

SANFORD C. BERNSTEIN LIMITED

SANFORD C. BERNSTEIN IRELAND LIMITED

ORDER EXECUTION POLICY 2019

INTRODUCTION

1. As required by the Markets in Financial Instruments Directive¹ (“**MiFID**”), this document sets out the Order Execution Policy (the “**Policy**”) of Sanford C. Bernstein Limited and Sanford C. Bernstein Ireland Limited (together “**Bernstein**”) and arrangements for complying with the obligation to take all sufficient steps to obtain the best possible outcome for our client’s orders (so called “best execution”). As detailed in the Bernstein Terms of Business, you are deemed to have consented to your transactions being handled in accordance with this Policy.
2. This Policy only applies to Professional Clients of Bernstein. Sanford C. Bernstein Ireland Limited receives and transmits orders to Sanford C. Bernstein Limited for execution or further onward transmission.

SCOPE OF OUR BEST EXECUTION OBLIGATION

3. Bernstein is required to put in place an Order Execution Policy, and to take all sufficient steps to obtain the best possible result for clients who are ‘legitimately relying’ (see paragraphs 5 and 0 below) on Bernstein for the execution or the reception and transmission of client orders in “financial instruments” (as defined in Annex 1, Section C of MiFID). An order is an instruction to buy or sell a financial instrument which is accepted by Bernstein for execution or onward transmission to a third party and which gives rise to contractual or agency obligations to the client. Where we transmit a client order to a third party for execution we will act honestly, fairly and professionally in accordance with your best interests as defined pursuant to MiFID.
4. This Policy covers only cash equity products (shares, warrants and exchange traded funds (“ETFs”). We shall assume that no transactions that we undertake on your behalf are securities financing transactions (“SFTs”) unless we are expressly informed otherwise.
5. A client’s regulatory classification, as detailed below, impacts the determination of whether a client is ‘legitimately relying’ on Bernstein to protect their interests, and as such whether best execution is owed.

¹ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (recast)

For **Professional Clients**, each specific transaction needs to be assessed to determine whether the client is legitimately relying on Bernstein to protect their interests, as follows:

- **Four factors approach:** to determine whether a client is in fact legitimately relying on Bernstein in relation to a particular client order (whereby best execution is therefore owed to the client), the following four factors are applied by Bernstein:
 - a) **Which party initiates the transaction:** where it is a client that 'initiates' a transaction the client is more likely to place legitimate reliance on Bernstein. In this context, 'initiate' means where the client approaches a client Bernstein regarding a potential transaction;
 - b) **Market practice and the existence of a convention to 'shop around':** in certain wholesale markets, there is a common practice or convention to 'shop around' and obtain quotes from several dealers prior to a client executing any transaction. The existence of such a practice indicates that a client is less likely to place legitimate reliance on Bernstein for best execution of the order;
 - c) **The relative levels of price transparency within a market:** in certain markets, transparent prices may not be readily available, and a client may be able to speak to different brokers to get a better view on pricing (see also b) above). This indicates that the best execution obligation is less likely to apply; and
 - d) **The Terms of Business and other information provided to clients should make clear if best execution applies or not.** This must reflect the economic reality of the relationship.

Paragraph 7 onwards provides further guidance as to how best execution applies to Professional Clients, with various trading scenarios and examples provided.

6. All Bernstein employees who, on behalf of Professional Clients, either execute client orders or pass orders for execution to other entities must ensure such activities are conducted in accordance with this Policy.
7. Where a Professional Client legitimately relies on Bernstein to protect their interests in relation to the relevant elements of a transaction that may be affected by how Bernstein, or the entity to which the order is transmitted, executes the order, then the best execution obligation will apply. For example, a best execution obligation would likely apply where Bernstein executes an order by:
 - a) dealing as agent (e.g. Bernstein transmits an order for execution to a third party or Bernstein execution desk); and
 - b) 'working' an order on behalf of a client (e.g. where Bernstein makes decisions as to how the order is executed).

8. Bernstein is required to have in place policies and procedures that are designed to obtain, on a consistent basis, the best possible result for the execution of client orders, by considering: the nature of the client orders, the priorities placed on Bernstein in filling those client orders and the nature of relevant markets. Bernstein will ensure that clear instructions are received from clients on the relevant aspects of an order that Bernstein executes on the client's behalf, so that where there is a legitimate reliance on Bernstein for best execution, Bernstein will endeavour to meet its client's expectations.
9. In taking all sufficient steps, Bernstein will look to achieve the best balance across a range of sometimes conflicting Execution Factors (see paragraph 10 onwards, below). This does not mean that every individual client order will receive the best outcome, but rather the best possible overall outcome that can reasonably be expected for our clients' orders will be achieved by following this Policy.

EXECUTION FACTORS

10. We will take all sufficient steps to obtain the best possible result for you by considering a range of execution factors, when executing client orders or placing orders with (or transmitting orders to) other entities for execution. The execution factors that Bernstein may consider include, but are not limited to:
 - price;
 - liquidity quality;
 - latency;
 - likelihood of execution and settlement;
 - costs;
 - size;
 - nature; and / or
 - any other consideration relevant to the execution of the order,taken together, the **"Execution Factors"**.
11. When executing your orders we will determine the relative importance of the Execution Factors based on any information or instructions you give us with your order and market information at the relevant time, taking into account the following criteria: (i) your characteristics including your client categorisation as a Professional Client; (ii) the characteristics of your order; (iii) the characteristics of the financial instrument which is the subject of your order; and (iv) the characteristics of the execution venue(s) to which your order can be directed. For example, where a client instructs us to act aggressively on an order, the style of execution will involve a higher number of execution venues and order types. This will increase fill rates and increased impact cost.
12. In the absence of Specific Instructions from you (see paragraph 15 onwards, below), Bernstein will exercise its own judgement, skill and experience, having regard to available market information, when determining the Execution Factors that we need to consider to provide you with best execution, but we will always seek to exercise that judgement to obtain the best possible result for you.

