

EMEA CASH EQUITIES: ORDER HANDLING AND FREQUENTLY ASKED QUESTIONS

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## Table of contents

1. Introduction .....	1
2. Typical instructions.....	3
3. Our execution practices.....	8
4. Common overlays and execution preferences.....	17
5. Appendix A – glossary of terms .....	18

## 1. Introduction

This document provides illustrations and answers to frequently asked questions on the approach that J.P. Morgan Securities plc (**JPMS plc**) and J.P. Morgan AG (**JPM AG**) will generally take when executing client orders in cash equities and *equity like instruments*. In this document, JPMS plc and JPM AG shall together be referred to herein as **J.P. Morgan, we** or **us** as appropriate).

This document describes:

- the range of client instructions that we typically receive;
- the practices we expect to employ when executing such instructions;
- the nature and methodologies behind the practices themselves; and
- key order-by-order and standing instructions (or preferences) that you may specify and which may further influence the way in which your order is executed.

We use certain industry terms marked in italics. Where we do not immediately explain them, please refer to the glossary at Appendix A.

For the avoidance of doubt, this document does not constitute part of the J.P. Morgan Execution Policy. The J.P. Morgan Execution Policy is available [here](#).

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## 2. Typical instructions

We have set out below the range of instructions that we typically receive and which provide the best collective illustration as to how we will usually execute orders on your behalf. We have termed these instructions **typical instructions**.

This list is not exhaustive; should you wish to discuss our treatment of an instruction which is not listed, please get in touch with your usual J.P. Morgan contact.

We have divided our typical instructions into two categories:

Working orders: those orders which cannot, by virtue of their nature or size, be sent immediately to one or more *execution venues*; and

Routing orders: those orders which can be sent immediately to one or more *execution venues*.

When we execute a working order, we expect to generate routing orders on your behalf which we will treat in the same way as if we had received the routing order from you directly.

## Typical working orders

Order Instruction	Description
<b>Volume-weighted average price (VWAP)</b>	A request to execute an order over the specified time period and to obtain an average price as close to the <i>VWAP</i> over that period as possible. The executed <i>volume</i> of the order should aim to follow the distribution of <i>volume</i> executed by the market as a whole during that period. Limit prices and maximum <i>participation rate</i> constraints may also be applied to this request. As appropriate to the indicated time-frame, instructions may include inclusion or avoidance of either the opening or <i>closing auction</i> periods.
<b>Time-weighted average price (TWAP)</b>	Similar to <i>VWAP</i> with the exception that execution should occur at a more or less even rate throughout the period of execution.
<b>Percentage of volume (POV)</b>	A request to progress an order at a client defined rate which is expressed as percentage of the <i>addressable volume</i> observed on the market as a whole. We often refer to the indicated percentage of <i>volume</i> as the <i>participation rate</i> .
<b>POV with discretion</b>	Similar to the above instruction but with specified lower and upper bounds to the <i>participation rate</i> .
<b>Laddered POV</b>	A request to execute at a specific <i>participation rate</i> with an additional instruction to modify the rate of execution if the market reaches a specified price level.
<b>Implementation shortfall (IS)</b>	A request to execute an order whilst exercising some discretion over the pace of the execution according to our view of the market and the potential availability of liquidity. The trader or algorithm will usually be expected to minimise both <i>market impact</i> and <i>timing risk</i> by executing at some minimum approximate <i>participation rate</i> whilst taking the opportunity to accelerate execution if this can be achieved without material adverse price movement.
<b>Get done within limit</b>	A request to obtain as much available liquidity as possible within the specified limit price: the trader is expected to buy or sell shares urgently. There is no maximum <i>participation rate</i> , within the specified price we are expected to buy or sell shares as quickly as possible until the order is completed.
<b>Close subject to volume</b>	A request to execute as much of the order as possible at the closing price of the relevant security but with constraints placed on the <i>participation rate</i> that any order submitted to the relevant <i>trading venue</i> should represent of the final <i>closing auction volume</i> .
<b>Target close</b>	A request to try to obtain the closing price for the submitted order but with discretion allowed for a trader or algorithm to work part of the order prior to the <i>closing auction</i> to avoid excessive <i>market impact</i> during the <i>closing auction</i> . <i>Participation rates</i> may be specified for the <i>closing auction</i> and the <i>continuous trading</i> period prior to it.
<b>Multiple instructions</b>	An order in which you may work very closely with the trader handling your order throughout its lifecycle. You may update your instructions frequently throughout the lifecycle of the order. The resulting instruction may form a hybrid of the other instructions that we describe.

