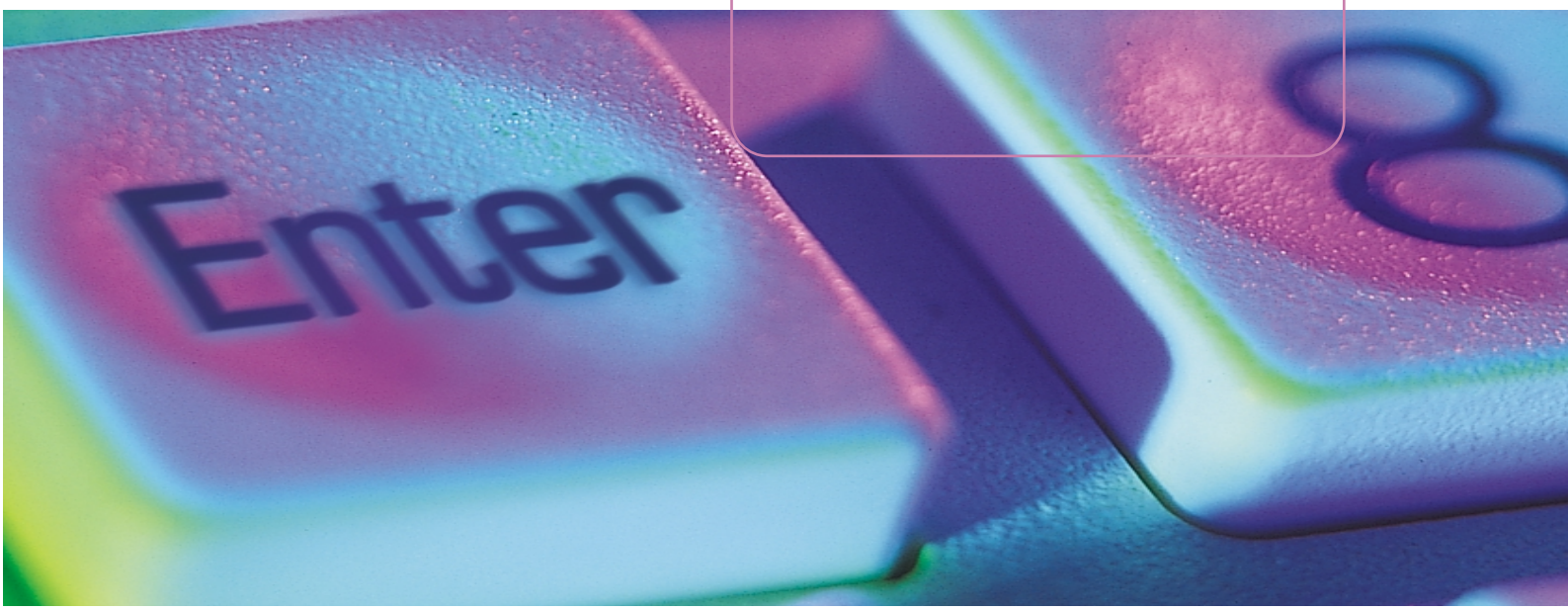
London Stock Exchange
market enhancements

Release 3.1
worked examples



London STOCK EXCHANGE

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Contents

Introduction

The purpose of this document is to build on the detail of the Guide to Release 3.1 document, published in November 1999, by providing detailed worked examples of new SETS functionality.

The document is structured in the same manner as the Guide to Release 3.1 document, allowing ease of cross-reference. For each topic, a summary of the changes is presented in plain English, and detailed worked examples given.

Overview of market operation from May 2000

The key changes to the market structure from May 2000 are summarised below.

1. Auction functionality
Examined in further detail in Section 1 below, auction functionality enhancements in Release 3.1 will include market orders, auction extension periods and the dissemination of an indicative auction price.

2. Application of auctions
Release 3.1 will see the introduction of a closing auction to set the official closing price for SETS securities, and intra-day auctions into selected SEAQ stocks.

3. Treatment of unexecuted market orders
Section 3 gives examples to explain the treatment of market orders in the unlikely event that they pass into continuous trading due to non-execution in an auction.

4. Price monitoring during continuous trading
Section 4 details the use of static and dynamic price monitoring during continuous trading on SETS following Release 3.1.

Section 1: Auction functionality

Overview

Release 3.1 will enhance existing SETS auction functionality by the inclusion of:

- market orders
- indicative auction price during the auction call
- random ends to auction call periods
- auction call period extensions
- enhanced matching algorithm
- single trade dissemination.

1.1 Market orders

What are they?

