party service provider. ²⁰¹
<i>Automated trading services</i>	services provided by means of electronic facilities, not being facilities provided by a recognized exchange company or a recognized clearing house, whereby: (a) offers to sell or purchase securities or futures contracts or to enter into OTC derivatives transactions are regularly made or accepted in a way that forms or results in a binding transaction in accordance with established methods, including any method commonly used by a stock market or futures market; (b) persons are regularly introduced, or identified to other persons in order that they may negotiate or conclude, or with the reasonable expectation that they will negotiate or conclude sales or purchases of securities or futures contracts or OTC derivatives transactions in a way that forms or results in a binding transaction in accordance with established methods, including any method commonly used by a stock market or futures market; (c) transactions (i) referred to in paragraph (a); (ii) resulting from the activities referred to in paragraph (b); or (iii) effected on, or subject to the rules of, a stock market or futures market, may be novated, cleared, settled or guaranteed. Automated trading services do not include such services provided by a corporation operated by or on behalf of the government or any excluded services. ²⁰²
<i>Electronic trading</i>	trading of securities and futures contracts electronically and includes internet trading, direct market access and algorithmic trading. ²⁰³
<i>Exchange participant</i>	a person (a) who, in accordance with the rules of a recognized exchange company, may trade through that exchange company or on a recognized stock market or a recognized futures market operated by that exchange company; and (b) whose name is entered in a list, roll or register kept by that recognized exchange company as a person who may trade through that exchange company or on a recognized stock market or a recognized futures market operated by that exchange company. ²⁰⁴
<i>Licensed corporation or LC</i>	a corporation which is granted a license under the SFO to carry out regulated activities, including dealing in or advising on securities. ²⁰⁵

²⁰⁰ See SFC Code of Conduct, Section 18.2(a).

²⁰¹ See SFC Code of Conduct, Section 19.2(b).

²⁰² See SFO, Schedule 5, Part 2.

²⁰³ See SFC Code of Conduct, Section 18.2(d).

²⁰⁴ See SFO, Schedule 1, Part 1.

²⁰⁵ See SFO, Schedule 1, Part 1; Schedule 5, Part 1.

<i>Recognized exchange company</i>	a company recognized under the SFO as an exchange company authorized to operate a stock market or futures market. ²⁰⁶
<i>Recognized exchange controller</i>	a company recognized under the SFO as controller of a recognized exchange company. ²⁰⁷

b. Trading venues

Under the SFO, the only recognized exchange controller in Hong Kong is HKEx, which operates the only recognized exchange company, the Stock Exchange of Hong Kong Limited (“**SEHK**”).²⁰⁸ As of the end of March 2019, the SEHK had 2,346 listed companies with a total market capitalization of more than HK\$33.8 trillion.²⁰⁹

Off-exchange trading venues are permitted, but like exchanges they must be registered with and regulated by the SFC.²¹⁰ Hong Kong's statutory framework for off-exchange trading venues was introduced in 2003.²¹¹ In December 2015, after a series of enforcement actions related to automated trading services provided by large financial firms, the SFC issued new regulations governing the operation of alternative liquidity pools. In an April 2018 report on off-exchange trading, the SFC noted that turnover on automated trading services fluctuated between 1% and 1.7% of total securities market turnover between October 2016 and September 2017.²¹² Thus, the vast majority of trading in Hong Kong takes place on the SEHK.

Stock exchanges

The HKEx is the only recognized exchange controller under the SFO, and it owns and operates the SEHK, the only stock exchange in Hong Kong. The HKEx is a listed company on the SEHK, and the

²⁰⁶ See SFO, Schedule 1, Part 1.

²⁰⁷ See SFO, Schedule 1, Part 1.

²⁰⁸ SECURITIES AND FUTURES ORDINANCE, A1241, <https://www.sfc.hk/web/EN/pdf/laws/sfo/1/Ordinance/5%20of%202002.pdf> (“[T]he Stock Exchange Company... shall... be deemed to have been recognized as an exchange company.”).

²⁰⁹ https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/HKEX-Monthly-Market-Highlights?sc_lang=en.

²¹⁰ SECURITIES AND FUTURES COMMISSION, *Do you need a licence or registration?* (Feb. 11, 2019) <https://www.sfc.hk/web/EN/regulatory-functions/intermediaries/licensing/do-you-need-a-licence-or-registration.html#1>.

²¹¹ https://www.hksfa.org/upload/menu_content_detail/original/369866376630.pdf (p. 5) (“In Hong Kong, the concept of licensing those carrying on the business of providing ATS was first introduced when the SFO came into effect in 2003.”).

²¹² Securities and Futures Commission, Report on the Thematic Review of Alternative Liquidity Pools in Hong Kong, 4 (Apr. 9, 2018) [https://www.sfc.hk/web/EN/files/IS/publications/ALP%20Report%20\(EN\).pdf](https://www.sfc.hk/web/EN/files/IS/publications/ALP%20Report%20(EN).pdf). See also Gregor Stuart Hunter, *Hong Kong’s ‘Dark Pools’ Start to Dry Up After New Rules Rolled Out*, THE WALL STREET JOURNAL (Mar. 4, 2016) <https://www.wsj.com/articles/hong-kong-dark-pool-trading-volume-sinks-after-new-rules-rolled-out-1457095088> (“In February [2016], automated trading services—a catchall term that includes dark pools—generated turnover of just 15.9 billion Hong Kong dollars (US\$2 billion), representing just 1.3% of total market volume on the exchange and a record low in absolute terms”).

Government of Hong Kong retains more than 5 percent of the shares.²¹³ Under the SFO, the Financial Secretary (“**FS**”) has the power to appoint up to eight directors of HKEx.²¹⁴ The appointment of directors by the FS is considered necessary to ensure adequate reflection of public interest and interest of the investing public in decision making by the HKEx. The board of the SEHK is appointed by HKEx as its sole shareholder, but the approval of the SFC is required for the appointment of the chief executive of the SEHK.²¹⁵

The HKEx and the SEHK perform self-regulatory functions in the Hong Kong financial markets. Under the SFO, a *recognized exchange controller* must ensure an orderly, informed and fair market in securities traded on the stock market.²¹⁶ The SFO provides that a *recognized exchange company* must also ensure an orderly, informed and fair market in securities that are traded on that stock market or through the facilities of that company, weighing the interest of the public more heavily where it conflicts with the private interest of the recognized exchange company.²¹⁷

The SFO authorizes a recognized exchange company to make rules for the proper regulation and efficient operation of the market which it operates.²¹⁸ However, rules of recognized exchange companies and rule amendments only have effect once approved in writing by the SFC.²¹⁹ In addition, the SFC, after consulting the FS and the relevant exchange, can make statutory rules on a variety of matters relating to market activity, for example regarding the admission of exchange participants, that can preempt the rules of the exchange company.²²⁰ The SEHK has adopted trading rules that govern participation in its stock market.

Access to exchanges

An entity that wants to participate directly in trading equities listed on the SEHK must apply to become an exchange participant. The eligibility requirements and ongoing obligations of exchange participants are set out in the regulations of the SEHK. One of the eligibility criteria established by the SEHK is that exchange participants must be licensed corporations.²²¹

Trading information is disseminated directly to participants by the SEHK.²²² The SEHK rules provide that all participants may use the software provided by the exchanges, by vendors or developed in-house. Participants are free to choose trading devices which suit their business requirements and nature to access the trading systems. For example, the SEHK started offering co-location services in November 2012. All participants have equal opportunity to obtain co-location services, and among those participants who have trading systems at the co-location center, system access time and latency are equal.²²³

²¹³ See IMF, Hong Kong: IOSCO Objectives and Principles of Securities Regulation at 69.

²¹⁴ See SFO, Section 77.

²¹⁵ See SFO, Section 26.

²¹⁶ See SFO, Section 63(1).

²¹⁷ See SFO, Section 21(1).

²¹⁸ See SFO, Section 23(1).

²¹⁹ See SFO, Section 24.

²²⁰ See SFO, Section 36.

²²¹ See IMF, Hong Kong: IOSCO Objectives and Principles of Securities Regulation at 71.

²²² See *id.*

²²³ See *id.* at 204.

Trading fees

Fees imposed by recognized exchanges controllers (such as HKEx) and recognized exchanges companies (such as SEHK) must be specified in rules approved by SFC.²²⁴ In making its decision on fee rules, SFC must take into account the level of competition, if any, in Hong Kong for the matter for which the fee is to be imposed and the fees, if any, imposed by another recognized exchange controller or recognized exchange company or any similar entity outside Hong Kong for equivalent matters.²²⁵ The SFC does not permit tailored or negotiated fees.²²⁶

Each purchase and sale of securities on the SEHK incurs (i) a stamp duty imposed (0.1% of the value of the transaction, taxed to both the buyer and seller),²²⁷ (ii) an HKEx trading fee (0.005% of the price paid, charged to both the buyer and seller), (iii) an HKEx transaction levy (0.0027% of the price paid, charged to both buyer and seller), and (iv) an HKEx trading tariff (HK\$0.50 payable per transaction).²²⁸ According to June 2018 statements by HKEx CEO Charles Li, "HKEX is considering whether to ask the government to reduce or remove [the 0.1%] stamp duty" on both sides of a trade in an effort to increase trading volume.²²⁹ Notably, HKEX's fee structure does not discriminate between makers and takers of liquidity.²³⁰

Alternative trading venues

Hong Kong's regulation of off-exchange trading venues was introduced in 2003.²³¹ Pursuant to the SFO, only LCs holding a Type 7 authorization (for providing automated trading services)²³² and the registered persons of such authorized LCs can provide automated trading services ("ATS").²³³ ATS operators that trade securities listed on the SEHK must be generally licensed to

²²⁴ SFO, Section 76.

²²⁵ See SFO, Section 76.

²²⁶ See INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS, *Trading Fee Models and their Impact on Trading Behaviour* 15 (Dec. 2013) <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD430.pdf>.

²²⁷ Hong Kong Stamp Duty Ordinance (Cap 117) (July 1, 1981), <https://www.elegislation.gov.hk/hk/cap117>.

²²⁸ HONG KONG STOCK EXCHANGE, *Transaction: Securities (Hong Kong)* (Sept. 26, 2016) [https://www.hkex.com.hk/Services/Rules-and-Forms-and-Fees/Fees/Securities-\(Hong-Kong\)/Trading/Transaction?sc_lang=en](https://www.hkex.com.hk/Services/Rules-and-Forms-and-Fees/Fees/Securities-(Hong-Kong)/Trading/Transaction?sc_lang=en).

²²⁹ <https://www.bloomberg.com/news/articles/2018-01-08/hong-kong-eyes-new-trading-rules-adding-rebates-to-spur-volume>; <https://www.bloomberg.com/news/articles/2017-10-13/hong-kong-exchange-said-to-consider-asking-for-trading-tax-cut>.

²³⁰ Id. (drawing no distinction between liquidity makers and takers). See also DEUTSCHE BANK, *Global Market Structure: Guide to Global Equity Exchanges* (Feb. 2019) <https://www.autobahn.db.com/equity-market-guide/mktgd/exchanges.html>; INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS, *Trading Fee Models and their Impact on Trading Behaviour* 18 (Dec. 2013) <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD430.pdf> (excluding HKEx from the list of trading venues including standard or inverted maker-taker pricing as part of their fee model).

²³¹ https://www.hksfa.org/upload/menu_content_detail/original/369866376630.pdf (p. 5) ("In Hong Kong, the concept of licensing those carrying on the business of providing ATS was first introduced when the SFO came into effect in 2003.").

²³² See SFO, Schedule 5, <https://www.elegislation.gov.hk/hk/cap571>.

²³³ SECURITIES AND FUTURES COMMISSION, *Do you need a licence or registration?* (Feb. 11, 2019) <https://www.sfc.hk/web/EN/regulatory-functions/intermediaries/licensing/do-you-need-a-licence-or-registration.html#1>.

carry on the business of dealing in securities and specifically licensed to carry on the business of providing ATSS.²³⁴

There are no statutory obligations concerning pre- and post-trade transparency for ATS. In regard to post-trade transparency, pursuant to the trading rules of the HKEx all trades conducted through ATS must be reported to the HKEx within one minute after execution (other trades that are executed off-exchange must be reported within 15 minutes). This allows the HKEx (and vendors) to provide consolidated post-trade information.²³⁵

In December 2015, after a series of enforcement actions related to ATSS provided by large financial firms, the SFC issued new regulations governing the operation of alternative liquidity pools (“ALPs”). ALPs are electronic systems operated by broker-dealers through which the crossing or matching of orders (including the internalization of orders) is conducted anonymously without any pre-trade transparency (i.e., dark trading).²³⁶ The SFC has described ALPs as an electronic subset of ATS.²³⁷ Since they provide ATS, ALP operators are required to report and flag to the HKEX all transactions conducted on their ALPs within one minute after trade execution.²³⁸

Only institutional investors, including professional/experienced investors with a net worth of over HK\$40 million or an investment portfolio of at least HK\$8 million, are allowed to use ALPs.²³⁹ Notably, as of 2016 retail investors account for approximately 25 percent of trading value on the SEHK.²⁴⁰

c. Pre- and post-trade transparency

There is no explicit statutory requirement for exchanges to provide pre-trade transparency as to the best bid and ask quotations and market depth for stocks. However, the trading rules of the SEHK prohibit dark trading, so pre-trade transparency exists in practice.²⁴¹ In addition, **foreign** trading venues are prohibited by SEHK regulations from facilitating off-exchange dark trading of SEHK-listed stocks in Hong Kong.²⁴²

Likewise, there is no statutory requirement for post-trade transparency, but it is mandated by the trading rules of the SEHK. Post-trade information includes last traded price, day high, day low,

²³⁴ https://www.hksfa.org/upload/menu_content_detail/original/369866376630.pdf (p. 4)

²³⁵ See IMF, Hong Kong: IOSCO Objectives and Principles of Securities Regulation at 214.

²³⁶ Id.

²³⁷ Securities and Futures Commission, Consultation Paper Concerning the Regulation of Alternative Liquidity Pools, 4 (Feb. 27, 2014) <https://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=14CP3> (“ALPs are also known by other names such as electronic ‘alternative trading systems’ and, in Hong Kong, the operation of an ALP requires a broker-dealer operator to be licensed under the Securities and Futures Ordinance (SFO) to carry on the business of providing “automated trading services” (ATS).”).

²³⁸ <https://www.sfc.hk/edistributionWeb/gateway/EN/consultation/openFile?refNo=14CP3>

²³⁹ <http://hk-lawyer.org/content/enhancing-hong-kong%E2%80%99s-dark-pools-regime-will-benefit-industry-say-of-ficials>

²⁴⁰ https://www.hkex.com.hk/news/news-release/2017/170713news?sc_lang=en

²⁴¹ International Monetary Fund. Monetary and Capital Markets Department, People’s Republic of China–Hong Kong Special Administrative Region : Financial Sector Assessment Program-IOSCO Objectives and Principles of Securities Regulation-Detailed Assessment of Observance, Country Report No. 14/205, 212 (July 16, 2014).

²⁴² Email exchange with HKEx.

closing price and trading volume.²⁴³ Through HKEx-approved information vendors, investors can access live feeds and 15-minute delayed feeds including trade times, prices and quantities.²⁴⁴ In addition, HKEx also provides end-of-day trade data by security, including turnover by volume in HK dollars (HK\$).²⁴⁵ Further, SEHK rules apply post-trade transparency obligations to trades executed off exchange by exchange participants: off-exchange trades must be reported to the SEHK within 15 minutes after the conclusion of the transactions.²⁴⁶

d. Best execution

The best execution provision of the SFC's Code of Conduct requires licensed corporations ("**LCs**")²⁴⁷ acting for or with clients to "execute client orders on the best available terms."²⁴⁸ LCs are the Hong Kong-equivalent of U.S. broker-dealers.

In January 2018, the SFC issued a circular to licensed corporations on best execution.²⁴⁹ The circular emphasizes that "sufficient steps should be taken to obtain the best available terms when executing client orders, taking into account" factors such as (1) price, (2) cost, (3) speed of execution, (4) likelihood of execution, (5) speed of settlement, (6) likelihood of settlement, and (7) the size and nature of an order, noting that "the relative importance of each best execution factor may vary from case to case and best execution of certain types of instructions should be assessed against multiple factors."²⁵⁰ The circular also notes that "where a client has given specific instructions which cover one part or aspect of an order, this should not be treated as releasing LCs from their best execution obligations for other parts or aspects of the order."²⁵¹

The January 2018 circular on best execution emphasizes that "delivering best execution is fundamental to market integrity and protection of investors who rely on LCs to act in their best interests during the execution process."²⁵² Regarding the applicability of best execution, the January 2018

²⁴³ International Monetary Fund. Monetary and Capital Markets Department, People's Republic of China–Hong Kong Special Administrative Region : Financial Sector Assessment Program-IOSCO Objectives and Principles of Securities Regulation-Detailed Assessment of Observance, Country Report No. 14/205, 212-213 (July 16, 2014), <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Peoples-Republic-of-ChinaHong-Kong-Special-Administrative-Region-Financial-Sector-Assessment-41750>.

²⁴⁴ HONG KONG STOCK EXCHANGE, *Information Vendors List* (updated Aug. 31, 2019), https://www.hkex.com.hk/Services/Market-Data-Services/Real-Time-Data-Services/Data-Licensing/Market-Data-Vendor-Licence/Information-Vendors-List?sc_lang=en. HONG KONG STOCK EXCHANGE, *Market Data Services: Historical Data* (last accessed Oct. 2, 2019), <https://www.hkex.com.hk/eng/ods/historicalData.aspx#LC6oZm8xGDafsbCnRRE7Qg>.

²⁴⁵ HONG KONG STOCK EXCHANGE, *Market Data Securities Prices: Equities* (last accessed Sept. 21, 2019), https://www.hkex.com.hk/Market-Data/Securities-Prices/Equities?sc_lang=en&sort=0.

²⁴⁶ See IMF, Hong Kong: IOSCO Objectives and Principles of Securities Regulation at 212-13.

²⁴⁷ Those licensed by SFC under the Securities and Futures Ordinance.

²⁴⁸ SECURITIES AND FUTURES COMMISSION, *Code of Conduct for Persons Licensed by or Registered with the Securities and Futures Commission* (Nov. 25, 2018) <https://www.sfc.hk/web/EN/assets/components/codes/files-current/web/codes/code-of-conduct-for-persons-licensed-by-or-registered-with-the-securities-and-futures-commission/code-of-conduct-for-persons-licensed-by-or-registered-with-the-securities-and-futures-commission.pdf>.

²⁴⁹ <https://www.sfc.hk/edistributionWeb/gateway/EN/circular/doc?refNo=18EC7>

²⁵⁰ See id at 2.

²⁵¹ See id

²⁵² <https://www.sfc.hk/edistributionWeb/gateway/EN/circular/openAppendix?refNo=18EC7&appendix=0>

report explains that “when LCs enter into agency or back-to-back principal transactions with clients, the obligation to deliver best execution remains with LCs where clients rely on LCs to protect their interests in order execution.”²⁵³ The report also states that orders should be executed in the order that they are received.²⁵⁴

After a licensed corporation has effected a transaction on behalf of a client, it is required to promptly confirm the essential features of the transaction with the client (unless otherwise agreed to by the client in writing).²⁵⁵ Though the details of this requirement are not specified, the SFC has identified as a good practice the preparation of post-trade execution reports that compare the execution outcomes of client orders to benchmarks such as VWAP, to be provided to clients upon request.²⁵⁶

The SFC allows third party payments related to the routing or execution of trade orders, but mandates that “firms that exercise investment discretion on behalf of clients” should “only receive goods and services from a broker in relation to directing business to them if they benefit the client, the execution is consistent with the best execution standards, the client has consented in writing to the receipt of the goods and/ or services and disclosure on the firm’s practices for receiving the goods and/ or services is made to the client.”²⁵⁷ In addition, firms are required “to ensure that where conflicts of interest cannot be prevented, clients are nevertheless treated fairly”²⁵⁸ and to “disclose any material interest in a transaction that is a conflict of interest to clients.”²⁵⁹

²⁵³ Id.

²⁵⁴ Id.

²⁵⁵ See SFC Code of Conduct, 8.2(a).

²⁵⁶ See SFC, Report on the Thematic Review of Best Execution (January 30, 2018), at 5.

²⁵⁷ Code of Conduct, 13.1

²⁵⁸ Code of Conduct, General Principle 1

²⁵⁹ Code of Conduct, 10.1

e. Tick sizes

The table below highlights the minimum spread applicable for certain stocks that trade on the SEHK.²⁶⁰ The SFC must approve changes to these tick sizes. ALPs adopt their own tick size rules, often with reference to the tick sizes on exchanges.²⁶¹

Price of securities	Minimum spread
$0.01 \leq p < 0.25$	0.001
$0.25 < p \leq 0.5$	0.005
$0.5 < p \leq 10$	0.01
$10 < p \leq 20$	0.02
$20 < p \leq 100$	0.05
$100 < p \leq 200$	0.1
$200 < p \leq 500$	0.2
$500 < p \leq 1000$	0.5
$1000 < p \leq 2000$	1
$2000 < p \leq 5000$	2
$5000 < p \leq 9995$	5

f. Algorithmic and high-frequency trading

In January 2014, the SFC's Code of Conduct was updated to include new rules governing electronic trading. The new rules apply to firms already registered with or licensed by the SFC that engage in electronic trading, including internet-based trading as well as algorithmic trading.

The Code of Conduct requires that all firms engaged in electronic trading or operating electronic trading systems: (1) control and supervise orders; (2) manage and supervise the "design, development, deployment and operation of the electronic trading system"; and (3) ensure adequate se-

²⁶⁰ https://www.hkex.com.hk/Global/Exchange/FAQ/Securities-Market/Trading/Securities-Market-Operations?sc_lang=en.

²⁶¹ See, e.g., CREDIT SUISSE, *Asia Pacific Crossfinder User Guidelines* (2018) <https://www.credit-suisse.com/media/ib/docs/investment-banking/client-offering/crossfinder-user-guidelines-2018.pdf> ("Crossfinder internal Tick Size: Half of HKEx tick size"); MORGAN STANLEY HONG KONG SECURITIES LIMITED, *ALP Guidelines for MS POOL for the Hong Kong Market* (Mar. 2018) <https://www.morganstanley.com/institutional-sales/hkdp-guidelines-mspool-mar2018.pdf> ("MS POOL accepts orders at full or half the SEHK standard tick sizes.").

curity, reliability, and capacity, and keep detailed records of all aspects of the trading system including audit logs.²⁶² It also mandates that all electronic trading firms append risk disclosure statements to their client contracts,²⁶³ which include both generic and (if appropriate) specific disclosures as to the risks of electronic trading.²⁶⁴ This rule aims to facilitate, among other things, client understanding of the risks of the technologies employed by electronic trading firms.²⁶⁵

The Code of Conduct also has rules that are specific to algorithmic trading. Algorithmic traders must (1) “ensure that the algorithmic trading system and trading algorithms it uses or provides to clients... are adequately tested to ensure that they operate as designed” and (2) adopt risk management controls to preserve the integrity of its algorithms and ensure they “operate in the interest of the integrity of the market.”²⁶⁶ In addition, algorithmic trading systems must be tested at least once per year with adequate recordkeeping maintained for at least two years, and risk management controls must be put in place.²⁶⁷

In December 2016, the SFC issued a circular to firms engaged in algorithmic trading assessing overall compliance with the 2014 updates to the Code of Conduct.²⁶⁸ The circular highlighted five areas of compliance deficiency and need for improvement, including: (1) insufficient involvement from management and control functions regarding governance of algorithmic trading; (2) insufficient pre-trade controls; (3) inadequate due diligence of algorithmic trading systems provided by third-party providers; (4) lack of written contingency plans to cope with potential emergencies specific to algorithmic trading; and (5) absence of policies and procedures for testing algorithmic trading systems.²⁶⁹

The Code of Conduct does not include rules that apply specifically to HFT, though the general rules applicable to algorithmic trading would also apply to HFT. There are also structural barriers to the use of HFT strategies in Hong Kong equity markets. Stamp duties on the transfer of listed securities, as well as other transaction fees, precede the advent of HFT, but increase the cost of executing HFT strategies.²⁷⁰ The “tick rule”, which provides that a short sale order for a security cannot be made on the SEHK if it is below the security’s prevailing ask price, is also an impediment

²⁶² Code of Conduct, 18.1-18.6.

²⁶³ Code of Conduct, Schedule 1 (“The substance contained in the following risk disclosure statements is considered to be the minimum required. A licensed or registered person may elect to provide additional risk disclosure information as appropriate... The substance contained in the following declaration by staff and acknowledgement by client is considered to be the minimum required.”).

²⁶⁴ Code of Conduct, Schedule 1 (“If you undertake transactions on an electronic trading system, you will be exposed to risks associated with the system including the failure of hardware and software. The result of any system failure may be that your order is either not executed according to your instructions or is not executed at all.”).

²⁶⁵ Robert J. Kauffman, Yuzhou Hu and Dan Ma, Will high-frequency trading practices transform the financial markets in the Asia Pacific Region?, 1 Financial Innovations 1, 16 (2015).

²⁶⁶ Code of Conduct, 8.10-8.11.

²⁶⁷ Code of Conduct, Schedule 7, 3.2-3.4.

²⁶⁸ SECURITIES AND FUTURES COMMISSION, *Circular to all Licensed Corporations on Algorithmic Trading* (Dec. 13, 2016) <https://www.sfc.hk/edistributionWeb/gateway/EN/circular/intermediaries/supervision/doc?refNo=16EC67>.

²⁶⁹ SECURITIES AND FUTURES COMMISSION, *Circular to all Licensed Corporations on Algorithmic Trading* (Dec. 13, 2016) <https://www.sfc.hk/edistributionWeb/gateway/EN/circular/intermediaries/supervision/doc?refNo=16EC67>.

²⁷⁰ See the discussion of “Trading fees” in Section 3.b above. Because some of the transaction fees are charged on a per-trade basis on top of the standard volume basis, HFT strategies are disproportionately affected given their relatively small trade sizes.

to certain HFT strategies.²⁷¹ As such, HFT has historically represented a lower share of equity trading in Hong Kong than the United States and Japan (as of 2012, it represented 20 percent of equity trading volume).²⁷²

g. Volatility controls

In 2016, HKEx introduced a volatility control mechanism (“**VCM**”) for individual stocks to prevent “extreme price volatility arising from major trading errors and other unusual incidents.”²⁷³ The VCM is applicable to the index constituents of the Hang Seng Index (about fifty companies) and the Hang Seng China Enterprise Index (about eighty securities).²⁷⁴ These indices account for approximately two-thirds of the total market capitalization of the SEHK. The HKEx does not have a market-wide circuit breaker that halts trading of multiple stocks based on market-wide volatility.

The VCM is applicable to the HKEX’s entire continuous trading session, except for:²⁷⁵ the first 15 minutes of the morning and afternoon trading sessions; the first 15 minutes after a market re-opening; and the last 20 minutes of the afternoon trading session.

The VCM operates as follows: If the trading price of a stock to which the VCM applies changes by more than $\pm 10\%$ relative to the reference price (as defined by the price from 5 minutes earlier), a 5 minute cooling-off period will be triggered.²⁷⁶ During the cooling-off period, trading is restricted and must be within the trading band range of 10 percent above and below the cooling-off period reference price.²⁷⁷ Any order that exceeds this price band will be rejected by the exchange. In addition, the system will also cancel the highest-priced buy order in the buying queue (that is, where the buying price is higher than the price limit) or the lowest-priced sell order in the selling queue (that is, where the selling price is lower than the lower price limit).²⁷⁸ The VCM can be triggered at most once during SEHK’s morning trading session, and at most once during SEHK’s afternoon trading session. Normal trading resumes for the VCM-triggered stock after the cooling-off period. Once a cooling off period is triggered by the VCM, the market is notified of the activated price limits and time of VCM expiration.²⁷⁹

With respect to electronic trading, the SFC’s Code of Conduct requires licensed and registered firms to ensure that their electronic trading systems enable them to: “(a) immediately prevent the system from generating and sending orders to the market; and (b) cancel any unexecuted orders

²⁷¹ STOCK EXCHANGE OF HONG KONG, *Rules of the Exchange*, Schedule 11(15).

²⁷² Robert Kauffman, Yuzhou Hu and Dan Ma, *Will high-frequency trading practices transform the financial markets in the Asia Pacific Region?* (2015), <https://link.springer.com/content/pdf/10.1186%2Fs40854-015-0003-8.pdf>

²⁷³ <https://www.marketsmedia.com/hkex-roll-volatility-control-mechanism-securities-market/>

²⁷⁴ <https://www.marketsmedia.com/hkex-roll-volatility-control-mechanism-securities-market/>

²⁷⁵ https://www.hkex.com.hk/eng/market/sec_tradinfra/vcm_cas/Documents/VCM%20CAS%20Web%20Corner%20FAQ%20ENG.pdf (p. 13)

²⁷⁶ https://www.hkex.com.hk/eng/market/sec_tradinfra/vcm_cas/Documents/VCM%20CAS%20Web%20Corner%20FAQ%20ENG.pdf (p. 13)

²⁷⁷ <https://www.ft.com/content/17f3fba8-6828-11e6-ae5b-a7cc5dd5a28c>

²⁷⁸ HONG KONG EXCHANGE, *Frequently Asked Questions* (May 26, 2017), https://www.hkex.com.hk/eng/market/sec_tradinfra/vcm_cas/Documents/VCM%20CAS%20Web%20Corner%20FAQ%20ENG.pdf.

