

**Auction Process** 



# **Table Of Contents**

1.	The Auction Process	3
2.	Auction Management	3
	2.1. Auction Scheduling	3
	2.2. Cancelling A Scheduled Auction	3
3.	Auction Pre-Open (T – 10)	3
	3.1. Auction Indicative Price (AIP) and Maximum Executable Volume (MEV)	3
	3.2. Buy Order	4
	3.3. Sell Order	4
	3.4. Amending Orders	4
4.	Auction Pre-Close (T – 2)	4
5.	Auction Date (T – O)	4
<b>6</b> .	Reading The Order Book	5
	6.1. Auction Algorithm (standard)	5
	6.1.1. Principle 1 – Determining The Maximum Executable Volume (MEV)	6
	6.1.2. Principle 2 – Establishing The Minimum Surplus (MS)	8
	6.1.3. Principle 3 – Ascertaining Where Market Pressure Exists	9
	6.1.4. Principle 4 – Consulting The Reference Price	10
	6.1.5. Summary Of Auction Results	11
	6.2. Auction Algorithm (pre-emption)	11
	6.2.1. Minimum Investment Thresholds	11
	6.3. Plans And Sessions	12
	6.3.1. Enquiry Plan	12
	6.3.2. Entry Plan	12
	6.3.3. Auction Plan	12
	6.3.4. Initialise	12
	6.3.5. Enquiry	12
	6.3.6. Pre-Open	12
	6.3.7. Auction	12
	6.3.8. Halted	12





# **1. The Auction Process**

Auction trading supports market liquidity by bringing together all buy and sell orders to maximise the volume traded at a single auction price. This document uses the example of a 10-day auction.

# 2. Auction Management

## 2.1. Auction Scheduling

The company will define an auction period by setting the entry date and the auction date. The auction period must be at least 5 business days up to a maximum of 20 business days.

Once an auction has been scheduled, all holders will be notified via email of:

- the date and time the auction opens
- the date and time the auction pre-close occurs
- the date and time the auction closes
- the period orders can be placed
- the deadline for pre-funding orders
- the date auction results can be expected

The auction schedule for a company can be found under the 'Auction Calendar' tab in the holder portal and the 'Scheduled Auctions' section of the company's portal, where details of the upcoming auctions are displayed.

Note: The auction date cannot be set to fall on a weekend or a public holiday. Auction periods cannot overlap or run concurrently.

#### 2.2. Cancelling a Scheduled Auction

The company may decide to cancel a scheduled auction at any point before or during the auction period. Holders will be notified of the cancellation, all orders will be cancelled, and all funds received will be returned.

# 3. Auction Pre-Open (T – 1O)

When an auction is in pre-open, the order book is open and holders can submit orders. These orders are registered in the order book, but no matching of orders takes place. Orders can be amended or cancelled throughout this period.

#### 3.1. Auction Indicative Price (AIP) and Maximum Executable Volume (MEV)

The Auction Indicative Price (AIP) is the price at which the Maximum Executable Volume (MEV) of shares is likely to occur, given the priority of holders and the orders registered in the order book. The AIP and MEV are displayed alongside the live order book. The AIP and MEV are continuously calculated as each order is submitted, amended or cancelled.



## 3.2. Buy Order

Buy orders confirm the quantity of shares a holder would like to buy and the maximum price the holder is willing to pay per share. The time at which the order is submitted is recorded and will be considered to determine order prioritisation in the matching process.

Potential buyers are expected to pre-fund their buy orders via bank transfer ahead of the auction preclose period starting (see below). When a buy order is submitted, a payment instruction will be generated within the 'Notifications' section of the holder portal.

Note: All buy orders must be pre-funded by the end of the auction pre-open period.

### 3.3. Sell Order

Sell orders confirm the quantity of shares a holder would like to sell and the minimum price the holder is willing to accept per share. The time at which the order is submitted is recorded and will be considered to determine order prioritisation in the matching process.

## 3.4. Amending Orders

All orders have time priority at the original order price. The following actions to amend an order will change an order's priority:

- amending an order to increase the quantity of shares to buy or sell will reset its priority the order goes to the back of the queue at the original price; and
- amending an order to change the price of shares to buy or sell will reset its priority the order goes to the back of the queue at the new price.

Amending an order to decrease the quantity of shares to buy or sell will not affect its priority.

Note: In an auction where pre-emption is enabled, the holder category (new versus existing) will also be considered to determine order prioritisation in the matching process.