ASSESSING THE DIFFERENT EXECUTION FACTORS

13. In general, we consider that price will be the primary factor in achieving best execution in accordance with this Policy. However, in certain circumstances, Bernstein may, in its absolute discretion, determine that the other Execution Factors above may be more important than price. We may, therefore, place particular significance on probability of fill, probability of finding additional liquidity and liquidity quality. Whilst price is a strong determinative factor in achieving best execution, it should be noted that best execution is broader than the 'best price' as this may not offer the best result for a client if it is associated with higher costs (e.g. cost of market impact, exchange or clearing fees and commission/spreads) or relates to venues with less liquidity. Only in a tied situation among other factors will the cost of trading be incorporated.
14. Subject to any Specific Instructions (see 15 onwards, below) from you, the financial instrument to which the order relates will often dictate the determination and ranking of the relative importance of the Execution Factors. In addition, the diverse markets for different financial instruments, and the types of orders that clients place with Bernstein, mean that different Execution Factors could be applicable each time we consider a particular execution strategy.

SPECIFIC CLIENT INSTRUCTIONS

15. If you give us specific instructions as to how you wish your order to be executed ("**Specific Instructions**"), we will execute that order in accordance with those Specific Instructions. Specific Instructions could relate to execution price, venue, method of execution and instructions to use a particular algorithm or individual parameters of an algorithm. If you require us to execute an order adhering to your Specific Instructions, you must clearly state the preferred method of execution at the time you place the order with Bernstein.
16. Whenever there is a Specific Instruction from you, Bernstein shall consider that following the Specific Instruction as discharging our obligation to take all sufficient steps to obtain the best possible result for you (as per Article 27(1) of MiFID – see paragraph 1 above) in respect of that part of the order to which the Specific Instructions relate.
17. Notwithstanding paragraph 16, to the extent a client's Specific Instructions are not comprehensive, Bernstein shall, in seeking to achieve best execution for any remaining part of an order to which Specific Instructions do not relate, continue to assess all other relevant Execution Factors (see also paragraph 14 above).
18. Specific Instructions may prevent us from taking the steps that we have designed and implemented to execute your order in accordance with this Policy and to achieve the best possible result in respect of those elements to which the Specific Instructions relate.
19. Where you transmit orders to us referencing a security symbol which is execution venue or exchange specific, as opposed to a generic identification symbol (e.g. ISIN or CUSIP number), Bernstein will

consider that we can facilitate trading across all relevant execution venues unless explicitly stated otherwise.

20. Where an algorithm is used in the execution of a client order, then the choice of that particular algorithm is not considered to be a Specific Instruction.

USE OF EXECUTION VENUES FOR EXECUTION

21. Subject to any Specific Instructions, to achieve best execution we consider appropriate execution venues to include:

- Regulated markets;
- Multilateral trading facilities (“MTFs”);
- Systematic Internalisers (“SIs”); and
- Non-EEA markets, third party broker-dealers and market makers.

22. A list of the execution venues used by Bernstein is set out in Appendix 1 to this Policy. This list specifies which execution venues or entities we use for different classes of financial instruments. Our choice of venue aims to obtain, on a consistent basis, the best possible result for the execution of client orders having regard to the Execution Factors.

23. When determining which venues to connect to, Bernstein reviews the rules of the venue, available order types and, on multi-lateral venues, pre-existing liquidity conditions, if available.

24. The execution venues on which Bernstein places “significant reliance” in meeting its obligation to take all sufficient steps to obtain, on a consistent basis, the best possible result for the execution of client orders are set out at Appendix 2 to this Policy.

25. Bernstein will conduct a formal review of execution venues on a quarterly basis. This incorporates examining trade volume, market share and liquidity quality metrics and data published by individual execution venues. Bernstein algorithms will also manage venue interaction in real time based on liquidity quality metrics and probability of fill.

26. Bernstein may also cross your order with a matching order from another Client in a non-systematic manner. The execution price of this cross will depend on several factors including any limits you have applied to your order, the price on the primary market, and any other relevant circumstances such as liquidity of the relevant equity instrument. On most occasions, crosses via Bernstein will transact at a price within the primary market spread.

27. Where an execution commission rate is negotiated by you that make access to all venues unprofitable, Bernstein will remove higher cost execution venues from the routing decision. Venue exclusions would be clearly highlighted to you during the commission rate negotiation process. Bernstein looks to pay for higher cost access to premium liquidity where it is deemed beneficial to the overall execution performance.

28. If you wish to choose the execution venue Bernstein can provide our own independent analysis of that venue to assist clients in making an informed decision.