²⁷⁹ <https://www.mayerbrown.com/-/media/files/perspectives-events/publications/2015/07/hong-kong-to-introduce-volatility-control-mechanis/files/get-the-full-update/fileattachment/150723-hkgprc-corporatesecurities.pdf>

that are in the market.”²⁸⁰ This “kill-switch” functionality empowers firms to immediately halt their trading in the event of uncertainty, error or high volatility. Further, all entities trading on the Hong Kong Futures Automated Trading System (“**HKATS**,” operated by HKEx) are required to use the HKATS Risk Functions software, which among other things empowers users to execute mass order cancellation.²⁸¹

²⁸⁰ Code of Conduct, Schedule 7, 1.2.1.

²⁸¹ HONG KONG EXCHANGES AND CLEARING LIMITED, *HKATS Risk Functions User’s Guide* (June 2018) [https://www.hkex.com.hk/-/media/HKEX-Market/Services/Trading/Derivatives/Overview/Trading-Mechanism/Pre-Trade-Risk-Management-\(PTRM\)-System-in-Derivatives-Markets/HKATS_Risk_Functions_User_Guide.pdf?la=en](https://www.hkex.com.hk/-/media/HKEX-Market/Services/Trading/Derivatives/Overview/Trading-Mechanism/Pre-Trade-Risk-Management-(PTRM)-System-in-Derivatives-Markets/HKATS_Risk_Functions_User_Guide.pdf?la=en). See also HONG KONG EXCHANGES AND CLEARING LIMITED, *Information Paper: Pre-Trade Risk Management (PTRM) System in Derivatives Market* (June 2015) [https://www.hkex.com.hk/-/media/HKEX-Market/Services/Trading/Derivatives/Trading-Mechanism/Pre-Trade-Risk-Management-\(PTRM\)-System-in-Derivatives-Markets/Information-Paper/PTRM_Info_Paper.pdf](https://www.hkex.com.hk/-/media/HKEX-Market/Services/Trading/Derivatives/Trading-Mechanism/Pre-Trade-Risk-Management-(PTRM)-System-in-Derivatives-Markets/Information-Paper/PTRM_Info_Paper.pdf).

4 Regulation of Equity Market Structure in the European Union

a. Regulatory framework

MiFID 2, together with its predecessor MiFID 1, provides an overarching framework²⁸² for securities trading in the EU, covering financial instruments, investment firms (as entities who deal in/with financial instruments, similar to U.S. broker-dealers), and trading venues, including regulated markets (as places where financial instruments are dealt with, similar to U.S. stock exchanges).

Although MiFID 2 provides a general framework, there are regulatory differences amongst the EU Member States in relation to MiFID 2 implementation,²⁸³ because Member States²⁸⁴ have certain discretion as to how to implement EU Directives and EC Delegated Directives within the limits provided therein.²⁸⁵ Only EU Regulations apply automatically in the Member States from their effective date.²⁸⁶

The original MiFID, the Markets in Financial Instruments Directive,²⁸⁷ was finalized in 2004 and has been in force in the EU since November 2007. It strengthened **a single market** for investment services²⁸⁸ and activities in the EU (sometimes referred to as 'passporting')²⁸⁹ and **abolished the concentration rule** in which Member States of the EU could require investment firms to route clients' orders to domestic regulated markets, preventing competition between national exchanges and alternative trading venues.²⁹⁰

²⁸² MiFID II is in that respect similar to the original MiFID, but is wider in reach when it comes to, for example, the definition of 'trading venue', see Developments in Banking Law, Review of Banking & Financial Law, Vol. 37, footnote 39 on p. 609 (for more detail see World Bank Working Paper No. 184, 'Comparing European and US Securities Regulations (2010), p. 2).

²⁸³ For example, the UK and France have different views on research commissions, which may affect their implementation approaches, see <https://www.fnlonon.com/articles/five-ways-uk-and-french-differ-on-mifid-research-rules-20160930>.

²⁸⁴ Specifically, Member States designate "National Competent Authorities" to implement directives within their area of expertise. For example, the "National Competent Authority" for securities and markets in the United Kingdom is the Financial Conduct Authority. EUROPEAN SECURITIES AND MARKETS AUTHORITY, *Board of Supervisors and NCAs* (last accessed Aug. 14, 2019) <https://www.esma.europa.eu/about-esma/governance/board-supervisors-and-ncas>.

²⁸⁵ In the MiFID 2 case, that is the position with, for example, the research and execution payments unbundling provisions.

²⁸⁶ In the MiFID 2 case, that is the position with, for example, the double volume cap mechanism for certain dark trading in equities.

²⁸⁷ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments.

²⁸⁸ The single market for investment services was introduced in various steps. See, e.g., European Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) (Dec. 20, 1985) (facilitating the cross-border offerings of investment funds to retail investors); European Council Directive 93/22/EEC on investment services in the securities field (May 10, 1993) (introducing "passporting" for investment services).

²⁸⁹ In the EU, trading is fragmented across many execution venues. One can trade shares in one EU country, in relation to shares listed on an exchange in another EU country. So, for example, in London, one can trade on Turquoise, a multilateral trading facility (defined below), in securities from 18 European countries.

²⁹⁰ World Bank Working Paper No. 184, 'Comparing European and US Securities Regulations (2010), pp. 14 – 15.

The original MiFID has now been partly recast as the new Directive on Markets in Financial Instruments (“**MiFID 2**”),²⁹¹ and partly replaced²⁹² by the Regulation on Markets in Financial Instruments (“**MiFIR**”),²⁹³ with both the Directive and the Regulation having been in operation since 3 January 2018.²⁹⁴ These obligations have been further specified in the Commission Delegated Directive²⁹⁵ and the Commission Delegated Regulations,²⁹⁶ including technical standards adopted by the European Commission with input and advice from the European Securities and Markets Authority (“**ESMA**”).²⁹⁷ Collectively, we refer here to all these measures as “MiFID 2” (unless it is necessary to differentiate amongst the Directive, the Regulation, implementing or technical standards). The understanding of the MiFID 2 measures is aided by ESMA’s Guidelines and Q&A documents, which are ‘a practical convergence tool used to promote common supervisory approaches and practices’ across the EU and hence contribute to the EU Single Market.²⁹⁸

²⁹¹ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments.

²⁹² MiFID 2 Directive, Recital 7. This means that the effective acts are now the new (MiFID 2) Directive and the Regulation and not the original MiFID.

²⁹³ Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments.

²⁹⁴ The initial implementation date of 3 January 2017 was delayed to allow for the development of the necessary IT and other systems.

²⁹⁵ **Commission Delegated Directive (EU) 2017/593** of 7 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to safeguarding of financial instruments and funds belonging to clients, product governance obligations and the rules applicable to the provision or reception of fees, commissions or any monetary or non-monetary benefits.

²⁹⁶ (1) **Commission Delegated Regulation (EU) 2017/565** of 25 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council as regards organizational requirements and operating conditions for investment firms and defined terms for the purposes of the Directive; (2) **Commission Delegated Regulation (EU) 2017/575** of 8 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 concerning the data to be published by execution venues on the quality of execution of transactions; (3) **Commission Delegated Regulation (EU) 2017/576** of 8 June 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards for the annual publication by investment firms of information on the identity of execution venues and on the quality of execution.

²⁹⁷ For useful links, see ESMA Interactive Single Rulebook, available at <https://www.esma.europa.eu/rules-databases-library/interactive-single-rulebook-isrb>, FIA list of the implementing standards, at <https://fia.org/articles/mifid-ii-rts-published-eu-official-journal> or the UK’s Financial Conduct Authority’s list of MiFID technical standards at <https://www.fca.org.uk/publication/documents/technical-standards-under-mifid-ii-and-mifir.pdf>

²⁹⁸ ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), p. 16.

Key definitions

The definitions set out here are derived from Article 4 of MiFID 2, unless otherwise stated.

<i>Approved publication arrangement or APA</i>	a person authorised under MiFID 2 Directive to provide the service of publishing trade reports on behalf of investment firms. ²⁹⁹
<i>Approved reporting mechanism or ARM</i>	a person authorised under MiFID 2 to provide the service of reporting details of transactions to domestic competent authorities or ESMA on behalf of investment firms. ³⁰⁰
<i>Execution venues</i>	includes RMs, MTFs, OTFs, SIs, market makers and other liquidity providers. ³⁰¹ 'Other liquidity providers' are defined broadly, ³⁰² as including firms 'holding themselves out as being willing to deal on their own account and which provide liquidity as part of their normal business activity, whether or not they have formal agreements in place or commit to providing liquidity on a continuous basis'. ³⁰³ A firm that regularly and consistently provides liquidity in an instrument will be seen as meeting the definition. ³⁰⁴
<i>Investment firm</i>	any legal person ³⁰⁵ whose regular occupation or business is the provision of one or more investment services to third parties and/or the performance of one or more investment activities on a professional basis. ³⁰⁶ Investment firms must be authorized in their home Member State. ³⁰⁷ National Competent Authorities as designated by Member States keep registers of all authorized investment firms and authorized activities by those firms. ³⁰⁸
<i>Investment services and activities</i>	any of the following services in relation to a range of financial instruments: ³⁰⁹ (a) reception and transmission of orders; (b) execution of orders on behalf of clients; (c) dealing on own account; (d) portfolio management;

²⁹⁹ MiFID 2 Directive, Article 4(1)(52).

³⁰⁰ MiFID 2 Directive, Article 4(1)(54).

³⁰¹ Commission Delegated Regulation (EU) 2017/575 of 8 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 concerning the data to be published by execution venues on the quality of execution of transactions ('**RTS 27**'), Recital 2.

³⁰² RTS 27 at Recital 7.

³⁰³ MiFID 2 Directive, Recital 18.

³⁰⁴ ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', 28 March 2019, Section 1, Answer 18

³⁰⁵ It is possible for Member States, when implementing MiFID 2, to cover undertakings which are not legal persons, see Article 4 of the MiFID 2 Directive.

³⁰⁶ For organizational and other requirements, including provisions on conflict of interest, relevant to investment firms, see Commission Delegated Regulation (EU) 2017/565, Articles 21 – 76. On investor protection (including product governance obligations, and payments of fees, commissions or other inducements in connection with provision of investment advice or research), see Commission Delegated Directive (EU) 2017/593.

³⁰⁷ MiFID 2 Directive, Recital 37, Articles 5 and 6.

³⁰⁸ MiFID 2 Directive, Article 5(3).

³⁰⁹ Specified in Section C of Annex 1 to the MiFID2 Directive.

	(e) investment advice; ³¹⁰ (f) underwriting and/or placing of financial instruments on a firm commitment basis; (g) placing of financial instruments without a firm commitment basis; (h) operation of a multilateral trading facility; (i) operation of an organized trading facility. ³¹¹
<i>Market operator</i>	a person who manages or operates the business of a regulated market and may be the regulated market itself.
<i>Multilateral system</i>	any system or facility in which multiple third-party buying and selling trading interests in financial instruments are able to interact in the system.
<i>Multilateral trading facility or MTF</i>	a multilateral system, operated by an investment firm or a market operator, which brings together multiple ³¹² third-party buying and selling interests in financial instruments – in the system and in accordance with its non-discretionary rules – in a way that results in a contract in accordance with MiFID 2.
<i>Organised trading facility or OTF</i>	a new type of trading venue in Europe. It is a multilateral system, which is not a regulated market or an MTF, and in which multiple third-party buying and selling interests in bonds, structured finance products, emission allowances or derivatives are able to interact in the system in a way that results in a contract in accordance with MiFID 2. ³¹³ We do not focus on OTFs in this report as they are not used for equities trading.
<i>Regulated market or RM</i>	a multilateral system operated and/or managed by a market operator which brings together, or facilitates bringing together, multiple third-party buying and selling interests in financial instruments – in the system and in accordance with its non-discretionary rules – in a way that results in a contract, in respect of the financial instruments admitted to trading under its rules and/or systems, and which is authorized or functions regularly in accordance with the terms of MiFID 2. Regulated markets are the only trading venue on which a company can conduct its primary listing.
<i>Systematic internalisers or SIs</i>	a sub-category of investment firms. They deal, on an organized, frequent systematic and substantial basis, on their own account when executing client orders outside a regulated market, an MTF or an OTF. SIs are precluded from bringing together third party buying and selling interests in functionally the same way as a trading venue. ³¹⁴ They are subject to certain obligations, additional to those that already apply to investment firms, as further explained in this report.

³¹⁰ For further detail on what constitutes investment advice, see MiFID 2 Directive, Article 4(1)(4) and Commission Delegated Regulation 2017/565, Article 9.

³¹¹ MiFID 2 Directive, Section A of Annex 1.

³¹² Both MTFs and OTFs must have at least three active members or users, each having the opportunity to interact with all the others in respect to price formation, MiFID 2 Directive, Article 18(7).

³¹³ As the subject of this report is equity markets, OTFs will not be discussed in any great detail.

³¹⁴ MiFID 2 Directive, Recital 17. The concept of SI is further specified in the Commission Delegated Regulation (EU) 2017/565.

Trading venue a regulated market, a multilateral trading facility, or an organized trading facility.³¹⁵

b. Trading venues

Regulated markets and multilateral trading facilities

MiFID 2, like MiFID 1, divides European trading venues into two categories for equities trading,³¹⁶ namely regulated markets (“**RM**”) and multilateral trading facilities (“**MTF**”). The intent of MiFID 2 is to subject similar activities to a similar level of regulation.³¹⁷ Therefore, many of the requirements that apply to RMs and MTFs are highly similar as both types of trading venues involve matching trades between third parties on the basis of *non-discretionary* rules. The key difference between RMs and MTFs is that companies can list on RMs but not MTFs. However, the focus of this report is on secondary market trading, not primary listings. In this section we review the various requirements that apply to trading on RMs and MTFs.

Regulated markets need to be authorized by their competent (regulatory) authority.³¹⁸ Authorization as a regulated market is only granted where the competent authority is satisfied that both the market operators,³¹⁹ and the system of the regulated market, meet the requirements of the MiFID 2 regime.³²⁰ Authorization may be revoked for, among other things, serious and systematic infringements of the Directive purposes.³²¹

MTFs can only be operated by investment firms (who would need to be authorized for that particular investment activity)³²² or market operators (who are also subject to MiFID 2 requirements).³²³ MTFs must provide their competent authorities with information on their rules and procedures for trading and in what instances the operation of the system will give rise to conflicts of interest between the MTF, its operators or owners, and its functions.³²⁴

³¹⁵ MiFID 2 Directive, Article 4(1)(24).

³¹⁶ MiFID 2 Directive, Article 4(1)(24).

³¹⁷ MiFIR, Recital 8.

³¹⁸ MiFID 2, Article 44.

³¹⁹ Market operators need to be able to satisfy the regulatory authority of their compliance at least with the Title III of the MiFID 2 Directive. Overall, key MiFID 2 provisions applying to market operators are MiFID 2 Directive, Article 18(1) (applying the organizational requirements set out in Article 16) and 45; Commission Implementing Regulation (EU) 2017/1093 of 20 June 2017 laying down implementing technical standards with regard to the format of position reports by investment firms and market operators; Commission Delegated Regulation (EU) 2017/1018.

³²⁰ MiFID 2 Directive, Article 44(1).

³²¹ MiFID 2 Directive, Article 44(5)(d).

³²² MiFID 2 Directive, Annex I, Section A, point (8).

³²³ MiFID 2 Directive, Article 16 (as applied to market operators by Article 18).

³²⁴ Commission Implementing Regulation (EU) 2016/824 of 25 May 2016 laying down implementing technical standards with regard to the content and format of the description of the functioning of multilateral trading facilities and organized trading facilities and the notification to the European Securities and Markets Authority according to Directive 2014/65/EU of the European Parliament and of the Council on markets in financial instruments (“**RTS 19**”), Recital 2, and Articles 1 – 5.

Trading, access and fees

RMs and MTFs³²⁵ must have transparent and non-discretionary rules for fair and orderly trading, and objective³²⁶ criteria for the efficient execution of orders in the system.³²⁷ The operators of these systems cannot execute orders against proprietary capital or engage in matched principal trading.³²⁸

RMs³²⁹ and MTFs must provide *transparent, fair and non-discriminatory access* to market participants, which includes fee structures and co-location services.³³⁰ In relation to fees, trading venues must use objective criteria when determining rebates, incentives and disincentives.³³¹ Fee structures that contribute to conditions leading to disorderly trading conditions, through encouraging intensive trading and leading potentially to a stress of market infrastructures, are prohibited.³³² With respect to market data fees, trading venues are required to provide market data on a “reasonable commercial basis.”³³³ As a result, market data prices must be: (i) based on costs of producing and disseminating such data, including a reasonable margin; (ii) offered on a non-discriminatory basis to all clients; (iii) charged according to the individual end-user’s use; and (iv) available without being bundled with other services.³³⁴

Different fee structures for the same services can only be established where those fee structures relate to (a) the total volume traded, the number of trades or cumulated trading fees; (b) the services or packages of services provided by the trading venue; (c) the scope or field of use demanded; (d) the provision of liquidity.³³⁵ Trading venues can adjust their fees for cancelled orders according to the length of time for which the order was maintained and to calibrate the fees to each financial instrument to which they apply.³³⁶ They can also impose higher fees for placing an order that is subsequently cancelled than for an order which is executed; trading venues can also

³²⁵ The terminology used in MiFID 2 is generally to impose the obligations on those who are operating the trading venues, i.e. investment firms or market operators. See for example, MiFID 2 Directive, Article 18.

³²⁶ Conditions which would be considered non-objective and discriminatory are, for example, requiring minimum trading activity, or imposing restrictions on the number of participants that a participant can interact with in a request for quote protocol, see ESMA, Q & A, ‘On MiFID and MiFIR market structure topics’ (1 February 2019), Section 5, Answer 3.

³²⁷ MiFID 2 Directive, Articles 47(1)(d) and 19(1).

³²⁸ MiFID 2 Directive, Articles 47(2) and 19(5).

³²⁹ For a list of EU regulated markets, see <https://ec.europa.eu/info/node/7511>

³³⁰ For more detail, see Commission Delegated Regulation (EU) 2017/573 of 6 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 on requirements to ensure fair and non-discriminatory co-location services and fee structures (**‘RTS 10’**).

³³¹ RTS 10, supra note 330, at Recital 5.

³³² RTS 10, supra note 330, at Recital 6.

³³³ EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments, 15 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

³³⁴ EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments, 15 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

³³⁵ RTS 10, supra note 330, at Article 3.

³³⁶ MiFID 2 Directive, Article 48(9).

impose a higher fee on participants placing a high ratio of cancelled orders to executed orders and on those operating a high-frequency trading technique in order to reflect the additional system use.³³⁷ Volume discounts can be granted, provided that they are based on the total trading volume, the total number of trades or the cumulative trading fees generated by one member, where only the marginal trades executed subsequent to reaching the thresholds are executed at a reduced price.³³⁸ Member States are to ensure, among other things, that RM and MTF fee structures are transparent, fair and non-discriminatory.³³⁹

ESMA continues to review the issue of market data fees charged by trading venues,³⁴⁰ observing that further investigation is warranted because, since the implementation of MiFID 2, market data costs have at times increased 400% compared to pre-implementation prices.³⁴¹ Market participants claim that trading venues are charging fees far in excess of the costs of producing and distributing market data, and by increasing the number of their fees (by recategorizing fees and charging for supposedly 'new' products).^{342 343} Trading venues do not publish their cost of distributing the market data,³⁴⁴ which makes it difficult to determine whether the fees they charge are

³³⁷ MiFID 2 Directive, Article 48(9).

³³⁸ RTS 10, supra note 330, at Recital 6.

³³⁹ MiFID 2 Directive, Article 48(9).

³⁴⁰ See generally, EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

³⁴¹ ESMA, 'MiFID II Implementation – Achievements and Current Priorities' (21 June 2018), available at https://www.esma.europa.eu/sites/default/files/library/esma70-156-427_mifid_ii_implementation_-_achievements_and_current_priorities_steven_maijoor_fese_convention_2018_vienna_21_june_1.pdf

³⁴² Copenhagen Economics study '*Pricing of market data*' (commissioned by the Danish and Swedish dealers associations), November 2018. The study claims, among other things, (1) that the fees charged by trading venues for market data have increased by 30 – 60% in the period since 2008 (using Nasdaq Nordic Ltd as a case), while the cost of transmitting 1 Mbps of data is now around 1/20th of what it used to be a decade ago; and (2) that MiFID 2 itself has created opportunities for trading venues to charge further fees. See Copenhagen Economics, '*Pricing of Market Data*' (28 November 2018), available at <https://www.copenhageneconomics.com/dyn/resources/Publication/publicationPDF/6/466/1543587169/pricing-of-market-data.pdf>

³⁴³ The Copenhagen Economics study refers to the inequity of the 'reverse burden of proof' practices, where users are charged for every employee who could have had access to data, not just for those that de facto had it, and it is up to the users to prove who had access, see pp.27-28 of the Copenhagen Economics study. See also MFA AIMA Joint Letter to ESMA on Increased Fees for Access to Market Data, dated December 11, 2018, available at <https://www.managed-funds.org/issues-policy/mfa-comment-letters/mfa-aima-joint-letter-esma-increased-fees-access-market-data/>

³⁴⁴ The SEC issued guidance on May 21, 2019, as to the level of detail it expects to see from exchanges such as New York Stock Exchange and Nasdaq, when they seek to increase the fees they charge for market data, see <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees>. The details required include measuring down to the microsecond a faster data product, and showing the costs of producing data, if exchanges are using the cost as a basis for justifying their higher fees. The move was welcomed by IEX, a stock exchange which claims that the market data fees charged by the dominant US exchanges were 1,500 per cent times the cost of producing the data, when compared with its own data costs. See Henderson, '*Regulator calls on US exchanges to justify increases in data fees*' (FT, May 21, 2019) and Henderson, '*Flash Boys' exchange IEX backs regulator in data fees fight*' (FT, May 14, 2019).

excessive. On the other hand, one report prepared by economic consultancy Oxera for the Federation of European Securities Exchanges (FESA)³⁴⁵ claims that the aggregate market data revenues of the members of FESA have only risen in recent years by around 1% per year in real terms. In a July 2019 Consultation Paper, ESMA solicited additional feedback from market participants on the state of market data fees and prospective improvements to market data fee regulation.³⁴⁶

Transparency, record keeping and resiliency

As discussed in more detail in the section of this report dealing with transparency issues, MiFID 2 requires trading venues to make pre- and post-trade information available to the public on a 'reasonable commercial basis' and to 'ensure non-discriminatory access to the information'.³⁴⁷

Trading venue operators have detailed record keeping³⁴⁸ and operating obligations.³⁴⁹ For example, trading venues need to be able to identify orders generated by algorithmic trading,³⁵⁰ they also have to have in place effective, systems, procedures and arrangements to ensure that their trading systems are resilient and able to reject orders that exceed pre-determined volume and price thresholds or are clearly erroneous, have sufficient capacity to deal with peak order and message volumes, are able to ensure orderly trading under conditions of severe market stress, are fully tested to ensure such conditions are met, and are subject to effective business continuity arrangements to ensure continuity of their services if there is any failure of their trading systems.³⁵¹

Systematic internalisers

The definition of trading venues under MiFID 2 does not include SIs,³⁵² but SIs play a significant role in the equity markets. As part of a desire to capture, in regulatory terms, over-the-counter (OTC) trading activity, increase transparency and ensure that the internalization of order flow does not undermine the efficiency of price formation on trading venues,³⁵³ MiFID 2 provided additional

³⁴⁵ Oxera, 'The design of equity trading markets in Europe' (March 2019), available at <https://fese.eu/app/uploads/2019/03/190321-The-design-of-equity-trading-markets-in-Europe-full-report.pdf>. This report uses the term 'stock exchange' (and 'primary market') to refer to a country's primary stock exchange, 'which is usually also a 'regulated market' (see footnote 1, on p.1). The Copenhagen Economics report discusses trading venues more generally.

³⁴⁶ EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

³⁴⁷ MiFIR, Article 13(1).

³⁴⁸ See, for example, Commission Delegated Regulation (EU) 2017/580 of 24 June 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the maintenance of relevant data relating to orders in financial instruments ('**RTS 24**').

³⁴⁹ Commission Delegated Regulation 2017/565, Chapter IV.

³⁵⁰ MiFID 2 Directive, Article 48(10).

³⁵¹ MiFID 2 Directive, Articles 48(1) and (4) and 18(5).

³⁵² MiFID 2 Directive, Article 4(1) (24).

³⁵³ Callaghan, 'MiFID II implementation: the Systematic Internaliser regime' at <https://www.icmagroup.org/assets/documents/Regulatory/MiFID-Review/MiFIDII-the-SystematicInternaliserRegime-060417.pdf>

objective criteria to help investment firms determine whether they are an SI in relation to a particular financial instrument. Therefore, although the SI regulatory regime already existed under MiFID 1,³⁵⁴ it assumed greater significance under MiFID 2.

An SI is an investment firm which, on an *organized, frequent systematic and substantial basis*, deals on its own account when executing client orders outside a trading venue. ESMA has provided guidance on how to apply the definition. In ESMA's analysis, SI activity is characterized by risk-facing transactions that impact the profit and loss account of the firm.³⁵⁵ Investment firms that meet the definition of an SI for a particular financial instrument must notify their regulatory authority, who will in turn notify ESMA.³⁵⁶

Under MiFID 2, 'frequent and systematic basis' is measured by the size of OTC trades in the financial instrument carried out by the investment firm on their own account when executing client orders; 'substantial basis' is measured either by the size of the OTC trading carried out by the investment firm in relation to the total trading of the investment firm in a specific financial instrument, or by the size of the OTC trading carried out by the investment firm in relation to the total trading in the Union in a specific financial instrument.³⁵⁷ ESMA publishes quarterly data on the total level of trading and number of transactions in financial instruments and classes of instruments, so that investment firms can calculate whether or not they are required to notify their national competent authorities that they are an SI in particular instruments or classes of instrument.³⁵⁸ A firm will fall under the SI regulatory regime only (i) if it crosses both the pre-set limits for a frequent and systematic basis and for a substantial basis, or (ii) where an investment firm chooses to opt-in under the SI regime.³⁵⁹

With respect to SIs, MiFID 2 aims for pre-set OTC trading limits to (i) include OTC trading that materially affect price formation but (ii) exclude smaller OTC trading for which the cost compliance with SI requirements is disproportionate in light of the minimal effect on price formation.³⁶⁰

The best execution obligation, described in detail later in this report, requires that investment firms attempt to obtain the best possible results for their clients taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order.³⁶¹ For orders at or below standard market size, SIs are generally required to execute client orders at the SI's quoted prices at the time of reception of the orders.³⁶² However, when "justified," they may execute those orders at a **better** price provided that the price

³⁵⁴ MiFID 1 Directive, Article 4(1)(7).

³⁵⁵ ESMA, Q&A on MiFID II and MiFIR market structure topics (1 February 2019), Section 5.3, Answer 26.

³⁵⁶ MiFIR, Article 15(1)

³⁵⁷ MiFID 2 Directive, Article 4(1) (20). For exact details of the criteria in relation to shares and equity-like instruments, see Commission Delegated Regulation (EU) 2017/565, Article 12.

³⁵⁸ FCA, 'Supervisory Statement on the Operation of the MiFID Transparency Regime post-Brexit' (14 March 2019), Para 34.

³⁵⁹ MiFID 2 Directive, Article 4(1)(2).

³⁶⁰ Commission Delegated Regulation (EU) 2017/565, Recital 18.

³⁶¹ MiFID 2 Directive, Article 27 (1).

³⁶² MiFIR, Article 15(2) ("Systematic internalisers shall... execute the orders they receive from their clients... at the quoted prices at the time of reception of the order."); MiFIR, Article 14(2) (exempting orders above standard market size from the execution requirements in Article 15).

falls within a public range³⁶³ close to prevailing market conditions.³⁶⁴ ESMA considers that price improvements would only be “justified” where they are meaningful and reflect the minimum tick size applicable to the same financial instrument traded on a trading venue. Otherwise, according to ESMA, marginal price improvements on quoted prices would challenge the efficient valuation of equity instruments without bringing any real benefits to investors.³⁶⁵ Conversely, for orders above standard market size, SIs can offer sub-tick price improvement.³⁶⁶

SIs are allowed to withdraw their quotes under exceptional market circumstances (such as where there are trading halts or suspensions from trading).³⁶⁷ In order to limit their counterparty exposure, SIs are also allowed to limit in a non-discriminatory way the number of transactions from the same client which they undertake to enter at the published conditions, or to limit the total number of transactions from different clients at the same time where the number and/or volume of the orders exceeds the norm.³⁶⁸

c. Pre- and post-trade transparency

MiFID 2 imposes requirements for (a) pre-trade transparency and (b) post-trade transparency and regulatory reporting.³⁶⁹ With respect to post-trade information, MiFID 2 requires both:³⁷⁰ (1) certain post-trade transparency *to the public* (trade reporting) and (2) post-trade disclosures *to regulators* (transaction reporting).³⁷¹

Pre-trade transparency is to be provided on a continuous basis, throughout normal trading hours. Post-trade trade reporting to the public must be done in real time to support the accurate formation of prices. Transaction reporting to regulators must be completed no later than the close of business on the business day following the execution day. Regulators collect transaction reports

³⁶³ MiFIR, Article 15(2) and (3); Commission Delegated Regulation (EU) 2017/567, Article 14(3) – (5). A price will fall within a public range close to market conditions where it is within the bid and offer quotes of the SI and those quotes reflect prevailing market conditions.