# 4. Auction Pre-Close (T - 2)

The order book will close 2 business days prior to the auction date. No new orders will be accepted, and holders cannot amend or cancel their existing orders.

Any buy orders which are partially funded or unfunded at the start of the auction pre-close period will automatically be cancelled and removed from the order book. The holders responsible for these orders will be notified and, in the case of partially funded orders, any funds received will be returned.

# 5. Auction Date (T – O)

The auction will close at the most recent AIP and orders will be matched in order of priority. Orders present in the order book may match completely, partially, or not match at all.

Once the matched orders have been approved by the company, cash and share settlement will take place. The requirement for buyers to pre-fund their orders ensures that the electronic transfer of cash and shares takes place efficiently. The company's register of shareholders is updated and the holder accounts of the buyers and sellers are updated to reflect their current holdings. Holders can download a balance statement confirming their shareholding from the holder portal.

Where a holder's buy order is unmatched or only partially matched, the surplus funds will be returned to the holder.

Note: The company may decline the auction results. All orders will be cancelled and any funds received will be returned.



# 6. Reading the Order Book

The order book is a collection of buy and sell orders submitted by holders during an auction period. Each order consists of the type (buy or sell), quantity, price, and time the order was placed. At the close of the auction, a single price at which all matched orders will trade is determined by applying an algorithm to the orders present in the order book.

# 6.1. Auction Algorithm (standard)

The standard auction algorithm is a four-step approach to determine the auction price and involves the use of conditional decision principles. If a clear result cannot be achieved when the first decision principle is applied, the model progresses to the second decision principle and so on. The decision principles are always applied in the same order:







#### 6.1.1. Principle 1 – Determining the Maximum Executable Volume (MEV)

The first principle determines the price level(s) at which MEV of shares exists. There are two steps in applying Principle 1:

#### Step 1 - Determining the cumulative buy and sell quantities at each eligible price.

Given that there may be multiple orders at a single price, the order quantities are first aggregated at each price level.

The maximum matchable quantity is calculated by cumulating the order quantities at each price level.

The buy price is the maximum a buyer is willing to pay per share, however, it is accepted that the buyer will pay a lower price. As such, the cumulative buy quantities increase as prices decrease.

The sell price is the minimum a seller is willing to accept per share, however, it is accepted that the seller will accept a higher price. As such, the cumulative sell quantities increase as prices increase.

Using the example market in Image 2, the cumulative buy and sell quantities at each price are listed in Image 3:

Buyer	Buy Quantity	Price	Sell Quantity	Seller
	0	£7.5O	4,500	9
	0	£7.1O	7,250	8
	0	£6.8O	11,100	7
А	4,500	£6.4O	8,500	6
В	28,200	£6.3O	16,900	5
	0	£6.2O	1,900	4
С	1,900	£6.1O	0	
D	49,700	£5.9O	17,500	3
E	8,000	£5.8O	3,600	2
F	16,400	£5.7O	11,600	1
G	3,250	£5.4O	0	
Н	12,500	£5.00	0	
1	800	£4.8O	0	

#### Image 2: Example market immediately prior to auction



In this example (Image 3):

- sell orders at prices £6.80, £7.10 and £7.50 are not eligible to trade as no buyer is willing to pay the sell order prices;
- buy orders at prices £5.40, £5.00 and £4.80 are not eligible to trade as no seller is willing to accept the buy order prices; and
- the potential auction prices exist between £5.70 and £6.40 (inclusive).

Cumulative Buy Quantity	Buy Quantity	Price	Sell Quantity	Cumulative Sell Quantity
0	0	£7.50	4,500	82,850
0	0	£7.10	7,250	78,350
0	0	£6.8O	11,100	71,100
4,500	4,500	£6.4O	8,500	60,000
32,700	28,200	£6.3O	16,900	51,500
32,700	0	£6.2O	1,900	34,600
34,600	1,900	£6.1O	0	32,700
84,300	49,700	£5.9O	17,500	32,700
92,300	8,000	£5.8O	3,600	15,200
108,700	16,400	£5.7O	11,600	11,600
111,950	3,250	£5.4O	0	0
124,450	12,500	£5.00	0	0
125,250	800	£4.80	0	0

#### Image 3: Cumulative buy and sell quantities at each price

#### Step 2 – Establishing the total tradeable volume at each eligible price step.

The MEV at a price is the lower of the cumulative buy quantity and cumulative sell quantity at that price, as the lower quantity limits how many shares could be traded.