USE OF OTHER BROKER-DEALERS FOR EXECUTION

29. We may use other brokers to execute your orders to achieve best execution, for example, in those jurisdictions where we have no local presence or where an ID market operates. We may also transmit orders to exchanges via direct market access connectivity provided by other brokers. We only select partnering brokers following the execution venue selection process detailed at paragraph 23 above.
30. When Bernstein receives a client order and transmits that order to another entity for execution, we will take all sufficient steps to achieve the best outcome, in accordance with this Policy, taking account of the Execution Factors set out above and any Specific Instructions received from the client in relation to that order. When determining the strategy for obtaining the best outcome for a client's order, in the absence of any Specific Instructions, Bernstein will consider if it is reasonable to simply transmit the order to another entity or whether it is necessary to exercise additional control when instructing the other entity in relation to that order. Where an affiliate of Bernstein is the entity to which it transmits an order for execution, Bernstein will review the quality of the execution in the same way as it would for any other execution venue.
31. Where your order is for the purchase or sale of securities in North America, Latin America or Asia we will, in most cases, transmit your order for execution by our US-regulated affiliate Sanford C. Bernstein & Co., LLC or our Hong Kong regulated affiliate, Sanford C. Bernstein (Hong Kong) Limited, as appropriate. We are satisfied that in doing so, we comply with our overarching obligation to you to consistently achieve the best possible result for you in all circumstances.
32. Where we transmit an order to a broker-dealer (Bernstein affiliate or otherwise) for execution, we will monitor their executions to check that they are achieving the best possible outcome for our clients. Where Bernstein determines that the local broker is not providing best execution, they will be removed from our approved broker list.

EXECUTION STRATEGY: EQUITY AND WARRANT PRODUCTS

33. For Professional Clients trading equity and warrant products using Bernstein's Cash, Program or Algorithmic trading routes, the execution strategy likely to be employed, along with the relative importance given to the Execution Factors, is set out below:
34. Bernstein's portfolio of algorithmic strategies provides for numerous single stock and portfolio executions within a risk-controlled framework. These strategies aim to achieve a variety of different trading objectives which can be determined by the client. The client can further adapt the strategy by adjusting a range of trading parameters. Bespoke customised strategies can also be requested.
35. Bernstein aims to achieve the best routing result for our institutional clients. Price, Liquidity Quality, Size and Probability of fill are all prioritised over explicit cost.

36. Bernstein can incorporate client preferences into the order routing logic. This can include the exclusion of venues and changes to the significance of each of the Execution Factors that influence the routing decision.
37. It should be noted that several possible factors may lead to Bernstein not achieving our goal of best execution. Influencing factors include, but are not limited to, latency, speed of client connection, market volatility.

EXECUTION STRATEGY: EXCHANGE TRADED FUNDS

38. Sufficiently liquid ETFs will be executed following a similar process to that described for equities and warrants. For less liquid ETFs, if deemed appropriate, a Request for Quote (RFQ) process may be employed that uses multiple market-leading liquidity providers.

COSTS AND CHARGES

39. Bernstein considers that controlling the costs incurred on behalf of clients as being integral to achieving best execution. We distinguish between two broad categories of cost:
- a) Implicit costs – these arise from how a trade is executed (e.g. immediately or worked over a period of time, in a block, aggregated with other trades, or as child orders sent to multiple execution venues); and,
 - b) Explicit costs – these include commissions, fees, taxes, exchange fees, clearing and settlement costs, or any other costs passed onto the client by intermediaries participating in the transaction.

Please be aware that in our assessment of costs of trading we will often place greater significance on those implicit costs described above rather than on explicit costs.

40. Bernstein's commissions and charging structure is designed not to discriminate between venues. Certain venues will be removed from the routing decision where clients choose to pay an exceptionally low commission rate which limits the available sources of liquidity. This will always be made clear to a client pre-trade before any venues are disabled. In 2018, Bernstein received a reduced fee tariff when posting passively on Cboe Europe, Chi-X order book and Turquoise. The Turquoise reduction no longer applied from October 2018 onwards. The reduction does not exceed the fees incurred for posting aggressive trades on those venues.

MONITORING AND REVIEW

41. Bernstein monitors the effectiveness of its order execution arrangements. For example, real-time order monitoring and benchmarking by sales traders, supported by real-time performance-based alerts. All executions are reviewed at the end of day against 'best execution' criteria and exception reports are reviewed by senior management. In-house Transaction Cost Analysis ("TCA") is also used in to post-trade performance reviews with our clients. Bernstein regularly assess whether the execution venues it

accesses, and the brokers and dealers to whom Bernstein transmit orders, continue to provide for the best possible result for clients.

42. Bernstein formally reviews the quality of execution venues and relevant order types on a quarterly basis. Ad hoc reviews also take place between these diarised events. Venue quality is linked to level of aggression within the Bernstein algorithms with venues displaying higher transaction cost used for more aggressive orders.
43. Bernstein formally reviews both its order execution arrangements and this Policy at least annually or when a material change occurs in respect of one of our chosen execution venues or otherwise that affects our ability to continue to deliver best execution to clients.

GENERAL PROVISIONS

44. The obligations established in this policy extend to transactions executed with or through Sanford C. Bernstein Limited or orders received and transmitted through Sanford C. Bernstein Ireland Limited. This policy does not apply to other Sanford C. Bernstein affiliates or AllianceBernstein entities. If, at any time, you have questions or concerns about how an order was handled, Bernstein would be pleased to provide a detailed breakdown and the steps taken to achieve best execution.
45. The terms of the Order Execution Policy as may be amended from time to time, will prevail in the event of any conflict between them and the provisions of any Terms of Business that may be agreed between us. You will be notified of any material change to our order execution arrangements.
46. Where Bernstein receives a reasonable and proportionate request for information about the firm's policies and arrangements and how they are reviewed, Bernstein will answer clearly within a reasonable time.
47. This Policy, including the list of execution venues, can be found at https://www.bernsteinresearch.com/CMSObjectBR/SCBL_Best_Execution_Policy.pdf.
48. Further to the client's prior express consent, the entity to which its order is transmitted may execute that order outside a regulated market or an MTF or similar non-EEA venue.
49. If a client gives Bernstein a limit order in relation to shares admitted to trading on an EEA Regulated Market, Bernstein is required to make such limit orders public to the extent they are not immediately executed under prevailing market conditions unless you consent to Bernstein exercising its discretion as to whether to make such limit orders public.