³⁶⁴ Ibid. There are specific provisions for orders from professional clients in respect of transactions where execution in several securities is part of one transaction, where orders are subject to conditions other than the current market price; or where an SI receives an order of a size bigger than its quotation size but lower than the standard market size, MiFIR, Article 15(3) and (4).

³⁶⁵ ESMA, Q & A, ‘On MiFID II and MiFIR market structure topics’ (1 February 2019), Section 5, Answer 29.

³⁶⁶ MiFIR, Article 14(2) (exempting orders above standard market size from certain execution requirements).

³⁶⁷ MiFIR, Article 15(1); Commission Delegated Regulation (EU) 2017/567, Article 14(1).

³⁶⁸ MiFIR, 17(2); on what exceeds the ‘norm’, see Commission Delegated Regulation (EU) 2017/567, Article 15.

³⁶⁹ This is a MiFID term; it can also be called ‘quotation data.’ See CCMR, ‘The US Equity Markets Report’ (July 2016), p.xxiii.

³⁷⁰ This can also be referred to as ‘execution data’.

³⁷¹ See also ESMA, Q& A on MiFID II and MiFIR on transparency issues (1 February 2019), and MiFID 2 technical standards, in particular Commission Delegated Regulation (EU) 2017/587 of 14 July 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on transparency requirements for trading venues and investment firms in respect of shares, depositary receipts, exchange-traded funds, certificates and other similar financial instruments and on transaction execution obligations in respect of certain shares on a trading venue or by a systematic internaliser (‘**RTS 1**’), and Commission Delegated Regulation (EU) 2017/577 of 13 June 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council on markets in financial instruments with regard to regulatory technical standards on the volume cap mechanism and the provision of information for the purposes of transparency and other calculations (‘**RTS 3**’).

in order to monitor markets and supervise for manipulation of financial markets or other market abuses.

Pre-trade transparency

In terms of pre-trade transparency, trading venues (i.e. RMs, MTFs) must make public³⁷² current bid and offer prices, and the depth of trading interests (including actionable indications of interest) at those prices, which are advertised through their systems for shares and other equity-like instruments.³⁷³ Those transparency requirements are calibrated for different types of financial instruments (taking into account the interests of investors and issuers, and market liquidity) and different trading systems (taking account of transaction size, and other relevant criteria).³⁷⁴ The information is to be made available to the public on a reasonable commercial basis,³⁷⁵ with non-discriminatory access,³⁷⁶ and disaggregated from other services.³⁷⁷ The information is to be free of charge 15 minutes after publication.³⁷⁸ However, due to continuing low levels of compliance, ESMA issued guidance in July 2019 to discourage practices that were inconsistent with the obligation to make information available free of charge (including access restrictions, the use of formatting that is not machine-readable, and deleting data shortly after publication).³⁷⁹

Likewise, for orders at or below the standard market size, SIs need to make public and easily accessible³⁸⁰ on a continuous basis during normal trading hours³⁸¹ firm two-way quotes in respect of shares and equity-like instruments for which (i) they are SIs and (ii) there is a liquid market.³⁸² “Standard market size” is the average value of transactions for each financial instrument over the preceding year in the EU, subject to certain adjustments.³⁸³ Any restrictions they impose on access to that information could be based on commercial policy (distinguishing for example between different categories of clients)³⁸⁴ but needs to be done in an objective non-discriminatory manner.³⁸⁵ Where there is no liquid market, SIs are only required to disclose quotes to their clients

³⁷² Strictly speaking, the obligation is imposed on ‘market operators’ (i.e. those who manage and/or operate a regulated market, and may be the regulated market themselves, MiFID 2 Directive, Article 4 (1)(18)) and investment firms operating a trading venue, RTS 1, Article 3(1).

³⁷³ MiFIR, Article 3(1); RTS 1, Article 3. This is subject to waivers set out in Article 4, see further below.

³⁷⁴ MiFIR, Article 3(2), Recital 16.

³⁷⁵ On the parameters for determining what is ‘reasonable commercial basis’ for both trading venues and SIs, see Commission Delegated Regulation (EU) 2017/565, Articles 6 and 7.

³⁷⁶ On the meaning of ‘non-discriminatory’ in this context, see Commission Delegated Regulation (EU) 2017/567, Article 8.

³⁷⁷ Commission Delegated Regulation (EU) 2017/567, Article 10.

³⁷⁸ MiFIR, Article 13.

³⁷⁹ EUROPEAN SECURITIES AND MARKETS AUTHORITY, *Q&A: On MiFID and MiFIR Transparency Topics*, 25-27 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-35_qas_transparency_issues.pdf.

³⁸⁰ On the meaning of which see Commission Delegated Regulation (EU) 2017/567, Article 13.

³⁸¹ MiFIR, Article 15. Commission Delegated Regulation (EU) 2017/567, Article 12.

³⁸² MiFIR, Article 14; RTS 1, Articles 9 and 10.

³⁸³ Commission Delegated Regulation (EU) 2017/587, Article 11 (July 14, 2016); Article 14(2) and (4) of Regulation (EU) No 600/2014.

³⁸⁴ MiFIR, Recital 21.

³⁸⁵ Commission Delegated Regulation (EU) 2017/567, Article 17.

upon request.³⁸⁶ Quotes are to be made public in a manner which is easily accessible to other market participants on a reasonable commercial basis.³⁸⁷

National competent authorities have discretion to waive the obligation for trading venues to disclose the above pre-trade information. There are four types of such waivers (all discussed in further detail in the section on 'Dark v lit trading'):³⁸⁸ (1) the reference price waiver;³⁸⁹ (2) the negotiated trade waiver;³⁹⁰ (3) the large in scale waiver;³⁹¹ and (4) the order management facility.³⁹² Waivers are seen as ensuring an appropriate balance between transparency and liquidity in equities markets.³⁹³ Both the ESMA and various national regulators have issued guidance on waiver applications.³⁹⁴

Pre-trade and post-trade transparency data is to be made available by the trading venue and SIs separately.³⁹⁵ ESMA has specified the level of disaggregation of that data (data is to be disaggregated by asset class, by country of issue, by the currency in which a financial instrument is traded, and according to whether data comes from scheduled daily auctions or from continuous trading).³⁹⁶

Post-trade disclosure to regulators: transaction reporting

Investment firms that execute transactions³⁹⁷ in financial instruments³⁹⁸ need to report to regulators the complete and accurate details of such transaction no later than the first business day following execution,³⁹⁹ with each report needing to include 65 data fields (increased from 23 fields

³⁸⁶ MiFIR, Article 14(1).

³⁸⁷ MiFIR, Article 15(1).

³⁸⁸ MiFIR, Article 4.

³⁸⁹ On the requisite calculations for this waiver, see RTS 1, Article 4.

³⁹⁰ On the specific characteristics required for this waiver to apply, see RTS 1, Articles 5 and 6.

³⁹¹ On further details for this waiver, see RTS 1, Article 7.

³⁹² On further details for this waiver, see RTS 1, Article 8.

³⁹³ UK FCA, 'MiFID background and MiFID 2 objectives', Chapter 6 (Transparency), available at <https://www.fca.org.uk/mifid-ii/6-transparency> (visited on April 1, 2019).

³⁹⁴ ESMA, Q&A on MiFID II and MiFIR transparency topics (1 February 2019); and see for example, in the UK, FCA, 'MiFID II – Application and notification user guide', January 2017.

³⁹⁵ MiFIR, Article 12.

³⁹⁶ Commission Delegated Regulation (EU) 2017/572 of 2 June 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council with regard to regulatory technical standards on the specification of the offering of pre- and post- trade data and the level of disaggregation of data ('**RTS 14**'), Article 1.

³⁹⁷ The meaning of a transaction for reporting purposes is broad. It covers purchases and sales of reportable instruments, as well as other cases of acquisitions or disposals of reportable instruments. For further details, see Commission Delegated Regulation (EU) 2017/590 of 28 July 2016 supplementing Regulation (EU) No 600/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the reporting of transactions to competent authorities ('**RTS 22**'), Recital 2, Article 2.

³⁹⁸ For detail of reference data that needs to be provided by trading venues and SIs, see Commission Delegated Regulation (EU) 2017/585 of 14 July 2016 supplementing Regulation (EU) 600/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the data standards and formats for financial instrument reference data and technical measures in relation to arrangements to be made by the European Securities and Markets Authority ('**RTS 23**').

³⁹⁹ MiFIR, Article 26.

under MiFID 1).⁴⁰⁰ These transaction reports are collected in order to prevent the manipulation of financial markets, or other market abuse.⁴⁰¹

The reports have to identify both the client and the trader or algorithm responsible for the investment decision and execution, so investment firms that receive and transmit orders have to include such details in any orders they transmit, unless they wish to report such orders themselves.⁴⁰²

The reports essentially cover every stage of the trade, from the portfolio investment decision, initial indication of interest and order management right through to execution.⁴⁰³ One major change that MiFID 2 has brought is the mandatory introduction of Legal Entity Identifiers (LEIs) – unique 20-digit alpha-numeric codes identifying legal entities or structures trading on EU markets, which are included in a global data system and enable every legal entity that is a party to a relevant financial transaction to be identified, no matter where it is located.⁴⁰⁴ All entities trading with European counterparties across all asset classes must obtain LEIs.⁴⁰⁵ There was an extension of the initial deadline for compliance, but the grace period for all legal entities involved in executing trades to obtain LEIs ended on July 2, 2018.⁴⁰⁶

Under MiFID I, transaction reporting applied only to shares trading on an RM.⁴⁰⁷ The requirements have been extended to all trading venues and to all financial instruments that are admitted to trading on a trading venue, even if trades take place outside the trading venue.⁴⁰⁸ Transaction reporting requirements are calibrated for different types of instruments and different types of trading.⁴⁰⁹

Transaction reporting can be made by the investment firm, an Approved Reporting Mechanism (“**ARM**”) acting on its behalf, or by the trading venue through whose system the transaction was completed.⁴¹⁰ Alternatively, reporting to a trade repository under EMIR⁴¹¹ satisfies the obligation.⁴¹² The responsibility for the accuracy, completeness and timely submission of the transaction

⁴⁰⁰ MiFIR, Article 26; RTS 22, Table 2 of Annex I.

⁴⁰¹ Explanatory Memorandum to the Data Reporting Services Regulation 2017 (SI 699/2017), para 7.7.

⁴⁰² MiFIR, Article 26(4)

⁴⁰³ EY, ‘MiFID II – The front office impact’, p. 6, available at [https://www.ey.com/Publication/vwLUAssets/ey-mifid-ii-the-front-office-impact/\\$FILE/ey-mifid-ii-the-front-office-impact.pdf](https://www.ey.com/Publication/vwLUAssets/ey-mifid-ii-the-front-office-impact/$FILE/ey-mifid-ii-the-front-office-impact.pdf)

⁴⁰⁴ ‘MiFID II and the fight against financial crime’, speech by Mark Steward, FCA Director of Enforcement and Market Oversight, 3 July 2018.

⁴⁰⁵ LEIs are issued by ‘Local Operating Units’ of the Global LEI System, for more detail see <https://www.lei-roc.org/lei/how.htm>

⁴⁰⁶ ESMA Statement on LEI requirements under MiFIR (20 June 2018), available at https://www.esma.europa.eu/sites/default/files/library/esma70-145-872_public_statement_on_lei.pdf

⁴⁰⁷ https://www.lexisnexis.com/uk/lexispsl/financialservices/document/393813/5MM4-8TS1-F18F-M04H-00000-00/MiFID_and_MiFID_II_overview.

⁴⁰⁸ For transactions that are within reporting requirements of Article 26 of the MiFIR.

⁴⁰⁹ RTS 1, Recital 6; see also ESMA, Q & A, On MiFID II and MiFIR transparency topics (1 February 2019).

⁴¹⁰ MiFIR, Article 26(7).

⁴¹¹ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC Derivatives, Central Counterparties and Trade Repositories (referred to as the European Market Infrastructure Regulation or EMIR).

⁴¹² <https://www.nortonrosefulbright.com/knowledge/publications/abde0e6a/mifid-ii-mifir-series>

reports lies with the investment firms⁴¹³ (except where the failure is attributable to the ARM or the trading venue which is submitting the report, but even then investment firms must take reasonable steps to verify those reports).⁴¹⁴

Post-trade transparency to the public: trade reporting

The post-trade public transparency obligation is often referred to as ‘trade reporting’.⁴¹⁵ It applies to trading venues⁴¹⁶ and investment firms trading outside the rules of a trading venue (including SIs).⁴¹⁷ The purpose of trade reporting is to support efficient price formation.⁴¹⁸

The obligation requires that trading venues and investment firms make public the price, volume and time of the executed transactions in shares (and other equity-like instruments)⁴¹⁹ as close to real time as is technically possible.⁴²⁰ The information is to be made public directly (by trading venues) and through an Approved Publication Arrangement (“**APA**”) (for SIs and other investment firms).⁴²¹ The information is to be made available to the public on a reasonable commercial basis, with non-discriminatory access.⁴²² It also must be offered free of charge 15 minutes after publication,⁴²³ but compliance with the latter obligation has been limited and inconsistent.⁴²⁴

Where a transaction between two investment firms is concluded outside the rules of a trading venue, either on own account or on behalf of clients, only the selling firm shall make the disclosure (unless only one of them is a systemic internaliser and that firm is a buyer, in which case the buyer will make the disclosure).⁴²⁵

Trade reporting requirements are subject to the possibility of a deferral of disclosure for transactions that are large in scale compared to normal market size (block trades),⁴²⁶ if authorized to do

⁴¹³ For an example of the potential consequences of transaction reporting failures, see the UK Financial Conduct Authority £27.6m fine of UBS AG, for 135.8m reporting errors over 9.5 years, including the failure to provide complete and accurate information on 86.67m reportable transactions, <https://www.fca.org.uk/news/press-releases/fca-fines-ubs-ag-276-million-transaction-reporting-failures> (March 19, 2019)

⁴¹⁴ MiFIR, Article 26(7)

⁴¹⁵ See, for example, UK FCA, ‘Supervisory Statement on the Operation of the MiFID Transparency Regime post-Brexit’ (March 14, 2019), paras 38 – 41.

⁴¹⁶ Strictly speaking, the obligation is imposed on ‘market operators’ (i.e. those who manage and/or operate a regulated market, and may be the regulated market themselves, MiFID 2 Directive, Article 4 (1)(18) and investment firms operating a trading venue, RTS 1, Article 3(1).

⁴¹⁷ RTS 1, Article 12(1).

⁴¹⁸ Explanatory Memorandum to the (UK) Data Reporting Services Regulation 2017 (SI 699/2017), para 7.5.

⁴¹⁹ MiFIR, Articles 6 (requirements for trading venues) and 20 (requirements for investment firms, including SIs); for the details of the reporting format, see RTS 1, Articles 12 and 13.

⁴²⁰ On the meaning of ‘real time’, see RTS 1, Article 14.

⁴²¹ MiFID 2 Directive, Article 64.

⁴²² MiFIR, Article 13.

⁴²³ MiFIR, Article 13.

⁴²⁴ EUROPEAN SECURITIES AND MARKETS AUTHORITY, *Q&A: On MiFID and MiFIR Transparency Topics, 25-27* (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-35_qas_transparency_issues.pdf (advising against practices inconsistent with the obligation because they were common).

⁴²⁵ RTS 1, Article 12 (4) and (5).

⁴²⁶ MiFIR, Article 7; see RTS 1, Article 15, for more details on the size and the period of deferral.

so by the national competent authority. The existence of deferred trade-publication arrangements is to be clearly disclosed to market participants and the public.

Data reporting service providers

Data reporting service providers must be authorized under MiFID 2 and are thereafter subject to ongoing compliance duties,⁴²⁷ in particular with regard to the existence and management of any conflicts of interest. There are three different kinds of data providers (“**DRSP**”) under MiFID 2, all independent entities, which must be authorized by the relevant the National Competent Authority in each Member State (that authorization then allows them to provide services throughout the EU).⁴²⁸ The three types of DRSPs are: Approved Reporting Mechanisms (“**ARM**”), Approved Publication Arrangements (“**APA**”), and Consolidated Tape Providers (“**CTP**”).

ARMs enable investment firms to meet their transaction reporting obligations⁴²⁹ by reporting details of transactions to competent authorities (in the UK, for example, that is the FCA) or to ESMA, no later than the close of the working day following the day on which the transaction took place.⁴³⁰ As set out above, transaction reports are collected in order to prevent the manipulation of financial markets or other market abuse.⁴³¹

APAs enable investment firms to meet their trade reporting obligations by making public the relevant details of the trades as close to real time as is technically possible.⁴³² The information must be published on a reasonable commercial basis, and after 15 minutes without charge. The publication of this information is part of the MiFID 2 transparency regime intended to support the accurate formation of prices.⁴³³ However, the market has not yet achieved widespread compliance.⁴³⁴

CTPs collect trade reports⁴³⁵ for financial instruments from trading venues and APAs, and they then consolidate them into a continuous electronic live data stream providing price and volume data for each financial instrument. The data stream is to be made available to the public on a reasonable commercial basis.⁴³⁶

⁴²⁷ See for example Commission Delegated Regulation 2017/565, Chapter VI.

⁴²⁸ MiFID 2 Directive, Articles 59(1) and 60(2). Commission Delegated Regulation (EU) 2017/571 of 2 June 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to the regulatory technical standards on the authorization, organizational requirements and the publication of transactions for data reporting services providers (“**RTS 13**”) sets out detailed requirements relating to authorization, organizational requirements, and publication arrangements.

⁴²⁹ MiFID 2 Directive, Article 66.

⁴³⁰ MiFID 2 Directive, Article 66; MiFIR, Article 26.

⁴³¹ Explanatory Memorandum to the (UK) Data Reporting Services Regulation 2017 (SI 699/2017), para 7.7.

⁴³² MiFID 2 Directive, Article 64(1); MiFIR, Article 20.

⁴³³ Explanatory Memorandum to the (UK) Data Reporting Services Regulation 2017 (SI 699/2017), para 7.5.

⁴³⁴ See, e.g., EUROPEAN SECURITIES AND MARKETS AUTHORITY, *Q&A: On MiFID and MiFIR Transparency Topics*, 25-27 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-35_qas_transparency_issues.pdf.

⁴³⁵ MiFID 2 Directive, Article 65(1).

⁴³⁶ Explanatory Note to the (UK) Data Reporting Services Regulation 2017 (SI 699/2017).

In the UK, for example, there are currently six DRSPs authorized,⁴³⁷ two as only APAs and four as both APAs and ARMs.⁴³⁸

No CTPs have emerged in Europe following the implementation of MiFID 2. While MiFID 2 sets out the legal framework for operating voluntary consolidated tapes, it anticipates rather than directly mandates their creation. However, it also sets forth a mechanism to review and revisit the framework to ensure CTPs do eventually emerge.⁴³⁹ Although an EU-wide CTP would improve efficiency by consolidating all post-trade information into one place and format, ESMA has found that there are few commercial rewards for operating a consolidated tape, the CTP regulatory framework is too restrictive, and CTPs would face stiff competition from unregulated entities.⁴⁴⁰ As a result, it is currently uneconomical for a commercial organization to undertake the required data processing and cleaning.⁴⁴¹ In its July 2019 report on trading costs and market data, ESMA concluded that the successful establishment of a pan-European CTP would require, among other things: (i) the mandatory reporting of post-trade data by trading venues and APAs; and (ii) the mandatory of consolidated market data by investment firms.⁴⁴²

d. Pre-trade transparency: dark trading versus lit trading

Dark trading refers to trading in equities without pre-trade transparency, where the price and volume of orders are hidden and anonymous.⁴⁴³ Dark trading in the EU can take place across different execution venues, including Regulated Markets, MTFs and SIs. Execution venues can allow for both lit and dark trading.⁴⁴⁴ Dark trading generally involves matching trades through a

⁴³⁷ For the UK implementation of MiFID 2 in relation to DRSPs, see in particular The Data Reporting Services Regulations 2017 (SI 2017 No. 699). The UK government was concerned about the circularity of MiFID 2 definitions of these services, but has adopted a 'direct copy out approach' to avoid the risk of transposing the relevant provisions incorrectly or differently from the other Member States, see UK HM Treasury, 'Transposition of the Markets in Financial Instruments Directive II: response to the consultation' (February 2017), section 3.

⁴³⁸ For the full list, see <https://www.fca.org.uk/markets/data-reporting-services-providers-drsp/authorised-drsp>

⁴³⁹ EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments, 26 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

⁴⁴⁰ *Id.* at 30-33.

⁴⁴¹ Blackrock, Viewpoint, 'Mark-to-market structure: An end-investor perspective on the evolution of developed equity markets' (February 2019). BlackRock is of the view that ESMA is well placed to take the lead in providing a pan-European consolidated tape solution. As BlackRock points out, a consolidated tape of post-trade information discloses execution quantities and prices in a timely manner after trades occurred (with the exception of large-in-size waiver); that real time trade information then strengthens price discovery and optimal venue choice, in line with best execution obligations, as well as promoting investor confidence and execution quality generally.

⁴⁴² EUROPEAN SECURITIES AND MARKETS AUTHORITY, Consultation Paper: MiFID II/MiFIR Review Report on the Development in Prices for Pre- and Post-Trade Data and on the Consolidated Tape for Equity Instruments, 48-49 (July 12, 2019), https://www.esma.europa.eu/sites/default/files/library/esma70-156-1065_cp_mifid_review_report_cost_of_market_data_and_consolidated_tape_equity.pdf.

⁴⁴³ FCA, 'Catching a falling knife: an analysis of circuit breakers in UK equity markets', 03/08/2017, available at <https://www.fca.org.uk/publications/research/analysis-circuit-breakers-uk-equity-markets>

⁴⁴⁴ See, Comerton-Forde, C. 2017, 'Shedding Light on dark trading in Europe', CEPR-Imperial-Plato Inaugural Market Innovator (MI3) Conference, Table III. An example is Turquoise, which is an MTF that has two electronic orders book services, Turquoise Lit (combining limit and iceberg orders with LIS hidden orders) and Turquoise Plato (previously

reference price system. Typically, the reference price for dark trading is based on the best bid and offer on the primary Regulated Market, known as the Primary Best Bid and Offer (PBBO) (for shares in the UK, this is the London Stock Exchange). Alternatively, reference prices can also incorporate the best bid and offer prices at other lit venues, with this typically labelled as the European Best Bid and Offer (EBBO)⁴⁴⁵. As can be seen from this description, the process of determining reference price may differ between execution venues, leading potentially to differences in execution prices.⁴⁴⁶

Pre-trade transparency waivers

The key regulatory issue relevant to dark trading is the requirement for pre-trade transparency for trading in stocks. In 2007, the original MiFID introduced the concept of pre-trade transparency waivers. This meant that, in situations where waivers applied, bid and offer prices did not need to be published by the trading venue before an order was executed (in other words dark trading could take place). Dark trading existed prior to MiFID I through over the counter trading or special hidden order types on exchanges, but following the introduction of the waivers, dark trading volumes increased.⁴⁴⁷

MiFID 2 also provides for pre-trade transparency waivers, although with some changes in their definitions. The four waivers under MiFID 2 are: the reference price waiver, the negotiated trade waiver, the large in scale waiver, and the order management facility waiver.⁴⁴⁸

As previously described, the “**reference price waiver**” allows for trades to take place without the public display of price or size, so long as the price is determined with reference to the publicly displayed price for that stock on the primary listing exchange or the most relevant market in terms of liquidity.⁴⁴⁹ The scope of this waiver has been narrowed under MiFID 2. Reference price trades are now only allowed at the midpoint between the best bid and offer, while previously they were allowed at the bid and offer.⁴⁵⁰ If a trade is taking place outside of trading hours and the midpoint price is not available, the opening or closing price of the trading session can be used.⁴⁵¹

called Turquoise Midpoint Dark). For detail see <https://www.lseg.com/markets-products-and-services/our-markets/turquoise/turquoise-trading-services> (visited on March 29, 2019).

⁴⁴⁵ This is not an equivalent to the US ‘National Best Bid and Offer’ (NBBO); these are self-calculated and there is no prescribed standard. There is a view that pre-trade transparency in the EU could be strengthened via an EU equivalent to the US NBBO, as good pre-trade transparency would facilitate optimal order routing and compliance with best execution obligations (in addition to mitigating any concerns that SI activity is detrimental to price discovery), see BlackRock, Viewpoint, February 2019.

⁴⁴⁶ Petrescu and Wedow ‘Dark pools in European equity markets: emergence, competition and implications’ (ECB, Occasional Paper Series, No. 193, July 2017), available at <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op193.en.pdf>, at p.30.

⁴⁴⁷ Petrescu and Wedow (2017), at p. 8. This paper also discusses the effect of US regulation on the increase of dark trading in the US, see pp. 20-21.

⁴⁴⁸ MiFIR, Article 4.

⁴⁴⁹ MiFIR, Article 4(1)(a).

⁴⁵⁰ Comerton-Forde, C. 2017, ‘Shedding light on dark trading in Europe, CEPR-Imperial-Plato Inaugural Market Innovator (MI3) Conference p. 8; ‘The future of dark liquidity in Europe’, Automated Trader Magazine Issue 41 Q4 2016, <http://www.automatedtrader.net/articles/strategies/156769/the-future-of-dark-liquidity-in-europe>;

⁴⁵¹ MiFIR, Article 4(2).

The “**negotiated trade waiver**” allows for trades to take place without the public display of price or size, so long as members or participants of a trading venue privately negotiate the terms of a transaction, which is then reported under the rules of the trading venue.⁴⁵² There are three types of negotiated trades that qualify for the waiver. First, trades that are made within the current volume weighted spread reflected on the order book, or the quotes of the market makers of the trading venue operating that system. Second, trades in illiquid shares dealt within a percentage of a suitable reference price (the percentage and the reference price being set in advance by the system operator). Third, trades that are subject to conditions other than the current market price.⁴⁵³

The “**large in scale waiver,**” or “**LIS waiver,**” allows for trades to take place without the public display of price or size, so long as orders are sufficiently large in size compared with normal market size.⁴⁵⁴ The minimum size thresholds are set with reference to average daily turnover for the financial instrument in question.⁴⁵⁵

The “**order management facility waiver**” allows for trades to take place without the public display of price or size, so long as orders have been held in an order management facility of the trading venue pending disclosure.⁴⁵⁶ Order management facilities enable investment firms to break up large client orders into smaller orders for execution on a trading venue. Doing so is intended to reduce the price impact of these large orders.⁴⁵⁷

Double volume caps

MiFID 2 introduced the double volume cap mechanism (“**DVC**”) to limit the amount of dark trading in equities allowed under two of the waivers, namely the *reference price waiver* and the first of the three types of the *negotiated trade waiver*.^{458 459} MiFID 2 also changed the size thresholds for the use of the LIS waiver, lowering them for low volume stocks, and increasing them for the most

⁴⁵² FIA Europe (report drafted by the London office of Covington & Burley LLP), ‘Special Report Series: Transparency’ (3 July 2014), available at <https://fia.org/articles/special-report-series-transparency>

⁴⁵³ MiFIR, Article 4(1)(b). It is important to differentiate amongst them, as the double volume cap mechanism applies only to the first one.

⁴⁵⁴ MiFIR, Article 4(1)(c).

⁴⁵⁵ For the latest ESMA calculations published on March 6, 2019, see <https://www.esma.europa.eu/press-news/esma-news/mifid-ii-esma-makes-available-results-annual-transparency-calculations-equity>

⁴⁵⁶ MiFIR, Article 4(1)(d).

⁴⁵⁷ Gladwin, ‘MiFID II: How Can Caps on Dark Pools be Implemented When There is No Consolidated Tape?’ (December 19, 2013), available at <https://www.bloomberg.com/professional/blog/in-the-news-mifid-dark-pools/>

⁴⁵⁸ ESMA Report on Trends, Risks and Vulnerabilities (28 February 2019), p. 55.

⁴⁵⁹ Illiquid or transactions that are subject to other conditions do not contribute to the price formation process, and the whole point of the DVC is to avoid negative impact on the price formation process, Recital 17 to the MiFIR.

active stocks in the market.⁴⁶⁰ The double volume caps only apply to transactions executed on multilateral trading venues (i.e. RMs, MTFs) but not to OTC or SI transactions.⁴⁶¹

The first DVC cap applies to the *total amount of dark trading per venue*. It limits the percentage of trading in a financial instrument carried out on any individual trading venue under the reference price waiver and the first negotiated price waiver to 4% of the total volume traded in that instrument on all trading venues in the EU over the previous 12 months.

The second cap applies to *overall dark trading*. It limits the percentage of dark trading in a financial instrument carried out under the reference waiver and the first negotiated price waiver to 8% of the total volume traded in that financial instrument on all trading venues in the EU over the previous 12 months.⁴⁶²

If a trading venue reaches the first cap, then the use of the two waivers in question on that venue for that instrument is suspended for six months. If the EU wide limit for the instrument is reached (the second cap), then the use of both waivers for that instrument is suspended for all trading venues for six months.⁴⁶³ The trading of the respective stock is suspended by the national competent authority within two working days for either the respective trading venue, or all trading venues, depending on which cap has been triggered,⁴⁶⁴ based on ESMA's previous month's published calculations.⁴⁶⁵ ESMA performs its calculations over a twelve-month rolling period and publishes the data on its website, in the Double Volume Cap Register.⁴⁶⁶

The DVC does not apply to a share for which there is no liquid market.⁴⁶⁷ There is no liquid market if: i) the free float is less than EUR 100 million for shares admitted to trading on a regulated market and less than EUR 200 million for shares that are only traded on MTFs; ii) the average daily number of transactions in the share is less than 250; iii) the average daily turnover for the share is less than EUR 1 million.⁴⁶⁸

⁴⁶⁰ Comerton-Forde (2017), p. 8; for latest LIS calculations, see ESMA, <https://www.esma.europa.eu/sections/mifid-ii-transparency-calculations-and-dvc>; Under the original MiFID, RMs were also using the LIS waiver, but that waiver has become even more important in the market place, due to the introduction of the double volume caps. LSEG, 'MiFID II: Six months on, six industry insights', available at <http://www2.londonstockexchangegroup.com/mifidii-insights>, page 4.

