Irish Stock Exchange

Market Model for the Electronic Trading System of the Irish Stock Exchange: ISE T7

T7 Release 5.0

Effective Date: 17th July 2017 (v2)

Contents

1 Introduction

The Irish Stock Exchange migrated its electronic trading system, ISE Xetra, to the next generation T7 trading platform on **17th July 2017**.

The migration to T7 represents the next stage in our successful strategic technology partnership with Deutsche Börse. ISE T7 ensures that the ISE continues to enhance its trading architecture for the benefit of members by providing access to a new, world class platform. ISE T7 provides low latency, high throughput and greater flexibility for ISE member firms.

ISE T7 provides order book trading facilities for equities and ETFs admitted to the ISE's markets.

ISE T7 is located on a separate partition on the T7 platform. This provides ISE members with the same core functionality that is available for the Xetra Frankfurt cash market, while also providing flexibility for the ISE to tailor certain functionality and parameters for the ISE market.

This Market Model document defines the principles of order matching and price determination in the ISE T7 order book trading system. This includes prioritisation of orders, a description of the different order types and trading restrictions available, the safeguards contained within the system, the functions of market makers, as well as the type and scope of information made available to market participants during trading sessions.

Off order book trade reporting is not available via ISE T7. This functionality continues to be provided by the ISE Xetra system until 4th December 2017 when it will be migrated to a new system, ISE OBOE.

Member firms should also refer to the Member Firm Rules of the ISE which contain the rules in relation to trading on ISE T7, including the responsibilities of those with access to the system. Further information is also contained in the Market Parameters.

In this document, T7 refers to the overall trading platform which is applicable to both Deutsche Börse and to the ISE. ISE T7 refers specifically to the partition of the Irish Stock Exchange.

Questions regarding ISE T7 functionality can be e-mailed to iseT7@ise.ie.

2 Fundamental Principles of the Market Model

The following are the fundamental principles for the ISE T7 Market Model:

1. The trading model is order driven. Available order types are market orders, limit orders, stop orders and iceberg orders. In addition, market makers can enter quotes.

2. There are three phases to the trading day; a pre-trading phase, a (main) trading phase, and a post-trading phase.

3. Trading in the trading model "continuous trading with auctions" starts with an opening auction and ends with a closing auction.

4. All whole-number order sizes are tradable, i.e. trading of fractions is not supported. The minimum order size for all securities traded on ISE T7 is a round lot of one share.

5. Orders are executed according to price/time priority.

6. Trading is anonymous, i.e. market participants cannot identify which member entered an order pre-execution. Post trade anonymity is also provided as all securities are central counterparty (CCP) eligible securities.

7. The tick size for orders is set as €0.001 for all order book securities with the exception of orders in the securities that are constituents of the ISEQ 20 which follow the FESE Table 4 tick size bands:

	Stock Prices		Table 4
	Lower Limit	Upper Limit	Tick Size €
Band 1	-	9,999	0.001
Band 2	10,000	49,995	0.005
Band 3	50,000	99,990	0.01
Band 4	100,000	-	0.05

8. The order book is fully open for trading during the continuous trading phase.

9. During the auction (call) phase, the order book remains partially closed. The indicative auction price or the best bid and/or ask limit is displayed. In the case of an uncrossed order book, the accumulated volumes at the best bid and best ask are displayed in addition to the best bid and ask limits. In case of a crossed order book the executable volume for the indicative auction price and the 10 best bids and asks are displayed.

10. The last determined price of a security in an auction or during continuous trading generally serves as the reference price.

11. The following aspects ensure price continuity and price quality:

    - A volatility interruption takes place if the potential next execution price lies outside either of the two pre-defined price ranges around the respective reference prices.

    - Market orders are executed at the reference price (last traded price) if there are only market orders executable in the order book.

    - Price determination takes place with consideration of the reference price (last traded price) if resting non-executed market orders (in the order book in continuous trading) are matched against incoming limit orders during the continuous trading phase.

12. All order types in order book securities can be entered, modified and deleted during all trading phases with the exception that no orders can be entered during the price determination phase of auctions.

3 Products and Segmentation

Generally in T7 each market has the following structure: “Product Assignment Groups”, “Products” and “Instruments”.

Instruments (securities) are the tradeable entities, i.e. an order always refers to buying or selling a specified quantity of a certain instrument (security).

Every tradeable instrument must belong to a product. Instruments of the same type can be grouped together to form Products.

Instruments of the same product are traded in the same way, i.e. trading parameters and trading schedules are defined for products rather than for individual instruments.

The product itself is always associated to a product assignment group which is used for entitlement. With the Release 5.0 migration, ISE T7 will follow the general T7 concept of products and instruments with a 1:1 relation of product to instrument.

4 Access to ISE T7

Prior to having access to trade in order book securities on ISE T7, a member firm has to fulfil the authorisation, suitability and other membership requirements outlined in the Membership chapter of the Member Firm Rules. Approval is granted by the ISE and access to ISE T7 is provided in co-ordination with Deutsche Börse.

An ISE member firm is then set up as a 'participant'. In order to trade in T7, a participant will be assigned a Trading Business Unit. The business logic of T7 makes use of the business unit rather than of the participant. Within the Trading Business Unit users can be grouped into trading groups.

From a member's point of view, users can be divided into two categories:

- **Traders**

  Traders are individuals admitted for trading. A trader can act as agent trader (account A), as proprietary trader (account P) or as a market maker (account M). Orders submitted by the trader will be flagged accordingly. Three hierarchy levels of traders are distinguished:

  - Trader, who can only maintain own orders.
  - Head Trader, who can maintain own orders as well as orders of all other traders within the same trader group.
  - Supervisor, who can maintain own orders as well as orders of all other traders in trader groups of the business unit.

- **Other users**

  Administrators are users which are not admitted or authorised for trading (they assign and maintain authorisation rights for the traders and other users). This category also includes those users in settlement, operation and compliance as well as information users.

  Other users may include electronic trading facilities such as Algorithmic Trading Programmes (ATP), Direct Market Access (DMA) and Order Routing Services (ORS). An appropriate user ID should be set-up so that orders placed by these facilities are separately identifiable.

5 Provision of Additional Liquidity by Market Makers

In the trading model *continuous trading with auctions* members may act as Market Makers increasing a security's liquidity by simultaneously offering to buy and sell, thereby improving the price quality of supported securities.

Only traders using the M account can enter quotes. Quotes are entered as pairs of buy and sell limit orders, also referred to as Double-Sided Quotes[1]. A quote in T7 belongs to the technical session through which it had been entered. A session can only have one buy quote and one sell quote per security. Sessions belonging to the same business unit may have different quotes in the same security, but only one quote per session. If a quote is entered through a session that already has a quote in the same security, then the old quote is replaced by the new one. All quotes entered into the system are good-for-day.

Quotes can be inactivated by setting their status to "quotes inactive". In this case the system will hide these quotes from trading. When "quotes inactive" is set for a session, none of the quotes of that session participate in matching nor are visible in the order book depth. The trader can continue to add, modify, and delete individual quotes for this session, while all these quotes neither participate in matching nor are visible to the market. The status "quotes inactive/quotes active" is persisted for the current business day. After a system failover all quotes are cancelled, but the latest status (quote active/quotes inactive) of a session and scope will remain in place after the failover. At the start of a new business day the default status for all sessions' scopes is "quotes active".

Market Makers have to provide double-sided quotes for a certain minimum time during the trading day as determined by the ISE. The ISE defines requirements for the minimum quantity, the maximum bid/ask spread, and the minimum time the quote has to remain on the order book. Details of these parameters are outlined in the Market Parameters of the ISE.

[1] In the order book quotes are handled like two orders (a limit buy and a limit sell order). Therefore, the document refers in the following only to orders.

6 Trading Phases

Trading takes place beginning with the pre-trading phase, followed by the trading phase, and then ending with the post-trading phase. The system is not available for trading between the post-trading and pre-trading phases.