## How we handle typical working orders

The table below summarizes both the important execution factors for each typical working order, together with the relevance of each of our execution practices. Each of the execution practices listed in the table is described in the following section:

	Order Types	Volume-Weighted Average Price (VWAP)	Time-Weighted Average Price (TWAP)	Percentage of Volume (POV)	POV with Discretion	Implementation Shortfall	Close Subject to Volume	Get Done Within Limit	Multiple Instructions	Target Close
<b>Priority of Execution Factors</b>										
Price	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Speed	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Costs	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Likelihood Of Execution	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
<b>Relevance of Execution Practices (Order Working)</b>										
Time Based Scheduling	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Volume-Based Scheduling	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Discretionary Scheduling for Market Impact and Risk	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Scheduling Overlays (Signal Based Scheduling)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Spread and Short Term Price Capture	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Fair Value and Price Protection	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Minimum Acquisition Size	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
<b>Relevance of Execution Practices (Order Routing)</b>										
Internalisation (Centralised Liquidity Access)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Internalisation (Continuous Natural Access Service)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Manual Internalisation	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of Marketable Orders	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of Non-Marketable Orders	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing to Non-Displayed, Periodic Auction and Other Passive Venues	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of orders for the opening or closing Auctions	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■

Key (Execution Factors)	
Most Important	■ ■
Important	■ ■
Somewhat Important	■ ■
Not Considered	■ ■

Key (Execution Practices)	
Core Execution Practice	■ ■
Supporting Execution Practice	■ ■
May be Used if Appropriate	■ ■
Not Relevant	■ ■

## Typical routing orders

Order Instruction	Description
<b>Standard intra order</b>	An order with no limit price which is expected to execute immediately with existing buyers or sellers in the market.
<b>Standard intraday marketable limit order</b>	An order which either has no limit price or where the limit price is such that, given prevailing market conditions, at least part of the order is likely to match immediately with existing buyers or sellers.
<b>Standard non-marketable limit order</b>	An order with a limit price such that the order is not expected to execute immediately but should be routed to a venue with the aim of maximising the probability of an execution at that price whilst minimising the time taken to achieve that execution.
<b>Iceberg order</b>	An order with an instruction to display only a portion of its overall size on the relevant <i>trading venue</i> . As the displayed portion is executed, another tranche of the order may then be displayed for execution.
<b>Order for the close</b>	An order to be executed, in its entirety at the closing price of the relevant <i>trading venue</i> for the security. This may or may not have a limit price attached.
<b>Standard dark/passive order (mid-point peg)</b>	An order to execute across a range of <i>non-displayed, periodic auction and other passive execution venues</i> with a price no-worse than the prevailing mid-point <sup>1</sup> at the time of execution. Once available, this order type may also interact with our <i>Continuous Natural Access</i> service if you have opted to use it.  A limit price or minimum-acquisition / minimum-execution quantity may be attached.
<b>Internal dark/passive order (mid-point peg)</b>	An order to be executed at a price no worse than the mid-point of the prevailing <i>consolidated best bid / offer</i> , within our <i>continuous natural access service</i> . Such an order may have a limit price attached which will be observed.
<b>Internal dark/passive order (near-touch peg)</b>	An order to be executed at a price no worse than the near-touch of the prevailing <i>consolidated best bid/offer</i> <sup>2</sup> , within our <i>continuous natural access service</i> . Such an order may have a limit price attached which will be observed.
<b>Conditional order</b>	An order type which may be sent to a supporting venue to search for other matching orders. If the conditional order is matched, a message is returned to the execution algorithm which returns to the venue with a <i>firm</i> order to execute at a price no worse than the prevailing mid-point. Note that conditional orders are only available through the use of our own algorithms; they may not be accessed directly.

<sup>1</sup> This may be the mid-point of the *primary market* for the security or the *consolidated mid-point* depending on the venue being used.

<sup>2</sup> Only available to institutional clients for position building.