In this example (Image 4):

- the maximum quantity of shares that may trade is 32,700 and can be achieved at multiple prices, including £6.30, £6.20, £6.10 and £5.90, which are all potential auction prices. All other price levels are eliminated;
- where the maximum quantity of shares that may trade is achieved at a single price, that price will be the Official Auction Price; and
- here, the MEV exists at multiple prices, therefore Principle 2 is applied.



#### Image 4: Maximum Executable Volume (MEV) at each eligible price

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	MEV
0	£7.50	82,850	0
0	£7.10	78,350	0
0	£6.8O	71,100	0
4,500	£6.4O	60,000	4,500
32,700	£6.3O	51,500	32,700
32,700	£6.2O	34,600	32,700
34,600	£6.1O	32,700	32,700
84,300	£5.9O	32,700	32,700
92,300	£5.8O	14,200	14,200
108,700	£5.70	11,600	11,600
111,950	£5.4O	0	0
124,450	£5.00	0	0
125,250	£4.80	0	0

### 6.1.2. Principle 2 – Establishing the Minimum Surplus (MS)

The second principle determines the eligible price levels at which the unfilled or unmatched quantity is a minimum. The quantity of shares remaining in the market at the auction price should always be the lowest possible.

The MS at each price level is equal to the absolute value of the cumulative buy quantity less the cumulative sell quantity. The MS values at each potential auction price achieved after applying Principle 1 are shown in Image 5.

In this example (Image 5):

- the minimum surplus across all potential auction prices is 1,900 and is achieved at £6.20 and £6.10, eliminating the £6.30 and £5.90 price levels;
- where the minimum surplus is achieved at a single price, that price will be the Official Auction Price; and
- here, the MS exists at multiple prices, therefore Principle 3 is applied.

Image 5: Minimum Surplus (MS) at each eligible price (Prices eliminated by Principle \*1)

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	MEV	MS
0	£7.50	82,850	0	*
0	£7.10	78,350	0	*
0	£6.8O	71,100	0	*
4,500	£6.4O	60,000	4,500	*
32,700	£6.3O	51,500	32,700	-18,800
32,700	£6.2O	34,600	32,700	-1,900
34,600	£6.1O	32,700	32,700	1,900
84,300	£5.9O	32,700	32,700	51,600
92,300	£5.8O	14,200	14,200	*
108,700	£5.7O	11,600	11,600	*
111,950	£5.4O	0	0	*
124,450	£5.00	0	0	*
125,250	£4.8O	0	0	*



#### 6.1.3. Principle 3 – Ascertaining where market pressure exists

The third principle determines where the market pressure of the potential auction prices exist – on the buy or the sell side.

Where a surplus remains on the buy side of the order book at the conclusion of the auction, demonstrating positive (+) market pressure, the algorithm will favour the higher of the potential auction prices.

Where a surplus remains on the sell side of the order book at the conclusion of the auction, demonstrating negative (-) market pressure, the algorithm will favour the lower of the potential auction prices.

If both positive (+) and negative (-) market pressure exist, or if the minimum surplus for each potential auction price is zero, the algorithm continues to Principle 4: Consulting the Reference Price.

In this example (Image 6):

- \* at the potential auction price of  $\pounds$ 6.10, the surplus is positive (+1,900) indicating buy side market pressure. 1,900 shares will remain on the buy side should the Official Auction Price be  $\pounds$ 6.10; and
- \* at the potential auction price of  $\pounds$ 6.20, the surplus is negative (-1,900) indicating sell side market pressure. 1,900 shares will remain on the sell side should the Official Auction Price be  $\pounds$ 6.20.

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	MEV	MS
0	£7.50	82,850	0	*
0	£7.10	78,350	0	*
0	£6.8O	71,100	0	*
4,500	£6.4O	60,000	4,500	*
32,700	£6.30	51,500	32,700	**
32,700	£6.2O	34,600	32,700	-1,900
34,600	£6.1O	32,700	32,700	1,900
<b>34,600</b> 84,300	<b>£6.10</b> £5.90	<b>32,700</b> 32,700	<b>32,700</b> 32,700	1,900
<b>34,600</b> 84,300 92,300	<b>£6.10</b> £5.90 £5.80	<b>32,700</b> 32,700 14,200	<b>32,700</b> 32,700 14,200	1,900 ** *
<b>34,600</b> 84,300 92,300 108,700	£6.10     £5.90     £5.80     £5.70	<b>32,700</b> 32,700 14,200 11,600	<b>32,700</b> 32,700 14,200 11,600	1,900 ** * *
<b>34,600</b> 84,300 92,300 108,700 111,950	£6.10   £5.90   £5.80   £5.70   £5.40	32,700   32,700   14,200   11,600   0	<b>32,700</b> 32,700 14,200 11,600 0	1,900 ** * * *
<b>34,600</b> 84,300 92,300 108,700 111,950 124,450	£6.10     £5.90     £5.80     £5.70     £5.40     £5.00	<b>32,700</b> 32,700 14,200 11,600 0 0	32,700 32,700 14,200 11,600 0 0	1,900 ** * * *