6.1 PRE-TRADING PHASE

Member firms can enter orders and quotes in preparation for the trading day, and modify or delete their existing orders and quotes. Member firms neither receive an overview nor an update of the market's order book situation as the order book is closed during this phase. During pre-trading no matching of orders is conducted.

6.2 TRADING PHASE

During the trading phase orders are matched according to the trading form. For ISE T7 the trading phase consists of an opening auction, a continuous trading phase, and a closing auction. The continuous trading phase may be interrupted by one or more volatility interruptions. Details regarding the trading forms for ISE T7 applicable during the trading phase are given in chapter 7.

6.3 POST-TRADING PHASE

After the trading phase, new orders can be entered and existing orders can be modified or deleted in the post-trading phase. Member firms neither receive an overview nor an update of the market's order book situation as the order book is closed during this phase. New order entries will be held until the following trading day depending on the validity constraints applied. During post-trading no matching of orders is conducted.

7 Forms of Trading

The market model includes the trading forms ‘auction’ and ‘continuous trading’. These trading forms are combined to determine the trading model for ISE T7, which is described in chapter 8.

7.1 AUCTIONS

By considering all existing market orders, limit orders and iceberg orders in a security, a concentration of liquidity is ensured. Iceberg orders participate with their full volume in auctions. Book-or-cancel (‘BOC’) orders are deleted when an auction is triggered, and during auctions incoming BOC orders are rejected.

Price determination in auctions is effected according to the principle of most executable volume. At the same time, price/time priority is taken into account so that the maximum quantity of an order, which is limited to the auction price or unlimited, can be executed.

The order book remains partially closed during the auction’s call phase, however additional information in relation to market imbalance is disseminated during the call phase of the auction. This allows the market to react to the surplus before the price determination takes place.

- In the event of an uncrossed order book, the best bid/ask limit is displayed together with the accumulated volumes at the best bid and ask limits.
- In the event of a crossed order book, the indicative auction price is displayed together with the executable volume for the indicative auction price. This is the price which would be realised if the price determination was concluded at this time.

7.2 CONTINUOUS TRADING

Each new incoming order (except for stop orders) is immediately checked whether it is executable against orders on the other side of the order book. The execution of orders during continuous trading follows price/time priority. In this trading form, the order book is open. Limits and – depending on the market data interface – either a) accumulated order volumes and the number of orders per limit are displayed or b) each single order with its individual volume and priority is observable. In both cases only visible volume is considered, i.e. the overall volume of an iceberg order is not disclosed.

8 Trading Models

Trading of ISE securities follows the Continuous Trading with Auctions (an opening auction and a closing auction) Model.

8.1 CONTINUOUS TRADING WITH AUCTIONS

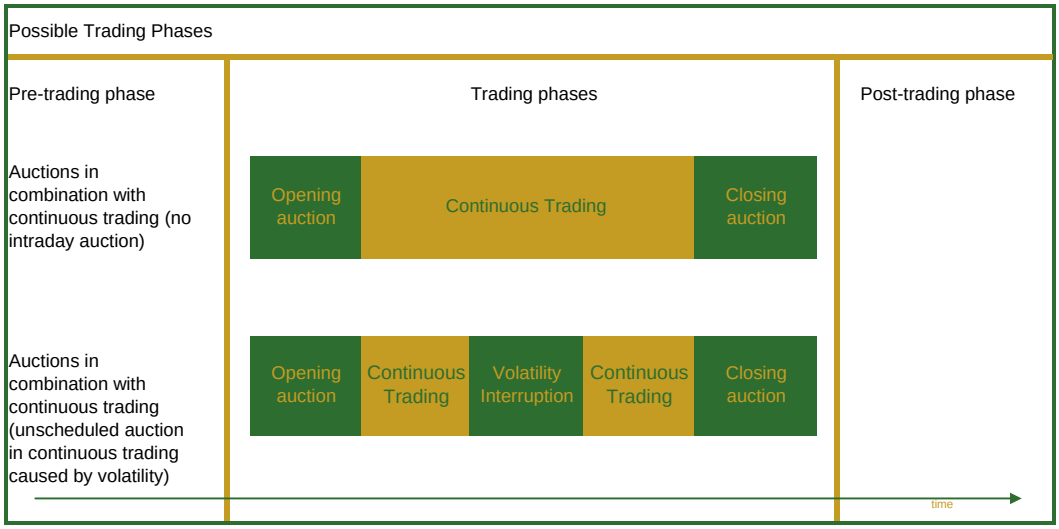
Trading starts with an opening auction. At the end of the opening auction continuous trading is started. Continuous trading can be interrupted by one or more intraday auctions triggered by volatility interruptions. At the end of continuous trading, the closing auction is initiated.

The following trading day and the related market hours (all Irish time) are adopted on ISE T7 for all ISE securities trading on the order book:

6:30–7:50	Pre-trading
7:50–8:00	Opening Auction*
8:00–16:28	Continuous Trading
16:28–16:30	Closing Auction*
16:30–17:15	Post-trading

* While the earliest times at which the opening and closing auctions will occur are 07.50.00 and 16.28.00 respectively, please note that there is a staggered timeframe for the commencement of the opening and closing auctions which varies from security to security and from day to day. The timeframe for all securities to enter into the auction phase will typically be no longer than five seconds however the delay may be longer when exceptional volumes of orders are present on the order book.

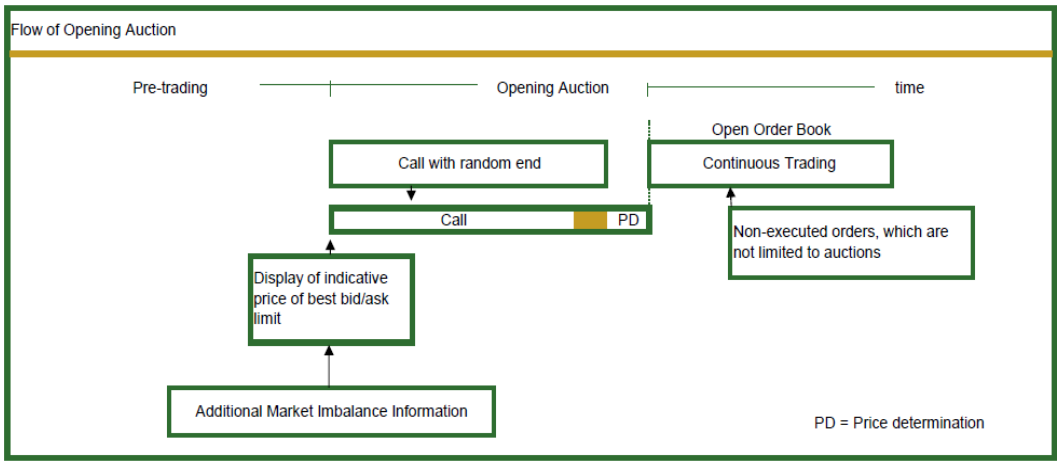
Diagram 1: Possible variations of continuous trading



8.2 OPENING AUCTION

An opening auction, comprising a call phase and a price determination phase, is carried out prior to continuous trading. The opening auction on ISE T7 is ten minutes in duration and takes place between 07:50 and 08:00 Irish time. All orders still valid from the previous day, or which have already been entered on the current trading day, participate in this auction unless their execution is restricted to the closing auction. Quotes are also taking part in the opening auction. Iceberg orders are considered with their overall volume. Resting BOC orders are deleted at the start of the opening auction and any incoming BOC orders will be rejected. All executable orders are matched in the opening auction, thus avoiding a ”crossed order book” (i.e. no price overlapping of bid/ask orders).

Diagram 2: Flow of Opening Auction



Call Phase

The opening auction begins with a call phase (see Diagram 2: Flow of an Opening Auction). Members are able to enter orders and quotes in this phase as well as modify and delete their own existing orders and quotes.

The order book is partially closed during the call phase, however information on the current order book situation is provided. For the ISE T7 trading model additional information in relation to market imbalance is disseminated during the call phase of the auction. This allows the market to react to the surplus before the price determination takes place.