⁴⁶¹ Ulrich Nogel, 'MiFID 2 double volume caps – the end of dark trading?' available at http://www.automated-trader.net/articles/strategies/158441/mifid-2-double-volume-caps_-the-end-of-dark-trading

⁴⁶² On reporting requirements (by trading venues, CTPs and national competent authorities), see RTS 3, Articles 6 and 7.

⁴⁶³ MiFIR, Article 5. Petrescu and Wedow (2017), at p. 15.

⁴⁶⁴ MiFIR Articles, 5(2) and 5(3)

⁴⁶⁵ ESMA Report on Trends, Risks and Vulnerabilities (28 February 2019), p. 55. Where the calculations show that the trading volumes are approaching either the per venue, or the overall venues, limit, ESMA publishes another report for the instrument within 5 days of the 15th of the calendar month, MiFIR Article 5(5).

⁴⁶⁶ See <https://www.esma.europa.eu/double-volume-cap-mechanism>

⁴⁶⁷ MiFIR Article 5.

⁴⁶⁸ Commission delegated regulation (EU) 2017/567, Article 1.

Impact of double volume caps

By June 2018, the DVC resulted in the suspension of dark trading of more than 900 financial instruments, mostly shares.⁴⁶⁹ As of September 2018, the application of the DVC resulted in the suspension of dark trading for more than 1,200 instruments, again mainly equities.⁴⁷⁰

The first set of restrictions expired in September 2018.⁴⁷¹ In its first detailed report on the impact of the rules (in February 2019),⁴⁷² ESMA said that, for the equities banned by the DVC mechanism in March 2018 and for which the ban ended in November 2018, the volume of trading executed in dark trading fell to less than 1 percent of the total traded in August 2018 (from 7 percent in January 2018). The report expressed a view that conditions in lit exchanges improved while the caps were in place, with the size of bid-ask spreads tightening, and breadth and depth improving, but worsened when measured by the turnover ratio and average trade size.⁴⁷³

e. Best execution

When executing client orders, investment firms must choose among multiple execution venues and the best execution obligation informs their routing decisions.

Article 27 of the MiFID 2 Directive introduced a new requirement for investment firms to take 'all sufficient steps' (not just 'all reasonable steps') to obtain, when executing orders, the best possible results for their clients, taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order (or "best execution").⁴⁷⁴ ESMA has specifically stated that 'the requirement for 'sufficient' steps sets a higher bar for compliance than 'reasonable' steps.'⁴⁷⁵

In addition, Article 23 of the MiFIR Directive requires investment firms to ensure that the trades that they undertake are in shares admitted to trading on a regulated market or traded on a trading venue take place on a regulated market, multilateral trading facility, systematic internaliser, or third-country trading venue assessed as equivalent by the EU.⁴⁷⁶ The European Commission has

⁴⁶⁹ ESMA FESE Convention 2018, Speech by Steven Maijor, 21 June 2018, available at [esma70-156-427_mifid_ii_implementation_-_achievements_and_current_priorities_steven_maijor_fese_convention_2018_vienna_21_june.pdf](#)

⁴⁷⁰ ESMA, Report on Trends, Risks and Vulnerabilities (28 February 2019), p. 55

⁴⁷¹ Ibid, p. 54.

⁴⁷² Ibid.

⁴⁷³ Ibid, p. 61.

⁴⁷⁴ This is subject to any specific instruction from the client to execute in accordance with that instruction.

⁴⁷⁵ ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', (28 March 2019, Section 1, Answer 1.

⁴⁷⁶ MiFIR Directive, Article 23 (May 15, 2014).

issued equivalence determinations with respect to trading venues in the United States,⁴⁷⁷ Hong Kong,⁴⁷⁸ and Switzerland.⁴⁷⁹

In the context of best execution, one can distinguish between the actions and processes involved in achieving best execution, on the one hand, and the reports and records that need to be available to evidence that execution, on the other. For clarity, these execution-related reports are different from and additional to the transaction reports to regulators discussed above.

Actions and processes

Investment firms have to ensure that the intended outcomes for their clients can be achieved successfully on an ongoing basis. This does not mean that the firm must be able to obtain the best possible price for its clients on every single occasion. It means that the firms will need to have processes in place, to verify that their order execution process is consistent with their best execution obligation. If any deficiencies are detected, they are required to take all appropriate remedial actions to ensure that they are taking 'all sufficient steps' to achieve the best possible results for their clients.⁴⁸⁰

When executing client orders, investment firms are to take into account a number of factors (characterization of the client, characteristics of the order, of the financial instrument, of the execution venue).⁴⁸¹ Where an investment firm executes an order on behalf of a **retail** client, the best possible result is determined in terms of the total consideration (representing the price and the costs relating to execution).⁴⁸² Investment firms cannot receive any remuneration, discount or non-monetary benefit for routing client orders to a particular trading or execution venue, as also addressed in the payment for order flow section of the report.⁴⁸³

When it comes to investment firms that do not directly execute on an execution venue, but rather place or transmit client orders for onward execution, they are also subject to the 'best execution' obligation. They need to provide disclosures in relation to the entities or intermediaries to which they pass an order in the chain of execution.⁴⁸⁴

⁴⁷⁷ Commission Implementing Decision (EU) 2017/2320 on the equivalence of the legal and supervisory framework of the United States of America for national securities exchanges and alternative trading systems in accordance with Directive 2014/65/EU of the European Parliament and of the Council (Dec. 13, 2017).

⁴⁷⁸ Commission Implementing Decision (EU) 2017/2319 on the equivalence of the legal and supervisory framework applicable to recognised exchange companies in Hong Kong Special Administrative Region in accordance with Directive 2014/65/EU of the European Parliament and of the Council (Dec. 13, 2017).

⁴⁷⁹ Commission Implementing Decision (EU) 2017/2441 on the equivalence of the legal and supervisory framework applicable to stock exchanges in Switzerland in accordance with Directive 2014/65/EU of the European Parliament and of the Council (Dec. 21, 2017).

⁴⁸⁰ ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', (28 March 2019), Section 1, Answer 1.

⁴⁸¹ Commission Delegated Regulation 2017/565, Article 64.

⁴⁸² MiFID 2 Directive, Article 27(1).

⁴⁸³ Article 27(2), discussed further under 'payments for order flow' below.

⁴⁸⁴ Commission Delegated Regulation 2017/565, Article 65.

Reports and recording

The detailed reporting rules are set out in RTS 27 (data to be published by execution venues) and RTS 28⁴⁸⁵ (information to be published by investment firms, on the identity of execution venues and on the quality of execution). These reports are different from the transaction reporting and trade reporting discussed in the previous section of this report. RTS 27 and 28 reports are meant to provide clients with an ongoing view of the execution they are receiving in the marketplace.⁴⁸⁶

RTS 27 requires that execution venues⁴⁸⁷ make available to the public, without any charges, detailed data relating to the quality of execution of transactions on that venue.⁴⁸⁸ The RTS 27 reporting requirements cover all transactions in financial instruments, including those that are subject to the pre-trade transparency waivers.⁴⁸⁹ The data is to include the details of the price, costs, speed and likelihood of execution for individual financial instruments⁴⁹⁰ and is to be published quarterly, no later than three months after the end of each quarter.⁴⁹¹

RTS 28 reports summarize execution quality achieved by investment firms. RTS 28 specifies both the format and the content of the information to be published⁴⁹² by investment firms on an annual basis in relation to client orders executed on trading venues, SIs, market makers or other liquidity providers or entities that perform a similar function in a third country.⁴⁹³ The reports are to be made public on or before the 30th of April following the end of the period to which the report relates,⁴⁹⁴ and are to remain available in the public domain for a minimum period of two years.⁴⁹⁵

In terms of their content, the RTS 28 reports by investment firms are to identify **the top five execution venues** or firms (brokers where they have sent client orders), in terms of trading volumes for all executed client orders per class of financial instrument (in different formats for retail

⁴⁸⁵ Commission Delegated Regulation (EU) 2017/576 of 8 June 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards for the annual publication by investment firms of information on the identity of execution venues and on the quality of execution ('**RTS 28**').

⁴⁸⁶ Mason, 'MiFID 2 best execution: Are firms ready for RTS27 and 28?' (April 10, 2018), <https://www.refinitiv.com/perspectives/regulation-risk-compliance/mifid-ii-best-execution-are-firms-ready-for-rts-27-and-28/>

⁴⁸⁷ Under Article 23 of MiFIR, discussed above. Trading venues and SI are obliged to produce reports in relation to shares subject to the 'share trading obligation' (which is set out in MiFIR, Article 23(1) and requires that shares admitted to trading on an RM be traded either on a trading venue or SI in the EU or a third country equivalent) while each execution venue is obliged to produce information in relation to shares not subject to the 'share trading obligation', RTS 27, Recital 1.

⁴⁸⁸ RTS 27, Articles 3 - 8.

⁴⁸⁹ RTS 27, Recital 6. ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', 28 March 2019, Section 1, Answer 20.

⁴⁹⁰ RTS 27, Articles 2 - 10.

⁴⁹¹ MiFID 2 Directive, Article 27(3); RTS 27, Article 11.

⁴⁹² This can be on a website, but reports are not to be placed behind a firewall, registration page or be subject to password encryption or other restrictions, ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', (28 March 2019), Section 1, Answer 8.

⁴⁹³ RTS 28, Article 1.

⁴⁹⁴ ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', (28 March 2019), Section 1, Answer 5.

⁴⁹⁵ ESMA, Q & A, 'On MiFID II and MiFIR investor protection and intermediaries topics', (28 March 2019), Section 1, Answer 4.

and for professional clients⁴⁹⁶).⁴⁹⁷ The reports should include a list of qualitative and quantitative factors used to select the execution venues.⁴⁹⁸ They are also to provide a summary of the analysis and conclusions the investments firms draw from their detailed monitoring of the quality of execution they obtained on the execution venues they used,⁴⁹⁹ again in relation to each class of financial instrument.⁵⁰⁰ The reports are to include matters such as how the price, costs, speed and likelihood of execution are factored in the overall assessment of execution quality achieved; whether there are close connections to venues, conflicts of interest or shared ownership of venues has influenced execution quality; whether (non-) monetary benefits have been received; whether any changes occurred regarding the execution venues listed in the best execution policy, and whether execution quality differs if confronted with retail or professional clients.⁵⁰¹

When firms provide both order execution and the transmission of orders to a third party for execution, they need to provide two separate reports in relation to those services. Specifically, they must provide (1) the top five execution venues at which they execute orders and (2) the top five entities (brokers) to which they routed client orders in the relevant period.⁵⁰²

As far as record keeping is concerned, MiFID 2 imposes the following record keeping and documentation obligations on investment firms:⁵⁰³ (1) the requirement to record all services, activities and transactions;⁵⁰⁴ and (2) the requirement to provide clients with reports on all services provided.⁵⁰⁵

Payment for order flow

Payment for order flow (“**PFOF**”) occurs when an investment firm that routes client orders receives a fee from the counterparty with which the trade is then executed (typically a market maker or other liquidity provider).⁵⁰⁶ Under MiFID 2, these payments are viewed as creating a conflict of

⁴⁹⁶ The investor protection rules in Europe are two-tiered between retail and professional investors, and client categorization is binding, World Bank Working Paper No. 184, p. vii.

⁴⁹⁷ RTS 28, Article 3.

⁴⁹⁸ RTS 28, Article 3. ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 1, Answer 3 sets out further details of what information might be helpful in this exercise, especially where single venue is used.

⁴⁹⁹ RTS 28, Article 3(3).

⁵⁰⁰ ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 1, Answer 10.

⁵⁰¹ PWC, ‘MiFID II Hot Topic: Best Execution’ (June 2017), available at <https://www.pwc.com/gx/en/financial-services/pdf/best-execution-hot-topic.pdf>

⁵⁰² ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 1, Answer 7.

⁵⁰³ This is in addition to the obligation to record certain face-to-face conversations, see ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 2, Answer 8.

⁵⁰⁴ MiFID 2 Directive, Article 16(6); Commission Delegated Regulation 2017/565, Article 74.

⁵⁰⁵ MiFID 2 Directive, Article 25(6); Commission Delegated Regulation 2017/565, Articles 59 – 63, 66 (execution policy); suitability reports are to be provided whether or not the investment advice given leads to a transaction, see ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 2, Answer 1. On requirement for disclosure of costs, see in particular Article 24 of the MiFID 2 Directive, Article 50(9) of the Commission Delegated Regulation 2017/565 and ESMA, Q & A, ‘On MiFID II and MiFIR investor protection and intermediaries topics’, (28 March 2019), Section 9.

⁵⁰⁶ FCA Market Watch, Newsletter on market conduct and transaction reporting issues, September 2018, p. 3

interest between the investment firm and its client, by incentivizing the firm to route its client orders to counterparties willing to pay the highest fee.

Specifically, Article 27(2) of the MiFID 2 Directive states: 'An investment firm shall not receive any remuneration, discount or non-monetary benefit for routing client orders to a particular trading venue or execution venue, which would infringe the requirements on conflicts of interest or inducements...'.⁵⁰⁷ The EU rules on conflict of interest or inducements are such that Article 27 has been construed as prohibiting payments for order flow in the EU.⁵⁰⁸ However, because the prohibition must be implemented by respective member states, there is potential for regulatory divergence.

Maker/taker arrangements

However, trading venues, can provide *market makers* with incentives to provide liquidity to the trading venue.⁵⁰⁹ MiFID 2 provides that trading venues need to have written agreements in place with any investment firms pursuing a market making strategy on their market, including details of any incentives in terms of rebates, or otherwise offered by them to the investment firm in return for providing liquidity⁵¹⁰ on a regular and predictable basis, or any other rights accruing to such a firm.⁵¹¹ Trading venues are obliged to inform their national competent authority about the content of those agreements.⁵¹²

ESMA has clarified that 'rebates' in this context includes negative fees, direct payments, refunds or discounts on fees due from the provider of liquidity to the trading venue.⁵¹³ 'Maker/taker arrangements', in which financial incentives are provided to market participants to conclude trades by posting passive orders, are permitted both in relation to investment firms required to enter into market making arrangements, and in relation to other market makers provided they are subject to the appropriate market making obligations.⁵¹⁴ Article 17(4) requires that investment firms engaged in algorithmic trading enter into a market making arrangement when they: deal on their own account, post firm simultaneous two-way quotes of comparable size and at comparative prices relating to one or more financial instruments on a single trading venue or across different trading venues, with the result of providing liquidity on a regular and frequent basis to the overall market.

⁵⁰⁷ Those are set out in particular in Art 27(1) (the best execution rule), Art 16(3) (organizational and administrative arrangements for avoiding conflicts of interest), Art 23 and 24 (investor protection).

⁵⁰⁸ See, for example, Ball, 'Expert Claims Payment for Order Flow Loophole in MiFID II', in FinReg Alert (May 9, 2018) at <http://www.finregalert.com/expert-claims-payment-for-order-flow-loophole-in-mifid-ii/>

⁵⁰⁹ MiFID 2 Directive, Article 4(1)(7).

⁵¹⁰ RTS 8, Recital 5 suggests that, with algorithmic trading, incentives under a market making scheme should only be required for certain instruments traded under a continuous order book trading system.

⁵¹¹ MiFID 2 Directive, Article 48(3) (which covers regulated markets) and Article 18(5) (which requires investment firms and market operators of MTFs and OTFs to comply with Article 48). This may include a firm engaging in algorithmic trading, that is pursuing a market making strategy under MiFID 2 Directive, Article 17(4).

⁵¹² MiFID 2 Directive, Article 48(3). For the templates to be used to notify 'incentive schemes' and provide copies of market making agreements in the UK, see FCA, 'Trading Venue Notifications', <https://www.fca.org.uk/publication/documents/trading-venue-notifications-mifid-ii.pdf>

⁵¹³ ESMA, Q & A, 'On MiFID and MiFIR market structure topics' (1 February 2019), Section 5, Answer 9.

⁵¹⁴ ESMA, Q & A, 'On MiFID and MiFIR market structure topics' (1 February 2019), Section 5, Answer 9.

f. Tick sizes

MiFID 2 requires a share's minimum tick size to be calibrated in terms of liquidity measured by the average daily number of transactions⁵¹⁵ executed on the most relevant market.⁵¹⁶ The regime applies equally, regardless of the currency of the financial instrument, as it determines only the minimum difference between the two price levels of orders sent in relation to a financial instrument in the order book.⁵¹⁷

The requirement applies to both orders and quotes.⁵¹⁸ Originally, SIs did not need to comply with the tick size regime,⁵¹⁹ but the regulatory standards were modified to extend the tick size regime to SIs for trades at or below standard market size.⁵²⁰

The table on the following page specifies the minimum tick size regime that applies to instruments depending on their liquidity and price level.

⁵¹⁵ MiFID 2 Directive, Article 49 and Commission Delegated Regulation (EU) 2017/588 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards on the tick size regime for shares, depositary receipts, and exchange-traded funds ('**RTS 11**'). RTS 11, Articles 2 and 3, Annex.

⁵¹⁶ RTS 11, Article 1. The most relevant market in terms of liquidity is determined in accordance with RTS 1, Article 4.

⁵¹⁷ RTS 11, Recital 8.

⁵¹⁸ ESMA, Q & A, 'On MiFID and MiFIR market structure topics' (1 February 2019), Section 4, Answer 10.

⁵¹⁹ See ESMA, Opinion – Amendments to Commission Delegated Regulation (EU) 2017/587 (RTS 1), https://www.esma.europa.eu/sites/default/files/library/esma70-156-354_final_report_rts_1_amendment.pdf.

⁵²⁰ Commission Delegated Regulation (EU) 2019/442 of 12 December 2018 amending and correcting Delegated Regulation (EU) 2017/587 to specify the requirement for prices to reflect prevailing market conditions and to update and correct certain provisions.

		Liquidity bands (average number of daily transactions)					
		$0 \leq t < 10$	$10 \leq t$	$80 \leq t$	$600 \leq t < 2,000$	$2000 \leq t < 9,000$	$9,000 \leq$
Price ranges	< 0.1	0.0005	0.0002	0.0001	0.0001	0.0001	0.0001
	$0.1 \leq p < 0.2$	0.001	0.0005	0.0002	0.0001	0.0001	0.0001
	$0.2 \leq p < 0.5$	0.002	0.001	0.0005	0.0002	0.0001	0.0001
	$0.5 \leq p < 1$	0.005	0.002	0.001	0.0005	0.0002	0.0001
	$1 \leq p < 2$	0.01	0.005	0.002	0.001	0.0005	0.0002
	$2 \leq p < 5$	0.02	0.01	0.005	0.002	0.001	0.0005
	$5 \leq p < 10$	0.05	0.02	0.01	0.005	0.002	0.001
	$10 \leq p < 20$	0.1	0.05	0.02	0.01	0.005	0.002
	$20 \leq p < 50$	0.2	0.1	0.05	0.02	0.01	0.005
	$50 \leq p < 100$	0.5	0.2	0.1	0.05	0.02	0.01
	$100 \leq p < 200$	1	0.5	0.2	0.1	0.05	0.02
	$200 \leq p < 500$	2	1	0.5	0.2	0.1	0.05
	$500 \leq p < 1,000$	5	2	1	0.5	0.2	0.1
	$1,000 \leq p < 2,000$	10	5	2	1	0.5	0.2
	$2,000 \leq p < 5,000$	20	10	5	2	1	0.5
	$5,000 \leq p < 10,000$	50	20	10	5	2	1
$10,000 \leq p < 20,000$	100	50	20	10	5	2	
$20,000 \leq p < 50,000$	200	100	50	20	10	5	
$50,000 \leq p$	500	200	100	50	20	10	

g. Algorithmic and high-frequency trading

MiFID 2 defines “**algorithmic trading**” 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.⁵²¹

MiFID 2 imposes organizational requirements on investment firms engaged in algorithmic trading,⁵²² including requirements to put in place systems and risk controls of algorithms and keep sequenced records with respect to its trading activity.⁵²³ Firms must have both pre and post trade controls to monitor, identify and reduce trading risks across algorithmic trading activity.⁵²⁴ The

⁵²¹ MiFID 2 Directive Article 4(1) (39).

⁵²² For detail, see Commission Delegated Regulation (EU) 2017/589 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 organizational requirements of investment firms engaged in algorithmic trading (**‘RTS 6’**).

⁵²³ MiFID 2 Directive, Article 17.

⁵²⁴ RTS 6, Articles 15 and 17. For the review of the application of those requirements in the UK, see FCA, ‘Algorithmic Trading Compliance in Wholesale Markets’ (February 2018), section 4.

aim of these requirements is to ensure the resilience of trading systems,⁵²⁵ to avoid the transmission of erroneous orders⁵²⁶ and to provide supervisors with information on the activities of algorithmic trading.⁵²⁷ Algorithmic traders that use market making strategies must enter into market making agreements with trading venues on which they operate, to ensure that they provide liquidity on a regular and predictable basis.⁵²⁸

An investment firm engaging in algorithmic trading or providing direct electronic access must notify its Member State competent authority and the Member State competent authority of any trading venue of which it is a member.⁵²⁹ Its competent authority may require it to provide, on a regular or ad-hoc basis, (a) a description of the nature of its strategies, (b) details of the trading parameters or limits to which the system is subject, (c) a description of the key compliance and risk controls that it has in place and (d) information about the testing of its systems.⁵³⁰ The competent authority of the investment firm's home jurisdiction is also required to communicate that information to the competent authority of the trading venue upon request.⁵³¹

Trading venues enabling or allowing algorithmic trading through their systems are also subject to various obligations, including certain organizational requirements,⁵³² and requirements affecting capacity and resilience.⁵³³ Trading venues are required to provide testing platforms to ensure that algorithms can deal with stressed market conditions.⁵³⁴ Trading venues must also have in place certain pre-trade controls adopted for each instrument traded on them (price collars, maximum order value and maximum order volume) and can have such post-trade controls as they deem appropriate on the basis of their risk assessment.⁵³⁵ Trading venues must set limits on the number of order messages that a market participant can send relative to the number of transactions they undertake (the participant's order-to-trade-ratio, or "**OTR**").⁵³⁶ In addition, to enable retrospective reconstruction of trading activity by regulators, investment firms and trading venues must synchronize their clocks.⁵³⁷

⁵²⁵ For further specification of 'resilience of trading systems', see RTS 6, Chapter II.

⁵²⁶ See for example RTS 6, Article 15.

⁵²⁷ FINANCIAL CONDUCT AUTHORITY, *Algorithmic Trading Compliance in Wholesale Markets*, 5 (Feb. 2018) <https://www.fca.org.uk/publication/multi-firm-reviews/algorithmic-trading-compliance-wholesale-markets.pdf>.

⁵²⁸ MiFID 2 Directive, Article 17(3).

⁵²⁹ MiFID 2 Directive, Article 17(2).

⁵³⁰ Id.

⁵³¹ Id.

⁵³² Commission Delegated Regulation (EU) 2017/584 of 14 July 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards specifying organizational requirements of trading venues ("**RTS 7**"), Chapter I.

⁵³³ RTS 7, Chapter II.

⁵³⁴ Article 48(6).

⁵³⁵ RTS 7, Article 20.

⁵³⁶ Commission Delegated Regulation (EU) 2017/566 of 18 May 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 for the ratio of unexecuted orders to transactions in order to prevent disorderly trading conditions ("**RTS 9**") provides the detail of the calculations to be done.

⁵³⁷ MiFID 2 Directive, Article 50.

MiFID 2 defines “**high frequency trading**” or “**HFT**”⁵³⁸ as a subset of algorithmic trading characterized by: (a) infrastructure intended to minimize network and other types of latencies, including at least one of the these facilities for algorithmic order entry: co-location, proximity hosting or high-speed direct electronic access; (b) system-determination of order initiation, generation, routing or execution without human intervention for individual trades or orders; and (c) high intraday message rates which constitute orders, quotes or cancellations.⁵³⁹

HFT firms are subject to the obligations imposed on algorithmic trading firms generally and also must comply with further obligations. For example, HFT firms must store time-sequenced records of their algorithmic trading systems and trading algorithms⁵⁴⁰ for at least five years.⁵⁴¹ Trading activity must be time-stamped with 100-microsecond accuracy.⁵⁴² Further, ESMA has taken the position that high frequency traders should ‘immediately’ seek authorization as investment firms.⁵⁴³

A salient characteristic of certain HFT strategies, including the market making and arbitrage activities described in Section 1f, is the submission, revision and or cancellation of a large number of orders within a short time period. The high number of order messages has given rise to concerns about the ability of IT systems at trading venues to handle these significant volumes. As noted earlier, MiFID 2 mandates that trading venues set limits on market participants’ OTR; MiFID 2 also allows, but does not require, OTR fees.⁵⁴⁴ Several European jurisdictions had already introduced OTR fees prior to MiFID 2. Italy was among the first jurisdictions to assess an OTR fee: Borsa Italiana, Italy’s main stock exchange, charges a fee-per-order that increases on a sliding scale based on a trader’s OTR.⁵⁴⁵ France implemented OTR fees as part of a legislative package that also included a financial transactions tax on certain stock transactions. A fee equal to 0.01% of the

⁵³⁸ MiFID 2 expressly recognizes the benefit of HFT – including wider participation in markets, increased liquidity, narrower spreads, reduced short-term volatility and better execution for client orders—but also identifies concerns such as the potentially increased risk of market disruption. See MiFID 2 Directive, Recital 62.

⁵³⁹ MiFID 2 Directive, Article 4(1) (40). The concept of “high message intraday rates” was further clarified to mean: (1) at least two messages per second with respect to any single financial instrument traded on a trading venue; (2) at least four messages per second with respect to all financial instruments traded on a trading venue. The calculations include messages concerning financial instruments for which there is a liquid market, messages introduced for the purpose of market-making, and messages introduced for the purpose of proprietary dealing. Commission Delegated Regulation (EU) 2017/565, Article 19(1)-(3).

⁵⁴⁰ MiFID 2 Directive, Article 17.

⁵⁴¹ RTS 6, Article 28.

⁵⁴² MiFID 2 Directive, Article 17(2). See also EUROPEAN SECURITIES AND MARKET AUTHORITY, *Regulatory technical and implementing standards – Annex I – MiFID II / MiFIR*, ESMA/2015/1464, 222-23 (September 28, 2015).

⁵⁴³ EUROPEAN SECURITIES AND MARKET AUTHORITY, *Questions and Answers: On MiFID II and MiFIR market structures*, Question 5 (Feb. 1, 2019) https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-38_qas_markets_structures_issues.pdf. (“Where a firm engages in [high-frequency trading] and is not authorised as an investment firm under MiFID II, the firm is required to immediately seek authorisation as required under Article 2(1)(d)(iii) of MiFID II. ESMA reminds that any firm engaged in algorithmic trading (including HFT) has to notify this circumstance to the national competent authority of its home Member State and to the national competent authorities of the trading venues at which it engages in algorithmic trading as member or participant.”). See also MiFID 2 Directive, Recital 63.

⁵⁴⁴ MiFID 2 Directive, Articles 48(9) (regulated markets) and 18(5) (MTFs).

⁵⁴⁵ See Kee H. Chung and Albert Lee, *High-frequency Trading: Review of the Literature and Regulatory Initiatives around the World*, 45 Asia-Pacific Journal of Financial Studies 7, 23 (March 18, 2016); BORSA ITALIANA, *Pricelist for trading services*, 24 (Sep. 2018).

notional amount of modified or cancelled orders is imposed on financial intermediaries established in France whose OTR exceeds five.⁵⁴⁶ Notably, the OTR fee is directed only at HFT activities that are thought to be potentially harmful. Accordingly, activities pertaining to market making, smart order routing, and automated execution of large orders are exempt from the fee.⁵⁴⁷ Norway has also introduced OTR fees on the Oslo Stock Exchange; a fee of 0.05 Norwegian krone (NOK) per order is levied on traders with OTR higher than 70 to 1. The ratio is calculated on a monthly basis, and like the French OTR fee, is targeted only at activities that are perceived to be detrimental to market quality: orders that stay in the market for longer than a second, or that improve price or volume are not counted towards the OTR.⁵⁴⁸

The separate Market Abuse Regulation (MAR) targets market manipulation.⁵⁴⁹ Though the MAR is targeted at market manipulation rather than algorithmic trading, it includes provisions that specifically mention algorithmic trading and HFT: it explicitly prohibits sending orders, including by means of algorithmic trading and HFT strategies, that would disrupt or delay the functioning of trading venues' servers, make it difficult to identify genuine orders, or create or likely create misleading signals about the supply and demand of a financial product.⁵⁵⁰ Indicators of manipulative orders include the extent to which (1) trader's orders represent a significant proportion of trading activity, (2) orders are concentrated in a short time-span, and (3) orders change the order book, as well as (4) position reversals and (5) whether orders are sent at a specific time in the trading session. Investment firms or trading venues that detect suspicious trading activity are required to report to their regulator.⁵⁵¹

⁵⁴⁶ See Chung and Lee, *High-frequency Trading: Review of the Literature and Regulatory Initiatives around the World*, 45 Asia-Pacific Journal of Financial Studies at 24.