Market orders are unpriced orders, specifying a volume only. Market orders would be used by market participants wishing to gain convergence to an auction price.

Those entering market orders are willing to execute at any price. In return, they are given the highest execution priority, over all limit orders. Amongst market orders, time priority of execution applies.

When can I use them?

Market orders can be entered or deleted during the call phase of an auction (opening, closing or during the day as a result of an automatic execution suspension). Market orders cannot be entered during continuous trading, but may be manually deleted in the unlikely event that they remain unexecuted following an auction (see Section 3 for details).

How do they work?

Imagine it is the opening auction, and the order book for a given stock is as below:

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
10,000	**102½**	**103**	**5,000**
5,000	**102**	**103½**	**12,750**
6,520	**101½**	**104**	**200**

Since no limit orders on this order book can be matched, no trades will result if matching is run at this point in time. If a sell market order for 2,000 shares is now entered, then the order book will appear as overleaf.

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
10,000	102½	MO	2,000
5,000	102	103	5,000
6,520	101½	103½	12,750
		104	200

By placing a market order, the new participant is indicating a willingness to trade at any price for the stock.

If matching now took place, the market order would be matched against the best bid price, and a trade of 2,000 shares at a price of 102½p will result.

What will be the impact of market orders?

Market orders will bring about a significant change in the opening and closing process for SETS stocks. Arbitrageurs and other market participants wishing to converge to the closing price may now do so with greater ease.

As is shown above, the presence of market orders an auction generates matchable orders, increasing auction activity. Other markets where such orders are available consistently observe high levels of activity in the opening and closing auctions — it is hoped that this is a pattern that will continue in the London market.

1.2 Indicative auction price during the auction call

What does this mean?

The enhanced algorithm used to determine the auction price from May 2000 is presented in section 1.5.

Due to the complexity of this algorithm and potential future developments, the Exchange will centrally generate and disseminate the indicative auction price via the London Market Information Link in real-time during auction call periods.

This indicative price represents the theoretical price at which orders would execute if the auction was run immediately. If no auction trades are possible given the orders on the book, then the indicative auction price will be set to zero.

What will be the impact of an indicative auction price?

A more transparent indicative auction price will allow market participants to better gauge the price at which they may execute in an auction. By making the auction price formation process more transparent, auctions are likely to capture a larger proportion of trading volume.

1.3 Auction call period extensions

There are two possible auction call extensions — market order extensions and price monitoring extensions.

Market order extensions

What does this mean?

If, at the end of the scheduled auction call phase, some or all of the market orders on the order book can not be executed, then the auction call is extended for two minutes to allow the market to react to (and hopefully clear) the imbalance.

Since market orders indicate a willingness to trade at any price, such extensions are only triggered if the total volume of market orders on one side of the book can not be fully matched against all orders (limit and market) on the opposite side of the book.

Consider the example below.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
10,000	**MO**	**MO**	**20,000**
5,000	**102**	**103**	**5,000**
6,520	**101½**	**103½**	**12,750**

In this example, all of the buy market orders can be matched in the auction, since the total sell volume is 37,750 shares. Similarly, all of the sell market orders can be executed against the volume of 21,520 shares on the buy side. No market order extension would be required in this example.

In the second example below, however, a market order extension is required since not all of the sell market orders can be executed due to insufficient volume on the buy side.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
10,000	**MO**	**MO**	**30,000**
5,000	**102**	**103**	**5,000**
		103½	**12,750**

How do they work?

Market order extensions delay the auction match, drawing attention to the imbalance. Since all orders can be viewed during the auction call phase, the market can immediately identify and respond to the market order imbalance by entering buy or sell volume to clear the imbalance.

By allowing more time for participants to trade against a visible market order imbalance, the execution likelihood of market orders is significantly increased.

Price monitoring extensions

What does this mean?