- In the event of an uncrossed order book, the best bid/ask limit is displayed together with the accumulated volumes at the best bid and ask limits.
- In the event of a crossed order book, the indicative auction price is displayed together with the executable volume for the indicative auction price. This is the price which would be realised if the price determination was concluded at this time.

The call phase has a random end after a minimum period in order to avoid price manipulation.

Price Determination Phase

The call phase is followed by the price determination phase. Price determination only takes a few seconds. The auction price is determined according to the principle of highest executable volume on the basis of the order book situation at the end of the call phase. The auction price is the price with the highest order volume and the lowest surplus in the order book. If the order book situation is not clear i.e. if there is more than one limit with the same executable volume, further criteria are taken into consideration for the determination of the auction price (see Chapter 11). Orders of the relevant security **cannot** be entered, modified or deleted to/from the order book during the price determination phase.

Time priority ensures that the maximum of one order limited to the auction price or unlimited is partially executed. At the end of the auction, all market orders and limit orders which were not or were only partially executed, are forwarded to the next possible trading form according to their trading restrictions. Iceberg orders are transferred to continuous trading with only their respective peak shown in the order book.

8.3 CONTINUOUS TRADING

Continuous trading commences after the termination of the opening auction. On ISE T7 the continuous trading period is from 08:00 to 16:28 Irish time.

During continuous trading the order book is open, thus displaying the limits and the individual order volumes (depending on the market data interface instead of each single order the accumulated order volumes of each limit and the number of orders in the book at each limit might be displayed). Each incoming new order is immediately checked for execution against orders on the other side of the order book. Furthermore, new orders are checked for Self Match Prevention.

The orders will be executed according to price/time priority. Orders can either be executed fully, partially or not at all, thus generating one or more trades or none at all. Orders, which were not or only partially executed, are entered into the order book and sorted according to price/time priority.

Sorting orders by price/time priority ensures that buy orders with a higher limit take precedence over buy orders with lower limits. Vice versa, sell orders with a lower limit take precedence over sell orders with a higher limit. The second criterion ‘time’ applies in the event of orders sharing the same limit, i.e. orders which were entered earlier take priority. Market orders have priority over limit orders in the order book. Between market orders, time priority also applies.

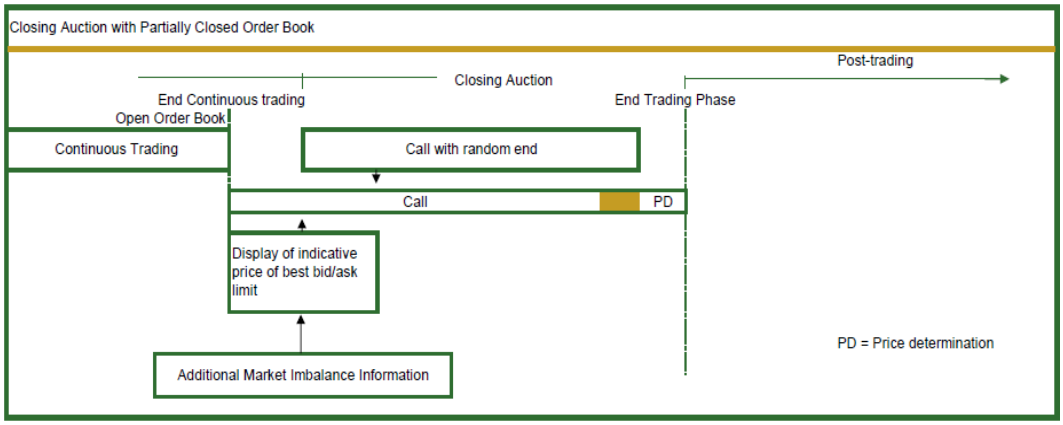
When a peak of an iceberg order has been completely executed and a hidden volume is still available, another peak with a new time priority is shown in the book. The hidden volume of an iceberg order has to be completely executed before orders at the next limit in the order book are executed. Therefore, execution of orders limited at less favourable prices is only possible after all orders at that limit are fully executed. However, orders with the same limit as the new peak are executed before the new peak is executed due to having an older timestamp. If multiple iceberg orders are available at a time the respective peaks are introduced according to price/time priority.

Rules for price determination during continuous trading are described in more detail in chapter 11.

8.4 CLOSING AUCTION

Continuous trading is followed by the closing auction phase. On ISE T7 the closing auction is two minutes in duration and takes place between 16:28 and 16:30 Irish time. This period may be extended due to a volatility interruption as detailed in Chapter 10. The closing auction is also divided into call phase and a price determination phase.

Diagram 3: Flow of Closing Auction



In the closing auction, all available orders participate. This applies to orders and quotes taken over from continuous trading as well as orders which have the trading restrictions “auction only” or “closing auction only” or are only entered in the order book during the closing auction. All iceberg orders entered in the order book also take part in the closing auction with their full volume. Resting BOC orders are deleted at the start of the closing auction, and any incoming BOC orders will be rejected.

The order book is partially closed during the call phase, however information on the current order book situation is provided. For the ISE T7 trading model additional information in relation to market imbalance is disseminated during the call phase of the auction. This allows the market to react to the surplus before the price determination takes place.

- In the event of an uncrossed order book, the best bid/ask limit is displayed together with the accumulated volumes at the best bid and ask limits.
- In the event of a crossed order book, the indicative auction price is displayed together with the executable volume for the indicative auction price. This is the price which would be realised if the price determination was concluded at this time.

After price determination, non-executed or only partially executed orders are transferred to the next trading day according to their validity. Quotes are deleted at the end of the trading day as they are only good-for-day. Non-persistent orders are also deleted at the end of each trading day.

9 Order Types

There are a number of different order types available in ISE T7 for members to use. This section describes each order type, the available execution conditions, validity constraints, trading restrictions, and other relevant order attributes. On T7, the allowed combination of order types, restrictions, price conditions and validities is defined by an order profile which in turn is then assigned to products and their instruments.

Each order entered on the order book is identified by a time stamp, an order ID and a version number. An order modification leads to a new time priority if either the limit is changed or the order modification has a negative impact on the priority of the execution of other orders in the order book (e.g. increase of the volume of an existing order). However, if the volume of an existing order is decreased, the currently valid time priority will remain. User driven modifications which trigger a priority change also result in the version number increasing. However while the priority of an order might change, the 20 digit system order ID assigned by ISE T7 upon entry stays the same over the whole lifecycle. Functionally the latest status of an order can be identified by the system order ID and the version number, where the system order ID is the unique identifier to refer to an order.

Orders can be entered as persistent or as non-persistent orders. Non-persistent orders are automatically deleted as soon as a trading interruption occurs in the corresponding security.

For orders flagged as “lean”, only the execution notifications and unsolicited events can be recovered via a re-transmission request. All data on lean orders are visible only to the session that submitted the order. For an order that is not flagged as a lean order, the receipt of status information messages is not restricted to the session through which the order had been entered, and information messages about all events regarding the order may be recovered via a retransmission request.

T7 does not accept orders that are both lean and persistent.

9.1 BASIC ORDER TYPES

Two basic order types are available for entry to the order book:

- Market orders which are unlimited bid/ask orders, to be executed at the next price determined.
- Limit orders which are bid/ask orders to be executed at their specified limit or better.

Order types can be specified further through additional execution conditions, validity constraints and trading restrictions.

9.2 ADDITIONAL ORDER TYPES

9.2.1 Stop Orders

In order to support certain trading strategies, two stop order types can be used, the execution of which will be possible after reaching a predefined price (stop price):

- **Stop market order:** When the stop price is reached (or exceeded for stop buy orders or fallen below for stop sell orders), the stop order is automatically placed in the order book as a market order.
- **Stop limit order:** When the stop price is reached (or exceeded for stop buy orders or fallen below for stop sell orders), the stop order is automatically placed in the order book as a limit order.

Execution conditions and trading restrictions are not supported for stop orders.