#### Image 6: Determine market pressure (Prices eliminated by Principles \*1 and \*\*2)

In an auction where market pressure exists on the buy side only, the algorithm will opt for the highest potential auction price as the Official Auction Price. Where market pressure exists on the sell side only, the algorithm will opt for the lowest potential auction price as the Official Auction Price.

Since there are multiple prices with identical surplus but opposite market pressures in the example, it is not yet possible to determine the auction price at Principle 3. Principle 4: Consult the Reference Price is applied to establish the Official Auction Price.



#### 6.1.4. Principle 4 – Consulting the Reference Price

The fourth and final principle determines the Official Auction Price from the remaining potential auction prices (established in Principles 2 and 3) based on their proximity to the Reference Price. The Reference Price is the Official Auction Price from the preceding auction.

There are two steps in applying Principle 4:

#### Step 1 - Narrowing the number of potential auction prices to two (where applicable)

If the:

- result of Principle 3 is a combination of price levels with positive (+) and negative (-) market pressure, then the algorithm considers the two price levels where the market pressure changes from positive (+) to negative (-).
- minimum surplus for all potential auction prices is zero, the algorithm considers the highest and lowest price levels within that range of the potential auction prices.

In Image 6, the market pressure at  $\pounds$ 6.10 is positive and changes to negative at  $\pounds$ 6.20 and are both considered when consulting the Reference Price.

#### Step 2 - Determining the relationship between the Reference Price and the Final Auction Price.

If the Reference Price:

- is equal to or greater than the higher of the two potential auction prices established in step 1 of Principle 4, then the higher price becomes the Official Auction Price.
- is equal to or less than the lower of the two potential auction prices established in step 1 of Principle 4, then the lower price becomes the Official Auction Price.
- is between the two potential auction prices established in step 1 of Principle 4, then the Reference Price itself becomes the Official Auction price.

Cumulative Buy Quantity	Price	<b>Cumulative Sell Quantity</b>	MEV	MS
0	£7.50	82,850	0	*
0	£7.10	78,350	0	*
0	£6.8O	71,100	0	*
4,500	£6.4O	60,000	4,500	*
32,700	£6.30	51,500	32,700	**
32,700	£6.20	34,600	32,700	***
34,600	£6.1O	32,700	32,700	1,900
84,300	£5.90	32,700	32,700	**
92,300	£5.8O	14,200	14,200	*
92,300 108,700	£5.80 £5.70	14,200 11,600	14,200 11,600	*
92,300 108,700 111,950	£5.80 £5.70 £5.40	14,200 11,600 0	14,200 11,600 0	* * *
92,300 108,700 111,950 124,450	£5.80 £5.70 £5.40 £5.00	14,200 11,600 0 0	14,200 11,600 0	* * * *

#### Image 7: Auction results after applying Principle 4 (Prices eliminated by Principles \*1, \*\*2 and \*\*\*4)

Assuming the Reference Price is £6.00 (which is lower than the higher of the two potential auction prices), the algorithm will opt for the lowest of the potential auction prices. The Official Auction Price for this auction is therefore £6.10 (Image 7).



#### 6.1.5. Summary of Auction Results

The Official Auction Price is £6.10 and orders will be matched according to price – time priority. Details of match orders are shown in Image 8:

Image 8: Summary of matched orders

Transaction	Description
]	Buyer A buys 4,500 shares from Seller 1's available 11,600 shares. Buyer A satisfies their order completely. Seller 1 has 7,100 shares for sale
2	Buyer B buys 7,100 shares from Seller 1's available 7,100 shares. Buyer B has 21,100 unsatisfied shares. Seller 1 satisfies their order completely
3	Buyer B buys 3,600 shares from Seller 2's available 3,600 shares. Buyer B has 14,300 unsatisfied shares. Seller 2 satisfies their order completely
4	Buyer B buys 17,500 shares from Seller 3's available 17,500 shares. Buyer B satisfies their order completely. Seller 3 satisfies their order completely

Any orders (either buy or sell) not matched during the auction will be removed from the order book at the end of the Auction Period.