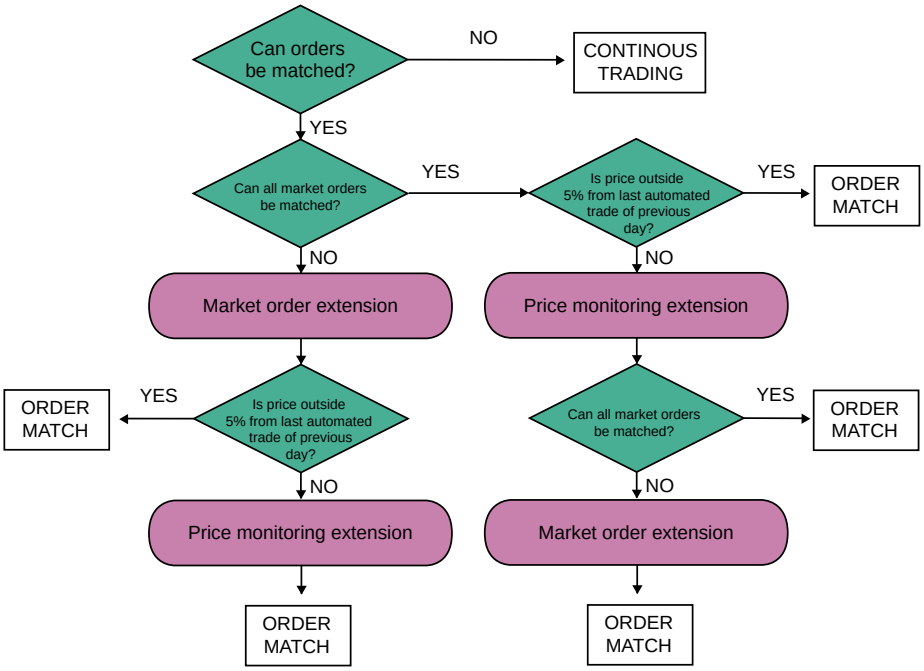
If at the end of the scheduled auction call phase the indicative auction price would lie a given distance or more from the reference price, then an extension of the call phase is run. The reference price is either the last automated trade in the case of an opening auction or continuous execution suspension, or the closing 10 minute VWAP in the case of a closing auction.

How do they work?

Price monitoring extensions delay the auction match, drawing attention to the pending price move. The extension gives the market time to respond to this price move by entering additional orders or deleting existing orders.

If at the end of the price monitoring extension the theoretical auction price remains outside acceptable thresholds, then this price is accepted by the trading system (ie no further price monitoring extensions are run), and the auction price stands. The only exception to the rule is the closing auction which has a further volume check to protect against unrepresentative auction prices generating the closing price. For further information on the closing auction, see section 2.3.

The following decision tree shows the checks run when determining whether auction extensions are required to an opening auction.



Note that the above tree is slightly different for the closing auction, due to the presence of a volume check and an alternative price monitoring reference price. This is discussed in greater detail in section 2.3.

1.4. Random ends to auction call periods

What does this mean?

With a random time element to the auction, market participants can no longer be certain of the exact time that the stock moves into a new state (or period), such as an auction match, or an auction extension. The incentive to enter erroneous orders in order to influence price formation near to the end of the auction call is significantly reduced, since market participants entering such orders run the risk of being held to those prices in the auction.

The manner in which stocks are assigned a random end depends on which sector the stock is in (eg FTSE 100 or FTSE 250), and its individual requirement for auction call extensions.

How do they work?

The scheduled call phase of the closing auction is due to end at 16:30:00. Stocks will enter the next phase of the auction grouped by sector. Suppose the random ends (not known by the market) are determined as follows:

Sector	Random element
FTSE 100	**6 seconds**
FTSE 250	**0 seconds**
Other SETS	**29 seconds**

In this example, the period from 16:30:00 to 16:30:30 will run as follows;

Now consider FTSE 100 stocks only — the process will be similar for other SETS stocks. Suppose now that, FTSE 100 stocks A and B require a price monitoring extension, and stocks C and D require a market order extension, but all other FTSE 100 stocks are ready for matching. These extension periods will all begin at 16:30:06 (at the end of the last period), and have a scheduled duration of two minutes. The stocks move out of these phases according to individual random times.

Suppose that the random times for these stocks are as below:

Stock	Random element	Start time	End time
A	**8 seconds**	**16:30:06**	**16:30:14**
B	**30 seconds**	**16:30:06**	**16:30:36**
C	**16 seconds**	**16:30:06**	**16:30:22**
D	**1 second**	**16:30:06**	**16:30:07**