## How we handle typical routing orders

The table below summarizes both the important execution factors for each typical working order, together with the relevance of each of our execution practices. Each of the execution practices listed in the table is described in the following section:

	Standard Intraday Market Order	Standard Intraday Market Order	Standard Non-marketable Limit Order	Internal Dark/Passive Order	Internal Dark/Passive Order (mid-point peg)	Internal Dark/Passive Order (near-touch-pe.g)	Conditional Order
<b>Priority of Execution Factors</b>							
Price	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Speed	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Costs	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Likelihood Of Execution	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
<b>Relevance of Execution Practices</b>							
Internalisation (Centralised Liquidity Access)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Internalisation (Continuous Natural Access Service)	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Manual Internalisation	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of Marketable Orders	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of Non-Marketable Orders	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing to non-displayed, periodic-auction and other passive venues	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Routing of orders for the opening or Closing Auctions	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■

Key (Execution Factors)	
Most Important	■ ■
Important	■ ■
Somewhat Important	■ ■
Not Considered	■ ■

Key (Execution Practices)	
Core Execution Practice	■ ■
Supporting Execution Practice	■ ■
May be Used if Appropriate	■ ■
Not Relevant	■ ■

### 3. Our execution practices

These are the building blocks of our service that we may use to execute your order. Some are fundamental to every order that we handle; others will only be applicable to certain types of instruction. The tables in the previous section show how these practices apply to the different types of instruction that we typically receive.

**We have divided our execution practices into two categories:**

- (a) Order routing and internalization practices: how we choose which of the venues, we have access to, should be used to execute all or part of your order. How we may use our own liquidity to execute part of your order at our discretion.
- (b) Order working practices: how we manage orders that require some form of scheduling. How and when we generate routing orders and set the parameters of those orders.

#### **(a) Order routing, matching and internalisation practices**

##### **(i) Internalisation and matching**

These activities may be performed on an over the counter basis, in our capacity as a Systematic Internaliser or by concluding the transaction under the rules of a trading venue.

We may manually or automatically internalise an order on your behalf.

##### **Manual Processes**

We may obtain liquidity manually for you in one of the following ways:

- Cross: by occasionally executing all or part of your order against either another client's order. Usually we will conclude the resulting execution using an external trading venue in this case.
- House: by executing all or part of your order against our own books.

## Automatic Internalisation Processes

We offer the following automatic internalisation services:

- Continuous Natural Access (opt-out)
- Centralized Liquidity Access (opt-out)
- Centralized Block Access (opt-in)
- Close Cross (opt-out)
- Direct to Capital (bespoke set-up)
- Parent Liquidity Provision (opt in)

### Continuous Natural Access

Our *continuous natural access* service (CNA) provides clients with the opportunity to access J.P. Morgan liquidity that arises from committed principal trading interests that the firm has acquired in the course of facilitating client business. We may also match your order with another client's order - in this case your order will be brought onto a trading venue and your execution will be marked with the Market Identifier Code (MIC) of the relevant trading venue.

You may use CNA directly, through one of our routing order types, or indirectly through one of our algorithms. If you use one of our algorithms they will search the CNA service for opposing trading interests whilst also placing orders on external trading venues and other execution venues. Success in finding liquidity through CNA will reduce the need to search for liquidity on external venues.

### Centralised Liquidity Access

Our *centralized liquidity access* service (CLA) provides clients with the opportunity to access J.P. Morgan liquidity within our Central Risk Book (CRB) which would not otherwise be available within the CNA service. The CRB broadcasts internal quotes to the CLA service where the quotes may be matched with part of your order based on the liquidity score sent on the child order by our Smart Order Router (SOR). This CRB liquidity is made available to clients either because the stock is part of our risk-managed portfolio or because the CRB is willing to meet client demand for liquidity.

If you would like to discuss our CLA service please contact your usual J.P. Morgan representative.

### Centralised Block Access

Our *centralized block access* service (CBA) provides clients with the opportunity to access J.P. Morgan block liquidity provided by our Central Risk Book (CRB) as part of its ongoing inventory management. This liquidity would not otherwise be available within the CNA service. The CRB makes available Large-in-Scale (LIS) orders in the CBA service at mid-point, which clients may interact with via our *Aqua Blocks* algorithm.

CBA is available on an opt-in basis. If you would like access to our CBA service please contact your usual J.P. Morgan representative.

### **Close Cross**

Our *Close Cross* service provides clients with the opportunity to access J.P. Morgan liquidity during the closing auction that arises from committed principal trading interests that the firm has acquired in the course of facilitating client business. We may also match your order with another client's order - in this case your order will be brought onto a trading venue and your execution will be marked with the Market Identifier Code (MIC) of the relevant trading venue. Close Cross executions occur at the primary closing auction price.

You may access Close Cross through any of our algorithms that interact with the closing auction using a market order instruction or a limit order instruction if sufficiently marketable. If no liquidity is found in Close Cross, the algorithm will then place your order in the primary closing auction according to your trading instructions. In this way, success in finding liquidity in Close Cross will diminish the need to participate in the primary closing auction.