⁵⁴⁷ See *id.*

⁵⁴⁸ See *id.*; OSLO STOCK EXCHANGE, *Oslo Børs to discourage excessive order activity* (May 24, 2012), available at https://www.oslobors.no/ob_eng/Oslo-Boers/About-Oslo-Boers/News-from-Oslo-Boers/Oslo-Boers-to-discourage-excessive-order-activity. Regulators in other jurisdictions have taken similar steps aimed at the submission of numerous, ultimately unexecuted orders. In 2012, the Investment Industry Regulatory Organization of Canada (IIROC, the Canadian regulator that oversees investment dealers and trading activities, changed the way it *allocates* fees (the overall amount of fees is determined on a cost recovery basis) between venues (which then pass fees on to broker-dealers, who in turn recover those fees through commissions or by charging clients on a message- or trade-basis). Before April 2012, IIROC's fees were allocated based on market share of *trading* volume; they were subsequently changed so that they are allocated in part based on the market share of *messages* (where a message includes a trade, order submission, cancellation or modification). See Katya Malinova, Andreas Park and Ryan Riordan, *Do retail traders suffer from high frequency traders?* (October 3, 2013), available at http://qed.econ.queensu.ca/pub/faculty/milne/322/IIROC_FeeChange_submission_KM_AP3.pdf.

⁵⁴⁹ The MAR replaces the 2003 Market Abuse Directive, which was considered to have too many loopholes. Article 12(1)(a) and (b) distinguish between open market manipulation (facially legitimate orders or transactions that are only intended to influence price) and the use of fictitious devices or contrivances (using out-of-market actions, such as disseminating false information, to influence prices). Article 12(2) includes a list of prohibited manipulative behaviors; Annex I gives a list of indicators of manipulative behavior (see also Commission Delegated Regulation 2016/422, which includes a longer list).

⁵⁵⁰ MAR Article 12(2)(c).

⁵⁵¹ MAR Article 16(3).

h. Volatility controls

In the EU, the primary volatility controls include measures on the provision of continuing liquidity,⁵⁵² on circuit breakers and trading halts,⁵⁵³ and on trading venue capacity generally.⁵⁵⁴

MiFID 2 requires trading venues to seek to ensure that they have in place a sufficient number of market-making agreements with investment firms to achieve liquidity, appropriate for the nature and the scale of their trading.⁵⁵⁵ Trading venues must also communicate the existence of stressed market conditions to all market makers.⁵⁵⁶ Exceptional circumstances, when the obligation to provide liquidity does not apply, are to be defined exhaustively.⁵⁵⁷

Further, trading venues are to have in place effective systems, procedures and arrangements to ensure that their trading systems have sufficient capacity to deal with peak order and message volumes, are able to ensure orderly trading under conditions of severe market stress, are fully tested to ensure such conditions are met, and are subject to effective business continuity arrangements to ensure continuity of their services if there is any failure of their trading systems.⁵⁵⁸ They should have effective systems, procedures and arrangements to reject orders that exceed pre-determined volume and price thresholds or are clearly erroneous.⁵⁵⁹

Trading venue obligations include the need to have mechanisms in place to temporarily halt or constrain trading if there is a significant price movement in a financial instrument on that trading venue or a related trading venue during a short period and, in exceptional cases, to be able to cancel, vary or correct any transaction⁵⁶⁰ (**a circuit breaker**). The trading venue with the highest turnover⁵⁶¹ in a financial instrument in the EU⁵⁶² has to have necessary systems and procedures in place to notify its competent authority that its circuit breaker has been triggered and its trading halts applied, so that a market-wide response could be put in place, if appropriate.

⁵⁵² MiFID 2 Directive, Article 48(2). Commission Delegated Regulation (EU) 2017/578 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**').

⁵⁵³ MiFID 2 Directive, Article 48(5).

⁵⁵⁴ RTS 7, Art 11

⁵⁵⁵ MiFID 2 Directive, Article 48(2). RTS 8.

⁵⁵⁶ RTS 8, Article 4.

⁵⁵⁷ RTS 8, Recital 8, Article 3.

⁵⁵⁸ MiFID 2 Directive, Articles 48(1) and 18(5). Article 48 covers regulated exchanges; Article 18(5) provides for investment firms and market operators operating an MTF or OTF to comply with Article 48. RTS 7 deals with volatility arrangements in relation to algorithmic trading.

⁵⁵⁹ MiFID 2 Directive, Article 48(4).

⁵⁶⁰ MiFID 2 Directive, Recital 64, Article 48(5). Trading halts include mechanisms to **interrupt continuous trading**. This may consist of (i) stopping trading in relation to a financial instrument for a certain period of time, with no trades being executed in that instrument and no new prices being determined, or (ii) switching trading from continuous trading to a call auction. Definition of trading halts used in ESMA Guidelines 'Calibration of circuit breakers and publication of trading halts under MiFID II' (06/04/2017)

⁵⁶¹ Turnovers are calculated, in accordance with certain specified parameters, by the national regulators, RTS 1, Article 4 (2) and (3).

⁵⁶² RTS 9, Recital 4, Article 1; RTS 1, Article 4.

ESMA has issued guidelines on the calibration of circuit breakers and publication of trading halts under MiFID 2.⁵⁶³ The calibration is to be done according to a pre-defined, statistically supported methodology, taking into account factors such as the nature of the financial instrument, the liquidity profile and the quotation level of the financial instrument, the volatility profile of the financial instrument, the order imbalance (when manual re-calibration may be required), and static and dynamic reference prices (unless the trading venue can demonstrate that only one of those categories is sufficient).⁵⁶⁴

MiFID 2 requires investment firms engaged in algorithmic trading to have emergency “**kill functionality**,” allowing them to cancel all of their unexecuted orders with immediate effect, where that becomes necessary.⁵⁶⁵

Trading venues must have systems and procedures in place to ensure that algorithmic trading cannot create or contribute to disorderly trading conditions. This includes an obligation to calculate the ratio of unexecuted orders to transactions effectively incurred by their members or participants at the level of each financial instrument traded on them, in order to ensure effectively that the ratio does not lead to excessive volatility in that instrument.⁵⁶⁶

⁵⁶³ ESMA Guidelines ‘Calibration of circuit breakers and publication of trading halts under MiFID II’ (06/04/2017).

⁵⁶⁴ ESMA Guidelines, para 5.1

⁵⁶⁵ RTS 6, Recital 9 and Article 12. For further detail see FCA, ‘Algorithmic Trading Compliance in Wholesale Markets’, cited above.

⁵⁶⁶ RTS 9, Recital 1 and 4, Article 2.

5 Regulation of Equity Market Structure in Japan

a. Regulatory framework

The main laws applicable to securities markets in Japan are the Financial Instruments Exchange Act (“**FIEA**”) and the Investment Trust and Investment Corporations Act (“**ITIC**”).⁵⁶⁷ The FIEA assigns primary responsibility for the regulation and supervision of securities markets to the Prime Minister.⁵⁶⁸

In practice, the regulation and supervision of securities markets is primarily delegated to the Financial Services Agency (“**FSA**”) and the Securities Exchange and Surveillance Commission (“**SESC**”). The FSA, which is a cabinet agency, is responsible for policy, off-site monitoring and enforcement. The SESC—a board within the FSA that is afforded a high degree of independence from the FSA under the FIEA—carries out onsite inspections and investigations of securities firms (“**financial instruments business operators**”, or “**FIBOs**”).⁵⁶⁹

The FIEA authorizes the FSA and SESC to delegate certain monitoring and inspection functions to local finance bureaus. From an operational perspective, the FSA and SESC entrust local finance bureaus with the registration of FIBOs and the off-site monitoring and on-site inspections of smaller FIBOs. In addition, the FIEA authorizes stock exchanges to exercise self-regulatory authority or to delegate such authorities to separate self-regulatory organizations (“**SROs**”). Other entities, such as the Japan Securities Dealers Association (“**JSDA**”), are also authorized to perform certain self-regulatory functions.⁵⁷⁰

Key definitions

Financial instruments business the performance of any of the following acts on a regular basis: (i) purchase and sale of securities or market derivatives transaction; (ii) intermediation, brokerage or agency for the purchase and sale of securities or market derivatives transactions; (iii) over-the-counter transactions of derivatives or intermediation, brokerage or agency for it; (iv) brokerage for clearing of securities; (v) securities underwriting; (vi) public offering or private placement of securities; (vii) secondary distribution of securities; (viii) dealing in public offering or secondary distribution of securities, or dealing in private placement of securities; (iv) purchase and sale of securities or intermediation, brokerage, or agency for it, using an electronic data processing system; (x) provision of investment advisory services; (xi) provision of investment management services; or (xii) acts specified by regulation as being equivalent to the foregoing.⁵⁷¹

⁵⁶⁷ See International Monetary Fund, Monetary and Capital Markets Department (IMF), *Japan: IOSCO Objectives and Principles of Securities Regulation— Detailed Assessment of Implementation*, IMF Country Report No. 12/230, 7 (August 2012).

⁵⁶⁸ See *id.* at 6.

⁵⁶⁹ See *id.*

⁵⁷⁰ See *id.*

⁵⁷¹ See FIEA, Article 2(8).

<i>Financial instruments business operator or FIBO</i>	a person registered to conduct a financial instruments business. ⁵⁷²
<i>Financial instruments market</i>	a market on which the purchase and sale of securities or market derivatives transactions are conducted (excluding a market in which only commodity-related market derivatives transactions are conducted). ⁵⁷³
<i>Financial instruments exchange</i>	a financial instruments membership corporation or stock company that is licensed to operate a financial instruments market. ⁵⁷⁴
<i>High-speed trading activity or HFT</i>	<p>(1) any activity that is either:</p> <ul style="list-style-type: none"> (a) the purchase or sale of securities or market transactions of derivatives ("Activity (a)"); (b) engaging a third party for Activity (a); (c) managing cash or other assets by way of Activity (a) (including giving an instruction); or (d) carrying out a transaction or other conduct that results in its counterparty conducting in Activity (a), such as conducting market transactions of derivatives with a party conducting in Activity (a) as the counterparty; where <p>(2) the decision to conduct such activity set forth in (1) above is made automatically by an electronic data processing system; and</p> <p>(3) the transmission of information necessary to carry out, based on such decision, the corresponding purchase or sale of securities or market transactions of derivatives to a financial instrument exchange or a proprietary trading system is done in a manner that utilizes information communication technology and shortens the time usually required for such communication to be transmitted and (a) the facility in which the electronic data processing system used for decision making is located within (or adjacent or in proximity to) the location in which the respective exchange or proprietary trading system has installed its electronic data processing system to receive such transmission of the information, and (b) a mechanism has been put in place to prevent the transmission of information hereunder from competing with other transmissions to carry out the purchase or sale of securities or market transactions of derivatives to such exchange or proprietary trading system.⁵⁷⁵</p>

⁵⁷² See FIEA, Article 2(9).

⁵⁷³ See FIEA, Article 2(14).

⁵⁷⁴ See FIEA, Article 2(16).

⁵⁷⁵ See FIEA, Article 2(41); Order for Enforcement of the FIEA, Article 1(22)(i)-(ii); Cabinet Office Ordinance regarding Definitions under Article 2 of the FIEA, Article 26(1)-(2).

<i>Proprietary trading system or PTS</i>	a market on which sales and purchase of securities is conducted through an electronic data processing system, by using any of the following price formation method or other similar method, and in which a large number of persons participate simultaneously as the one party in the transaction or the transaction is conducted between a large number of persons: (a) an auction method; (b) with respect to listed securities, a method using the trading price of securities on a financial instruments market; (c) with respect to over-the-counter securities, a method using the trading price of securities published by the authorized financial instruments firms association with which the securities are registered; (d) a method using the price decided by negotiation between customers; and (e) methods specified by regulation. ⁵⁷⁶
<i>Trading participant</i>	a person who is allowed to participate in the sales and purchase of securities or market transactions of derivatives in financial instruments exchange market based on the relevant qualifications for trading. ⁵⁷⁷
<i>Type I Financial Instruments Business</i>	the performance of one of the following activities on a regular basis: (i) the purchase and sale of securities; (ii) intermediation, brokerage or agency for the purchase and sale of securities or commodity-related market derivatives transactions; (iii) over-the-counter transactions of derivatives or intermediation, brokerage or agency for it; (iv) brokerage for clearing of securities, commodity-related market derivatives transactions or over-the-counter transactions of derivatives; (v) secondary distribution of securities; (vi) dealing in public offering or secondary distribution of securities, or dealing in private placement of securities; (vii) securities underwriting; or (viii) purchase and sale of securities or intermediation, brokerage, or agency for it, using an electronic data processing system. ⁵⁷⁸
<i>Type II Financial Instruments Business</i>	the performance of one of the following activities on a regular basis: (i) the public offering or private placement of certain specified liquid securities; (ii) purchase and sale of illiquid securities; (iii) intermediation, brokerage or agency for the purchase and sale of illiquid securities; (iv) brokerage for clearing of illiquid securities; (v) underwriting of illiquid securities; (vi) public offering or private placement of illiquid securities; (vii) secondary distribution of illiquid securities; or (viii) dealing in public offering or secondary distribution of illiquid securities, or dealing in private placement of illiquid securities. ⁵⁷⁹

⁵⁷⁶ See FIEA, Article 2(8)(x); Cabinet Office Ordinance on Financial Instruments Business, No. 52 of 2007, Article 4(ix).

⁵⁷⁷ See FIEA, Article 2(19).

⁵⁷⁸ See FIEA, Article 28(1).

⁵⁷⁹ See FIEA, Article 28(2).

b. Trading venues

There are four financial instruments markets (stock exchanges) in Japan: the Japan Exchange Group (“**JPX**”), formed from the combination of the Tokyo and Osaka exchanges, and the Nagoya, Sapporo, and Fukuoka exchanges.⁵⁸⁰ Japanese stock exchanges were historically membership organizations consisting of securities companies. However, under a 2000 amendment to the FIEA, they were authorized to change their status to joint stock companies—the JPX (parent company of the Tokyo Stock Exchange (“**TSE**”)) and the Nagoya Stock Exchange have already done so.⁵⁸¹ The JPX is listed on the TSE.⁵⁸²

The vast majority of companies listed on Japan’s stock exchanges are on the TSE: as of April 2019, there were 3,665 companies listed on the TSE, compared to 292 for the Nagoya Stock Exchange (of which only 66 were listed exclusively), 109 for the Fukuoka Stock Exchange (26 exclusive listings), and 57 for the Sapporo Securities Exchange (16 exclusive listings).⁵⁸³

In terms of equity market capitalization, the TSE is the third largest exchange in the world after the U.S. New York Stock Exchange and NASDAQ. In terms of value of trading, the TSE ranks sixth.⁵⁸⁴ As of February 2019, the total market capitalization of the shares listed on the TSE was JPY 629 trillion and the value of shares traded on the TSE in that month was JPY 54 trillion.⁵⁸⁵

As of 2017, TSE has 93 trading participants, all of which are registered FIBOs.⁵⁸⁶ Japanese securities firms include two major independent securities groups designated as Domestic Systemically Important Banks (D-SIBs) as well as the securities subsidiaries of the Japanese megabanks that are G-SIBs. Foreign-owned FIBOs that are part of global G-SIB banking groups also have a significant presence in Japan, accounting for more than half of the trading value at the TSE as of 2017.⁵⁸⁷ The clients of FIBOs are primarily institutional investors, and institutional order flow accounts for between 70 to 80% of trading volume in the Japanese stock market as of 2015.⁵⁸⁸

A 1998 amendment to the FIEA enabled competition between other trading venues and Japanese stock exchanges by: (1) abolishing the “concentration rule” that required FIBOs to route orders

⁵⁸⁰ See Japan Securities Research Institute (JSRI), *Securities Market in Japan: 2016*, 56 (2016), available at http://www.jsri.or.jp/publish/english/pdf/english_08.pdf.

⁵⁸¹ See *id.*

⁵⁸² See OECD, *OECD Equity Market Review: Asia 2018*, OECD Capital Market Series, 36 (2018), available at <http://www.oecd.org/daf/ca/OECD-Equity-Market-Review-Asia-2018.pdf>.

⁵⁸³ See Japan Exchange Group (JPX), *Number of Listed Companies/Shares* (Apr. 12, 2019), available at <https://www.jpx.co.jp/english/listing/co/index.html> (TSE); Nagoya Stock Exchange, *Listed Companies* (Apr. 16, 2019), available at <http://www.nse.or.jp/e/meigara/stockcount/>; Fukuoka Stock Exchange, *About Us: Introduction*, <https://www.fse.or.jp/english/about/index.php>; Sapporo Securities Exchange, *About Sapporo Securities Exchange* (January 1, 2019), available at <https://www.sse.or.jp/about>.

⁵⁸⁴ International Monetary Fund, Monetary and Capital Markets Department (IMF), *Financial Sector Assessment Program: Technical Note – Regulation and Supervision of Securities Firms*, IMF Country Report No. 17/284, 7 (September 2017).

⁵⁸⁵ See JPX, *Monthly Statistics Report: Key Statistics for Domestic Stocks* (February 2019), available at https://www.jpx.co.jp/english/markets/statistics-equities/monthly/b5b4pj000002r67z-att/01_sokatu1902.pdf.

⁵⁸⁶ See *id.*

⁵⁸⁷ See IMF, *Financial Sector Assessment Program: Technical Note* at 4 (cited in note 10).

⁵⁸⁸ See Hideaki Kudoh and Kiminori Sano, *Empirical Analysis of Transaction Costs in the Japanese Stock Market*, *Securities Analysts Journal* (August 2015), available at https://www.saa.or.jp/english/publications/kudoh_sano.pdf.

only to stock exchanges; (2) introducing a regulatory framework for “proprietary trading systems” (“**PTSs**”) similar to the “alternative trading system” (in the United States) and “multilateral trading facility” (in the European Union) frameworks; and (3) putting in place a set of rules for trading of unlisted stocks.⁵⁸⁹

Alternative trading venues in Japan include regulated, “lit” PTS and unregulated, “dark” venues (for both order matching and internalization) operated by FIBOs.⁵⁹⁰ In February 2019, approximately 9.8 percent of trading of listed stocks occurred off-exchange (including PTS and unregulated dark venues), with approximately 60 percent of off-exchange trading (or 5.9 percent of all trading) occurring on PTS.⁵⁹¹

Stock Exchanges

Financial instruments exchanges operate financial instruments markets (stock exchanges), managing and supervising the trading process and the business conduct of securities companies.⁵⁹² The FIEA requires financial instruments markets to be licensed by the Minister of Financial Services (“**MoFS**”) on behalf of the Prime Minister, based on the recommendation of the FSA, which reviews applications for compliance with legal requirements.⁵⁹³ Financial instruments exchanges, which operate financial instruments markets, must have capital of at least JPY1 billion.⁵⁹⁴

Financial instruments exchanges are overseen on an ongoing basis by the FSA and the SESC. Authorization from the FSA is required for any material change to the articles of incorporation, operational rules or brokerage contract rules.⁵⁹⁵ The FSA also must be notified if changes are to be made to other rules, when securities or financial instruments are listed or when trading suspensions are imposed or lifted.⁵⁹⁶

Financial instruments exchanges must ensure that securities and derivatives markets are fair and protect investors by conducting regulatory, supervisory and disciplinary activities with respect to their members.⁵⁹⁷ Financial instruments exchanges can exercise self-regulatory authority themselves or delegate this authority to a separate SRO.⁵⁹⁸ For example, the TSE and Osaka Exchange have delegated their self-regulatory services to Japan Exchange Regulation (“**JPX-R**”), a subsidiary

⁵⁸⁹ See Working Group on Financial Markets, *Agenda for competition among trading venues and alternative trading platforms*, Financial Markets Division, Financial Services Agency (Japan) (June 15, 2016), available at <https://www.fsa.go.jp/en/news/2016/20160513-1/03.pdf>.

⁵⁹⁰ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 101-02 (cited in note 1).

⁵⁹¹ See Japan Securities Dealers Association (JSDA), *Monthly PTS Trading Volume of Shares Listed on Financial Instruments Exchanges* (March 22, 2019), available at <http://www.jsda.or.jp/en/statistics/pts-for-equity/>. See also Working Group on Financial Markets, *Agenda for competition among trading venues and alternative trading platforms* (cited in note 14) (as of 2016, approximately 90% of trading in listed stocks occurred on the TSE and 5% of trading occurred on PTS).

⁵⁹² See JSRI, *Securities Market in Japan* at 56 (cited in note 6).

⁵⁹³ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 7, 96 (cited in note 1).

⁵⁹⁴ See FIEA Article 83-2; Cabinet Order for Enforcement of FIEA Article 19.

⁵⁹⁵ See FIEA Article 149.

⁵⁹⁶ See FIEA Articles 121, 128.

⁵⁹⁷ See FIEA Article 80.

⁵⁹⁸ See FIEA Articles 102-14.

of JPX. The other exchanges (Nagoya, Fukuoka, and Sapporo) undertake their own self-regulatory services.⁵⁹⁹ SROs must keep records and prepare reports as required by regulation.⁶⁰⁰

JPX-R determines disciplinary actions against trading participants for violations of laws and regulations. Possible actions include fines, censure, trading suspension, and limiting or canceling trading qualifications. The disciplinary actions are determined after a hearing with the trading participant and consultation with the disciplinary committee, which is an advisory body to the JPX-R board. The TSE and Osaka Exchange take action based on the recommendations of JPX-R. The disciplinary actions are published, and several actions have been taken over the past years.⁶⁰¹

Access to exchanges

In order to trade on an exchange, a FIBO must first pass a qualification examination to be designated a trading participant.⁶⁰² The operational rules of an exchange must contain detailed regulations relating to trading participants.⁶⁰³ Financial instruments exchanges are prohibited from unjust, discriminatory treatment of a member.⁶⁰⁴ Fairness of access is examined as part of the FSA's review of a financial instruments exchange's license application and any amendment after licensing is also reviewed for this purpose. Accordingly, before providing co-location facilities, both the TSE and Osaka Exchange discussed fair access with the FSA.⁶⁰⁵

JPX-R, the SRO responsible for conducting regulatory, supervisory and disciplinary activities for the TSE and Osaka Exchange, organizes qualification examinations for trading participants and conducts inspections of them.⁶⁰⁶ The admission process for trading participants on the TSE requires that the JPX-R conduct examinations based on documents, hearings, onsite inspections of internal management systems at the applicant's headquarters and branch offices, and interviews with senior executives. The qualification criteria for the TSE include: (1) financial criteria (capital of at least JPY 300 million, net assets of at least JPY 500 million and an amount greater than capital, and capital adequacy ratio exceeding 200 percent); and (2) operational criteria (sound management structure, order placement, execution, and clearing and settlement systems that contribute to fair and smooth trading, and appropriate internal management system (compliance with laws and regulations, risk management, development of rules, etc.)).⁶⁰⁷

Only approved trading participants are connected to a financial instruments exchange's trading systems and may conduct sales and purchases of securities. However, sponsored client access is permitted, so long as trading participants have appropriate order management systems for their

⁵⁹⁹ See IMF, Financial Sector Assessment Program: Technical Note at 15-16 (cited in note 10).

⁶⁰⁰ See FIEA Article 188; IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 42 (cited in note 1).

⁶⁰¹ See *id.* at 40.

⁶⁰² See *id.* at 16.

⁶⁰³ See FIEA Article 117.

⁶⁰⁴ See FIEA Articles 87-89.

⁶⁰⁵ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 98 (cited in note 1); IOSCO, Order Routing Incentives: Final Report, FR08/2017, 9 (June 2017).

⁶⁰⁶ See IMF, Financial Sector Assessment Program: Technical Note at 16 (cited in note 10).

⁶⁰⁷ See *id.* at 31.

clients. In practice, trading participants establish order limits per client based on ratings and financial standing. The robustness of such “filters” is reviewed ex-post via on-site inspections by the JPX-R, financial instruments exchanges and/or the FSA.⁶⁰⁸

Trading fees

Financial instruments exchanges are required to obtain approval from the FSA for changes to their fees or fee models.⁶⁰⁹ Exchanges are required to perform benchmarking analysis and/or impact analysis, and the FSA must determine whether the structure of the model or the fee change is fair or unduly discriminatory. The FSA evaluates the reasonableness of fee models and trading fees by considering service provided vs. fees charged, operational cost, value added, comparable fees of other trading venues and competition factors.⁶¹⁰

Trading participants on the TSE are required to pay several different fees: (1) a basic monthly fee assessed to every trading participant; (2) fees for traded stock, based on the value of the trade; (3) fees based on the number of accesses per month (each entry, change and cancellation of an order is considered an “access” for these purposes); and (4) trading system usage facility fees based on the number of servers and/or terminals used.⁶¹¹

Proprietary trading systems

Alternative trading venues in Japan include regulated, lit proprietary trading systems and unregulated, dark venues (for both order matching and internalization) operated by FIBOs.⁶¹² A PTS is an alternative trading platform where matching of trading orders from various FIBOs takes place in an organized fashion.⁶¹³ Operating a PTS requires both generic registration as a Type I Financial Instruments Business and a separate authorization for operating the PTS. The authorization is subject to having at least JPY 300 million of capital (higher than the JPY 50 million required for broker-dealers, but lower than the JPY 1 billion of capital required for financial instruments exchanges).⁶¹⁴

PTS must be authorized by the FSA. The applicant’s price formation method, settlement method, business plan and business methods must ensure that public interest and investor protection are maintained. FSA’s Supervisory Guidelines include further authorization criteria, such as internal controls, disclosure of price information, reporting of transaction volume, etc.⁶¹⁵

⁶⁰⁸ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 92 (cited in note 1).

⁶⁰⁹ See IOSCO, Trading Fee Models and their Impact on Trading Behaviour: Final Report, FR12/13 (December 2013).

⁶¹⁰ See *id.*

⁶¹¹ See Tokyo Stock Exchange Inc., *Trading Participation Fees* (September 2016), available at [https://www.jpx.co.jp/english/rules-participants/participants/fees/tvdivq000000v276-att/fee\(English\)20160901.pdf](https://www.jpx.co.jp/english/rules-participants/participants/fees/tvdivq000000v276-att/fee(English)20160901.pdf); Tokyo Stock Exchange Inc., *Rules regarding Trading Participant Fees, etc.* (July 2, 2018), available at https://www.jpx.co.jp/english/rules-participants/rules/regulations/tvdivq0000001vyt-att/trading_participant_fees_rules_20180702.pdf

⁶¹² See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 101-02 (cited in note 1).

⁶¹³ See Working Group on Financial Markets, Agenda for competition among trading venues and alternative trading platforms (cited in note 14).

⁶¹⁴ See IMF, Financial Sector Assessment Program: Technical Note at 30 (cited in note 10).

⁶¹⁵ See *id.*

A PTS operator is also required to provide fair market access,⁶¹⁶ which is determined as part of the authorization process as well as ongoing monitoring of subsequent amendments to relevant rules.⁶¹⁷ PTS are not required to disclose trading fees, but they generally do so in practice.⁶¹⁸

Bids and offers made on a PTS, as well as transactions completed in listed securities (and prices), must be disclosed to members and the public.⁶¹⁹ This information must also be provided to the FSA.⁶²⁰ In practice, information on PTS is consolidated by the Japan Securities Dealers Association (“**JSDA**”) and disclosed via the JSDA website.⁶²¹ Accordingly, PTSs are lit venues: they have well defined market structure and market participants with price formation taking place in the visible order book.⁶²²

The main differences between financial instruments markets (stock exchanges) and PTS are as follows:

- (1) approval (operation of an exchange requires a license, whereas operation of a PTS only requires authorization);
- (2) capital requirements (financial instruments exchanges are required to have capitalization of JPY 1 billion, compared to JPY 300 million for PTS);
- (3) financial instruments markets have restrictions on holding of voting rights constituting 20 percent or more;
- (4) financial instruments exchanges exercise (or delegate) self-regulatory functions such as examination of member compliance, surveillance of the members’ transactions, screening of membership qualifications, and sanctions against members who breach rules; and
- (5) PTS that reach 10% market share must be licensed to become a financial instruments market.⁶²³

Unregistered “dark pools”

FIBOs are allowed, without authorization as a PTS operator, to operate “dark” trading systems whereby customer orders are electronically matched or internalized and then reported to the off-auction trading hours trading network offered by a financial instruments exchange.⁶²⁴ These dark pools began to appear in Japan around 2005 and have since become a standard product offering for major international brokerage houses as well as some of the large domestic securities firms.⁶²⁵ The FSA currently plans to introduce new regulation enhancing the transparency of dark pools.

⁶¹⁶ See Cabinet Office Ordinance, Article 17(12).

⁶¹⁷ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 98 (cited in note 1).

⁶¹⁸ See *id.*

⁶¹⁹ See FIEA Article 67-19.

⁶²⁰ See FIEA Article 67-20.

⁶²¹ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 102 (cited in note 1).

⁶²² See Kim, Barriers to Market Structure Evolution in Japan (cited in note 45).

⁶²³ See Working Group on Financial Markets, Agenda for competition among trading venues and alternative trading platforms (cited in note 14).

⁶²⁴ See Working Group on Financial Markets, Initiatives toward Stable Asset Building and the Development of Institutional Systems related to Markets and Exchanges at 23 (cited in note 46).