9.2.2 Iceberg Orders

In order to enable market participants to enter large orders into the order book without revealing the full volume to the market, iceberg orders are provided.

An iceberg order is specified by its mandatory limit, its overall volume and an initial peak volume. Optionally, a minimum and a maximum peak volume can be specified to trigger a randomisation of the peak volume on peak replenishment. The ISE specifies the minimum peak value and minimum overall value of iceberg orders for each security. The current parameters for all ISE T7 securities are:

minimum peak value = €100

minimum overall value = €1,000

Ratio of peak / overall size = 5%

The initial peak is the visible part of an iceberg order and is introduced in the order book with the original timestamp of the iceberg order according to price/time priority. In continuous trading as soon as the peak has been completely executed and a hidden volume is still available, a new peak is entered into the book with a new time stamp. In case the minimum and maximum peak volumes are specified, the new peak volume is randomised. Example: If the minimum peak volume is set to 100 and the maximum peak volume is set to 500, on replenishment the peak volume will be randomly drawn between 100 and 500, e.g. 151, 436, 356, 500 etc. In case no minimum or maximum peak volume is specified, the initial peak volume is the volume re-entered into the book as the next peak. In auctions, including volatility interruptions, iceberg orders participate with their overall volume.

The last peak introduced in the order book may be smaller than the initial or minimum peak volume specified. Iceberg orders will not be marked as such in the order book. Additional execution conditions or trading restrictions cannot be assigned to an iceberg order.

9.3 CROSS REQUEST

The cross request functionality enables a member firm to notify all other participants of the firm's intent to cross against itself on the order book. Corresponding orders should be entered as standard orders. However, there is no guarantee that these orders will in fact be executed against each other. Any other participant can enter orders in the order book which in turn can be executed against the orders designated for the crossing.

The cross request functionality will apply to continuous trading only.

9.4 SELF MATCH PREVENTION

With the “Self Match Prevention” (‘SMP’) functionality, members are able to avoid the execution of an order or quote against other orders or quotes from the same trading business unit in the same security.

9.4.1 Overview

The Self Match Prevention functionality can be used via the optional order attribute “CrossID”.

During continuous trading the trading system checks whether orders/quotes which are executable against each other are from the same trading business unit of a participant and are entered with the same “CrossID”. If this is the case the Self Match Prevention processing is started.

Orders/quotes which become executable against each other during a volatility interruption or a regular auction will not be validated for the SMP criteria, i.e. SMP is not offered during these trading phases.

Self Match Prevention is not supported for Iceberg Orders or orders with the execution restriction Fill-or-Kill.

In case a Book-or-Cancel order is entered and immediately cancelled since it could match against a visible order or quote, this will not trigger the SMP process even if the incoming order and the resting order have the same “CrossID” and member ID.

Per default, Self Match Prevention is switched on for all members. In case SMP is switched off, an incoming order or quote containing a “CrossID” will be rejected.

By entering different values in the “CrossID” field, members have the flexibility to define different rules for individual traders, trader groups or sessions.

9.4.2 Self Match Prevention Process

If an incoming SMP order or quote with a “CrossID” is immediately executable, it will be checked if a matching order or quote with the same “CrossID” which was submitted by a trader of the same member and same trading business unit exists in the order book (resting SMP-Order).

The incoming SMP-Order will be allowed to match until it hits a resting SMP-Order, i.e. it can match partially against other orders in the book with a higher priority than the resting SMP-Order, even against resting orders of the same member but with different “CrossID”.

As soon as the incoming SMP-Order would match against a resting SMP-Order at a certain price level, the matching process will stop and the following procedure will be triggered:

- If the incoming SMP-Order’s (remaining) quantity is equal to the quantity of the first resting SMP-Order it hits, the incoming order is cancelled and the resting order gets deleted as well.

- If the incoming SMP-Order's (remaining) quantity is smaller than the quantity of the first resting SMP-Order it hits, then the incoming SMP-Order will be cancelled. The quantity of the resting SMP-Order will be decreased by the incoming order's quantity.
- If the incoming SMP-Order's quantity relevant for the price level is greater than the quantity of the first resting SMP-Order it hits, the incoming order's (remaining) quantity will be decreased by the resting SMP-Order's quantity and the resting order is deleted. The incoming SMP-Order's remaining quantity will then match against other executable resting orders until there are no further executable orders on this price level, or until it is fully executed, or until it hits another resting SMP-Order at this price level. In the latter case the described steps will be repeated. In case there is still quantity left from the incoming SMP-Order after matching on the respective price level has been completed, it will not match at further price levels but will be cancelled.

9.5 EXECUTION CONDITIONS FOR CONTINUOUS TRADING

Market orders and limit orders in continuous trading can be assigned one of the following execution conditions:

- **An immediate-or-cancel order (IOC Order)** is an order which is executed immediately and fully or as fully as possible. Non-executed parts of an IOC order are deleted without entry in the order book.
- **A fill-or-kill order (FOK Order)** is an order which is executed immediately and fully or not at all. If immediate and full execution is not possible, the order is rejected without entry in the order book.

In particular limit orders can alternatively be assigned the following execution condition in continuous trading:

- **A book-or-cancel order (BOC Order)** is a limit order placed as resting liquidity in the order book in order to ensure passive execution. It will only be accepted and added to the order book if it is not immediately executable against a resting order in the order book, i.e. if the limit of a buy (sell) BOC order is smaller (greater) than the best ask (bid). If immediate (and hence aggressive) execution is possible, the order is rejected without entry in the order book. Resting BOC orders are deleted when an auction or volatility interruption is triggered, as any trading volume executed in an auction or volatility interruption is classified as non-passive trading volume. During auctions and volatility interruptions, incoming BOC orders are rejected.

9.6 VALIDITY CONSTRAINTS

The validity of orders can be determined by means of further constraints.

- **Good-for-day (GFD):** Order only valid for the current exchange trading day.
- **Good-till-date (GTD):** Order only valid until a trading day specified by the trader on order entry. Order can be entered with a date up to T+359 days.

- **Good-till-cancelled (GTC):** Order only valid until it is either executed or deleted by the member or by the system.

9.7 TRADING RESTRICTIONS

By means of the following restrictions, it is possible to assign market and limit orders to participate only in scheduled auctions or in particular to the opening or closing auction.

- **Opening auction only:** Order only valid in opening auctions.
- **Closing auction only:** Order only valid in closing auctions.
- **Auction only:** Order only valid in auctions. This trading restriction considers only scheduled auctions, but not auctions dynamically triggered by potential prices, i.e. volatility interruptions.

Orders that use any of the aforementioned trading restrictions are only activated and considered for matching during the respective auction(s). With the activation, a new time priority is assigned to the order. Among the activated orders the sequence of priority corresponds to the sequence of order entry.

9.8 HANDLING OF ORDERS IN CASE OF EVENTS AFFECTING PRICES

The ISE can suspend an order book security from trading in the event of it being suspended from listing or where the ISE in its judgement considers there to be a disorderly market in that security or considers that it is in investors' interests to do so. The ISE will also suspend a security from trading if directed by the Competent Authority to do so. The ISE can also interrupt trading in an order book security. In case of suspension, orders existing in the system are deleted. In case of interruption, only non-persistent orders are deleted.

Orders in the order book are also centrally deleted where dividend payments and other corporate actions (e.g. capitalisation issue) arise as this may affect the price of that order book security. This is completed prior to trading commencing on the first relevant trading day.

10 Volatility Interruptions

The trading models provide safeguards to improve price continuity and ensure price quality. Those are volatility interruptions as well as extended volatility interruptions.

A volatility interruption can occur in auctions and continuous trading. Section 10.1 details the fundamental principles of the safeguards while section 10.2 & 10.3 detail the implementation in the specific trading forms.

10.1 FUNDAMENTAL PRINCIPLES OF VOLATILITY INTERRUPTIONS

The volatility interruption mechanism strengthens the price continuity of determined prices. In summary, trading is interrupted by an additional unscheduled auction in case the potential next execution price would deviate significantly from previously determined references prices.