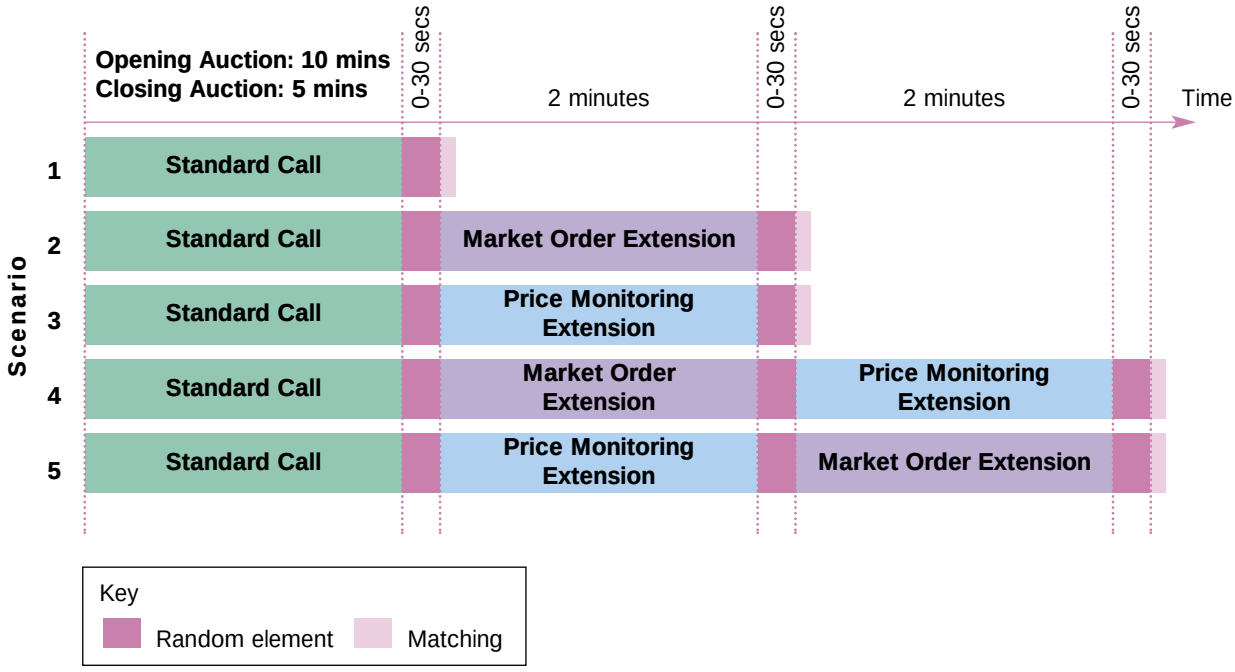
Once these extensions and random ends are completed, a further check for extensions is run before matching

What will be the impact of a random time element?

For those participants entering a serious order to trade, there will be no adverse effect. Random ends will, however, deter orders from participants without a serious intention to trade according to the conditions of their order.

Can we have price monitoring extension and a market order extension?

Market order extensions and price monitoring extensions are added to the scheduled call phase as required. The following diagram summarises all possible combinations of auction extensions.



The latest possible time for a stock to move into auction matching is therefore 08:05:30 in the opening auction, or 16:35:30 in the closing auction.

1.5 Enhanced auction algorithm

Why is it being changed?

In order to support the new market orders in SETS auctions, a change was required to the auction algorithm for SETS. The new algorithm is also congruent with the European Alliance market model.

Auction matching will also run much faster than previously, with most stocks being released into the next phase of the trading day (either continuous trading for opening auctions, or administration for the closing auction) within seconds rather than minutes as currently.

What is the new algorithm?

The new algorithm seeks out the most acceptable auction price from limit order prices on the order book. It will work on the basis of four principles which are used in turn to narrow down the possible set of auction prices.

1. Maximum executable volume
Any auction will always attempt to match the largest possible volume of orders.

2. Minimum surplus
The auction price should minimise the volume of orders left on the order book at the auction price after the auction.

3. Market pressure
By principle 2, all potential auction prices must have an identical order surplus, but these may not always be on the same side of the order book. If they are all on the buy side of the order book, then unexecuted buy orders will be left after matching, and the price is likely to go up so the highest price is accepted. Similarly, if all order surpluses are on the sell side of the order book, then the lowest price is taken.

4. Reference price
If there are still two or more possible prices, then the price closest to the reference price (last automated trade) is used.

Note that from May 2000, the Exchange will calculate and disseminate an indicative auction price in real-time throughout the call phase of all auctions to aid market participants in gauging the likely auction price. The following section detailing the algorithm in depth is therefore optional reading.

How does it work?

Example 1: Maximum executable volume

Suppose the order book at the end of the auction is as follows:

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
10,000	**105½**	**MO**	**2,500**
5,600	**104½**	**103**	**6,900**
200	**104**	**104½**	**1,000**
		106	**200**

To determine the auction price, it is easier to rearrange the information into a slightly different form.

BUY			SELL	
Aggregate volume	Volume at price	Price (p)	Volume at price	Aggregate volume
	0	MO	2,500	
0	0	106	200	10,600
10,000	10,000	105½	0	10,400
10,000	0	105	0	10,400
15,600	5,600	104½	1,000	10,400
15,800	200	104	0	9,400
15,800	0	103½	0	9,400
15,800	0	103	6,900	9,400

The order book information is transposed into the above table, and is contained in the second and fourth columns. The first and fifth columns use the information in the second and fourth to calculate the volume of buy and sell orders which can be executed at a given price level.