### **Direct To Capital**

Our *Direct To Capital* service (DTC) provides clients with access to capital provided by our Central Risk Book (CRB). This service is bespoke to each client and pricing / fill rates are agreed in advance with each client wishing to use the service. DTC can be accessed via both High Touch and Electronic execution channels.

If you would like to discuss our DTC service please contact your usual J.P. Morgan representative.

### **Parent Liquidity Provision**

Our *Parent Liquidity Provision* service (PLP) allows clients to receive an automatic midpoint fill from our Central Risk Book (CRB). Interaction with the CRB is controlled by the trading algorithms. When an eligible parent order meets pre-agreed characteristics (including a completion threshold), the algorithm will automatically and anonymously route the remaining quantity to the CRB. If the CRB is unable to facilitate, the algorithm will resume trading as usual.

If you would like to discuss our PLP service please contact your usual J.P. Morgan representative.

**(ii) Order routing**

The tables below describe the processes that we typically use when we are choosing between external venues or where we choose between internalisation and a range of external venues.

<i>Routing marketable orders to external displayed venues</i>	
What does this mean?	Our process
<p>In this situation we intend to send an order, at least part of which, is expected to execute immediately on one or more execution venues according to the market data recently broadcast by those venues.</p> <p>Our priorities are to fill as much of the order as possible, at the best price possible, within any price constraint that you have provided. We prioritise price, followed by likelihood of execution.</p>	<ul style="list-style-type: none"> <li>▪ To make our routing decision, we first collect real-time market data on the bids and offers available on the venues to which we have access to trade the relevant instrument.</li> <li>▪ If you are using one of our automatic internalisation services, our router will also check to see whether we can match part of your order at a price which is equal to or better than the best price available on an external displayed venue. If this is the case, we will do so before proceeding.</li> <li>▪ If you have opted to interact with non-displayed venues as part of routing marketable orders to displayed venues, we will also send short-duration orders to execute at a price better than the best price available on external displayed venues.</li> <li>▪ If you have opted to interact with liquidity from external SIs, our router will also route orders to external SIs where we see a suitable quote in terms of price and size. In general, we will send an order to an external SI where both the quoted price is equal to or better than the best price available on external displayed venues, and where the quoted size is greater or equal to the size of our order.</li> <li>▪ If we have been unable to fill the order at this point, our router will then determine which of the available external bids or offers should be targeted to produce the best overall execution price available. Often we will be able to fill your order at the same price by using different execution venues or combinations thereof. In these cases, our router will refer to a ranking table. This table is reviewed monthly and updated to prioritise venues which have historically shown higher fill rates.</li> <li>▪ When the router has calculated a target list of bids and offers it will route a single immediate or cancel order to each venue on which a targeted bid or offer exists. The orders will be routed more or less simultaneously but in a specific order and with specific timing that reduces fading risk.</li> </ul>

Routing <i>non-marketable</i> orders to external <i>displayed venues</i>	
What does this mean?	Our process
<p>In this situation, we are routing an order which has a price constraint on it that is expected to prevent it from executing immediately given the prevailing <i>market data</i>.</p> <p>The intended execution price has already been determined, so our priority is to maximise the speed and likelihood of the execution of the order at that price.</p> <p>The displayed order-driven venues that we use all operate on a <i>price-time priority</i> basis. This means that those venues operate what is, in effect, a queuing system for <i>non-marketable orders</i> to be executed against incoming <i>marketable orders</i>. Our router uses a process designed to get orders to the front of those queuing mechanisms as quickly possible.</p>	<p>(Non iceberg orders)</p> <ul style="list-style-type: none"> <li>■ We estimate the future speed of progress of the “queue” on the venue’s order book by examining the <i>volume</i> of trades that are being reported. We estimate the queue speed by security, <i>trading venue</i> and <i>side of book</i>.</li> <li>■ When the router receives a <i>non-marketable order</i>, it will examine the current depth of the queue on each of the order books of the venues to which it can potentially send the order.</li> <li>■ With the above two pieces of information, the router is able to estimate the time that it should be expected to take (on average) for any part of the order to be filled on any of the venues to which it has access.</li> <li>■ With this information, the router uses an algorithm to calculate the quantity that should be distributed to each venue with the goal of minimising the time expected to fill the order.</li> <li>■ When the allocation quantities have been calculated, the router will send <i>day orders</i> to each venue at the price that has been specified on the incoming order.</li> <li>■ The result may be that the order is sent to single or multiple venues.</li> <li>■ Once the router has placed its initial orders, it may move some or all of those orders to other venues as new information arrives.</li> <li>■ If for any reason we do not have sufficient data to make the above assessment, we will <i>post</i> the order to the <i>primary market</i> for the relevant security.</li> </ul>