⁶²⁵ See Kim, Barriers to Market Structure Evolution in Japan (cited in note 45); IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 102 (cited in note 1).

Over-the-counter market

Shares of companies that are not listed on a stock exchange or registered with the over-the-counter (“**OTC**”) market are traded over the counters of securities companies; these transactions are reported to the JSDA, but the volume of trading in these issues is limited.⁶²⁶

c. Pre- and post-trade transparency

Financial instruments exchanges are required to provide pre-trade transparency, because they must publicly display information on bids and offers.⁶²⁷ Separately, when entering bids or offers, trading participants must disclose *to the exchange* whether the transaction is as principal or agent, a short or margin sale,⁶²⁸ but this information need not be publicized more broadly.

Financial instruments exchanges also are legally required to provide post-trade transparency: post-trade information must be publicly displayed immediately after a trade occurs.⁶²⁹ Financial instruments exchanges must also publicly disclose the total volume of daily transactions, highest price, lowest price, and closing price for each listed security. Such information must also be directly provided to the FSA.⁶³⁰

The TSE publicizes pre-trade quotation information, as well as execution prices via its own market information dissemination systems.⁶³¹ Pre-trade quote information is also available to the market via third-party distribution services, some of which integrate information from the TSE with information from other venues, including proprietary trading systems. Exchange trade data and quote information is available to all members in real time. The TSE also makes more detailed real-time information available to members for additional fees.⁶³²

d. Best execution

FIBOs are required to establish a policy and method for executing orders from customers under the best terms and conditions (“**Best Execution Policy**”) and execute orders in accordance with the Best Execution Policy.⁶³³ Before accepting an order from a customer, FIBOs need to deliver in advance to the customer a document stating the Best Execution Policy. FIBOs are prohibited from providing and promising special profits to a particular client.⁶³⁴ Unlike the United States and EU, Japan does not have detailed regulations regarding best execution, including a requirement for transparency.

All FIBOs and their directors and employees are also required to execute business in good faith and fairly to customers.⁶³⁵ Conflicts of interest must be prevented and appropriate management

⁶²⁶ See JSRI, *Securities Market in Japan* at 56.

⁶²⁷ Cabinet Office Ordinance on Financial Instruments Business Table 1, Articles 74-75.

⁶²⁸ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 102, .

⁶²⁹ See FIEA Article 130.

⁶³⁰ See FIEA Article 131.

⁶³¹ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 102.

⁶³² See *id.* at 99.

⁶³³ See FIEA Article 40-2.

⁶³⁴ See IOSCO, *Order Routing Incentives: Final Report* at 21.

⁶³⁵ See FIEA Article 36.

systems to identify them and address them must be developed.⁶³⁶ In addition, guidelines require that an independent conflict of interest manager be appointed to monitor different sales lines.⁶³⁷ These general rules concerning conflicts of interest and best execution apply to intermediaries routing customer orders regardless of whether those orders may be routed internally, to an affiliate or to another venue.⁶³⁸

By the middle of 2010 (after information vendors introduced PTS price information streaming, the TSE started offering colocation services, and Japan Securities Clearing Corporation began offering clearing services for PTS) several FIBOs in Japan revised their Best Execution Policy to address smart order routing connections to PTSs.⁶³⁹ However, many FIBOs continue to use exchanges as the default execution venue,⁶⁴⁰ especially for retail customers.

e. Tick sizes

Tick sizes on the TSE vary based on share price, with lower-priced stocks having smaller tick sizes (see table on the following page).⁶⁴¹ Proprietary trading systems (“**PTSS**”) initially defined their tick increments at about 1/10th those of the exchanges.⁶⁴² Under pressure from PTSs, which began to directly compete with exchanges in 2005, the TSE reduced its tick sizes for highly-liquid stocks with large market capitalizations (the TOPIX100 constituents) over three stages.⁶⁴³

⁶³⁶ See FIEA Articles 36, 44.

⁶³⁷ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 92 (cited in note 1); IOSCO, Order Routing Incentives: Final Report at 9, 21 (cited in note 31).

⁶³⁸ See *id.* at 20.

⁶³⁹ Yoichi Ishikawa, *Proprietary Trading Systems in Japan*, Global Trading (June 15, 2010), available at <https://www.fixglobal.com/home/proprietary-trading-systems-in-japan/>.

⁶⁴⁰ See, for example, Deutsche Bank Group Japan, *Principles of Best Execution* (May 7, 2018), available at https://japan.db.com/en/content/best_execution_policy.html.

⁶⁴¹ See Japan Exchange Group (JPX), *Trading Rules of Domestic Stocks: Tick Size* (December 1, 2015), available at <https://www.jpx.co.jp/english/equities/trading/domestic/07.html>.

⁶⁴² See Michael Kim, *Barriers to Market Structure Evolution in Japan*, Global Trading (June 15, 2010), available at <https://www.fixglobal.com/home/barriers-to-market-structure-evolution-in-japan/>.

⁶⁴³ See Working Group on Financial Markets, *Initiatives toward Stable Asset Building and the Development of Institutional Systems related to Markets and Exchanges*, Financial System Council, Financial Services Agency (Japan), 20 (December 22, 2016), available at https://www.fsa.go.jp/en/refer/councils/singie_kinyu/20170509/03.pdf; Ravi Kashyap, *A Tale of Two Consequences: Intended and Unintended Outcomes of the Japan TOPIX Tick Size Changes* (February 5, 2019), available at <https://arxiv.org/pdf/1602.00839.pdf>.

TOPIX 100 Constituents	
Price per share (JPY)	Tick size (JPY)
$p < 1,000$	0.1
$1,000 < p \leq 3,000$	0.5
$3,000 < p \leq 10,000$	1
$10,000 < p \leq 30,000$	5
$30,000 < p \leq 100,000$	10
$100,000 < p \leq 300,000$	50
$300,000 < p \leq 1,000,000$	100
$1,000,000 < p \leq 3,000,000$	500
$3,000,000 < p \leq 10,000,000$	1,000
$10,000,000 < p \leq 30,000,000$	5,000
$30,000,000 < p$	10,000

Other issues	
Price per share (JPY)	Tick size (JPY)
$p < 3,000$	1
$3,000 < p \leq 5,000$	5
$5,000 < p \leq 30,000$	10
$30,000 < p \leq 50,000$	50
$50,000 < p \leq 300,000$	100
$300,000 < p \leq 500,000$	500
$500,000 < p \leq 3,000,000$	1,000
$3,000,000 < p \leq 5,000,000$	5,000
$5,000,000 < p \leq 30,000,000$	10,000
$30,000,000 < p \leq 50,000,000$	50,000
$50,000,000 < p$	100,000

f. Algorithmic and high-frequency trading

The FIEA was amended in May 2017 (taking effect in April 2018) to specifically address algorithmic high speed trading. “High speed trading” is defined as algorithmic trading of securities or derivatives that minimizes latency by submitting orders to a trading venue (1) from a place that is adjacent or in proximity to the trading venue and (2) that are segregated from other orders. This definition would include algorithmic trading using an exclusive virtual server that is located inside a stock exchange, such as the co-location service provided by the TSE.⁶⁴⁴

Firms that engage in high speed trading are required to register with the FSA. FIBOs that are licensed to engage in securities businesses must notify the FSA if they engage in high speed trading, but do not have to separately register as a high speed trading firm. As part of their registration with or notification to the FSA, firms that engage high speed trading are required to provide the FSA with information related to their trading, such as information on their strategies and key compliance and risk controls. Required information includes: the category of each strategy (market-making, arbitrage, etc.); the markets in which the investor conducts high speed trading; the category of securities or listed derivatives covered by the strategy; and the names of the brokers retained.⁶⁴⁵

High speed trading firms also are required to establish operational control systems by: establishing company rules regarding high speed trading; providing training or other measures for employees to ensure compliance with those rules; take appropriate measures to maintain computer systems related to high speed trading; implement necessary and appropriate measures to prevent unfair trading through abuse of material non-public information; and implement sufficient trading controls to prevent intentional market manipulation.⁶⁴⁶ FIBOs are prohibited from accepting orders for high speed trading from firms that are not licensed and/or licensed firms for which the

⁶⁴⁴ FIEA Article 2(41); Cabinet Office Order on Definitions under Article 2 of the Financial Instruments and Exchange Act, Article 26.

⁶⁴⁵ FIEA Articles 66-50, 66-51; Cabinet Office Order on Financial Instruments Business, etc., Articles 327-329..

⁶⁴⁶ FIEA Articles 66-55, 66-57; Cabinet Office Order on Financial Instruments Business, etc., Articles 336-337.

FIBO is unable to confirm that its operational control system or risk controls are appropriately implemented.⁶⁴⁷

In addition, firms that engage in high speed trading are subject to record-keeping and annual business reporting. Foreign investors can substitute books and records made in accordance with foreign regulations (such as MiFID II) for Japan's high speed trading regulations. Foreign firms that engage in high speed trading are required to retain books and records for 7 or 10 years from the date of creation.⁶⁴⁸

The FIEA also includes separate rules governing market manipulation in Japanese securities. These rules apply to all kinds of trading, including algorithmic trading. The FIEA prohibits conducting, or offering to conduct, a series of purchases and sales of securities, in a manner that misleads a person into believing that the purchase and sales of securities are thriving or causes fluctuations in the market for the purpose of inducing the purchase and sales of securities.⁶⁴⁹ The SESC, which is responsible for market surveillance, including inspections of financial instruments firms, investigation of market misconduct, disclosure statements inspections and criminal investigations of securities fraud, has penalized traders for engaging in market manipulation, such as spoofing, using algorithmic trading technology.⁶⁵⁰

g. Volatility controls

Financial instruments exchanges use price limitation functions, "tick" size limitations and circuit breakers to deal with excessive volatility.⁶⁵¹ The TSE, for example, sets daily price limits to prevent volatile swings in a stock's price and provides a "time-out" in the event of a sharp rise or decline in a stock's price. Daily price limits are set in absolute yen values according to the previous day's closing price of each stock based on a sliding scale (ranging from \pm JPY 30 for stocks with a price of less than JPY 100, to \pm JPY 10 million for stocks with a base price of JPY 50 million). Bids and offers may not be placed at prices beyond the set limits: for example, if the previous day's closing price for a stock was JPY 1000, the lower and upper limits will be JPY 700 and JPY 1300, respectively, and no trading will be allowed outside of those limits.⁶⁵² On certain occasions, such as if there are three consecutive trading days in which the stock is stuck at the upper (lower) daily price limits, then the TSE will adjust the upper (lower) price limit.⁶⁵³

To prevent stock prices from fluctuating by large amounts suddenly, the TSE also delays the execution of quotes that are outside a certain range (again based on a sliding scale depending on stock price). Rather than execute immediately, a so-called "special quote" is indicated, which gives other investors a chance to place balancing orders. For example, if a buy order is placed at JPY 550 (outside the range) after an execution price of JPY 500 and there is no sell order below JPY

⁶⁴⁷ FIEA Article 38(viii); Cabinet Office Order on Financial Instruments Business, etc., Article 116-4.

⁶⁴⁸ FIEA Article 66-58; Cabinet Office Order on Financial Instruments Business, etc., Article 338.

⁶⁴⁹ See FIEA Article 159.

⁶⁵⁰ See Daisuke Niwa, *Market Manipulation Using High Frequency Trading and Issues Facing Japan*, Japan Lawyers Guide 2016/17, 38 (October 2016).

⁶⁵¹ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 92 (cited in note 1).

⁶⁵² See Tokyo Stock Exchange Inc., *Guide to TSE Trading Methodology*, 11-14 (2015), available at https://www.jpex.co.jp/english/equities/trading/domestic/tvdivq000000tpfi-att/Guide_to_TSE.pdf.

⁶⁵³ See id at 50.

550, then a special bid quote of JPY 510 will be publicly disseminated, which will be gradually raised every three minutes if there are no offers at the indicated price. If a counter-offer comes in, the investor that places the bid gets the benefit of execution at the lower price (closer to the prior execution price).⁶⁵⁴

The FSA also has the power to halt trading at an exchange in appropriate circumstances.⁶⁵⁵ However, the FSA has indicated that in practice this is not necessary as there is constant dialogue with the exchanges.⁶⁵⁶

⁶⁵⁴ See *id* at 33-37.

⁶⁵⁵ See FIEA Article 152.

⁶⁵⁶ See IMF, Japan: IOSCO Objectives and Principles of Securities Regulation at 106 (cited in note 1).

6 Regulation of Equity Market Structure in the United States

a. Regulatory framework

The U.S. equity markets are primarily regulated by the Securities and Exchange Commission (the “**SEC**”) pursuant to the Securities Exchange Act of 1934, as amended (the “**Exchange Act**”), and the rules and regulations promulgated thereunder. These regulations include Regulation National Market System (“**Reg NMS**”) and Regulation Alternative Trading Systems (“**Reg ATS**”), which governs certain non-exchange trading venues.

Exchanges and “national securities associations” are designated as self-regulatory organizations (“**SROs**”) under the Exchange Act.⁶⁵⁷ The only national securities association is the Financial Industry Regulatory Authority (“**FINRA**”), an independent organization that regulates the securities industry.⁶⁵⁸

In practice, exchanges do not execute their SRO obligations independently. The SEC maintains a role in regulating exchanges—exchange rules and disciplinary decisions are subject to SEC review, and the SEC may “suspend, bar or otherwise censure” an SRO that fails in its self-regulatory responsibilities.⁶⁵⁹ With respect to rulemaking, under the Exchange Act, an SRO’s proposed rule may not take effect until approved by the SEC⁶⁶⁰ unless it is the type of rule that becomes effective immediately upon filing with the SEC,⁶⁶¹ such as (i) policies and practices governing the administration of existing rules; (ii) fee changes; (iii) internal administrative rules; and (iv) certain other rules that do not significantly affect investor protection.⁶⁶² Although rarely invoked, the SEC also has authority to unilaterally amend SRO rules.⁶⁶³

The Exchange Act also allows the SEC to re-allocate regulatory responsibilities among SROs.⁶⁶⁴ In addition, SROs have voluntarily entered into Regulatory Services Agreements (“**RSAs**”) with other SROs to contract out certain regulatory responsibilities.⁶⁶⁵ As a result of this ability to allocate or

⁶⁵⁷ 15 U.S.C. § 78(c)(a)(26) (2012).

⁶⁵⁸ See *Self-Regulatory Organization Rulemaking*, U.S. SEC. & EXCH. COMM’N, <https://www.sec.gov/rules/sro.shtml> (last modified Mar. 5, 2019).

⁶⁵⁹ 15 U.S.C. § 78s(h)(1) (2010).

⁶⁶⁰ 15 U.S.C. § 78s(b)(2). See generally, U.S. SEC. & EXCH. COMM’N, Staff Guidance on SRO Rule Filings Relating to Fees: Subject: Fee Filings (May 21, 2019) <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees>.

⁶⁶¹ 15 U.S.C. § 78s(b)(3)(A).

⁶⁶² 17 C.F.R. § 240.19b-4(f). In October 2019, the SEC proposed a rule rescinding the current exception that allows exchange fee changes to become immediately effective upon filing. U.S. SEC. & EXCH. COMM’N, *Rescission of Effective-Upon Filing Procedure for NMS Plan Fee Amendments*, Exchange Act Release No. 34-87193 (Oct. 1, 2019), <https://www.sec.gov/rules/proposed/2019/34-87193.pdf>.

⁶⁶³ 15 U.S.C. § 78s(c).

⁶⁶⁴ 15 U.S.C. § 78(q)(d) (2010); 17 C.F.R. § 240.17d-2 (1976).

⁶⁶⁵ See, e.g., Notice of Filing and Immediate Effectiveness of Proposed Rule Change to Amend Chapter IX of its Rulebook, Exchange Act Release No. 71445, File No. SR-EDGX-2014-01 2 (Jan. 30, 2014) <https://www.sec.gov/rules/sro/edgx/2014/34-71445.pdf>; Self-Regulatory Organizations; New York Stock Exchange LLC; Notice of Filing and Immediate Effectiveness of Proposed Rule Change Amending Rules 9268, 9559, and 9620, Exchange Act Release No. 71986, File No. SRNYSE-2014-20 2 (Apr. 22, 2014) <https://www.sec.gov/rules/sro/nyse/2014/34-71986.pdf>.

outsource SRO obligations, FINRA now handles many of exchanges' self-regulatory responsibilities on their behalf.⁶⁶⁶

SROs are able to exert significant influence in establishing market-wide rules through NMS Plans. SROs must submit NMS Plans to the SEC,⁶⁶⁷ and NMS Plans (and any amendments) do not become effective until they are approved by the SEC through notice-and-comment rulemaking.⁶⁶⁸ SROs' authority to file NMS Plans originates in the Exchange Act, which allows the SEC to delegate the development and operation of key elements of market infrastructure to the SROs.⁶⁶⁹ The Exchange Act and Reg NMS do not expressly restrict the scope or contents of NMS Plans, so they can govern a wide range of important market structure issues. As a result, their contents affect essentially every market participant, although non-SROs play a limited role in NMS plan design. For example, the consolidated audit trail, the tick-size pilot program, and the governance of the consolidated market data aggregators (SIPs) are all managed according to NMS Plans.⁶⁷⁰

SROs are also immune from certain types of legal liability when acting in their self-regulatory capacity.⁶⁷¹ SRO immunity originates from their adjudicatory and disciplinary responsibilities, but it has expanded to encompass certain of their regulatory functions more generally.⁶⁷²

⁶⁶⁶ Daniel M. Gallagher, U.S. SEC. & EXCH. COMM'N, Remarks at the SRO Outreach Conference (Jan. 12, 2012) <https://www.sec.gov/News/Speech/Detail/Speech/1365171489690#.VI58F0sUybl>; Robert W. Cook, FINRA, Equity Market Surveillance Today and the Path Ahead (Sep. 20, 2017), <https://www.finra.org/newsroom/speeches/092017-equity-market-surveillance-today-and-path-ahead>.

⁶⁶⁷ 17 C.F.R. § 242.608(a).

⁶⁶⁸ 17 C.F.R. § 242.608(b)(1).

⁶⁶⁹ See 15 U.S.C. § 78k-1(a)(3)(B) (2012).

⁶⁷⁰ See Joint Industry Plan; Order Approving the National Market System Plan Governing the Consolidated Audit Trail, 81 Fed. Reg. 84696 (Nov. 23, 2016); U.S. SEC. & EXCH. COMM'N, *Statement on the Expiration of the Tick Size Pilot* (Sept. 10, 2018), <https://www.sec.gov/news/public-statement/tm-dera-expiration-tick-size-pilot>; Second Restatement of Plan Submitted to the Securities and Exchange Commission Pursuant to Rule 11aa3-1 under the Securities Exchange Act of 1934 ("CTA Plan") (August 27, 2018), available at <https://www.nyse.com/publicdocs/ctaplan/notifications/trader-update/CTA%20Plan%20-%20Composite%20as%20of%20August%2027,%202018.pdf>.

⁶⁷¹ The precise scope of and limitations on SRO liability continue to be subject to debate, but the SEC has taken the position that (i) "absolute immunity is properly afforded to the exchanges when engaged in their traditional self-regulatory functions—where the exchanges act as regulators of their members" and (ii) "immunity does not properly extend to functions performed by an exchange itself in the operation of its own market, or to the sale of products and services arising out of those functions." *Brief of the Securities and Exchange Commission, Amicus Curiae, City of Providence* at 22, *Rhode Island v. BATS Global Markets, Inc.* (2nd Circuit, 2016) (No. 15-3057) <https://www.sec.gov/litigation/briefs/2016/providence-bats-global-markets-1116.pdf>.

⁶⁷² Rohit A. Nafday, Comment, From Sense to Nonsense and Back Again: SRO Immunity, Doctrinal Bait-and-Switch, and a Call for Coherence, 77 U. CHI. L. REV. 847, 854 (2010); Merritt Fox & Gabriel Rauterberg, Stock Market Futurism, 42 J. CORP. L. 793, 799 (2017).

Key definitions

<i>Alternative trading systems or ATS</i>	as defined by Reg ATS, any organization, association, person, group of persons, or system: (1) that constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange; and (2) that does not: (i) set rules governing the conduct of subscribers other than the conduct of such subscribers' trading on such organization, association, person, group of persons, or system; or (ii) discipline subscribers other than by exclusion from trading. ⁶⁷³
<i>Broker-dealer</i>	as defined by the Exchange Act, any person (i) "engaged in the business of effecting transactions in securities for the account of others" (a "broker") ⁶⁷⁴ and (ii) "engaged in the business of buying and selling securities... for such person's own account through a broker or otherwise" (a "dealer"). ⁶⁷⁵
<i>Broker-dealer internalization</i>	trading activity whereby a broker-dealer systematically executes customer orders as a principal against the broker-dealer's own inventory of stocks (instead of routing them to an exchange or alternative trading system). ⁶⁷⁶
<i>Exchange</i>	as defined by the Exchange Act, "any organization... whether incorporated or unincorporated, which constitutes, maintains, or provides a marketplace or facilities for bringing together purchasers and sellers of securities." ⁶⁷⁷
<i>Exchange Act</i>	the Securities Exchange Act of 1934, as amended.
<i>National best bid and national best offer or NBBO</i>	as defined by Reg NMS, with respect to quotations for a given security, the best bid and best offer for such security that are calculated and disseminated on a current and continuing basis by a plan processor pursuant to an effective national market system plan. ⁶⁷⁸
<i>National market system plan or NMS plan</i>	as defined by Reg NMS, "any joint self-regulatory organization plan in connection with: (i) The planning, development, operation or regulation of a national market system (or a subsystem thereof) or one or more facilities thereof; or (ii) the development and implementation of procedures and/or

⁶⁷³ 17 C.F.R. § 242.300(a). Though ATSS meet the Exchange Act definition of an exchange, they are not required to register as exchanges so long as meet the regulatory requirements of Reg ATS. Under Reg ATS, ATSS are generally subject to a lighter regulatory regime than exchanges.

⁶⁷⁴ Definitions and application, 15 U.S.C. § 78c(a)(4).

⁶⁷⁵ *Id.* at § 78c(a)(5).

⁶⁷⁶ Commission Request for Comment on Issues Relating to Market Fragmentation, Exchange Act Release No. 42450, File No. SR-NYSE-99-48 (Feb. 23, 2000), <https://www.sec.gov/rules/sro/ny9948n.htm> ("Internalization is the routing of order flow by a broker to a market maker that is an affiliate of the broker. An integrated broker-dealer, for example, internalizes orders by routing them to the firm's market-making desk for execution.").

⁶⁷⁷ Definitions and application, 15 U.S.C. § 78c(a)(1).

⁶⁷⁸ 17 C.F.R. § 242.600(b)(43).

	facilities designed to achieve compliance by self-regulatory organizations and their members with any section of this Regulation NMS.” ⁶⁷⁹
<i>NMS stock</i>	any stock listed on a national securities exchange. ⁶⁸⁰
<i>Reg ATS</i>	the Regulation ATS, which concerns the regulation of alternative trading systems.
<i>Reg NMS</i>	the Regulation NMS, which concerns the regulation of the national market system.
<i>Trading venue</i>	exchanges, alternative trading systems, and broker-dealer internalizers.

b. Trading venues

Until the mid-2000s, the U.S. equity markets were dominated by exchange-based floor trading. This manual market landscape had some marked differences from the modern structure. For example, trading was highly centralized and competition among trading venues was limited. At the same time, there are similarities between the manual and modern market structure, such as the existence of undisplayed or “dark” trading and broker-dealer internalization.

Once automated electronic communication systems proliferated in the late 1990s, broker-dealers began to use these technologies to implement trading systems that challenged the dominance of the exchange-based manual model. In 1998, the SEC adopted Regulation ATS (“**Reg ATS**”), subjecting these trading venues to regulation.

Despite the advent of electronic marketplaces, certain regulations that were in place until 2006 gave a competitive advantage to slower manual markets for exchange-listed stocks. In 2006, the implementation of Regulation National Market System (“**Reg NMS**”) reshaped the equity market regulatory structure by spurring competition among trading venues, leading to the automation of equity markets and lowering investor transaction costs.

As of September 2017, dark trading accounted for approximately 45% of trading in U.S. equity markets, largely flat since 2014.⁶⁸¹ It can take place across all three types of trading venues.⁶⁸² The vast majority of trading on ATs and broker-dealer internalization can be considered dark trading, and approximately 9% of trading on exchanges involves the execution of undisplayed interest.⁶⁸³

⁶⁷⁹ 17 C.F.R. § 242.600(b)(44).

⁶⁸⁰ Rule 600(b)(46) of Reg NMS defines NMS security as “any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan...,” and Rule 600(b)(47) defines NMS stock as an NMS security other than an option. 17 C.F.R. § 242.600 (2005). *See also Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee*, Rule 611 of Regulation NMS, U.S. SEC. & EXCH. COMM’N 3 (Apr. 30, 2015) (“An NMS stock generally means any exchange-listed security (other than listed options) for which consolidated market data is disseminated.”).

⁶⁸¹ COMM. ON CAP. MKTS REG., *The State of the U.S. Equity Markets* (Sept. 2017), <https://www.capmksreg.org/wp-content/uploads/2017/10/2017-CCMR-EMS-Empirical-Updates.pdf>.

⁶⁸² OECD, *Changing business models of stock exchanges and stock market fragmentation*, in OECD Business and Finance Outlook 2016, 127, 130–1 (2016), available at <https://www.oecd.org/daf/ca/BFO-2016-Ch4-Stock-Exchanges.pdf>.

⁶⁸³ *Id.* at 126.

There are no caps on dark trading in U.S. equity markets. However, any dark trading must occur in a manner consistent with Reg NMS.

Stock exchanges

The Exchange Act defines an exchange as “any organization, association, or group of persons, whether incorporated or unincorporated, which constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities.”⁶⁸⁴ The Exchange Act provides that an exchange may seek to register as a “national securities exchange” by publicly filing an application with the SEC.⁶⁸⁵

The key requirements that apply to exchanges are set forth in the Exchange Act and in regulations promulgated thereunder by the SEC. Under the Exchange Act, exchanges must permit any registered broker-dealer in good standing to become a member of the exchange.⁶⁸⁶ Exchanges must file their proposed rules, which cover trading at the exchange and member conduct, for public comment and SEC approval before they can go into effect.⁶⁸⁷ In addition, exchanges are the only trading venues that are “self-regulatory organizations” (“**SROs**”).⁶⁸⁸ As SROs, exchanges must have the capacity to carry out the purposes of the Exchange Act and to enforce compliance by their members with the Exchange Act and related exchange rules.⁶⁸⁹ Such enforcement is generally achieved through disciplinary proceedings and membership restrictions, for which the Exchange Act also sets forth guidelines.⁶⁹⁰

Alternative trading systems

In 1998, the SEC implemented Reg ATS and established a new category of trading venue regulation, the alternative trading system (“**ATS**”).⁶⁹¹ This new type of trading venue was designed to respond to the proliferation of automated trading platforms that market participants had developed, which “furnish[ed] services traditionally provided solely by registered exchanges.”⁶⁹² Although these electronic venues meet the Exchange Act definition of exchange, Reg ATS exempts them from exchange registration if they comply with Reg ATS and their operators are registered as broker-dealers.⁶⁹³

Reg ATS requires that an ATS’s rules can only pertain to its subscribers’ trading conduct,⁶⁹⁴ and ATSs can only discipline subscribers by excluding them from trading.⁶⁹⁵ Unlike an exchange, an

⁶⁸⁴ 15 U.S.C. § 78c(a)(1) (2010).

⁶⁸⁵ *Id.* at § 78f.

⁶⁸⁶ *Id.* at § 78f(b)(2).

⁶⁸⁷ *Id.* at § 78s(b); SEC Form 19b-4, available at <https://www.sec.gov/about/forms/form19b-4.pdf>.

⁶⁸⁸ *Id.* at § 78s(a).

⁶⁸⁹ *Id.* at § 78f(b)(1).

⁶⁹⁰ *Id.* at § 78f(c),(d).

⁶⁹¹ Regulation of Exchanges and Alternative Trading Systems, Exchange Act Release No. 40760, File No. S7-12-98 (Dec. 8, 1998), <https://www.sec.gov/rules/final/34-40760.txt> (“**Reg ATS Release**”).

⁶⁹² *Reg ATS Release*.

⁶⁹³ *Id.*

⁶⁹⁴ 17 C.F.R. § 242.300.

⁶⁹⁵ *Id.*

ATS can effect trading rules without the SEC's preapproval.⁶⁹⁶ ATSs can also limit access to trading on their platform and can restrict participation among its subscribers, unless their average daily trading volume in a *particular stock* equals or exceeds approximately 5% of overall trading volume in that stock.⁶⁹⁷ If trading volume on an ATS exceeds the 5% threshold, then the ATS must establish written standards for granting open access to all registered broker-dealers seeking to trade that stock on the ATS.⁶⁹⁸

ATSs are not required to publicly display orders, unless: (1) their trading volume in a stock equals or exceeds 5% of total trading in that stock; *and* (2) the ATS displays prices to more than one of its participants (i.e., it is not a "dark pool").⁶⁹⁹ If an ATS exceeds the 5% threshold, then it must publicly display orders in that stock,⁷⁰⁰ but no ATSs presently exceed the threshold.