For example, at a price of 104^{1}_{2} pence, two buy orders would be satisfied, with a total executable volume of 15,600 shares. On the sell side of the order book, three orders can be satisfied — the market order (prepared to pay any price), and the two limit orders at 103p and 104^{1}_{2}p. Total executable sell volume at this price is therefore 10,400 shares.

In order for orders to execute, however, buy orders need sell orders and sell orders need buy orders. The total executable auction volume is therefore the **minimum** of the buy and sell executable volumes at any given price level. The above information can therefore be summarised into one further table.

Price (p)	Aggregate volume		Auction volume
	BUY	SELL	
106	0	10,600	0
105½	10,000	10,400	10,000
105	10,000	10,400	10,000
104½	15,600	10,400	10,400
104	15,800	9,400	9,400
103½	15,800	9,400	9,400
103	15,800	9,400	9,400

An auction price of 104^{1}_{2}p would uniquely maximise auction volume, and therefore this is chosen as the auction price.

Example 2: Minimum surplus

Consider the following order book situation.

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
10,000	105½	MO	2,500
5,600	104½	103	6,900
200	104	104	1,000
		106	200

As before, the executable buy, sell and auction volumes can be calculated.

BUY			SELL	
Aggregate volume	Volume at price	Price (p)	Volume at price	Aggregate volume
	0	MO	2,500	
0	0	106	200	10,600
10,000	10,000	105½	0	10,400
10,000	0	105	0	10,400
15,600	5,600	104½	0	10,400
15,800	200	104	1,000	10,400
15,800	0	103½	0	9,400
15,800	0	103	6,900	9,400

There are now two price levels with the same maximum executable volume (see table below). Prior to Release 3.1, the auction price would have been determined by averaging the possible price levels, and rounding up to the nearest tick. With the enhanced auction algorithm, however, we now look at the minimum surplus principle.

Price(p)	Aggregate volume		Auction Volume	Auction Surplus
	BUY	SELL		
106	0	10,600	0	-10,600
105½	10,000	10,400	10,000	-400
105	10,000	10,400	10,000	-400
104½	15,600	10,400	10,400	5,200
104	15,800	10,400	10,400	5,400
103½	15,800	9,400	9,400	6,400
103	15,800	9,400	9,400	6,400

The order surplus is the volume left unexecuted on the order book at the auction price following execution. A positive sign on the order surplus indicates a surplus left on the buy side of the order book, whilst a negative sign indicates a sell order surplus.

The above table shows the auction surplus for all price levels, although we need only compare the auction surplus for price levels of 104½p and 104p, as these are the levels which maximise executable volume.

Since the price of 104½p minimises auction surplus, this will be the auction price in this example.

Example 3: Market pressure

Consider a third order book scenario.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
10,000	**105½**	**MO**	**2,500**
5,600	**105**	**103**	**6,900**
1000	**104**	**104**	**1,000**
		106	**200**

The tables can now be updated to:

BUY			SELL	
Aggregate volume	**Volume at price**	**Price (p)**	**Volume at price**	**Aggregate volume**
	0	**MO**	**2,500**	
0	**0**	**106**	**200**	**10,600**
10,000	**10,000**	**105½**	**0**	**10,400**
15,600	**5,600**	**105**	**0**	**10,400**
15,600	**0**	**104½**	**0**	**10,400**
16,600	**1,000**	**104**	**1,000**	**10,400**
16,600	**0**	**103½**	**0**	**9,400**
16,600	**0**	**103**	**6,900**	**9,400**

Price (p)	Aggregate Volume		Auction Volume	Auction Surplus
	BUY	SELL		
106	0	10,600	0	-10,600
105½	10,000	10,400	10,000	-400
105	15,600	10,400	10,400	5,200
104½	15,600	10,400	10,400	5,200
104	16,600	10,400	10,400	6,200
103½	16,600	9,400	9,400	7,200
103	16,600	9,400	9,400	7,200

We can see from this final table that there are three price levels which maximise executable volume, and that two of these (105p and $104^{1}{}_{2}$p) both minimise auction surplus to 5,200 shares.

The third principle applied in such instances is market pressure. Taking either of the two prices would leave an order surplus on the buy side of the order book. This residual buy pressure is likely to cause the price to rise after the auction. To reflect this, the auction algorithm takes the highest of the two limits, yielding an auction price of 105p.