Routing orders to <i>non-displayed, periodic auction and other passive venues</i>	
What does this mean?	Our process
<p>This routing process is usually used when your instructions tell us that you want to maximise your access to liquidity in certain situations. The types of instruction that will invoke this routing behaviour are described in previous sections. We are usually routing large orders which are not appropriate to be routed directly to conventional <i>displayed venues</i>.</p> <p>Note that we also include our <i>Continuous Natural Access</i> service within this selection process.</p> <p>Our main priority when routing in this mode is to match as much of your order as possible at the prevailing market prices (or better) whilst ensuring that price movements are minimised in doing so.</p>	<ul style="list-style-type: none"> <li>▪ These venues may not provide concrete information as to available liquidity at the time that we wish to route an order.</li> <li>▪ Our starting point for routing decisions is therefore a historical analysis of our ability to find liquidity on those venues. This analysis provides us with a way to calculate the average amount of time we should expect to wait to get an order filled on the <i>non-displayed venues</i> to which we have access.</li> <li>▪ We introduce a bias to this process which favours venues that exhibit fewer adverse price movements before or after executions are received. Note that this may result in a bias towards our own internalisation services.</li> <li>▪ An algorithm will calculate the quantities to distribute to each potential venue that are expected to result in the best opportunity to fill your order in the shortest space of time.</li> <li>▪ If and when we experience executions on those submitted orders, we will adjust our historical analysis to reflect our most recent experiences. That may result in a further redistribution of orders toward the venues that are currently providing liquidity.</li> <li>▪ In addition to these executions, we also monitor executions on all submitted orders across J.P Morgan's cash equities in an attempt to improve the search process further.</li> <li>▪ If you have a small order or as the balance of your order becomes small it may not be efficient to distribute it in this manner. In this case, we will switch our approach, placing your entire order on different venues sequentially in the hope of finding a match for it.</li> </ul>

Routing to venues that support conditional orders	
What does this mean?	Our process
<p>Conditional orders are an order type sent to a venue for the purposes of finding a potential match with your order but without initially committing to execute your order. The venue itself must specifically support conditional orders. When the venue indicates a potential match with the conditional order, it invites the submitter of the conditional order to commit with a <i>firm order</i> which will generate an execution.</p>	<ul style="list-style-type: none"> <li>▪ <b>Routing of conditional orders:</b> Because conditional orders are not “firm”, your trading interest may be posted, at once, with multiple venues (including our own internalisation services), which support conditional orders.</li> <li>▪ <b>Routing of firm orders:</b> We will route <i>firm orders</i> to the first venue to respond with a possible match to a previously sent conditional order.</li> </ul>

Routing orders for the opening or closing auctions
<p>For the <i>opening auction</i>, we route an order directly to the <i>primary market</i> for the relevant security.</p> <p>For the closing auction, clients can also choose to participate in our Close Cross service, which provides clients with the opportunity to access J.P. Morgan liquidity during the closing auction that arises from committed principal trading interests that the firm has acquired in the course of facilitating client business. We may also match your order with another client’s order - in this case your order will be brought onto a trading venue and your execution will be marked with the Market Identifier Code (MIC) of the relevant trading venue. Close Cross executions occur at the primary closing auction price.</p> <p>You may access Close Cross through any of our algorithms that interact with the closing auction using a market order instruction or a limit order instruction if sufficiently marketable. If no liquidity is found in Close Cross, the algorithm will then place your order in the primary closing auction according to your trading instructions. In this way, success in finding liquidity in Close Cross will reduce the need to participate in the primary closing auction.</p>

Routing orders to the Trade At Last session
<p>Following the closing auction, clients can also choose to route orders to the primary Trade At Last session (where available).</p> <p>You may access Trade At Last through any of our algorithms that also interact with the closing auction, or by sending DMA orders during the Trade At Last session.</p>

## (b) Order working practices

When we work orders over a period of time on your behalf, we will use some or all of the practices described below. These practices will generate routing orders on your behalf and determine the type and parameters of those orders.

### Order scheduling and distribution

When we split up larger orders that you give us, we will generate smaller orders on your behalf according to the following processes. Note that we are obliged to avoid generating activity which might adversely affect the integrity of the market and this may constrain the implied schedule.

#### Time-based scheduling

Orders that we receive from you to target a benchmark over a specific time period (such as *VWAP* or *TWAP*) will employ time-based scheduling.