Volatility interruptions can be initiated in two ways:

- The potential next execution price lies outside the ”dynamic” price range around the reference price. The reference price (reference price 1) for the dynamic price range is the last traded price of a security on the order book, no matter whether it was determined in an auction, in continuous trading or in a volatility interruption. During continuous trading the reference price is re-adjusted with every order book trade. The dynamic price range defines the maximum percentage or absolute deviation around the respective reference price.
- The potential next execution price lies outside the ”static” price range. This wider static price range defines the maximum percentage or absolute deviation around an additional reference price (reference price 2) which corresponds to the last price determined on the current trading day in a scheduled auction or in a volatility interruption. If this price is not available, the OCP determined on the previous trading day is taken as the reference price. Reference price 2 is only re-adjusted during the trading day after an auction price determination in a scheduled auction or in a volatility interruption so that the position of the static price range remains largely unchanged during trading.

The static and dynamic price ranges are stipulated individually for each security and define the maximum percentage or absolute deviation (symmetrically positive and negative) of the respective reference price in a security. It should be noted that in a “fast market”, the relevant dynamic and static price ranges are doubled.

During continuous trading as well as at the end of an auction the potential execution price is checked against the volatility interruption parameters. If the respective requirements are met, a volatility interruption is triggered immediately. A volatility interruption has a duration of 2 or 5 minutes depending on the security. At the end of a volatility interruption, if there is a crossed order book, the potential execution price is checked against a wider dynamic range defined for extended volatility interruptions (‘extended dynamic range’). If the potential execution price is within that range, price determination is carried out and the next phase resumes.

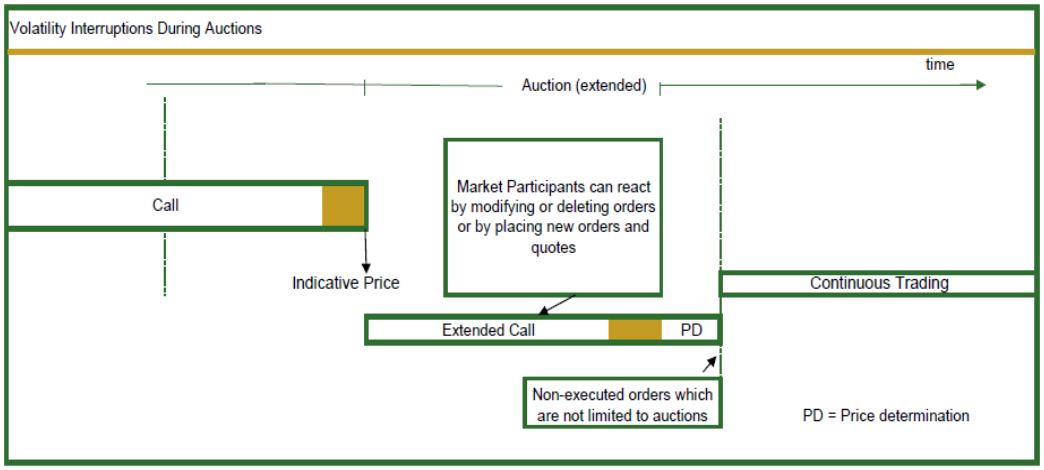
However, if at the end of a volatility interruption, the potential price lies outside the extended dynamic range, the volatility interruption will be extended. The extension of the volatility interruption is displayed to market participants.

10.2 VOLATILITY INTERRUPTION DURING AUCTIONS

A volatility interruption is initiated if the potential auction price at the end of the call phase lies outside the dynamic and/or static price range. Volatility interruptions in an auction are indicated to the market participants. Iceberg orders participate with their full volume in volatility interruption auctions.

A volatility interruption initiates a limited extension of the call phase, allowing market participants to enter new orders as well as to modify or delete orders resting in the order book. After a minimum duration (2 or 5 minutes), the call phase ends randomly. However, if the potential execution price lies outside the extended dynamic price range, the call will be extended until the volatility interruption is terminated manually according to the ISE. In an opening auction this extended volatility interruption will also be ended automatically once there is no longer an executable order book situation. All non-executed or partially executed market and limit orders are transferred to the next possible trading form according to their validity constraints and trading restrictions.

Diagram 4: Volatility Interruption during Auctions



10.3 VOLATILITY INTERRUPTION DURING CONTINUOUS TRADING

To ensure price continuity, continuous trading is interrupted by a volatility interruption whenever the potential next execution price of an order lies outside the dynamic and/or static price range around the reference price. Incoming orders are (partially) executed until the next potential execution price leaves the price corridor (exception: fill-or-kill orders). Volatility interruptions are indicated to the market participants.

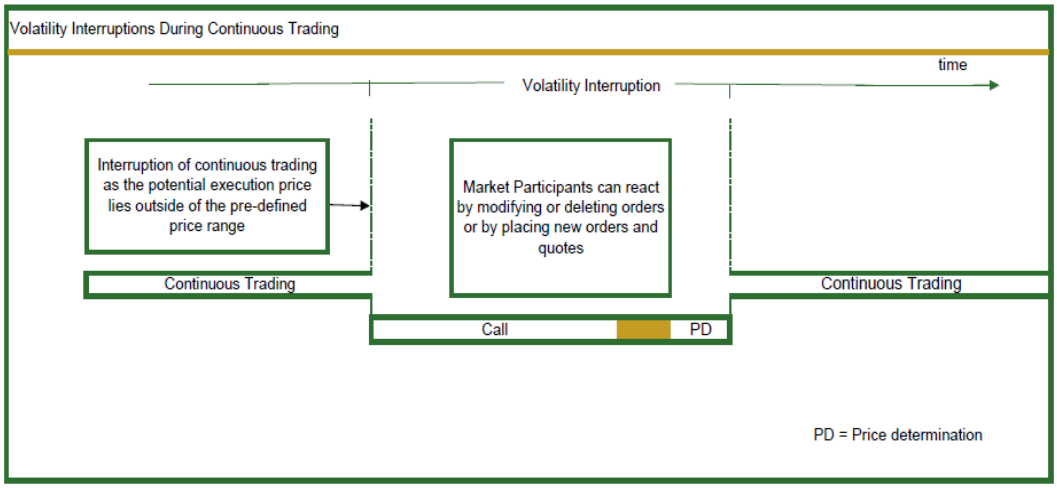
A volatility interruption triggers a change of trading form: continuous trading is interrupted and an auction price determination is initiated, which is restricted to orders designated for continuous trading. As with other price determination phases and according to the principle of most executable volume, iceberg orders participate with their full volume in volatility

interruptions. Resting BOC orders are deleted when a volatility interruption is triggered, and no BOC orders will be accepted while a volatility interruption is occurring.

The volatility interruption consists of a call phase and a price determination phase. After a minimum duration (2 or 5 minutes), the call phase ends randomly. However, if the potential execution price lies outside the extended dynamic price range, the call will be extended until the volatility interruption is terminated manually by the ISE. Alternatively, the extended volatility interruption will be ended automatically once there is no longer an executable order book situation.

If during the call phase of a volatility interruption or extended volatility interruption a closing auction is scheduled, the trading phase switches automatically to closing auction.

Diagram 5: Volatility Interruption during Continuous Trading



11 Illustration of Price Determination Processes

11.1 AUCTIONS

11.1.1 Basic Matching Rules

The auction price is determined on the basis of the order book situation stipulated at the end of the call phase. Concerning the price determination in auctions, iceberg orders are contributing with their overall volume like a limit order. The auction price is the limit with the most executable order volume and lowest surplus (see example 1).

However should this process determine more than one limit with the most executable order volume and the lowest surplus, the surplus is referred to for further price determination:

- The auction price is determined according to the highest limit if the surplus for all limits is on the buy side (bid surplus) (see example 2).
- The auction price is determined according to the lowest limit if the surplus for all limits is on the sell side (ask surplus) (see example 3).