Example 4: Reference price

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
6,000	105	103	6,000
1,000	104½	104	1,000
1,000	104	104½	1,000
6,000	103½	105½	6,000

BUY			SELL	
Aggregate volume	Volume at price	Price (p)	Volume at price	Aggregate volume
	0	MO	0	
0	0	105½	6,000	14,000
6,000	6,000	105	0	8,000
7,000	1,000	104½	1,000	8,000
8,000	1,000	104	1,000	7,000
14,000	6,000	103½	0	6,000
14,000	0	103	6,000	6,000

Price (p)	Aggregate Volume		Auction Volume	Auction Surplus
	BUY	SELL		
105½	0	14,000	0	-14,000
105	6,000	8,000	6,000	-2,000
104½	7,000	8,000	7,000	-1,000
104	8,000	7,000	7,000	1,000
103½	14,000	6,000	6,000	8,000
103	14,000	6,000	6,000	8,000

The price levels of 104p and 104½p maximise executable volume in this example. They also have the same auction surplus volume, but with opposing signs. If the price of 104p was taken, then 1,000 shares to buy would be left on the order book, but if the price of 104½p was taken, then 1,000 shares to sell would be left on the order book. Market pressure in this example is therefore equal and opposite for both prices.

Since the first three auction principles can not discern between these two price levels, the auction algorithm simply appeals to the reference price. Whichever of these two limits is closest to the last automated trade price is set as the auction price.

Note that if there are only market orders in the order book at the time of price determination, then the first three principles do not apply, and market orders are matched at the reference price.

1.6 Single trade dissemination

What does this mean?

Following a current SETS auction, each individual trade is published to the market separately. From May 2000, only the auction price and the total volume will be published to the market immediately following the auction match. Auction details will be indicated using the new order types "UT" (for a SETS auction trade) and "ST" (for a SEAQ auction trade).

Does this have any effect on trade confirmation?

No. There is no change to the execution confirmation messages received by parties to an auction trade. You will continue to receive all details of your auction trades required for settlement (including counterparty identity) from May 2000.

Section 2: Application of auctions

Overview

From May 2000, there will be four uses of auctions in the trading system — three of which refer to SETS, and one to SEAQ.

SETS

- opening auction
- automatic execution suspensions
- closing auction.

SEAQ

- intra-day auctions.

2.1 SETS opening auction

How has this changed?

As today, the opening auction in SETS will run from 7:50 to 8:00 GMT. There will be a number of changes to it, however, with the introduction of market orders, price monitoring (relative to the last automated trade of the previous day) and the enhanced auction algorithm. These have all been covered in the previous section.

2.2 Automatic execution suspension

How has this changed?

Section 4 will cover the conditions surrounding the use of automatic execution suspensions from May 2000.

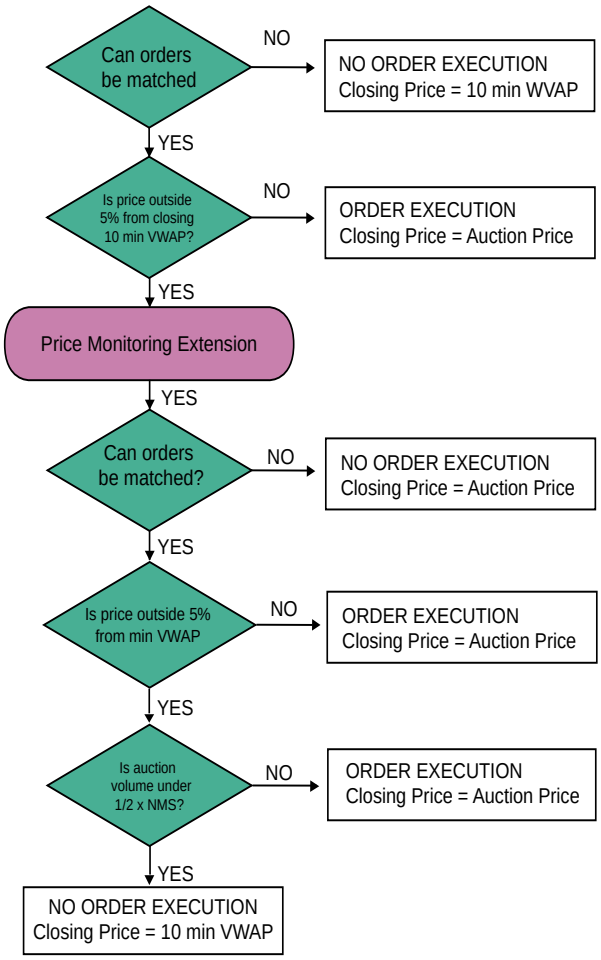
The auction itself, however, will be shorter in duration at five minutes. Participants will be able to enter market orders into such an auction, and automatic execution suspensions may therefore contain market order extensions. Random ends will also be a feature of these auctions.