For *TWAP* orders we will aim to execute your order at a consistent rate over the time period that you specify.

For *VWAP* orders, we will follow a schedule which aims to execute your order at a rate which is broadly in proportion to the rate at which we expect *addressable volume* to go through the market as a whole. This requires us to estimate the way in which trading *volumes* will be distributed in the market, between the time you ask us to begin executing the order, and the time that you want it to finish executing. Usually we will use automatic mathematical algorithms to do this. These algorithms will use observations of how the market and the relevant security have accumulated trading *volume* in the past, and on the day of execution itself, to estimate how *volume* will accumulate over the period relating to your order. In some cases, if you are using a *high-touch desk*, a trader may choose to deviate from the automatically generated schedule.

When we execute *VWAP* and *TWAP* orders according to a time schedule, we will do so by placing orders into the market which are of a size which is normal to be placed for the security in question. Note that this will limit the frequency with which we can place orders into the market and therefore the accuracy with which we can follow the intended schedule. As a result, larger orders can be expected to follow the schedule with greater accuracy than smaller orders.

#### Volume-based scheduling

*Volume* based scheduling will aim to schedule your order such that your order executes at a rate which represents a particular percentage of the actual *addressable volume* that goes through the market in that security. *Volume*-based scheduling will not aim to finish your order at any particular time other than that which is implied by the market *volume*.

**Note:** when we execute instructions according to a time or *volume-based* schedule, we consider that price is ultimately more important than speed of execution. In other words, if following the expected schedule rigorously may have a detrimental effect on the execution price, we may choose to slow down our rate of execution to protect your interests.

#### Discretionary scheduling for *market impact* and risk

For some of the instructions that you may give us (please refer to the table in the previous section), we will use a level of discretion over the rate at which we progress our order. In these circumstances, we will try to balance the twin aims of reducing the uncertainty associated with your final execution price, whilst achieving a favourable price. In balancing these aims, we will take into account our understanding of your tolerances to take increased risk to achieve better average outcomes. Scheduling will be influenced by the volatility and the available liquidity of the relevant security.

### Signal-based scheduling

When the execution of your order involves the use of a trading algorithm, we may use signal-based scheduling to adjust the schedules produced on a time, *volume* or discretionary basis over small time periods. Signal-based scheduling will not alter the fundamental nature of these schedules; but will adjust the timing of orders that we submit on your behalf, within those schedules, to try to take advantage of better prices in the market. Where employed, signal-based scheduling uses a mathematical model to compare the recent returns of the security you are executing with the returns of the wider market to identify advantageous pricing.

### Pricing of orders and parameter setting

When we generate orders to be routed into the market on your behalf we will set parameters on those orders with the objective of obtaining the best expected price. The processes described below relate to mathematical models used by our algorithms. If your order is executed manually, the trader may also set similar parameters according to their own judgement.

### Spread and short term price capture: setting of limit prices

We will try to use a mixture of *marketable* (or aggressive) and non-marketable (or passive) orders when we execute on external displayed markets. *Non-marketable* orders offer the opportunity to receive a better price at the expense of taking some risk that the order will not be executed. A *marketable* order can be expected to be executed immediately; but removes the opportunity to receive a better price. Our processes will determine limit prices that will usually create a mixture of marketable and non-marketable limit orders whilst adhering to the constraints imposed by the relevant schedule. To do this we use a mathematical model which tries to determine if the expected outcome from placing a *non-marketable* order (including the possibility that it will not be executed at that price) is better than that of placing a *marketable order*.

### Fair value

Fair value is a process that we may use to set the limit prices of larger orders placed into *non-displayed venues*. This process will only be used when your order is being traded by an algorithm that has significant discretion to advance your order by executing in *non-displayed venues*.

The mathematical process is similar to that used for signal-based scheduling: rather than adjusting the timing of execution, though, fair value will simply place limit prices on non-displayed orders such that they will only execute within prices that the model determines as reasonable given recent *market data*.

### Minimum acquisition quantity, minimum execution size

Usually, *non-displayed venues* allow us to send a parameter (set in shares) which controls the size of execution that may be received. There are two standards in operation today: Minimum Acquisition Quantity (**MAQ**) and Minimum Execution Size (**MES**).

**MAQ:** when MAQ is used we may receive more than one simultaneous execution where the total number of shares executed is above the quantity specified.

**MES:** when MES is used, no individual execution may be smaller than the quantity specified. With limited exceptions, the venues that we use either support or allow us to use MES.