APPENDIX 1: EXECUTION VENUES UTILISED BY BERNSTEIN IN 2018

Bernstein is not affiliated with or invested in any execution venues.

| <u>Execution Venue Name</u> | <u>MIC</u> | <u>Country</u> | <u>Venue Type²</u> |
|---|------------|-----------------|---|
| Aquis Exchange | AQXE | United Kingdom | MTF |
| Athens Exchange S.A. - Cash Market | XATH | Greece | RM |
| Blockmatch Dark | BLOX | United Kingdom | MTF |
| Bolsa de Madrid | XMAD | Spain | RM |
| Borsa Istanbul – Equity Market | XEQY | Turkey | RM |
| Budapest Stock Exchange | XBUD | Hungary | RM |
| Commerzbank Equity – Systematic Internaliser | CBKE | Germany | SI (Market Maker) |
| Cboe Europe – BXE Order Books | BATE | United Kingdom | MTF |
| Cboe Europe – CXE Order Books ³ | CHIX | United Kingdom | MTF |
| Cboe Europe – LIS Service | LISX | United Kingdom | MTF (Conditionals) |
| Cboe Europe – BXE Dark Order Book | BATD | United Kingdom | MTF |
| Cboe Europe - BXE Periodic | BATP | United Kingdom | MTF |
| Cboe Europe – CXE Dark Order Book | CHID | United Kingdom | MTF |
| Citadel Connect Europe – Systematic Internaliser | CCEU | United Kingdom | SI (Market Maker) |
| Citi Match - GB | CGME | United Kingdom | SI (Broker) |
| Credit Suisse AES Crossfinder Europe | CSCF | United Kingdom | BCN (for non-MiFID eligible securities) |
| Credit Suisse Securities (Europe) Limited – Systematic Internaliser | SICS | United Kingdom | SI (Broker) |
| Deutsche Bank AG – Systematic Internaliser | DBES | Germany | SI (Broker) |
| Deutsche Boerse AG | XFRA | Germany | RM |
| Euronext – Euronext Amsterdam | XAMS | The Netherlands | RM |
| Euronext – Euronext Brussels | XBRU | Belgium | RM |
| Euronext – Euronext Paris | XPAR | France | RM |
| Euronext – Euronext Lisbon | XLIS | Portugal | RM |
| Euronext Block | XSMP | United Kingdom | MTF (Conditionals) |

² ‘BCN’ – Broker Crossing Network; ‘MTF’ – Multilateral Trading Facility; ‘RM’ – Regulated Market and ‘SI’ – Systematic Internaliser;

³ Bernstein receives fee rebates for executing passive lit liquidity on Cboe Europe – CXE Order Book (CHIX). Fee rebates are only included in the routing logic when all other performance metrics are tied. Bernstein can provide the value of fee rebates received on individual orders or over a client specified period.

| <u>Execution Venue Name</u> | <u>MIC</u> | <u>Country</u> | <u>Venue Type⁴</u> |
|---|------------|----------------|-------------------------------|
| IMC – Systematic Internaliser | IMCT | Netherlands | SI (Market Maker) |
| Irish Stock Exchange – All Market | XDUB | Ireland | RM |
| Jane Street Financial Ltd – Systematic Internaliser | JSSI | London | SI (Market Maker) |
| Johannesburg Stock Exchange | XJSE | South Africa | RM |
| J.P. Morgan Securities Plc | JPSI | London | SI (Broker) |
| Liquidnet Systems | LIQU | United Kingdom | MTF |
| Ljubljana Stock Exchange (Official Market) | XLJU | Slovenia | RM |
| London Stock Exchange | XLON | United Kingdom | RM |
| Milan Electronic Share Market | MTAA | Italy | RM |
| Morgan Stanley MTF | MSAX | London | MTF |
| Moscow Exchange – All Markets | MISX | Russia | RM |
| Nasdaq Copenhagen A/S | XCSE | Denmark | RM |
| Nasdaq Helsinki Ltd | XHEL | Finland | RM |
| Nasdaq Stockholm AB | XSTO | Sweden | RM |
| Nasdaq Copenhagen A/S – Auction On Demand | MCSE | Denmark | MTF (for periodic auctions) |
| Nasdaq Helsinki Ltd – Auction On Demand | MHEL | Finland | MTF (for periodic auctions) |
| Nasdaq Stockholm AB – Auction On Demand | MSTO | Sweden | MTF (for periodic auctions) |
| Nasdaq Copenhagen A/S – Nordic@Mid | DCSE | Denmark | RM |
| Nasdaq Stockholm AB – Nordic@Mid | DSTO | Sweden | RM |
| Nasdaq Helsinki Ltd – Nordic@Mid | DHEL | Finland | RM |
| Oslo Axess North Sea – Dark Pool | XOAD | Norway | RM |
| Oslo Bors ASA | XOSL | Norway | RM |
| Posit Auction | XPAC | Ireland | MTF (for periodic auctions) |
| Posit Dark | XPOS | Ireland | MTF |
| Posit RFQ | XRFO | Ireland | MTF (Conditionals) |
| Prague Stock Exchange | XPRA | Czech Republic | RM |
| Sigma X MTF | SGMX | United Kingdom | MTF |