If the inclusion of the surplus does not lead to a clear auction price, the reference price is included as additional criterion. This may be the case:

- If there is a bid surplus for one limit and an ask surplus for another limit (see example 4),
- If there is no surplus for any limit (see example 5).

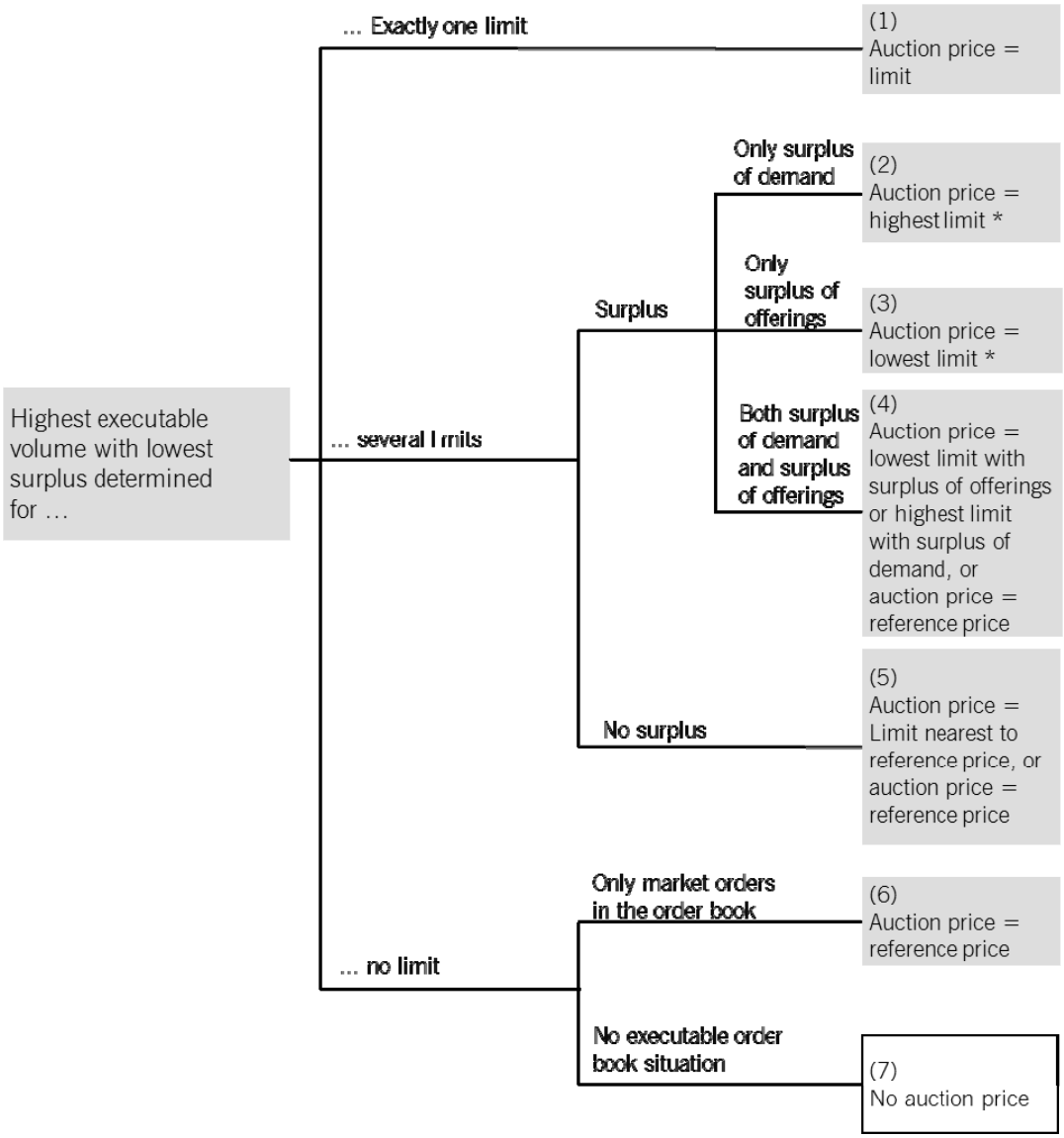
In the first case, the lowest limit with an ask surplus and the highest limit with a bid surplus is chosen for further price determination. In both cases, the reference price is considered for determining the auction price:

- If the reference price is higher than or equal to the highest limit, the auction price is determined according to this limit.
- If the reference price is lower than or equal to the lowest limit, the auction price is determined according to this limit.
- If the reference price lies between the highest and lowest limit, the auction price equals the reference price.

If only market orders are executable against one another, they are matched at the reference price (see example 6).

An auction price cannot be determined if orders are not executable against one another. In this case, the best bid and ask limits (if available) are displayed (see example 7).

The following figure gives an outline of how price determination rules affect possible order book situations in an auction. The number in brackets refers to the corresponding example for this rule.



*** In case there is a market order surplus: Auction price = limit nearest to the reference price**

11.1.2 Matching Examples

The following examples are given to clarify the basic matching rules in auctions. In the examples, price determination is carried out using exemplary order book situations assuming a tick size of €0.01.

Example 1: There is only one limit at which the highest order volume can be executed and which has the lowest surplus.

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
Limit	200	200		2.02	500	700		
Limit	200	400		2.01	300	700		
Limit	300	700		**2.00**		700	100	Limit
		700	100	1.98		600	200	Limit
		700	300	1.97		400	400	Limit

The auction price will be €2.00 according to the limit.

Example 2a: There are several possible limits and there is a surplus of demand (bids).

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
Limit	400	400		2.02	100	500		
Limit	200	600	100	**2.01**		500		
		600	100	1.99		500	300	Limit
		600	400	1.98		200	200	Limit

The auction price will be €2.01 according to the highest limit.

Example 2b: There are several possible limits and there is a surplus on the bid caused by a market order.

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
Market	500	500	200	Market		300		
		500	200	2.02		300		
		500	200	2.01		300		
		500	200	200		300		
		500	200	1.99		300	300	Limit

The auction price either equals the reference price or is fixed according to the limit nearest to the reference price:

a) If the reference price is €1.99 or below, the auction price will be €1.99.

b) If the reference price is above €1.99, the auction price will be the reference price.

Example 3a: There are several possible limits and there is a surplus of supply (asks).

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
Limit	300	300		2.02	300	600		
Limit	200	500		2.01	100	600		
		500		**1.99**	100	600	400	Limit
		500	300	1.98		200	200	Limit

The auction price will be €1.99 according to the lowest limit.

Example 3b: There are several possible limits and there is a surplus on the ask caused by a market order.

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	Ask
Limit	300	300		2.02	200	500		
		300		2.01	200	500		
		300		2.00	200	500		
		300		1.99	200	500		
		300	300	Market		500	500	Limit

The auction price either equals the reference price or is fixed according to the limit nearest to the reference price:

a) If the reference price is €2.02 or above, the auction price will be €2.02.

b) If the reference price is below €2.02, the auction price will be the reference price.

Example 4: There are several possible limits and there is both a surplus of demand (bids) and supply (asks).

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	Ask
Market	100	100		Market	100	200		
		100		2.02	100	200		Limit
Limit	100	200	100	1.99		100		
		200	100	Market		100	100	Market

The auction price either equals the reference price or is determined according to the limit nearest to the reference price:

a) If the reference price is €2.00, the auction price will be €2.00

b) If the reference price is €2.03, the auction price will be €2.02

c) If the reference price is €1.99, the auction price will be €1.99

Example 5: There are several possible limits and no surplus available.

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	Ask
Limit	300	300		2.02	200	500		
Limit	200	500		2.01		500		
		500		1.99		500	300	Limit
		500	300	1.98		200	200	Limit

The auction price either equals the reference price or is determined according to the limit nearest to the reference price:

a) If the reference price is €2.05, the auction price will be €2.01

b) If the reference price is €2.00, the auction price will be €2.00

c) If the reference price is €1.97, the auction price will be €1.99

Example 6: Only market orders are executable in the order book.