### 6.2. Auction Algorithm (pre-emption)

A company can maintain pre-emptive rights by selecting the pre-emption auction algorithm. The pre-emption auction algorithm follows the same four principles as the standard auction algorithm (as described above) but with an adjustment to include the holder category (new versus existing) in the order prioritisation.

The standard auction algorithm considers a 'price – time' priority, whereas the pre-emption auction algorithm introduces a new 'holder' category ahead of 'price' and 'time'. The pre-emption auction algorithm therefore considers a 'category – price – time' priority. Buy orders from existing holders rank ahead of buy orders from new holders. Additionally, the price of buy orders from new holders is not considered in the price formation process and only serves to informs the priority amongst new holders.

If in an auction there are no buy orders from existing holders at or above the price being asked by sellers, then there will be no AIP calculated or displayed. Instead, the auction price will be determined by the sell order at the lowest price point and the order book will display this price as 'Trade Will Occur'. Only sell orders at this price point will be matched with buy orders from new holders in order of priority.

#### 6.2.1. Minimum Investment Thresholds

A company may determine and apply a minimum holding threshold below which a holder will be categorised as a new holder for the purposes of the auction. This supports new holders to build up their shareholding over several auctions. Once the minimum holding threshold has been met, a holder will be re-categorised as an existing holder.



### 6.3. Plans and Sessions

A plan is made up of a collection of sessions configured to create a timetable for a trading day depending on the desired outcome of the trading day. The plans are as follows:

### 6.3.1. Enquiry Plan

The Enquiry Plan is scheduled by default for every trading day.

- Initialise (00:00:00 07:59:59)
- Enquiry (08:00:00 14:59:59)
- Closed (15:00:00 15:59:59)
- Halted (16:00:00 23:59:59)

#### 6.3.2. Entry Plan

The Entry Plan is scheduled on trading days which allow for orders to be entered into the order book.

- Initialise (00:00:00 07:59:59)
- Pre-Open (08:00:00 18:59:59)
- Enquiry (19:00:00 22:59:59)
- Halted (23:00:00 23:59:59)

### 6.3.3. Auction Plan

The Auction Plan is scheduled on the final trading day of an auction period.

- Initialised (00:00:00 07:59:59)
- Enquiry (08:00:00 09:00:00)
- Auction (09:00:00)
- Enquiry (09:00:00 17:59:59)
- Halted (18:00:00 23:59:59)

A description of each session can be found below:

#### 6.3.4. Initialise

The system prepares for the upcoming trading day.

#### 6.3.5. Enquiry

Holders can only view orders already registered in the order book. Holders are unable to add new orders, or modify or cancel existing orders during this session. This session is used before and after the market is open.

#### 6.3.6. Pre-Open

The order book is open. Holders can submit orders, which are registered in the order book, but no matching of orders takes place. Orders can also be modified or cancelled during this session.

The AIP and MEV are continuously calculated as each order is submitted, modified, or cancelled. The AIP is the price at which the highest matching/trading volume is likely to occur, given the priority of each holder and the current order book. The AIP and MEV are displayed along with the live order book.

### 6.3.7. Auction

Orders are matched according to the selected algorithm. Trades are executed where possible and any remaining orders are cancelled.

#### 6.3.8. Halted

The order book is unavailable.



# **Auction Process**

Version: September 2023

T: +44 (O) 1481 753000 | E: support-tpm@tisegroup.com | W: tiseprivatemarkets.com

DISCLAIMER: This material is intended to provide general information regarding TISE Private Markets and is not intended to, nor does it, constitute investment or other professional advice or a recommendation to buy, sell, hold or solicit any investment, security or other financial instrument or product. Suitably qualified professional advisers should be consulted before making any investment decision or taking, or omitting to take, any action which might affect your personal finances or business affairs. This material is provided without any representation or warranty being given by TISE as to the accuracy, completeness or otherwise of its content and to the extent permitted by law, no responsibility of any kind or nature, howsoever arising (including in negligence), is accepted by TISE, its officers, employees and/or agents for any representation or does or damage arising to any person from use of, or reliance on, the contents. This material and information is intended only to be viewed by persons who fall outside the scope of any law, order or regulation that regulates financial advertisements in any country to which it has been communicated and is not intended for distribution in or into, or for use by any person or entity in, any jurisdiction where any such distribution or use would be contrary to any local law, order or regulation. Legal and regulatory information: tisegroup.com/legal-and-regulatory