⁴ ‘BCN’ – Broker Crossing Network; ‘MTF’ – Multilateral Trading Facility; ‘RM’ – Regulated Market and ‘SI’ – Systematic Internaliser;

| <u>Execution Venue Name</u> | <u>MIC</u> | <u>Country</u> | <u>Venue Type⁵</u> |
|---|------------|----------------|-------------------------------|
| SIX Swiss Exchange | XSWX | Switzerland | RM |
| SIX Swiss Exchange – Blue Chips Segment | XVTX | Switzerland | RM |
| SIX Swiss Exchange – SIX Swiss Exchange At Midpoint | XSWM | Switzerland | RM |
| SSW Market Making – Systematic Internaliser | SSWM | Germany | SI (Market Maker) |
| Tel Aviv Stock Exchange | XTAE | Israel | RM |
| Turquoise | TRQX | United Kingdom | MTF (Lit) |
| Turquoise Dark | TRQM | United Kingdom | MTF (Dark) |
| Turquoise Lit Auctions | TRQA | United Kingdom | MTF (for periodic auctions) |
| UBS MTF | XUBS | United Kingdom | MTF |
| Warsaw Stock Exchange – Equities/Main Market | XWAR | Poland | RM |
| Wiener Boerse AG Amlicher Handel (Official Market) | WBAH | Austria | RM |
| Xetra – Regulierter Markt | XETA | Germany | RM |
| Xetra | XETR | Germany | RM |

⁵ ‘BCN’ – Broker Crossing Network; ‘MTF’ – Multilateral Trading Facility; ‘RM’ – Regulated Market and ‘SI’ – Systematic Internaliser;

APPENDIX 2: EXECUTION VENUES ON WHICH BERNSTEIN PLACES SIGNIFICANT RELIANCE BY CLASS OF INSTRUMENT IN 2018

(a) Equities – Shares & Depositary Receipts – (i) Tick size liquidity bands 5 and 6 (from 2,000 trades per day)

| Execution Venue Name | MIC | Country |
|--|------|-----------------|
| Aquis Exchange | AQXE | United Kingdom |
| Athens Exchange S.A. - Cash Market | XATH | Greece |
| Bolsa de Madrid | XMAD | Spain |
| Borsa Istanbul – Equity Market | XEQY | Turkey |
| Budapest Stock Exchange | XBUD | Hungary |
| Cboe Europe – BXE Order Books | BATE | United Kingdom |
| Cboe Europe – CXE Order Books | CHIX | United Kingdom |
| Deutsche Boerse AG | XFRA | Germany |
| Euronext – Euronext Amsterdam | XAMS | The Netherlands |
| Euronext – Euronext Brussels | XBRU | Belgium |
| Euronext – Euronext Paris | XPAR | France |
| Euronext – Euronext Lisbon | XLIS | Portugal |
| Irish Stock Exchange – All Market | XDUB | Ireland |
| Johannesburg Stock Exchange | XJSE | South Africa |
| Ljubljana Stock Exchange (Official Market) | XLJU | Slovenia |
| London Stock Exchange | XLON | United Kingdom |
| Milan Electronic Share Market | MTAA | Italy |
| Moscow Exchange – All Markets | MISX | Russia |
| Nasdaq Copenhagen A/S | XCSE | Denmark |
| Nasdaq Helsinki Ltd | XHEL | Finland |
| Nasdaq Stockholm AB | XSTO | Sweden |
| Oslo Bors ASA | XOSL | Norway |
| Prague Stock Exchange | XPRA | Czech Republic |
| SIX Swiss Exchange | XSWX | Switzerland |
| SIX Swiss Exchange – Blue Chips Segment | XVTX | Switzerland |
| Tel Aviv Stock Exchange | XTAE | Israel |
| Turquoise | TROX | United Kingdom |
| Warsaw Stock Exchange – Equities/Main Market | XWAR | Poland |
| Wiener Boerse AG Amlicher Handel (Official Market) | WBAH | Austria |
| Xetra – Regulierter Markt | XETA | Germany |
| Xetra | XETR | Germany |

(b) Equities – Shares & Depositary Receipts – (ii) Tick size liquidity bands 3 and 4 (from 80 to 1,999 trades per day)

| <u>Execution Venue Name</u> | <u>MIC</u> | <u>Country</u> |
|--|-------------------|-----------------------|
| Aquis Exchange | AQXE | United Kingdom |
| Athens Exchange S.A. - Cash Market | XATH | Greece |
| Bolsa de Madrid | XMAD | Spain |
| Borsa Istanbul – Equity Market | XEQY | Turkey |
| Budapest Stock Exchange | XBUD | Hungary |
| Cboe Europe – BXE Order Books | BATE | United Kingdom |
| Cboe Europe – CXE Order Books | CHIX | United Kingdom |
| Deutsche Boerse AG | XFRA | Germany |
| Euronext – Euronext Amsterdam | XAMS | The Netherlands |
| Euronext – Euronext Brussels | XBRU | Belgium |
| Euronext – Euronext Paris | XPAR | France |
| Euronext – Euronext Lisbon | XLIS | Portugal |
| Irish Stock Exchange – All Market | XDUB | Ireland |
| Johannesburg Stock Exchange | XJSE | South Africa |
| Ljubljana Stock Exchange (Official Market) | XLJU | Slovenia |
| London Stock Exchange | XLON | United Kingdom |
| Milan Electronic Share Market | MTAA | Italy |
| Moscow Exchange – All Markets | MISX | Russia |
| Nasdaq Copenhagen A/S | XCSE | Denmark |
| Nasdaq Helsinki Ltd | XHEL | Finland |
| Nasdaq Stockholm AB | XSTO | Sweden |
| Oslo Bors ASA | XOSL | Norway |
| Prague Stock Exchange | XPRA | Czech Republic |
| SIX Swiss Exchange | XSWX | Switzerland |
| SIX Swiss Exchange – Blue Chips Segment | XVTX | Switzerland |
| Tel Aviv Stock Exchange | XTAE | Israel |
| Turquoise | TRQX | United Kingdom |
| Warsaw Stock Exchange – Equities/Main Market | XWAR | Poland |
| Wiener Boerse AG Amlicher Handel (Official Market) | WBAH | Austria |
| Xetra – Regulierter Markt | XETA | Germany |
| Xetra | XETR | Germany |