2.3 Closing auction

A closing auction will be used to set the official closing price from May 2000. This auction will begin with a halt to continuous execution at 16:25, and is scheduled to end at 16:30 (subject to random time elements and the requirement for price monitoring and/or market order extensions).

To ensure against the possibility of an unrepresentative closing price due to a large price movement on the back of small volume, a volume check will be introduced for the closing auction only.

The following diagram summarises the closing process from May 2000, assuming no requirement for a market order extension.



2.4 SEAQ auctions

What will change?

Selected stocks in the FTSE 250 index currently traded on SEAQ will be the subject of a pilot of two, blind, intra-day auctions offered in addition to firm market maker quotes.

What will the auctions look like?

The auctions will be blind in nature — ie participants will be able to enter orders in the knowledge that no other participant will be able to view any information about these orders or the auction (such as indicative auction price).

The orders entered will themselves determine the auction price. This is a significant difference from many of the crossing networks currently operating in the UK market, which import a price from prevailing SEAQ quotes in order to match business. In the Exchange-provided model, SEAQ quotes and the auction price will be independent.

Only limit orders are eligible for entry. Given the lack of visibility (ie no order details or indicative auction price), unpriced market orders would be a very risky order type to use. Furthermore, the operation of market order extensions would become confusing, as the market would not be able to see or respond to such imbalances.

Similarly, there will be no price monitoring in SEAQ auctions, due to the possible requirement for confusing price monitoring extensions when the market can not view or respond to the orders causing the price movement.

SEAQ auctions will not contain random time elements as used in the SETS auction.

Since no order details are sent to the market, all unexecuted limit orders at the end of each auction are automatically deleted from the trading system (with a corresponding message sent to the originator of the order).

What about market maker quotes?

Market maker quotes will remain firm and visible throughout the trading day. There is no change to existing market maker obligations, and they have no obligation to gravitate their quotes towards auction prices. Continuity of prices is therefore preserved.

Who can enter orders?

All market participants who have passed user acceptance for SETS may enter orders into a SEAQ auction. These may be entered in either an agent or principal capacity.

Market makers are also free to enter orders into the SEAQ auction. Indeed they may find such auctions useful for unwinding positions acquired in the process of making markets.

Section 3: Treatment of unexecuted market orders

Overview

The presence of market order extension periods in SETS auctions greatly reduces the risk of non-execution of market orders. In the highly unlikely event of non-execution in an opening auction, market orders will move into continuous trading, with safeguards to limit price moves.

Participants may delete their market orders from the system at any time (including during continuous trading) although entry of such orders is restricted to the auction call phase or an extension thereof.

This section details the treatment of unexecuted market orders which pass into continuous trading, and is split into the options where an incoming order is priced (limit, fill or kill or execute and eliminate) or unpriced (at best).

Note that in order for there to be unexecuted market orders following an auction, one side of the order book must be empty — otherwise auction volume can be increased.

3.1 Incoming priced order

At what price will a market order execute in continuous trading?
Market orders are unpriced orders, indicating a willingness to trade at any price. As such, market orders must pay at least:

- the limit price of the incoming order
- the last trade price (normally the auction price)
- the best price available on the book.

The trade price is the maximum or the minimum of these prices depending on whether the market order is to buy or sell. If it is a buy market order, then the maximum is taken. The lowest price is taken if it is a market order to sell.

Here are some examples:

Example 1

The auction yielded a price of 105p and the order book appears as below. Suppose an order to sell 2,000 shares at a limit price of 105p is entered.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
5,000	**MO**		
4,500	**MO**		
1,000	**104**		

Since the market order is to buy, then the execution price will be the highest of the above prices.

Execution price = Max (incoming limit, last trade price, best book price)

= Max (105, 105, 104)

= 105p

Example 2

The auction yielded a price of 105p. Suppose an order to buy 2,000 shares at a limit price of 105p is entered into the following order book.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
		MO	**5,000**
		MO	**4,500**
		104	**1,000**

Since the market order is to sell, then the execution price will be the lowest price possible.

Execution price = Min (incoming limit, last trade price, best book price)

= Min (105, 105, 104)

= 104p

Example 3

The auction yielded a price of 105p. Suppose an order to sell 10,000 shares (execute and eliminate) at a price of no worse than 108p is entered into the order book below.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
5,000	**MO**		
4,500	**MO**		

Execution price = Max (incoming limit, last trade price, best book price)

= Max (108, 105, N/A)

= 108p

Since this is an execute and eliminate order, the remaining order for 500 shares is rejected from the trading system.