## 4. Common overlays and execution preferences

This section deals with order-by-order or standing instructions, which you may give us, that will modify the way in which we execute the typical instructions that we have already described.

### Overlays

Overlays are instructions provided alongside your order that allow us to deviate from the standard behaviour for particular eventualities. We typically deal with two types of overlay. These will not be applied unless you request them:

**“Would in dark”**: this overlay allows us to make exceptions to the trading schedule implied by your instructions if we are able to obtain liquidity from *non-displayed-venues* at any time.

**“Would at price”**: this is treated as a request to change your instruction to Get Done Within Limit (described above) if the market price is at, or more favourable than, the price that you specify.

### Execution settings

We offer a number of standard execution options as part of our service. The setting of these options can be arranged through your usual representative and will remain with us as a standing instruction.

If you select one of these options, it may naturally take precedence over the execution practices that we have previously described. By way of example; if you choose to exclude an execution venue that we access on your behalf, we will not access that venue although we will use the same process that we have described to access the remaining venues.

The standard settings that we list on the following page are those that are most commonly used; and all relate to how we interact with *execution venues*. For clients of our electronic trading service (Electronic Client Solutions, or ECS), we also offer the ability to customise the available trading strategies. For practical reasons we have not listed every such parameter that can be customised here. For the avoidance of doubt; such customisations (subject to cost) are equally available to every client.

### General Venue Preferences

General venue preference	
Preference Name	Purpose
Include / exclude venues	You may provide a list of venues that you would only like us to include, or a list which you would specifically like us to exclude
Include <i>Continuous Natural Access</i>	You may choose whether to use our <i>Continuous Natural Access</i> service.
Continuous Natural Access Scope	You may choose to restrict the range of principal trading interests that may provide inventory through the service. Please contact your usual J.P. Morgan representative to discuss any specific requirements.
Include <i>Centralised Liquidity Access</i>	You may choose whether to use our <i>Centralised Liquidity Access</i> service.
MAQ / MES	You may specify an MAQ / MES that you would like us to adopt on your orders when we are accessing <i>non-displayed venues</i> on your behalf

## 5. Appendix A – glossary of terms

Term	Explanation
<b>Addressable volume</b>	<p>The sum of the shares executed in the market that are executed in a way that we consider we could participate in. Typically we include / exclude the following <i>volumes</i>:</p> <p><b>Included</b></p> <p>(a) <i>Volume</i> executed on the order book of the <i>primary market</i>.</p> <p>(b) <i>Shares</i> executed on the displayed order books of Aquis<sup>3</sup>, BATS, CHI-X and Turquoise MTFs.</p> <p><b>Excluded</b></p> <p>(a) <i>Volume</i> executed <i>on-exchange but off-order book</i>.</p> <p>(b) <i>Volume</i> executed on an Over the Counter (OTC) basis.</p> <p>(c) <i>Volume</i> executed on non-displayed order books.</p>
<b>Auction</b>	An order matching mechanism which receives multiple orders over a period of time and then matches them at the end of that period according to an algorithm operated by the relevant execution venue. As distinct from <i>continuous trading</i> .
<b>Best offer / best offer price</b>	The lowest available <i>offer price</i> .
<b>Bid price(s) / bid(s)</b>	Obtained from the <i>market data</i> published by a <i>displayed execution venue</i> . The prices at which participants are currently willing to buy securities.
<b>Best bid price</b>	The highest available <i>bid price</i> .
<b>Broker crossing network (BCN)</b>	An automated facility operated by a broker; used to match the opposing trading interests of itself and its clients. BCNs operate under the over-the-counter (OTC) rules and are not regulated as <i>trading venues</i> .
<b>Closing auction</b>	The final <i>auction</i> in the trading day of the relevant venue.
<b>Consolidated best bid / offer</b>	<p>Also known as “EBBO” or the European Best Bid or Offer: The highest <i>bid price</i> from a *range of venues. The lowest <i>offer price</i> from the same range of venues.</p> <p>* We use <i>market data</i> from the <i>primary market</i> together with that from the displayed order books of Aquis<sup>4</sup>, BATS, CHI-X and Turquoise.</p>
<b>Consolidated mid-point</b>	The arithmetic average of the <i>best bid</i> and <i>best offer</i> prices.
<b>Continuous trading</b>	A mechanism operated to match incoming orders with orders already on the order book on a continuous basis.
<b>Day order</b>	An order, which if not executed, will reside on the order book of the relevant venue for the rest of the day on which it is sent.
<b>Displayed venue</b>	A venue which operates by matching incoming orders with other orders; and which publishes pre-trade market data to the market that shows the prices of the orders resting on its order book.