(c) Equities – Shares & Depositary Receipts – (iii) Tick size liquidity bands from 1 and 2 (from 0 to 79 trades per day)

| <u>Execution Venue Name</u> | <u>MIC</u> | <u>Country</u> |
|--|-------------------|-----------------------|
| Athens Exchange S.A. - Cash Market | XATH | Greece |
| Bolsa de Madrid | XMAD | Spain |
| Borsa Istanbul – Equity Market | XEQY | Turkey |
| Budapest Stock Exchange | XBUD | Hungary |
| Deutsche Boerse AG | XFRA | Germany |
| Euronext – Euronext Amsterdam | XAMS | The Netherlands |
| Euronext – Euronext Brussels | XBRU | Belgium |
| Euronext – Euronext Paris | XPAR | France |
| Euronext – Euronext Lisbon | XLIS | Portugal |
| Irish Stock Exchange – All Market | XDUB | Ireland |
| Johannesburg Stock Exchange | XJSE | South Africa |
| Ljubljana Stock Exchange (Official Market) | XLJU | Slovenia |
| London Stock Exchange | XLON | United Kingdom |
| Milan Electronic Share Market | MTAA | Italy |
| Moscow Exchange – All Markets | MISX | Russia |
| Nasdaq Copenhagen A/S | XCSE | Denmark |
| Nasdaq Helsinki Ltd | XHEL | Finland |
| Nasdaq Stockholm AB | XSTO | Sweden |
| Oslo Bors ASA | XOSL | Norway |
| Prague Stock Exchange | XPRA | Czech Republic |
| SIX Swiss Exchange | XSWX | Switzerland |
| SIX Swiss Exchange – Blue Chips Segment | XVTX | Switzerland |
| Tel Aviv Stock Exchange | XTAE | Israel |
| Warsaw Stock Exchange – Equities/Main Market | XWAR | Poland |
| Wiener Boerse AG Amlicher Handel (Official Market) | WBAH | Austria |
| Xetra – Regulierter Markt | XETA | Germany |
| Xetra | XETR | Germany |

APPENDIX 3: INFORMATION ON THE TOP 25 EXECUTION VENUES AND QUALITY OF EXECUTION OBTAINED⁶

| Class of Instrument | Equities – Shares & Depositary Receipts – (i) Tick size liquidity bands 5 and 6 (from 2,000 trades per day) | | | | |
|---|---|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 25 execution venues ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| MOSCOW EXCHANGE - ALL MARKETS [MISX] | 61.0 | 3.3 | 76.9 | 21.2 | 0.0 |
| LONDON STOCK EXCHANGE [XLON] | 10.9 | 15.6 | 57.6 | 37.4 | 0.0 |
| CBOE EUROPE - BXE PERIODIC [BATP] | 3.4 | 8.5 | 14.9 | 0 | 0.0 |
| MILAN ELECTRONIC SHARE MARKET [MTAA] | 3.2 | 2.0 | 60.6 | 33.9 | 0.0 |
| CBOE EUROPE - CXE DARK ORDER BOOK [CHID] | 1.5 | 4.7 | 92.1 | 7.9 | 0.0 |
| TURQUOISE DARK [TRQM] | 1.5 | 0.1 | 100 | 0 | 0.0 |
| CBOE EUROPE - CXE ORDER BOOKS [CHIX] | 1.4 | 6.3 | 22.7 | 76.7 | 0.0 |
| UBS MTF [XUBS] | 1.4 | 4.9 | 100 | 0 | 0.0 |
| BOLSA DE MADRID [XMAD] | 1.3 | 2.5 | 49.5 | 45.7 | 0.0 |
| NASDAQ STOCKHOLM AB [XSTO] | 1.3 | 4.5 | 53.7 | 39.6 | 0.0 |
| EURONEXT - EURONEXT PARIS [XPAR] | 1.2 | 7.8 | 60.9 | 33.1 | 0.0 |
| TURQUOISE [TROX] | 1.1 | 4.6 | 41.7 | 34.2 | 0.0 |
| EURONEXT - EURONEXT AMSTERDAM [XAMS] | 1.1 | 4.5 | 64.1 | 32 | 0.0 |
| CBOE EUROPE -BXE DARK ORDER BOOK [BATD] | 0.9 | 3.3 | 92 | 8 | 0.0 |
| XETRA [XETR] | 0.9 | 4.6 | 75.9 | 21.6 | 0.0 |
| AQUIS EXCHANGE [AQXE] | 0.8 | 2.3 | 5 | 95 | 0.0 |
| BORSA ITALIANA S.P.A. [XMIL] | 0.6 | 0.6 | 76.4 | 20.5 | 0.0 |
| EURONEXT - EURONEXT LISBON [XLIS] | 0.5 | 0.2 | 60.2 | 32.9 | 0.0 |
| CBOE EUROPE - LIS SERVICE [LISX] | 0.5 | 0.0 | 100 | 0 | 0.0 |
| CBOE EUROPE -BXE ORDER BOOKS [BATE] | 0.5 | 5.4 | 72.9 | 26.8 | 0.0 |
| J.P. MORGAN SECURITIES PLC [JPSI] | 0.5 | 0.9 | 100 | 0 | 0.0 |
| POSIT AUCTION [XPAC] | 0.4 | 0.7 | 100 | 0 | 0.0 |
| NASDAQ HELSINKI LTD [XHEL] | 0.3 | 1.0 | 70.5 | 22.8 | 0.0 |
| CREDIT SUISSE SECURITIES (EUROPE) LIMITED - SYSTEMATIC INTERNALISER [SICS] | 0.3 | 0.9 | 98.6 | 1.4 | 0.0 |
| XETRA - REGULIERTER MARKT [XETA] | 0.3 | 1.3 | 70.6 | 21.7 | 0.0 |