Example 4

The auction yielded a price of 105p. Suppose an order to buy 2,000 shares at a limit price of 108p is now entered into the following order book.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
		MO	**5,000**
		MO	**4,500**

Execution price = Min (incoming limit, last trade price, best book price)

= Min (108, 105, N/A)

= 105p

Isn't it very risky to allow market orders into continuous trading?

The above examples show that it is the incoming limit order which often determines the execution price against a market order in continuous trading. The presence of dynamic price monitoring (see section 4.2) in continuous trading, however, restricts the price movement to a maximum threshold relative to the auction price.

3.2 Incoming unpriced order

At what price will a market order execute in continuous trading?

If the incoming order does not have a limit price, then this can not be used to determine the execution price. The price is there determined by the last trade price and best price available on the book (where applicable) only.

Whether the trade price is the maximum or the minimum of two prices depends on whether the market order is to buy or sell.

Here are some examples:

Example 1

The auction yielded a price of 105p. An at best order to buy 3,000 shares is entered into the following order book.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
		MO	**5,000**
		MO	**4,500**
		104	**1,000**

Since the market order is to sell, then the execution price will be the lowest price possible.

Execution price = Min (last trade price, best book price)

= Min (105, 104)

= 104p

Example 2

The auction yielded a price of 105p and the order book is as follows.

BUY		SELL	
Volume	**Price (p)**	**Price (p)**	**Volume**
		MO	**5,000**
		MO	**4,500**

An at best order to buy 3,000 shares is now entered. Since the market order is to sell, then the execution price will be the lowest price possible.

Execution price = Min (last trade price, best book price)

= Min (105, N/A)

= 105p

Section 4: Price monitoring during continuous trading

Overview

Release 3.1 will introduce greater protection against rapid price movements by introducing new dynamic (trade to trade) price monitoring in addition to the existing static price monitoring.

The enhancements will also enable "mid-execution suspensions", which will stop a trade with a potential execution price at or outside specified ranges from execution, rather than letting the trade occur and halting automatic execution later.

4.1 Dynamic price monitoring

What does this mean?

Dynamic price monitoring protects against large trade-to-trade price movements that may result from trading in thin order books, or execution of orders with incorrect details.

By using dynamic price monitoring, prices are allowed to move steadily and freely, whilst protecting participants from large fast price swings which may result from errant orders or thin order books.

How will it differ from today?

Today, SETS uses static price monitoring, relative to the last auction price. From May 2000, this will be replaced by trade-to-trade (dynamic) price monitoring. This means that a share price may rise or fall in an unrestricted manner over the day, provided that it does so in a controlled way according to dynamic price monitoring.

4.2 Mid-execution suspensions

How will it differ from today?

In order for an automatic suspension to be triggered in SETS before May 2000, at best one trade must occur which breaches the dynamic price monitoring threshold. From May 2000, a suspension is triggered if the next potential execution price does not lie within the price monitoring threshold — ie the trade is stopped before it occurs.

For example, suppose the threshold to trigger an automatic execution suspension is 105p in the order book below.

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
1,000	103	104½	3,000
6,500	102	105½	4,500
200	101½	108	1,000

Suppose that an order to buy 8,000 shares at best enters the order book. Today, three trades will result from this order, at prices of 104^{1}_{2}, 105^{1}_{2} and 108p. The trading system would then halt continuous execution in this stock, and move into an auction phase.

From May 2000, only one trade would arise from the same order, at a price of 104^{1}_{2}p for 3,000. The trading system would then realise that the next potential execution price would breach the price monitoring threshold, and the stock would immediately move into an automatic execution suspension.

In the above example, the remainder of the at best order is rejected from the trading system (with a corresponding message sent to the relevant participant). The remainder of execute and eliminate orders would similarly be rejected from the system, while limit orders would be written to the book prior to the beginning of the suspension.

If a buy fill or kill order for 8,000 is entered into the above order book, then the trading system would check all potential executions, realise that the order would only partially execute before causing a suspension, and would reject the entire order without execution. Fill or kill orders will never, therefore, trigger automatic execution suspensions.

4.3. Automatic execution suspensions

How will they differ from today?

Automatic execution suspensions are triggered if the next potential trade price does not lie within the dynamic threshold. The suspension will last for five minutes as opposed to 10 minutes as today.

Market orders will be available for input into automatic execution suspensions, and there is therefore the potential for two minute market order extensions to the scheduled call phase. Random ends will apply as in the opening and closing auctions. No price monitoring extensions are possible to an automatic execution suspension.

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