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	Ask
Market	900	900	100	Market		800		
		900	100	Market		800	800	Market

The auction price equals the reference price.

Example 7: **There is no eligible limit as there are only non-executable orders in the order book.**

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
				2.01		80	80	Limit
Limit	80	80		2.00				
Limit	80	160		1.99				

It is not possible to determine an auction price. In this case, the highest visible bid limit (€2.00) and the lowest visible ask limit (€2.01) are disclosed to market participants.

Additional example: **Partial execution of an order in the opening auction.**

Bid	Quantity	Acc. Quantity	Surplus	Limit €	Surplus	Acc. Quantity	Quantity	**Ask**
Limit 9:00:00	300	600	200	2.00		400	400	Limit
Limit 9:01:00	300							

When two limit orders are available on the bid side at the auction price, time priority determines which of the orders is to be partially executed. In this case, the order with the time stamp 9:00:00 is executed fully and the order with the time stamp 9:01:00 is executed partially (100 shares) at an auction price of €2.00. The surplus of 200 shares resulting from the partial execution is transferred to continuous trading provided that the order is not limited to auctions only.

11.2 CONTINUOUS TRADING

11.2.1 Basic Matching Rules of the Order Book

Each new incoming order is immediately checked for execution against orders on the other side of the order book which will be executed according to price/time priority.

Orders can be executed fully in one or more steps, partially or not at all. Thus, each new incoming order may generate one or several trades, or none at all.

Orders or non-executed parts thereof or remaining peaks of an iceberg order are entered in the order book and sorted according to price/time priority.

Price determination and order matching in continuous trading is carried out in adherence to price/time priority and according to the following rules:

Rule 1: If an incoming market order meets an order book with market orders only on the other side, this market order is executed at the reference price (last traded price) as far as possible (see example 1).

Rule 2: If an incoming market order or limit order meets an order book with limit orders only on the other side, the highest bid limit or lowest ask limit, respectively, of the resting limit orders in the order book determines the price (see examples 2, 3, 13, 14).

Rule 3: If an incoming:

- market order meets an order book with market orders and limit orders on the other side (see examples 4, 5, 6, 7), or
- limit order meets an order book with market orders only on the other side (see examples 9, 10, 11, 12), or
- limit order meets an order book with market orders and limit orders on the other side (see examples 16, 17, 18, 19, 20, 21),

then the incoming order is executed against the market orders in accordance with price/time priority with respect to non-executed bid market orders at the reference price or higher (at the highest limit of the executable orders) or at the reference price or lower (at the lowest limit of the executable orders) with respect to non-executed ask market orders.

Market orders, which have not been executed in the order book, must be executed immediately with the next transaction (if possible). In this case, the following principles must be taken into consideration for continuous trading:

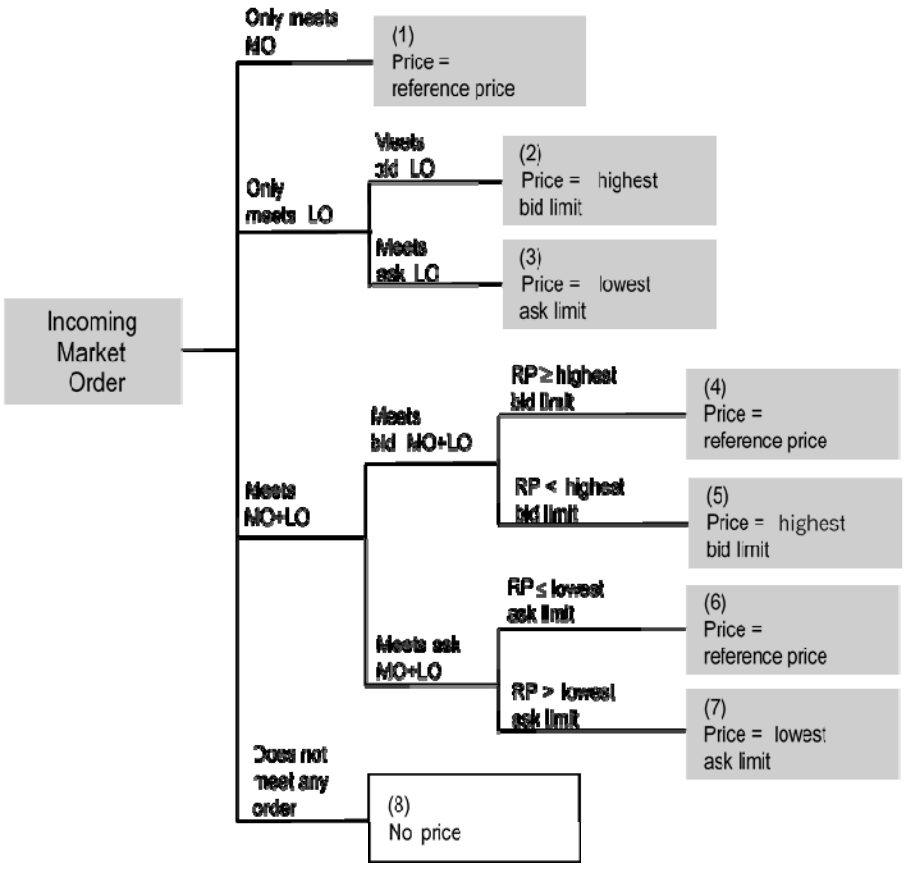
Principle 1: Market orders are given the reference price as a ”virtual” price. On this basis, execution is carried out at the reference price provided that this does not violate price/time priority.

Principle 2: If orders cannot be executed at the reference price, they are executed in accordance with price/time priority by means of price determination above or below the reference price (non-executed bid market orders or ask market orders)

i.e. the price is determined by a limit within the order book or a limit of an incoming order.

Rule 4: If an incoming order does not meet any order in the order book (see examples 8, 22) or if an incoming limit order meets an order book with limit orders only on the other side of the book and the limit of the incoming buy (sell) order is lower (higher) than the limit of the best sell (buy) order in the book (see example 15), no price is determined.