The SEC amended Reg ATS in July 2018 to enhance operational transparency and regulatory oversight of ATSs.⁷⁰¹ The new rule requires ATSs to file and update a Form ATS-N with the SEC, which will be made publicly available.⁷⁰² Form ATS-N requires *public* disclosure for the first time of information regarding each ATS's rules, services, fee structures, trading activity by the operators, and procedures regarding confidential customer information.⁷⁰³

Order protection rule

An order that is executed at a worse price than the best publicly available price is known as a "trade-through." The SEC adopted Rule 611 of Reg NMS (the "**order protection rule**") to reduce trade-throughs by requiring exchanges, ATSs and broker-dealer internalizers to establish, maintain, and enforce written policies and procedures that are reasonably designed to prevent trade-throughs of "protected quotations."⁷⁰⁴ Protected quotations are the best, automated,⁷⁰⁵ publicly displayed bids and offers on each exchange and the Alternative Display Facility operated

⁶⁹⁶ Regulation of Exchanges and Alternative Trading Systems, 63 Fed. Reg. 70844, 70864 (Dec. 22, 1998) <https://www.gpo.gov/fdsys/pkg/FR-1998-12-22/pdf/98-33299.pdf> ("Form ATS is not an application and the [SEC] would not 'approve' an ATS before it began to operate. Form ATS is, instead, a notice to the [SEC].").

⁶⁹⁷ 17 C.F.R. § 242.301(b)(5). The Fair Access Rule applies on a "security-by security basis." See Regulation of Exchanges and Alternative Trading Systems, 63 Fed. Reg. 70844, 70873 (Dec. 22, 1998) <https://www.gpo.gov/fdsys/pkg/FR-1998-12-22/pdf/98-33299.pdf>.

⁶⁹⁸ 17 C.F.R. § 242.301(b)(5)(ii)(C) and (d) also establish related record-keeping and reporting requirements.

⁶⁹⁹ Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee, Current Regulatory Model for Trading Venues and for Market Data Dissemination, U.S. SEC. & EXCH. COMM'N 4 (Oct. 20, 2015), <https://www.sec.gov/spotlight/emsac/memo-regulatory-model-for-trading-venues.pdf>

⁷⁰⁰ 17 C.F.R. §§ 242.301(b)(3) and (5).

⁷⁰¹ U.S. SEC. & EXCH. COMM'N, SEC Adopts Rules to Enhance Transparency and Oversight of Alternative Trading Systems (July 18, 2018), <https://www.sec.gov/news/press-release/2018-136>. See also DAVIS POLK, SEC Adopts New Transparency Requirements for NMS Stock Alternative Trading Systems (Aug. 21, 2018).

⁷⁰² U.S. SEC. & EXCH. COMM'N, *Form ATS-N Filings and Information*, <https://www.sec.gov/divisions/marketreg/form-ats-n-filings.htm> (last accessed Apr. 16, 2019).

⁷⁰³ U.S. SEC. & EXCH. COMM'N, Regulation of NMS Stock Alternative Trading Systems, 83 FED. REG. 38768 (Aug. 7, 2018), <https://www.govinfo.gov/content/pkg/FR-2018-08-07/pdf/2018-15896.pdf>.

⁷⁰⁴ Order Protection Rule, 17 C.F.R. § 242.611.

⁷⁰⁵ Automated quotations are displayed by an automated trading centre, and the definitions of both automated quotations and automated trading centre generally require that quotations be immediately and automatically executable, without any programmed delay. Regulation NMS, Adopting Release 70 FR 37496 (June 29, 2005).

by FINRA (which would include publicly displayed quotes from ATs if they exceeded the 5% threshold, but none have).⁷⁰⁶ While the rule restricts order execution at a price worse than the NBBO, trading venues can execute at a price matching the NBBO, even if they are not publicly displaying that price.⁷⁰⁷

Trading venue execution disclosures

To enhance transparency with respect to order execution, Rule 605 of Reg NMS requires all trading venues (including exchanges, ATs, and broker-dealer internalizers) to publicly disclose monthly reports with standardized information about the order execution quality they achieve for retail-size customer orders.⁷⁰⁸ The report must contain detailed information categorized by individual security, order type, and order size for all securities that the trading venue executes.⁷⁰⁹ It must include the speed at which orders are executed and the “average realized spread” (calculated with reference to the weighted price obtained versus the midpoint of the NBBO).⁷¹⁰

As to speed, Rule 605 currently requires trading venues to disclose the speed of execution to the tenth of a second.⁷¹¹ As to price, execution quality reported under Rule 605 is measured using the NBBO as disseminated by the SIP feeds.⁷¹² In emphasizing the required use of SIP-based NBBOs, the SEC staff has explained that benchmarking executions across market centers to the same reference points would further the important objective of generating “execution quality statistics that are comparable among different market centers.”⁷¹³

Together, these obligations assist investors, regulators, trading venues and broker-dealers in assessing effective compliance with the duty of best execution.

Access fees

Investors would not be able to obtain the best prices for their orders if broker-dealers could not access trading venues in a fair and efficient manner. Rule 610 of Reg NMS sets forth the rules by which market participants may access trading venues.⁷¹⁴

⁷⁰⁶ NMS Security Designation and Definitions, 17 C.F.R. § 242.600(b)(61)-(62) (defining “protected quotation”); FIN. IN. REG. AUTH., *Alternative Display Facility (ADF)* (last accessed Sept. 20, 2019), <https://www.finra.org/filing-reporting/alternative-display-facility-adf>.

⁷⁰⁷ Rule 611 of Regulation NMS, Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee, at 4 (Apr. 30, 2015), <https://www.sec.gov/spotlight/emsac/memo-rule-611-regulation-nms.pdf> (“Rule 611 only restricts trades at prices worse than a protected quotation. Any trading center is free to execute trades at prices that are equal to or better than a protected quotation, regardless of whether such trading center is currently quoting at that price or is a dark venue that never displays quotations.”).

⁷⁰⁸ See generally 17 C.F.R. § 242.605 (2005).

⁷⁰⁹ *Id.* at § 242.605(a).

⁷¹⁰ *Id.* at § 242.605(a)(1)(i)(K).

⁷¹¹ *Id.* at § 242.605.

⁷¹² U.S. SEC. & EXCH. COMM’N, *Division of Market Regulation: Staff Legal Bulletin No. 12R (Revised)* (June 22, 2001), <https://www.sec.gov/interps/legal/slbim12a.htm>.

⁷¹³ *Id.* (“One of the important objectives of the Rule is to generate execution quality statistics that are comparable among different market centers. Benchmarking the order executions of all market centers to a Consolidated BBO with a single time will further this objective.”).

⁷¹⁴ Access to Quotations, 17 C.F.R. § 242.610.

Trading venues have the authority to impose “access fees” on market participants executing trades on their platform.⁷¹⁵ This is subject, however, to the overall requirements of the Securities Exchange Act of 1934, including the requirements of Section 6 that, among other things, an exchange’s rules must provide for the *‘equitable allocation of reasonable dues, fees, and other charges among its members and issuers and other persons using its facilities’*, not *‘permit unfair discrimination between customers, issuers, brokers, or dealers’*, and *‘not impose any burden on competition not necessary or appropriate in furtherance of the purposes of’* the Securities Exchange Act. SROs/exchanges must have their rules and proposed rule changes approved by the SEC.⁷¹⁶ Since the Dodd-Frank Act in 2010, the exchanges have an option to designate their fee rules as immediately effective upon filing with the SEC,⁷¹⁷ but the SEC can suspend such an immediately effective rule.⁷¹⁸ In October 2019, to strengthen the considered review of fee changes, the SEC proposed to rescind the current exception allowing exchange fee changes to become immediately effective upon filing.⁷¹⁹

Because access fees are not expressly reflected in a stock’s publicly displayed price, and SEC Rule 611 mandates that best price protected quotes must be honored, the SEC implemented an access fee cap of \$0.0030 per share for *publicly displayed orders*.⁷²⁰ In practice, exchanges often charge the regulatory maximum as part of the “maker-taker” pricing system, whereby exchanges charge a fee to the market participants that remove (“take”) liquidity from an exchange and pay a rebate to market participants that provide (“make”) liquidity to an exchange. Access fees are generally used to fund liquidity rebates, and exchanges earn the difference.

Access fee pilot program

In December 2018, the SEC adopted Rule 610T of Regulation NMS to implement a transaction fee pilot program (the “**Fee Pilot**”) to “help the Commission analyze the effects of exchange transaction fee and rebate pricing models on order routing behavior, execution quality, and market quality generally.”⁷²¹ The Fee Pilot covers all exchanges and is to last one year with the prospect of a one-year extension by the SEC.⁷²² The Fee Pilot will include stocks that meet certain trading volume and price thresholds (the “**Fee Pilot Securities**”).⁷²³

⁷¹⁵ See Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee, Maker-Taker Fees on Equities Exchanges, U.S. SEC. & EXCH. COMM’N 29 (Oct. 25, 2015), <https://www.sec.gov/spotlight/em-sac/memo-maker-taker-fees-onequities-exchanges.pdf>.

⁷¹⁶ Section 19 of the Exchange Act of 1934 (15. U.S. Code § 78s).

⁷¹⁷ Section 19(b)(3)(A) of the Exchange Act of 1934 (15. U.S. Code § 78s(b)(3)(A)).

⁷¹⁸ Section 19(b)(3)(C) of the Exchange Act of 1934 (15. U.S. Code § 78s(b)(3)(C)).

⁷¹⁹ U.S. SEC. & EXCH. COMM’N, *Rescission of Effective-Upon Filing Procedure for NMS Plan Fee Amendments*, Exchange Act Release No. 34-87193 (Oct. 1, 2019), <https://www.sec.gov/rules/proposed/2019/34-87193.pdf>.

⁷²⁰ Access to Quotations, 17 C.F.R. § 242.610.

⁷²¹ U.S. SEC. & EXCH. COMM’N, *SEC Adopts Transaction Fee Pilot for NMS Stocks* (Dec. 2018), <https://www.sec.gov/news/press-release/2018-298> (“**SEC Release on Transaction Fee Pilot**”). See also U.S. SEC. & EXCH. COMM’N, *Transaction Fee Pilot for NMS Stocks*, Exchange Act Release No. 34-84875 (effective Apr. 22, 2019), <https://www.sec.gov/rules/final/2018/34-84875.pdf>.

⁷²² SEC Release on Transaction Fee Pilot.

⁷²³ *Id.*

The Fee Pilot Securities are divided into three groups. For Test Group 1, the access fee cap applicable to exchanges is reduced to \$0.0010.⁷²⁴ For Test Group 2, the access fee cap applicable to exchanges remains at \$0.0030, but *rebates* are generally prohibited.⁷²⁵ For the Control Group, the access fee cap applicable to exchanges remains at \$0.0030.⁷²⁶

In addition, the Fee Pilot requires exchanges to post the following to their websites: (i) transaction fee and rebate data on a monthly basis; and (ii) information about the Fee Pilot Securities they list and any changes to trading in those securities.⁷²⁷ Exchanges must also provide the SEC with aggregated order routing data on a monthly basis.⁷²⁸

The access fee pilot program reduces the ability of exchanges to implement a maker-taker pricing system. Three exchange groups (NYSE, Nasdaq and Cboe Global Markets) have sued the SEC to challenge the Fee Pilot⁷²⁹ on the grounds that it is arbitrary and capricious and exceeds the SEC's rulemaking authority under the Administrative Procedure Act.⁷³⁰

Market data fees

The US has a two-pronged system of market data (and market access) in equity markets, (1) the consolidated data feeds distributed pursuant to joint-SRO national market system plans; and (2) the proprietary data products and access services that are provided directly by the exchanges.⁷³¹ The latter set of products has less latency, include slightly different content (for example, proprietary feeds have depth of book information, which the SIPs do not, and SIPs have certain regulatory information, which the proprietary feeds do not), and is more costly.⁷³² The cost of the proprietary data products has been increasing over time and has become a contentious issue between the users and the dominant exchanges (NYSE and Nasdaq) who have the most valuable data streams.⁷³³

⁷²⁴ *Id.*

⁷²⁵ *Id.*

⁷²⁶ *Id.*

⁷²⁷ *Id.*

⁷²⁸ *Id.*

⁷²⁹ Alexander Osipovich and Dave Michaels, *Big Three Stock Exchanges Sue SEC Over Trading-Fee Plan*, THE WALL ST. J. (Feb. 15, 2019), <https://www.wsj.com/articles/nasdaq-joins-new-york-stock-exchange-in-suing-to-block-sec-rule-11550259637>.

⁷³⁰ Petition for Review at 1, *The Nasdaq Stock Market LL v. U.S. Sec. & Exch. Comm'n*, No. 19-1042 (D.C. Cir. Feb. 15, 2019) (invoking the applicable subsection of the Administrative Procedure Act); Scope of review, 5 U.S.C. § 706 (setting forth the applicable standards of review, including if an administrative action is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law" or "in excess of statutory jurisdiction").

⁷³¹ Brett Redfearn (Director, SEC Division of Trading and Markets), *'Opening Statement at the SEC Staff Roundtable on Market Data and Market Access'*, Oct. 25, 2018, available at <https://www.sec.gov/news/public-statement/statement-redfearn-102518>.

⁷³² *Id.*

⁷³³ IEX claims that the market data fees charged by the dominant US exchanges are 1,500 per cent times the cost of producing the data, when compared with its own data costs, see Henderson, *'Regulator calls on US exchanges to justify increases in data fees'* (FT, May 21, 2019) and Henderson, *'Flash Boys' exchange IEX backs regulator in data fees fight'* (FT, May 14, 2019). See also the significant percentage change in spending on NYSE proprietary data in the period 2010 – 2017, according to Expand Research/SIFMA Analysis 2018, set out in Stafford, *'MEMX turn up the heat on US stock exchanges'* (FT, January 9, 2019).

The SEC issued guidance on May 21, 2019, as to the level of detail it expects to see from the exchanges when they seek to increase the fees they charge for market data. The details required include measuring down to the microsecond a faster data product, and showing the costs of producing data, if exchanges are using the cost as a basis for justifying their higher fees.⁷³⁴

c. Pre- and post-trade transparency

Pursuant to the Exchange Act, the SEC aims to ensure that market participants have access to consolidated market data at fair cost and in an effective and timely manner.⁷³⁵ Consolidated market data generally refers to: (1) pre-trade transparency – timely information on the best-priced publicly displayed quotations; and (2) post-trade transparency – timely reports of trades that are executed.⁷³⁶

“Lit” trading, or trading with pre-trade transparency, refers to trading on venues with publicly displayed quotes that include: (1) the stock symbol, (2) whether the order is one to buy or to sell, (3) the number of shares, and (4) the price.⁷³⁷ Undisplayed or “dark” trading describes trades that are executed on venues without such pre-trade transparency and the execution of undisplayed interest on an otherwise lit venue.⁷³⁸ Pre-trade transparency serves an essential linkage function by helping to inform the public of the best displayed prices for stocks.⁷³⁹ There are no pre-trade transparency obligations in relation to odd lots,⁷⁴⁰ although some exchanges do provide odd lot quotations.⁷⁴¹

⁷³⁴ ‘Staff Guidance on SRO Rule Filings Relating to Fees’, May 21, 2019, *available at* <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees>.

⁷³⁵ See *generally* 15 U.S.C. § 78k–1 (2012). See also Regulation NMS, Exchange Act Release No. 51808, 70 Fed. Reg. 37496, 37560, 37567 (June 29, 2005), <https://www.sec.gov/rules/final/34-51808fr.pdf>.

⁷³⁶ Concept Release on Equity Market Structure, Exchange Act Release No. 61358, File No. S7- 02-10, 75 FED. REG. 3594, 3600 (proposed Jan. 21, 2010).

⁷³⁷ SIFMA Paper on Displayed and Non-Displayed Liquidity, SEC. INDUS. & FIN. MKT. ASS’N 3 (Aug. 31, 2009).

⁷³⁸ Robert Bloomfield et al., *Hidden Liquidity: Some New Light on Dark Trading*, 70 J. OF FIN. 2227–74 (Oct. 2015).

⁷³⁹ Concept Release on Equity Market Structure, Exchange Act Release No. 61358, File No. S7-02-10, 75 FED. REG. 3594, 3600 (proposed Jan. 21, 2010).

⁷⁴⁰ An odd lot is an order for an amount of a security that is less than the normal unit of trading for that particular security, so that in practice odd lots are generally defined as trades at less than 100 shares (the 100-share definition does not cover stock like Berkshire Hathaway Inc, which has a very high per share price). See SEC, ‘Odd Lot Rates in Post-Transparency World’, Jan. 9, 2014, *available at* <https://www.sec.gov/marketstructure/research/highlight-2014-01.html#.XPbbnS2ZOi4>.

⁷⁴¹ See the IEX comment that ‘current exchanges vary in how they handle odd-lots’ and the SEC observation that the ‘Commission is not aware of any evidence that the non-display of odd lot orders through proprietary market data feeds would systematically disadvantage retail investors’ in SEC Order in the Matter of the Application of Investors’ Exchange LLC for Registration as a National Securities Exchange (June 17, 2016), page 47.

Trades executed in the dark are still subject to “post-trade transparency.”⁷⁴² Post-trade transparency together with pre-trade transparency enables investors to monitor the prices at which orders are executed and assess whether their orders received best execution.⁷⁴³

Trading venues and broker-dealers must have access to consolidated market data in order to comply with the order protection rule and duty of best execution.

There are two ways that market participants can obtain consolidated market data. The first is via the securities information processors (“SIPs”), which are governed by Reg NMS plans. Each NMS plan utilizes one SIP, and there are currently two SIPs operated by a committee of exchanges: one for Nasdaq-listed securities (under the UTP Plan), and another for securities listed on NYSE and other exchanges (under the CTA Plan).⁷⁴⁴ Reg NMS requires trading venues to submit real-time quotation and trade information to the SIPs, which aggregate and disseminate consolidated market data.⁷⁴⁵ According to Reg NMS, consolidated data for each individual NMS stock must be disseminated through a *single* SIP under an NMS Plan.⁷⁴⁶ Because NMS Plans must designate a single SIP for each NMS Stock and only SROs are permitted to file NMS Plans, SROs determine the SIP for each NMS Stock.⁷⁴⁷ SROs charge market participants to access SIP data. Although the SEC must approve SIP fees, changes to them can be deemed effective when filed with the SEC.⁷⁴⁸ Under Rule 603(a)(1) of Reg NMS, when a trading venue distributes core data for NMS Stocks through a SIP, the data must be sold “on terms that are fair and reasonable.”⁷⁴⁹

Second, market participants can also privately purchase core and non-core market data directly from trading venues and consolidate it themselves. Reg NMS permits trading venues to sell access

⁷⁴² FINANCIAL INDUSTRY REGULATORY AUTHORITY, *National Market System Plans*, <http://www.finra.org/industry/national-market-system-plans> (last accessed Apr. 18, 2019). Post-trade transparency covers odd lots, see the orders approving amendments to the UTP (Unlisted Trading Privileges) Plan (Release No. 34-70793) and CTA (Consolidated Trade Association) Plan (Release No. 34-70794), October 31, 2013 and SEC, ‘Odd Lot Rates in Post-Transparency World’, January 9, 2014.

⁷⁴³ Concept Release on Equity Market Structure, Exchange Act Release No. 61358, File No. S7-02-10, 75 FED. REG. 3594, 3600 (proposed Jan. 21, 2010).

⁷⁴⁴ Jeff Kimsey, *Nasdaq Sets the Record Straight About the SIP*, NASDAQ (Oct. 25, 2016), <https://business.nasdaq.com/marketinsite/2016/Nasdaq-Sets-the-Record-Straight-About-the-SIP.html> (“There are two SIPs for cash equities, the Consolidated Tape Association (CTA) SIP (for New York Stock Exchange-listed securities) and the UTP SIP (for Nasdaq-listed securities), that are operated by a committee of exchanges.”). See also, UNLISTED TRADING PRIVILEGES, *Overview*, <https://www.utpplan.com/> (last accessed Apr. 25, 2019); Consolidated Tape Association, *Home Page*, <https://www.cta-plan.com/index> (last accessed Apr. 25, 2019).

⁷⁴⁵ 17 C.F.R. § 242.602; Regulation NMS, Exchange Act Release No. 51808, 70 Fed. Reg. 37496 (Jun. 29, 2005) <https://www.sec.gov/rules/final/34-51808fr.pdf>.

⁷⁴⁶ 17 C.F.R. § 242.603(b) (“Such plan or plans shall provide for the dissemination of all consolidated information for an individual NMS stock through a single plan processor.”).

⁷⁴⁷ *Id.* (“Every national securities exchange on which an NMS stock is traded and national securities association shall act jointly pursuant to one or more effective national market system plans to disseminate consolidated information. ... Such plan or plans shall provide for the dissemination of all consolidated information for an individual NMS stock through a single plan processor.”).

⁷⁴⁸ *Id.* at § 242.608(b)(3).

⁷⁴⁹ 17 C.F.R. § 242.603(a)(1).

to their own “proprietary” data feeds, which are used for this purpose.⁷⁵⁰ Rule 603(a)(2) of Reg NMS requires all trading venues that sell these proprietary data feeds to make their data feeds available “on terms that are not unreasonably discriminatory.”⁷⁵¹

In October 2018, pursuant to this statutory authority and Rule 603(a) of Reg NMS,⁷⁵² the SEC set aside core market data fee increases by NYSE Arca and Nasdaq on the grounds that the exchanges failed to meet the burden of showing the fees are fair and reasonable.⁷⁵³ In light of that decision, the SEC also remanded several other challenges to exchange fees for the exchanges to further review the fee increases (with respect to fairness and reasonableness) and develop procedures to assess their validity under the Exchange Act and, “if appropriate, resubmission to the Commission.”⁷⁵⁴ Several motions to reconsider the remand order remain pending before the SEC.⁷⁵⁵

d. Best execution

The duty of best execution requires broker-dealers to execute customer trades at the most favorable terms reasonably available under the circumstances. It derives, in part, from common law principles that obligate an agent to act exclusively in its principal’s best interest, and also has been incorporated explicitly in FINRA rules. Accordingly, broker-dealers that are FINRA members have best execution duties whether they are acting as an agent on behalf of a customer or whether they are trading with a customer in a principal capacity with a customer.⁷⁵⁶

FINRA’s best execution rule requires that, “[i]n any transaction for or with a customer or a customer of another broker-dealer, a member and persons associated with a member shall use reasonable diligence to ascertain the best market for the subject security and buy or sell in such market so that the resultant price to the customer is as favorable as possible under prevailing market conditions.”⁷⁵⁷ Broker-dealers must consider a number of factors to help them identify the best terms reasonably available. The factors that are considered in determining whether a firm has used “reasonable diligence” include: (1) the character of the market for the security (e.g., price,

⁷⁵⁰ See Regulation NMS, Exchange Act Release No. 51808, 70 Fed. Reg. 37496, 37567 (June 29, 2005), <https://www.sec.gov/rules/final/34-51808fr.pdf>.

⁷⁵¹ Distribution, consolidation, and display of information with respect to quotations for and transactions in NMS stocks, 17 C.F.R. § 242.603(a). See also the section on Access Rules and Fees below.

⁷⁵² The overarching Securities Exchange Act of 1934 provisions relevant to market data fees are sections 6, 11 and 19.

⁷⁵³ In the Matter of the Application of Securities Industry and Financial Markets Association for Review of Action taken by NYSE Arca, Inc. and Nasdaq Stock Market LLC, U.S. SEC. & EXCH. COMM’N, Exchange Act Release No. 84432 (Oct. 16, 2018), <https://www.sec.gov/litigation/opinions/2018/34-84432.pdf>.

⁷⁵⁴ In the Matter of the Application of Securities Industry and Financial Markets Association and Bloomberg L.P., U.S. SEC. & EXCH. COMM’N, Exchange Act Release No. 84433 (Oct. 16, 2018), <https://www.sec.gov/litigation/opinions/2018/34-84433.pdf>.

⁷⁵⁵ In the Matter of the Application of Securities Industry and Financial Markets Association and Bloomberg L.P., U.S. SEC. & EXCH. COMM’N, Exchange Act Release No. 84827 (Dec. 14, 2018), <https://www.sec.gov/litigation/opinions/2018/34-84827.pdf>.

⁷⁵⁶ See FINRA, *Best Execution: Guidance on Best Execution Obligations in Equity, Options and Fixed Income Markets*, Regulatory Notice 15-46 (Nov. 2015), available at http://www.finra.org/sites/default/files/notice_doc_file_ref/Notice_Regulatory_15-46.pdf.

⁷⁵⁷ See FINRA Rule 5310.

volatility, relative liquidity and pressure on available communications); (2) the size and type of transaction; (3) the number of markets checked; (4) accessibility of the quotation; and (5) the terms and conditions of the order which result in the transaction.⁷⁵⁸

Broker-dealer internalization

Broker-dealer internalization generally involves a broker-dealer executing customer orders against its own inventory of stocks.⁷⁵⁹ Broker-dealer internalizers do not meet the Exchange Act definition of an exchange, because they primarily execute trades as a principal and only incidentally match the undisplayed orders of their customers.⁷⁶⁰ Accordingly, they do not have to register as an exchange under the Exchange Act or an ATS under Reg ATS. Instead, broker-dealer internalizers must register as members of FINRA.⁷⁶¹ FINRA membership carries with it a number of regulatory obligations, such as examination, licensing, and reporting requirements.⁷⁶² Further, broker-dealer internalizers are subject to additional SEC requirements if they meet the definition of “market center,” including the requirement to file Rule 605 execution quality reports.⁷⁶³

Payment for order flow

Retail broker-dealers often route their orders to broker-dealer internalizers acting as market makers in the relevant security in order to obtain price improvement. These broker-dealer internalizers often execute retail orders as part of payment for order flow (“**PFOF**”) agreements with the retail broker-dealer.⁷⁶⁴ Under a typical PFOF agreement, the broker-dealer internalizer pays the retail brokerage to direct retail order flow to the broker-dealer internalizer for

⁷⁵⁸ See FINRA Rule 5310(a)(1).

⁷⁵⁹ Commission Request for Comment on Issues Relating to Market Fragmentation, Exchange Act Release No. 42450, File No. SR-NYSE-99-48 (Feb. 23, 2000) <https://www.sec.gov/rules/sro/ny9948n.htm> (“Internalization is the routing of order flow by a broker to a market maker that is an affiliate of the broker. An integrated broker-dealer, for example, internalizes orders by routing them to the firm’s market-making desk for execution.”).

⁷⁶⁰ 17 CFR § 240.3b-16(b) (“An organization [is not an exchange] solely because such organization... allows persons to enter orders for execution against the bids and offers of a single dealer; and... as an incidental part of these activities, matches orders that are not displayed to any person other than the dealer and its employees[.]”); U.S. SEC. AND EXCH. COMM’N, *Regulation of Exchanges and Alternative Trading Systems* (Dec. 8, 1998) <https://www.sec.gov/rules/final/34-40760.txt> (“Rule 3b-16 explicitly excludes those systems that the Commission believes perform only traditional broker-dealer activities. ... Rule 3b-16 now expressly excludes the following systems from the revised interpretation of “exchange”: ... systems that allow persons to enter orders for execution against the bids and offers of a single dealer.”).

⁷⁶¹ See, e.g., *Brokers*, FINRA, available at <http://www.finra.org/investors/brokers>.

⁷⁶² *Id.*

⁷⁶³ 17 C.F.R. § 242.600(b)(52) (2005). OTC market makers are considered “market centers” under Regulation NMS. See 17 C.F.R. § 242.600(b) (38),(52) (2005). Market centers are required to produce Rule 605 reports. See 17 C.F.R. § 242.605 (2005).

⁷⁶⁴ Memorandum from SEC Division of Trading and Markets to SEC Equity Market Structure Advisory Committee, Certain Issues Affecting Customers in the Current Equity Market Structure, U.S. SEC. & EXCH. COMM’N 2 (Jan. 26, 2016) <https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac012616.pdf> (referring to Concept Release on Equity Market Structure, Exchange Act Release No. 61358, File No. S7-12-98 20 (Jan. 14, 2010), available at <https://www.sec.gov/rules/concept/2010/34-61358.pdf>). A marketable order is an order to buy or sell a stock at the best publicly displayed price.

execution.⁷⁶⁵ Broker-dealer internalizers compete to offer price improvement to the best publicly displayed price available on an exchange.⁷⁶⁶ Rule 606 of Reg NMS requires retail brokerages to report information about their PFOF arrangements in quarterly public filings.⁷⁶⁷

Broker order-routing disclosure rule

On November 2, 2018, the SEC amended Rule 606 of Reg NMS to require greater disclosure from broker-dealers with respect to order routing, payments to and from trading venues, payments for order flow, and maker-taker arrangements.⁷⁶⁸

Newly-adopted Rule 606(b)(3) requires a broker-dealer, upon the request of an institutional customer, to provide its customer with disclosures concerning the handling, routing and execution of customer orders, including fees paid and rebates received from trading venues.⁷⁶⁹ Prior to the amendments, Rule 606(a) already required, among other things, broker-dealers that route customer orders to provide a quarterly public report with order routing information, including a description of the material aspects of their relationships with the venues to which they routed the most orders ("**Specified Venues**").⁷⁷⁰ Under the new rule as amended, this includes the top ten venues as well as any venue to which the broker routed more than 5% of its non-directed orders.⁷⁷¹ Amendments to Rule 606(a) require that: "for each Specified Venue, the broker-dealer report the net aggregate amount of any payment for order flow received, payment from any profit-sharing relationship received, transaction fees paid, and transaction rebates received."⁷⁷² Broker-dealers must publicize these reports online for three years.⁷⁷³ Together, the rules require greater transparency with respect to order routing in general and compensation arrangements in particular.

⁷⁶⁵ See, e.g., Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee, Certain Issues Affecting Customers in the Current Equity Market Structure, U.S. SEC. & EXCH. COMM'N 5 (Jan. 26, 2015) <https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac012616.pdf>.