⁶ The period of analysis is from 1 January 2018 to 31 December 2018.

| Class of Instrument | Equities – Shares & Depositary Receipts – (ii) Tick size liquidity bands 3 and 4 (from 80 to 1,999 trades per day) | | | | |
|---|--|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 25 execution venues ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| LONDON STOCK EXCHANGE [XLON] | 23.1 | 12.6 | 50.4 | 42.0 | 0.0 |
| CBOE EUROPE - BXE PERIODIC [BATP] | 8.0 | 5.9 | 0.0 | 13.6 | 0.0 |
| MILAN ELECTRONIC SHARE MARKET [MTAA] | 6.4 | 2.6 | 45.9 | 45.6 | 0.0 |
| OSLO BORS ASA [XOSL] | 3.9 | 2.2 | 42.0 | 46.8 | 0.0 |
| BOLSA DE MADRID [XMAD] | 3.4 | 2.8 | 61.2 | 33.2 | 0.0 |
| NASDAQ STOCKHOLM AB [XSTO] | 3.3 | 6.2 | 57.3 | 33.7 | 0.0 |
| TURQUOISE [TRQX] | 3.2 | 4.8 | 42.2 | 33.8 | 0.0 |
| TURQUOISE DARK [TROM] | 3.2 | 0.1 | 0.0 | 100.0 | 0.0 |
| EURONEXT - EURONEXT PARIS [XPAR] | 2.8 | 6.9 | 42.8 | 48.8 | 0.0 |
| CBOE EUROPE - CXE ORDER BOOKS [CHIX] | 2.8 | 6.6 | 80.7 | 18.8 | 0.0 |
| UBS MTF [XUBS] | 2.6 | 2.5 | 0.0 | 100.0 | 0.0 |
| CBOE EUROPE - CXE DARK ORDER BOOK [CHID] | 2.4 | 2.5 | 15.4 | 84.6 | 0.0 |
| XETRA [XETR] | 2.3 | 4.8 | 34.0 | 61.1 | 0.0 |
| CBOE EUROPE -BXE ORDER BOOKS [BATE] | 2.2 | 6.0 | 47.5 | 52.1 | 0.0 |
| POSIT AUCTION [XPAC] | 2.0 | 0.6 | 0.0 | 100.0 | 0.0 |
| CBOE EUROPE -BXE DARK ORDER BOOK [BATD] | 1.9 | 2.0 | 14.7 | 85.3 | 0.0 |
| AQUIS EXCHANGE [AQXE] | 1.6 | 2.3 | 94.2 | 5.8 | 0.0 |
| BORSA ITALIANA S.P.A. [XMIL] | 1.6 | 1.0 | 49.3 | 45.3 | 0.0 |
| SIX SWISS EXCHANGE [XSWX] | 1.5 | 4.4 | 39.6 | 52.3 | 1.8 |
| WARSAW STOCK EXCHANGE/EQUITIES/MAIN MARKET [XWAR] | 1.5 | 0.8 | 44.8 | 49.8 | 0.0 |
| ATHENS EXCHANGE S.A. CASH MARKET [XATH] | 1.4 | 0.3 | 43.9 | 46.7 | 0.0 |
| POSIT DARK [XPOS] | 1.2 | 0.1 | 0.0 | 100.0 | 0.0 |
| SIX SWISS EXCHANGE - BLUE CHIPS SEGMENT [XVTX] | 1.2 | 4.4 | 36.6 | 59.0 | 1.2 |
| CBOE EUROPE - LIS SERVICE [LISX] | 1.1 | 0.0 | 0.0 | 100.0 | 0.0 |
| IRISH STOCK EXCHANGE - ALL MARKET [XDUB] | 1.1 | 1.2 | 82.7 | 16.1 | 0.0 |