<sup>3</sup> Effective by end April 2018

<sup>4</sup> Effective by end April 2018

Term	Explanation
<b>Equity like instruments</b>	Depository receipts, exchange traded funds, certificates and other similar instruments.
<b>Execution venues</b>	Includes <i>trading venues</i> , together with other entities with which we might seek to match part of your order.
<b>Firm order</b>	An order sent to an <i>execution venue</i> which may be immediately executed by the relevant venue if a match is found.
<b>High-touch desk</b>	A non-electronic desk which will typically offer a higher level of interaction with the client submitting the order, together with the ability to make markets and to facilitate crosses between clients.
<b>Market data</b>	Information that is published in real time by a venue that informs participants as to the contents of the order book (pre-trade data) and the executions which have taken place (post-trade data).
<b>Market impact</b>	Movement of the price of a security that may follow orders or transactions in that security.
<b>Marketable order</b>	Either an order which has no limit price or; (a) an order to buy in which the limit price is greater than or equal to the <i>best offer price</i> ; or (b) an order to sell in which the limit price is less than or equal to the <i>best bid price</i> .
<b>MiFIDII/MiFIR</b>	Markets in Financial Instruments Directive 2 / Markets in Financial Instruments Regulation
<b>Non-displayed venue</b>	A venue which does not provide any pre-trade market data. The execution prices of such venues are usually derived from the bids / offers published by displayed execution venues.
<b>Non-marketable order</b>	An order with a limit price which does not meet the above criteria for a <i>marketable order</i> .
<b>Offer price(s) / offer(s)</b>	Obtained from the <i>market data</i> published by a <i>displayed execution venue</i> : the prices at which participants are currently willing to sell securities.
<b>On exchange, off-order book</b>	Describes trades, the price and size of which are negotiated outside of the order book of a <i>trading venue</i> , but which are subsequently brought onto that <i>trading venue</i> and subject to its rules.
<b>Other passive venues</b>	In this venue, we include any other venue, including investment firms acting as Systematic Internalisers in which it is potentially beneficial to leave an order to wait for the opportunity to execute in better size or price than might be expected on a conventional lit market.
<b>Participation rate</b>	Expressed as a percentage of the <i>addressable volume</i> : either a minimum, maximum or target rate of progress for an order.
<b>Periodic auction venue</b>	A venue that is pre-trade transparent but that operates a series of discrete auctions throughout the day and can be used for passive execution.
<b>Post / posting</b>	To submit a non- <i>marketable day order</i> which will reside on the order book of the relevant venue until such time as it is executed, cancelled or the day ends.

Term	Explanation
<b>Price-time priority</b>	A system operated by an <i>execution venue</i> whereby orders resting on the order book of the venue are executed against incoming <i>marketable orders</i> in the following order:  (a) the most competitively priced orders are executed first;  (b) orders with the same price are executed in order of the time that they have spent on the order book.
<b>Primary market</b>	The market on which the security which is the subject of the order is originally listed.
<b>Side of book</b>	Used to distinguish between the <i>bid prices</i> on one side and the <i>offer prices</i> on the other side, of the order book of the relevant venue.
<b>Standard Market Size (SMS)</b>	This is a size threshold which is to be applied to Systematic Internalisers operating under MiFID2/MiFIR. The threshold is banded and is intended to be representative of the average trade size of the security. In practice the majority of securities are expected to have an SMS equivalent in value to either EUR 10,000 or EUR 30,000. The majority of these will have an SMS with a value of EUR 10,000.
<b>Systematic Internaliser</b>	An investment firm which, on an organised, frequent, systematic and substantial basis, deals on own account when executing client orders outside a regulated market, an MTF or an OTF.
<b>Time weighted average price (TWAP)</b>	A benchmark price which is calculated as the average price of a security over the course of a specified period of time.
<b>Timing risk</b>	The risk that the final execution price of an order will move between the time at which the decision to deal is made and the time at which the order can be completed given available liquidity.
<b>Trading venue</b>	A term comprising venues which are regulated under <i>MiFID II</i> as either regulated markets or multilateral trading facilities.
<b>Volume / trading volume</b>	Term used to describe a number of shares or units of <i>equity like instruments</i> .
<b>Volume weighted average price (VWAP)</b>	A benchmark price which is calculated as an average of the execution prices over the relevant period; and which is weighted by the <i>volume</i> of those executions. Unless you instruct us otherwise, we will calculate VWAP using our definition of <i>addressable volume</i> .