⁷⁶⁶ See Memorandum from SEC Division of Trading and Markets to SEC Market Structure Advisory Committee, Certain Issues Affecting Customers in the Current Equity Market Structure, U.S. SEC. & EXCH. COMM'N 6 (Jan. 26, 2015) <https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac012616.pdf>. See generally Robert H. Battalio & Tim Loughran, Does Payment For Order Flow To Your Broker Help Or Hurt You?, 80 T. J BUS. ETHICS 37 (2008).

⁷⁶⁷ 17 C.F.R. § 242.606(a)(1)(iii) (2005).

⁷⁶⁸ U.S. SEC. & EXCH. COMM'N, SEC Adopts Rules That Increase Information Brokers Must Provide to Investors on Order Handling (Nov. 2, 2018) <https://www.sec.gov/news/press-release/2018-253>. ("**Routing Rule Press Release**").

⁷⁶⁹ *Routing Rule Press Release* ("The requirement to provide a report on the handling of not held orders... will be subject to two de minimis exceptions, one at the firm-level and the other at the customer-level.").

⁷⁷⁰ *SEC Routing Rule Release* at 124.

⁷⁷¹ *Id.*

⁷⁷² *Id.* at 135.

⁷⁷³ James Dombach, *SEC Adopts Amendments to Regulation NMS to Expand Disclosure*, MURPHY & MCGONIGLE P.C. (Nov. 5, 2018), <https://www.mmlawus.com/newsitem/alerts/sec-adopts-amendments-to-regulation-nms-to-expand-disclosure-632/>.

e. Tick sizes

Tick sizes are the minimum price variation (“**MPV**”) for quotations for stocks. Prior to 2000, the majority of exchanges set tick sizes at fractions (e.g., 1/8th) of a dollar.⁷⁷⁴ But in 2000, the SEC directed the exchanges to develop a plan to convert their quotations from fractions to decimals,⁷⁷⁵ primarily because fractional tick sizes were creating wide spreads and increasing transaction costs for investors.⁷⁷⁶ The SEC set the current MPV at one cent for listed stocks that trade above \$1 per share.⁷⁷⁷ Rule 612 of Reg NMS, the “sub-penny rule,” generally prohibits any trading venue from publicly displaying, ranking, or accepting orders in increments smaller than one penny.⁷⁷⁸

Tick size pilot program

The SEC approved a Tick Size Pilot Program that commenced on October 2016 and ran for two years as scheduled.⁷⁷⁹ Under the program, the MPV for certain smaller-capitalization stocks was temporarily increased to \$0.05 in order to examine the effect of larger minimum tick sizes on liquidity.⁷⁸⁰ The exchanges and FINRA submitted a joint assessment of the impact of the program to the SEC in August 2018,⁷⁸¹ and the program expired in September 2018.⁷⁸² The FINRA assessment revealed relatively unimpressive results and found that the program: (i) may have increased liquidity displayed at the NBBO, but also widened effective spreads; (ii) did not appear to increase the number of market makers per security, but it did increase their volume and profit; and (iii) appears to have driven some trading off-exchange.⁷⁸³ But the SEC has not publicized its conclusions on the results and implications of the program. There are presently no plans for the SEC to increase the MPV of smaller capitalization stocks to \$0.05.

⁷⁷⁴ See SEC Division of Market Regulation, *Market 2000: An Examination of Current Equity Market Developments*, U.S. SEC. & EXCH. COMM’N 37 (Jan. 1994), <https://www.sec.gov/divisions/marketreg/market2000.pdf>.

⁷⁷⁵ Order Directing the Exchanges and the National Association of Securities Dealers, Inc. to Submit a Phase-In Plan to Implement Decimal Pricing in Equity Securities and Options, Exchange Act Release No. 42914, 65 FED. REG. 38010 (June 8, 2000), available at <https://www.sec.gov/rules/other/34-42914.htm>.

⁷⁷⁶ Report to Congress on Decimalization, As Required by Section 106 of the Jumpstart Our Business Startups Act, U.S. SEC. & EXCH. COMM’N 4–5 (July 2012), <https://www.sec.gov/news/studies/2012/decimalization-072012.pdf>.

⁷⁷⁷ Rule 612(a) applies to stocks priced above \$1.00; Rule 612(b) applies a different set of tick size rules to stocks with a share price below \$1.00. Compare 17 C.F.R. § 242.612(a) (2005) with 17 C.F.R. § 242.612(b) (2005).

⁷⁷⁸ 17 C.F.R. § 242.612(a) (2005).

⁷⁷⁹ U.S. SEC. & EXCH. COMM’N, *Statement on the Expiration of the Tick Size Pilot* (Sept. 10, 2018), <https://www.sec.gov/news/public-statement/tm-dera-expiration-tick-size-pilot>.

⁷⁸⁰ U.S. SEC. & EXCH. COMM’N, *Tick Size Pilot Program*, <https://www.sec.gov/ticksizepilot> (last accessed Apr. 16, 2019).

⁷⁸¹ FINANCIAL INDUSTRY REGULATORY AUTHORITY, *Assessment of the Plan to Implement a Tick Size Pilot Program* (Aug. 2, 2018), <https://www.sec.gov/files/TICK%20PILOT%20ASSESSMENT%20FINAL%20Aug%202.pdf> (“**FINRA Assessment**”).

⁷⁸² U.S. SEC. & EXCH. COMM’N, *Statement on the Expiration of the Tick Size Pilot* (Sept. 10, 2018), <https://www.sec.gov/news/public-statement/tm-dera-expiration-tick-size-pilot>.

⁷⁸³ *FINRA Assessment* at 41–43 (Specifically, “lower-priced, higher-volume securities with the tightest pre-Pilot spreads experienced wider quoted spreads, longer inter-market price-time priority queues and greater fragmentation of trading volume” and “higher-priced, lower-volume stocks with the widest pre-Pilot spreads tended to experience the biggest reductions in quoted spreads and were not as affected by greater fragmentation.”).

f. Algorithmic and high-frequency trading

In the United States, there are no regulatory definitions or requirements that apply specifically to traders engaged in electronic trading, algorithmic trading or HFT in equity markets. However, any firm trading directly on an exchange must (i) be a registered broker-dealer with the SEC and (ii) become a member of an SRO, including FINRA and/or one of the national securities exchanges.⁷⁸⁴ Therefore, if a firm engaged in algorithmic trading or HFT seeks to trade directly on an exchange, then it would be subject to the regulatory requirements that apply to broker-dealers.

The SEC, FINRA and the national securities exchanges have adopted rules applying risk-controls to broker-dealers that increase in stringency based on their activities. For example, FINRA's Net Capital Rule requires broker-dealers to maintain minimum levels of liquid assets, or net capital.⁷⁸⁵ In addition, the SEC requires broker-dealers with access to trading on an exchange or ATS to maintain "risk management controls and supervisory procedures that, among other things, are reasonably designed to (1) systematically limit the financial exposure of the broker or dealer that could arise as a result of market access, and (2) ensure compliance with all regulatory requirements[.]"⁷⁸⁶ NASDAQ's rules for broker-dealer members explicitly incorporate FINRA's requirement that members establish a supervisory control system to ensure compliance with applicable rules and regulations.⁷⁸⁷ NYSE rules set a ceiling on the number of shares eligible for automatic order execution, implicitly limiting the size of orders that can be entered in an automated fashion.⁷⁸⁸ For its part, FINRA guidance indicates that it views the requirement to publish only bona fide offers to buy or sell as being relevant to algorithmic trading, even if the

⁷⁸⁴ U.S. SEC. & EXCH. COMM'N, Guide to Broker-Dealer Registration (Apr. 2008), <https://www.sec.gov/reportspubs/investor-publications/divisionsmarketregbdguidehtm.html#l> ("Before it begins doing business, a broker-dealer must become a member of an SRO. ... FINRA and the national securities exchanges are all SROs. If a broker-dealer restricts its transactions to the national securities exchanges of which it is a member and meets certain other conditions, it may be required only to be a member of those exchanges. If a broker-dealer effects securities transactions other than on a national securities exchange of which it is a member... including any over-the-counter business, it must become a member of FINRA, unless it qualifies for the exemption in Rule 15b9-1."); U.S. SEC. & EXCH. COMM'N, SEC Proposes Rule to Require Broker-Dealers Active in Off-Exchange Market to Become Members of National Securities Association (Mar. 25, 2015), <https://www.sec.gov/news/pressrelease/2015-48.html>.

⁷⁸⁵ Net capital requirements for brokers or dealers, 17 C.F.R. § 240.15c3-1; FINANCIAL INDUSTRY REGULATORY AUTHORITY, *Net Capital Requirements for Brokers or Dealers* (2014), <https://www.finra.org/sites/default/files/InterpretationsFOR/p037763.pdf>.

⁷⁸⁶ U.S. SEC. & EXCH. COMM'N, Risk Management Controls for Brokers or Dealers with Market Access, Exchange Act Release No. 34-63241 (Nov. 3, 2010), <https://www.sec.gov/rules/final/2010/34-63241.pdf>.

⁷⁸⁷ The Nasdaq rule incorporates NASD Rule 3012, which was subsequently superseded by FINRA Rule 3120. Nasdaq Rule 3012 ("Members and persons associated with a member shall comply with NASD Rule 3012 as if such Rule were part of Nasdaq's rules."); FINRA, 3012: Supervisory Control System, http://finra.complinet.com/en/display/display_main.html?rbid=2403&element_id=3722&print=1 ("NASD Rule 3012 has been superseded by FINRA Rule 3120."); FINRA Rule 3120: Supervisory Control System, http://finra.complinet.com/en/display/display.html?rbid=2403&element_id=11346.

⁷⁸⁸ NYSE Rule 1000: Automatic Execution ("Market and limit orders of such size as the Exchange may specify from time to time are eligible to initiate or participate in automatic executions. Orders up to 1,000,000 shares are eligible for automatic execution. Incoming orders of more than 1,000,000 shares that are marketable on arrival will be rejected. Upon advance notice to market participants, the Exchange may increase the order size eligible for automatic executions up to 5,000,000 shares on a security-by-security basis.").

rule itself does not specifically single HFT strategies.⁷⁸⁹ The SEC has also approved exchange rules prohibiting their members from engaging in or facilitating disruptive quoting and trading activity and giving the power to cut off-exchange access when a member engages in such activity.⁷⁹⁰ Thus, although U.S. securities markets lack a regulatory regime that specifically addresses algorithmic trading or HFT, registered broker-dealers are subject to various SEC and SRO regulations that ultimately do govern algorithmic trading and HFT.

Firms that do not trade directly on an exchange (and are therefore not required to register as broker-dealers) can obtain “sponsored” access to an exchange through a registered broker-dealer. SEC Rule 15c3-5 imposes minimum standards on these arrangements that are also intended to mitigate trading risk. For example, broker-dealers may only provide a market participant with sponsored access if the broker-dealer has established reasonable credit and capital thresholds for the market participant.⁷⁹¹ The broker-dealer must also maintain risk management controls and supervisory procedures for the market participant.⁷⁹² These standards are intended to mitigate the risk that a market participant with sponsored access could cause solvency concerns for the broker-dealer or volatility in the markets.

In 2014, the SEC adopted Regulation Systems Compliance and Integrity (“**Reg SCI**”), which imposes compliance and monitoring requirements on most trading venues, including exchanges and ATs that exceed certain volume thresholds.⁷⁹³ Reg SCI enhances the SEC’s oversight of U.S. securities markets’ technology infrastructure in order to reduce the occurrence of systems issues and improving resiliency when such issues do occur.⁷⁹⁴

Relatedly, the SEC has taken steps to improve its ability to perform ongoing surveillance and reconstruct market activity. In 2011, the SEC imposed registration and reporting requirements on traders that exceed defined volume thresholds, which allow the SEC to see how these major traders interact with securities markets and reconstruct trading activity following periods of

⁷⁸⁹ FINANCIAL INDUSTRY REGULATORY AUTHORITY, *Algorithmic Trading, Rules*, <http://www.finra.org/industry/algorithmic-trading> (last accessed Apr. 28, 2019); FINRA 5210. Publication of Transactions and Quotations (“No member shall publish or circulate, or cause to be published or circulated, any notice, circular, advertisement, newspaper article, investment service, or communication of any kind which purports to report any transaction as a purchase or sale of any security unless such member believes that such transaction was a bona fide purchase or sale of such security; or which purports to quote the bid price or asked price for any security, unless such member believes that such quotation represents a bona fide bid for, or offer of, such security.”).

⁷⁹⁰ See Order Approving BATS Proposed Rule Changes Relating to Disruptive Quoting and Trading Activity, Exchange Act Release No. 77171, 81 Fed. Reg. 9017 (Feb. 18, 2016); Rules of BATS BZX Exchange, Inc., BATS, at Rules 12.15, 8.17, http://cdn.batstrading.com/re-sources/regulation/rule_book/BATS_Exchange_Rulebook.pdf.

⁷⁹¹ 17 C.F.R. § 240.15c3-5; U.S. SEC. & EXCH. COMM’N, Risk Management Controls for Brokers or Dealers with Market Access, Exchange Act Release No. 34-63241 (Nov. 3, 2010), <https://www.sec.gov/rules/final/2010/34-63241.pdf>.

⁷⁹² Id.

⁷⁹³ See 17 C.F.R. §§ 242.1000-07 (2017). Reg SCI also applies to other SROs (such as registered clearing agencies, and FINRA), disseminators of consolidated market data and certain exempt clearing agencies.

⁷⁹⁴ See SEC, *Regulation SCI Adopting Release*, Exchange Act Release No. 73639, 79 Fed. Reg. 72252, 72410 (Dec. 5, 2014) (“The Commission believes that including market regulation and market surveillance systems under the definition of SCI systems should help ensure the robustness of the systems used by SCI entities to monitor compliance with relevant laws, rules, and their own rules, and detect any violations of such laws or rules by... participants”).

extreme market volatility.⁷⁹⁵ Likewise, in 2013, the SEC introduced the Market Information Data Analytics System (MIDAS), its official trade monitoring system; MIDAS gives the SEC the ability to reconstruct trading activity after extreme market events and detect illegal trading behavior.⁷⁹⁶ In addition, in 2012 the SEC adopted Rule 613, requiring national securities exchanges and FINRA to submit plans to create, implement, and maintain a consolidated audit trail designed to track the life cycle of all orders and trades, in order to allow regulators to track market activity more accurately and efficiently.⁷⁹⁷ By creating a central repository of trading data, the SEC and other regulators aim to link customer account information to order event data and perform ongoing surveillance while also enabling complete market reconstructions.⁷⁹⁸

The SEC has focused its enforcement resources on policing forms of market manipulation, such as quote stuffing (sending and instantly canceling a large number of orders to cause delays in execution of the orders of other traders), smoking (posting short-lived quotes inside the spread to tease slower traders to cross the spread) and spoofing (posting quotes away from the spread in order to create the illusion of trading interest).⁷⁹⁹ Although these activities can be facilitated using algorithmic trading, they are also employed by human beings to take advantage of other traders using legitimate algorithmic trading strategies.

The SEC has indicated that additional regulation of HFT firms may be on the horizon. In 2015, the SEC proposed eliminating or narrowing exemptions that allow some HFT firms to forego FINRA registration, which would expand the number of HFT firms subject to FINRA examinations and enforcement actions.⁸⁰⁰ The proposed rule has not yet been finalized. However, the SEC has approved a 2016 amendment to FINRA's rules that requires each person who is primarily responsible for the design, development or significant modification of an algorithmic trading strategy relating to equity securities, or who is responsible for the day-to-day supervision or

⁷⁹⁵ See *Large Trader Reporting Adopting Release*, Exchange Act Release No. 64976, 76 Fed. Reg. 46960 (Aug. 3, 2011) (codified at 17 C.F.R. § 240.13h-1) (requiring registration by entities who trade either two million shares or \$20 million during any calendar day, or 20 million shares or \$200 million during any calendar month).

⁷⁹⁶ See Frank Konkel, *SEC's MIDAS program highlights how to do big data*, FCW (Mar. 28, 2014), <https://fcw.com/articles/2014/03/28/sec-midas-big-data.aspx> (noting that MIDAS collects more than one billion time-stamped records per day from each of the 13 national equity exchanges in near real time).

⁷⁹⁷ See *Consolidated Audit Trail Adopting Release*, Exchange Act Release No. 67457, 77 Fed. Reg. 45722 (Aug. 1, 2012) (codified at 17 C.F.R. § 242.613).

⁷⁹⁸ See *id.*

⁷⁹⁹ See SEC, *SEC Charges New York-Based High Frequency Trading Firm With Fraudulent Trading to Manipulate Closing Prices* (Oct. 16, 2014), available at <https://www.sec.gov/News/PressRelease/Detail/PressRelease/1370543184457>; SEC, *SEC Charges Firm and Owner with Manipulative Trading* (Oct. 8, 2015), available at <https://www.sec.gov/news/pressrelease/2015-236.html>.

⁸⁰⁰ See SEC, *Exemption for Certain Exchange Members*, Exchange Act Release No. 74581, 80 Fed. Reg. 18036, 18038–39 (proposed Apr. 2, 2015). The proposed amendment would eliminate certain allowances for off-exchange and proprietary trading, replacing it “with a more targeted exemption from [FINRA registration] for a broker-dealer that conducts business on a national securities exchange” and trades off-exchange solely for hedging purposes. *Id.* at 18045–46.

direction of such activities, to register with FINRA as a “securities trader” and pass qualification exams.⁸⁰¹

g. Volatility controls

Market-wide circuit-breakers

Market-wide circuit breakers are designed to briefly shut down trading in all stocks across all trading venues to promote the orderly functioning of markets. Shutting down trading during periods of high volatility can promote the orderly functioning of markets, because doing so provides market participants with additional time to assess new information and significant changes in market prices and to adjust automated trading systems that may be executing trades at unintended prices. This can reduce the market impact of abrupt price movements.⁸⁰² The SEC’s market-wide circuit breakers are triggered at price declines of 7%, 13%, and 20%.⁸⁰³ The SEC uses the S&P 500 as the reference index.⁸⁰⁴

Trading halts for individual stocks

In 2012, the SEC approved the “Limit Up-Limit Down” (“**LULD**”) mechanism, proposed in a Reg NMS plan put forward by the US exchanges and FINRA,⁸⁰⁵ to address extraordinary market volatility.⁸⁰⁶ The LULD mechanism provides market-wide, single stock price bands that ‘are

⁸⁰¹ See Exchange Act Release No. 77551 (Apr. 7, 2016), 81 Fed. Reg. 21914 (Apr. 13, 2016) (Order Approving File No. SR-FINRA-2016-007). The goal of the amendment, according to FINRA, is to ensure that HFT firms identify and register one or more associated persons who possess knowledge of, and responsibility for, both the design of the intended trading strategy and its technological implementation to evaluate whether it is designed in accordance with regulatory requirements. See FINRA, *Qualification and Registration of Associated Persons Relating to Algorithmic Trading*, Regulatory Notice 16-21 (June 2016), available at <https://www.finra.org/sites/default/files/Regulatory-Notice-16-21.pdf>.

⁸⁰² Findings Regarding the Market Events of May 6, 2010, Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues 7 (Sept. 30, 2010), <https://www.sec.gov/news/studies/2010/marketevents-report.pdf>.

⁸⁰³ Self-Regulatory Organizations; Notice of Filing of Amendments No. 1 and Order Granting Accelerated Approval of Proposed Rule Changes as Modified by Amendments No. 1, Relating to Trading Halts Due to Extraordinary Market Volatility, Exchange Act Release No. 67090 (May 31, 2012) <http://www.sec.gov/rules/sro/bats/2012/34-67090.pdf>; Self-Regulatory Organizations; New York Stock Exchange LLC; Order Approving a Proposed Rule Change, as Modified by Amendment No. 1, To Require Certain Member Organizations To Participate in Scheduled Market-Wide Circuit Breaker Testing, Exchange Act Release No. 34-83836 (Aug. 13, 2018), <https://www.federalregister.gov/documents/2018/08/17/2018-17743/self-regulatory-organizations-new-york-stock-exchange-llc-order-approving-a-proposed-rule-change-as>, footnote 5.

⁸⁰⁴ Self-Regulatory Organizations; Notice of Filing of Amendments No. 1 and Order Granting Accelerated Approval of Proposed Rule Changes as Modified by Amendments No. 1, Relating to Trading Halts Due to Extraordinary Market Volatility, Exchange Act Release No. 67090 (May 31, 2012) <http://www.sec.gov/rules/sro/bats/2012/34-67090.pdf>; Self-Regulatory Organizations; New York Stock Exchange LLC; Order Approving a Proposed Rule Change, as Modified by Amendment No. 1, To Require Certain Member Organizations To Participate in Scheduled Market-Wide Circuit Breaker Testing, Exchange Act Release No. 34-83836 (Aug. 13, 2018), <https://www.federalregister.gov/documents/2018/08/17/2018-17743/self-regulatory-organizations-new-york-stock-exchange-llc-order-approving-a-proposed-rule-change-as>, footnote 5.

⁸⁰⁵ See <https://www.sec.gov/rules/sro/nms/2019/34-85623.pdf>, footnote 1.

⁸⁰⁶ The plan, submitted pursuant to Section 11A of the Exchange Act 1934 and Rule 608 of Regulation NMS, was first approved on a pilot basis by the SEC on May 21, 2012. It was amended a number of times, with the latest, eighteenth

designed to prevent trades in individual NMS stocks outside of specified price bands, while allowing trading to continue when the price move is transitory.⁸⁰⁷ Trading in a security is paused for five minutes if price volatility is not quickly corrected (i.e., if, but-for the pause, orders would execute outside of the band).⁸⁰⁸ LULD thus protects market participants from trading at extreme and unintended prices and provides time for them to adjust their orders during periods of volatility. The price band for each stock is calculated by the SIP responsible for consolidating information for each NMS stock.⁸⁰⁹ The plan defines price bands for two distinct group of securities, Tier 1 NMS Stock (S&P 500, the Russell 1000, and some high-volume exchange-traded ETFs) and Tier 2 NMS Stock (the remainder of the NMS stocks).⁸¹⁰

The width of LULD price bands doubles at the close of trading, between 3:35pm and 4:00 pm (or in the case of an early scheduled close, during the last 25 minutes of trading before the early scheduled close), for all stocks except Tier 2 NMS Stock with a reference price above \$3.00.⁸¹¹

Price collars

In addition to the operation of the LULD mechanism, some US exchanges have in place rules that provide for price collars⁸¹² in their opening, closing and/or reopening auctions, to reduce the risk of a poor execution price.⁸¹³ For example, NYSE American⁸¹⁴ has price collar thresholds⁸¹⁵ for the indicative match price for its core open auctions, trading halt auctions and closing auctions, with the collar being based on a price that is the greater of \$0.50 or 10% away from the auction reference price.⁸¹⁶

amendment, converting it from a pilot to a permanent basis (and approving a number of significant amendments) on April 11, 2019. See Joint Industry Plan; Order Approving the Eighteenth Amendment to the National Market System Plan to Address Extraordinary Market Volatility (Release No. 34-85623; File No 4-631) <https://www.sec.gov/rules/sro/nms/2019/34-85623.pdf>

⁸⁰⁷ Moise & Flaherty, "Limit Up-Limit Down' Pilot Plan and Associated Events' (March 2017), page 7, at <https://www.sec.gov/files/dera-luld-white-paper.pdf>

⁸⁰⁸ Id.

⁸⁰⁹ Pursuant to Rule 603(b) of Regulation NMS. For more information on calculation of price bands, see <http://www.luldplan.com>

⁸¹⁰ Moise & Flaherty, "Limit Up-Limit Down' Pilot Plan and Associated Events' (March 2017), page 7; NYSE, 'Volatility Mechanisms' at https://www.nyse.com/publicdocs/nyse/products/etp-funds/ETF_NYSE_Volatility_Fact_Sheet.pdf

⁸¹¹ Joint Industry Plan, page 23, <https://www.sec.gov/rules/sro/nms/2019/34-85623.pdf>

⁸¹² Price or trading collars impose restrictions on execution of marketable orders when automatic executions are in effect. The collars are set a given percentage away from the NBBO, with an incoming order neither executing nor routing away to a price equal to or inferior to the collar (the exact collar conditions will vary from exchange to exchange). SEC Division of Trading and Markets, Memorandum to Equity Market Structure Advisory Committee, January 26, 2016, available at <https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac-012616.pdf> page 5, footnote 16.

⁸¹³ Id.

⁸¹⁴ Exchange for growing companies.

⁸¹⁵ For more detail, see <https://www.nyse.com/markets/nyse-american/trading-info>

⁸¹⁶ NYSE was fined by the SEC in 2018 for the use of price collars by NYSE Arca (its market for exchange-traded funds, ETFs) during reopening auctions that followed LULD pauses during the August 24, 2015 ETF market volatility. SEC considered that, by applying price collars, Arca's order imbalances on reopening auctions resolved more slowly than they would have otherwise and potentially limited the extent to which the prices on reopening could adjust to changing

“Breaking” clearly erroneous trades

SROs have the authority necessary to cancel, or “break,” trades on any trading venue, if a trade exceeded a minimum percentage deviation from the last trade.⁸¹⁷ In other words, two counterparties that entered into a trade on an exchange would no longer be bound by their trade if an exchange broke that trade. Similarly, FINRA can break the trades of ATs and broker-dealer internalizers.⁸¹⁸ This power to nullify trades protects investors from being bound by unintentional trades at terms they clearly would not have intended to accept, thereby promoting fair and orderly markets.

Kill switches

Kill switches halt trading for a specific market participant on a trading venue when that entity’s trading activity has breached a pre-established exposure threshold on that trading venue.⁸¹⁹ They are thus intended to prevent a specific market participant’s erroneous orders or uncontrolled accumulation of unintended positions. Certain exchanges currently offer kill switches for broker-dealer members,⁸²⁰ but they are optional and non-uniform.

Regulatory trading halts

Exchanges have the authority to call regulatory trading halts for their listed securities under the NMS Plans that cover NYSE-listed securities and NASDAQ-listed securities.⁸²¹ Once a listing exchange decides a regulatory halt is appropriate and institutes one, the listing exchange must notify the other SROs. Regulatory trading halts are generally effective across all trading venues.⁸²²

conditions without triggering additional LULD halts. NYSE Arca rules described price collars for opening and closing auctions, but not for reopening auctions and, accordingly, Arca violated section 19(b)(1) of the Exchange Act because it did not comply with its rules. See SEC, ‘NYSE to pay \$14 Million Penalty for Multiple Violations’ (March 6, 2018), at <https://www.sec.gov/news/press-release/2018-31>

⁸¹⁷ Order Granting Approval of Proposed Rule Changes Relating to Clearly Erroneous Transactions, Exchange Act Release No. 62886, 4–5 (Sept. 10, 2010) <https://www.sec.gov/rules/sro/bats/2010/34-62886.pdf>; Self-Regulatory Organizations; NYSE American LLC; Notice of Filing and Immediate Effectiveness of Proposed Rule Change to Extend the Current Pilot Program Related to Rule 7.10E, Clearly Erroneous Executions, Exchange Act Release No. 34-85563, 2-3 (Apr. 9, 2019), <https://www.sec.gov/rules/sro/nyseamer/2019/34-85563.pdf>.

⁸¹⁸ FINRA Rule 11892, http://finra.complinet.com/en/display/display_main.html?rbid=2403&element_id=8854.

⁸¹⁹ Prepared Written Testimony Before the S. Comm. on Banking, Housing, and Urban Affairs, 113th CONG. 2 (2014) (statement of Hal S. Scott, Nomura Professor and Director of the Program on International Financial Systems, Harvard Law School).

⁸²⁰ See, e.g., NASDAQ, Equity Kill Switch: Frequently Asked Questions, available at <https://www.nasdaqtrader.com/content/EquityKillSwitch.pdf>.

⁸²¹ NYSE Rule 7.18 – Halts (Mar. 8, 2019), http://wallstreet.cch.com/NYSETools/PlatformViewer.asp?selected-node=chp_1_2_1_9_1_10&manual=%2Fnyse%2Frules%2Fnyse-rules%2F (“If the UTP Listing Market declares a UTP Regulatory Halt, the Exchange will halt trading in that security...”); Nasdaq Rule 4120 - Limit Up-Limit Down Plan and Trading Halts (Sept. 3, 2018), http://nasdaq.cchwallstreet.com/nasdaq/main/nasdaq-equityrules/chp_1_1/chp_1_1_4/chp_1_1_4_1/chp_1_1_4_1_1/chp_1_1_4_1_1_2/default.asp.

⁸²² Bidisha Chakrabarty et al., *When a Halt is Not a Halt: An Analysis of Off-NYSE Trading during NYSE Market Closures*, J. OF FIN. INTERMEDIATION 2 (2011), http://www3.nd.edu/~scorwin/documents/OffNYSETrading_000.pdf (noting that regulatory halts are “generally coordinated” across venues); When Trading Stops: What You Need to Know About Halts, Suspensions and Other Interruptions, FIN. IND. REG. AUTH., <https://www.finra.org/investors/alerts/when-trading-stops->

Regulatory trading halts may be called due to (i) inadequate or pending disclosure of material information to the public; or (ii) "regulatory problems relating to" a security "that should be clarified before trading therein is permitted to continue," including extraordinary market activity due to system misuse or malfunction.

halts-suspensions-other-interruptions (last updated Feb. 7, 2013) (noting that all "markets trading the stock must observe the trading halt").

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