| Class of Instrument | Equities – Shares & Depositary Receipts – (iii) Tick size liquidity bands 1 and 2 (from 0 to 79 trades per day) | | | | |
|---|---|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 25 execution venues ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| BORSA ISTANBUL [XIST] | 48.5 | 28.2 | 46.2 | 51.6 | 0.0 |
| JOHANNESBURG STOCK EXCHANGE [XJSE] | 21.5 | 26.9 | 27.3 | 53.6 | 0.0 |
| MOSCOW EXCHANGE - ALL MARKETS [MISX] | 10.9 | 11.5 | 12.3 | 83.4 | 0.0 |
| TEL AVIV STOCK EXCHANGE [XTAE] | 4.9 | 4.1 | 24.3 | 61.6 | 0.0 |
| LONDON STOCK EXCHANGE [XLON] | 3.1 | 2.0 | 62.4 | 15.0 | 0.0 |
| NASDAQ STOCKHOLM AB [XSTO] | 1.3 | 1.3 | 51.6 | 41.7 | 0.0 |
| EURONEXT ACCESS PARIS [XMLI] | 1.0 | 0.0 | 48.8 | 26.8 | 0.0 |
| POSIT DARK [XPOS] | 0.8 | 0.2 | 0.0 | 100.0 | 0.0 |
| LONDON STOCK EXCHANGE - AIM MTF [AIMX] | 0.8 | 0.1 | 16.0 | 31.3 | 0.0 |
| OSLO BORS ASA [XOSL] | 0.8 | 0.7 | 65.9 | 23.1 | 0.0 |
| FIRST NORTH SWEDEN [FNSE] | 0.7 | 0.1 | 39.2 | 49.5 | 0.0 |
| SIX SWISS EXCHANGE - BLUE CHIPS SEGMENT [XVTX] | 0.7 | 5.0 | 45.6 | 52.3 | 0.3 |
| SIX SWISS EXCHANGE [XSWX] | 0.6 | 6.3 | 59.1 | 31.9 | 1.7 |
| TURQUOISE DARK [TROM] | 0.5 | 0.2 | 0.0 | 29.5 | 0.0 |
| XETRA [XETR] | 0.3 | 1.5 | 46.9 | 30.9 | 0.0 |
| CBOE EUROPE - BXE PERIODIC [BATP] | 0.3 | 0.9 | 0.0 | 13.4 | 0.0 |
| TURQUOISE [TRQX] | 0.3 | 0.6 | 56.1 | 18.7 | 0.0 |
| CBOE EUROPE - CXE DARK ORDER BOOK [CHID] | 0.3 | 0.9 | 12.7 | 87.3 | 0.0 |
| EURONEXT - EURONEXT BRUSSELS [XBRU] | 0.2 | 0.3 | 44.7 | 37.2 | 0.0 |
| POSIT DARK [XPOS] | 0.2 | 0.1 | 0.0 | 100.0 | 0.0 |
| CBOE EUROPE -BXE DARK ORDER BOOK [BATD] | 0.2 | 0.8 | 13.5 | 86.5 | 0.0 |
| EURONEXT - EURONEXT PARIS [XPAR] | 0.2 | 1.1 | 68.1 | 23.9 | 0.0 |
| UBS MTF [XUBS] | 0.2 | 0.7 | 0.0 | 100.0 | 0.0 |
| CBOE EUROPE - LIS SERVICE [LISX] | 0.1 | 0.0 | 0.0 | 100.0 | 0.0 |
| SIX SWISS EXCHANGE - SIX SWISS EXCHANGE AT MIDPOINT [XSWM] | 0.1 | 0.8 | 3.5 | 96.5 | 0.0 |

APPENDIX 4: INFORMATION ON THE TOP 5 EXECUTING BROKERS AND QUALITY OF EXECUTION OBTAINED⁷

| Class of Instrument | Equities – Shares & Depositary Receipts – (i) Tick size liquidity bands 5 and 6 (from 2,000 trades per day) | | | | |
|---|---|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 5 executing brokers ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| BCS Prime Brokerage Ltd | 47.4 | 2.6 | 77.2 | 19.6 | 0.0 |
| Renaissance Capital Limited | 20.0 | 1.9 | 76.6 | 23.4 | 0.0 |
| Credit Suisse Securities (Europe) Ltd | 5.0 | 7.0 | 47.6 | 20.8 | 0.0 |
| Morgan Stanley & Co. International Plc | 3.7 | 4.0 | 37.4 | 39.4 | 0.0 |
| Goldman Sachs International | 3.0 | 13.6 | 60.5 | 32.0 | 0.0 |

| Class of Instrument | Equities – Shares & Depositary Receipts – (ii) Tick size liquidity bands 3 and 4 (from 80 to 1,999 trades per day)) | | | | |
|---|---|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 5 executing brokers ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| Credit Suisse Securities (Europe) Ltd | 17.3 | 11.9 | 29.6 | 47.6 | 0.0 |
| Goldman Sachs International | 12.0 | 17.2 | 44.3 | 46.8 | 0.0 |
| Morgan Stanley & Co. International Plc | 21.4 | 19.1 | 30.8 | 60.0 | 0.0 |
| JPMorgan Securities Plc | 5.4 | 12.3 | 50.0 | 46.3 | 0.0 |
| Investment Technology Group Limited | 4.9 | 1.1 | 100.0 | 0.0 | 0.0 |

| Class of Instrument | Equities – Shares & Depositary Receipts – (iii) Tick size liquidity bands 1 and 2 (from 0 to 79 trades per day) | | | | |
|---|---|--|------------------------------|---------------------------------|-------------------------------|
| Notification if < 1 average trade per business day in the previous year | N | | | | |
| Top 5 executing brokers ranked in terms of trading volumes (descending order) | Proportion of volume traded as a percentage of total in that class | Proportion of orders traded as a percentage of total in that class | Percentage of passive orders | Percentage of aggressive orders | Percentage of directed orders |
| AK Yatirim Menkul Degerler A.S. | 47.8 | 28.1 | 46.2 | 51.6 | 0.0 |
| Credit Suisse Securities (Europe) Ltd | 23.1 | 28.8 | 28.0 | 52.1 | 0.0 |
| BCS Prime Brokerage Ltd | 8.1 | 6.6 | 9.7 | 82.8 | 0.0 |
| Excellence Nessuah Brokerage Services Ltd | 3.6 | 3.1 | 27.0 | 59.3 | 0.0 |
| Renaissance Capital Limited | 2.6 | 4.9 | 15.8 | 84.1 | 0.0 |

⁷ The period of analysis is from 1 January 2018 to 31 December 2018.