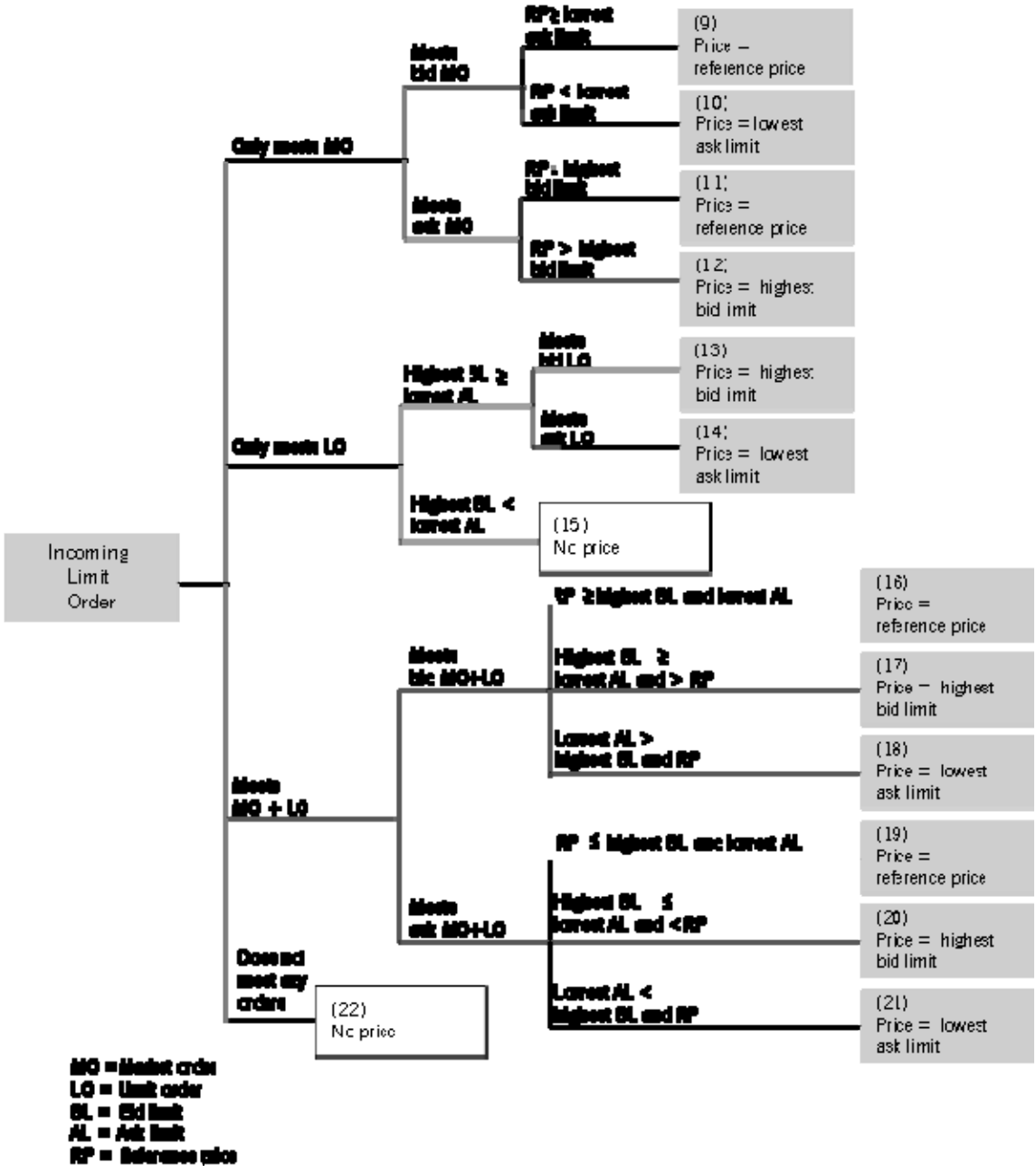
The following figures give an outline of how price determination rules affect possible order book situations in continuous trading. The head number refers to the corresponding example for these situations.



MO = Market order

LO = Limit order

RP = Reference Price


Incoming Limit Order
Only meets MO
Only meets LO
Meets MO + LO
Does not meet any orders
Meets bid MO
Meets ask MO
Highest BL ≥ lowest AL
Highest BL < lowest AL
Meets bid MO+LO
Meets ask MO+LO
RP ≥ lowest ask limit
RP < lowest ask limit
RP ≤ highest bid limit
RP > highest bid limit
Meets bid LO
Meets ask LO
RP ≥ highest BL and lowest AL
Highest BL ≥ lowest AL and > RP
Lowest AL > highest BL and RP
RP ≤ highest BL and lowest AL
Highest BL ≤ lowest AL and <RP
Lowest AL < highest BL and RP
(9) Price = reference price
(10) Price = lowest ask limit
(11) Price = reference price
(12) Price = highest bid limit
(13) Price = highest bid limit
(14) Price = lowest ask limit
(15) No price
(16) Price = reference price
(17) Price = highest bid limit
(18) Price = lowest ask limit
(19) Price = reference price
(20) Price = highest bid limit
(21) Price = lowest ask limit
(22) No price
MO = Market order
LO = Limit order
BL = Bid limit
AL = Ask limit
RP = Reference price

11.2.2 Matching Examples

This chapter is subdivided into two sections: the first section (11.2.2.1) provides matching examples that cover the order book situations mentioned in the figures presented above. In the second section (11.2.2.2) additional examples are provided which cover special order book situations, e.g. volatility interruptions and the functionality of iceberg orders. The last section (11.2.2.3) provides a matching example for the self-match prevention functionality.

The following examples are meant to clarify the basic matching rules for continuous trading by carrying out the price determination using exemplary order book situations assuming a tick size €0.01.

11.2.2.1 Examples for Basic Matching Rules in Continuous Trading

The following examples should clarify the basic matching rules for continuous trading by showing how price determination is carried out in different order book situations.

Example 1: A market order meets an order book with market orders only on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			

Incoming order: Ask market order, quantity 6,000 shares

The reference price is €2.00. Both market orders are executed at the reference price of €2.00 (see rule 1, page 32).

Example 2: A market order meets an order book with limit orders only on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	2.00			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	2.00			

Incoming order: Ask market order, quantity 6,000 shares

Both orders are executed at the highest bid limit of €2.00 (see rule 2, page 32).

Example 3: A market order meets an order book with limit orders only on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	**Ask** Time
			2.00	6000	9:01:00

Bid Time	Quantity	Limit €	Limit €	Quantity	**Ask** Time
			2.00	~~6000~~	9:01:00

Incoming order: Bid market order, quantity 6,000 shares

Both orders are executed at the lowest ask limit of €2.00 (see rule 2, page 32).

Example 4: A market order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	1.95			

Bid Time	Quantity	Limit €	Limit €	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			
9:02:00	1000	1.95			

Incoming order: Ask market order, quantity 6,000 shares

The reference price is €2.00 which is higher than or equal to the highest bid limit.

The incoming ask market order is executed against the bid market order in the order book at the reference price of €2.00 (see rule 3, page 32).

Example 5: A market order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			
9:02:00	1000	2.02			

Incoming order: Ask market order, quantity 6,000 shares

The reference price is €2.00. It is lower than the highest bid limit.

The incoming ask market order is executed against the bid market order in the order book at the highest bid limit of €2.02 (see rule 3, page 32).

Example 6: A market order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			Market	6000	9:01:00
			2.02	1000	9:02:00

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			Market	~~6000~~	9:01:00
			2.02	1000	9:02:00

Incoming order: Bid market order, quantity 6,000 shares

The reference price is €2.00. It is lower than or equal to the lowest ask limit.

The incoming bid market order is executed against the ask market order in the order book at the reference price of €2.00 (see rule 3, page 32).

Example 7: A market order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	6000	9:01:00
			2.02	1000	9:02:00

Incoming order: Bid market order, quantity 6,000 shares →

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	~~6000~~	9:01:00
			2.02	1000	9:02:00

The reference price is €2.03. It is higher than the lowest ask limit.

The incoming bid market order is executed against the ask market order in the order book at the lowest ask limit of €2.02 (see rule 3, page 32).

Example 8: A market order meets an order book in which there are no orders.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time

Incoming order: Bid market order, quantity 6,000 shares →

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
9:01:00	6000	Market			

The incoming bid market order is entered in the order book. A price is not determined and no orders are executed (see rule 4, page 33).

Example 9: A limit order meets an order book with market orders only on the other side of the order book

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			

Incoming order: Ask order, limit €1.95, quantity 6,000 shares

The reference price is €2.00. It is higher than or equal to the lowest ask limit. Both orders are executed at the reference price of €2.00 (see rule 3, page 32).

Example 10: A limit order meets an order book with market orders only on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			

Incoming order: Ask order, limit €2.03, quantity 6,000 shares

The reference price is €2.00. It is lower than the lowest ask limit. Both orders are executed at the lowest ask limit of €2.03 (see rule 3, page 32).

Example 11: A limit order meets an order book with market orders only on the other side of the order book.

Bid					**Ask**
Time	Quantity	Limit **€**	Limit **€**	Quantity	Time
			Market	6000	9:01:00

Incoming order: Bid order, limit €2.03, quantity 6,000 shares →

Bid					**Ask**
Time	Quantity	Limit **€**	Limit **€**	Quantity	Time
			Market	~~6000~~	9:01:00

The reference price is €2.00. It is lower than or equal to the highest bid limit. Both orders are executed at the reference price of €2.00 (see rule 3, page 32).

Example 12: A limit order meets an order book with market orders only on the other side of the order book.

Bid					**Ask**
Time	Quantity	Limit **€**	Limit **€**	Quantity	Time
			Market	6000	9:01:00

Incoming order: Bid order, limit €1.99, quantity 6,000 shares →

Bid					**Ask**
Time	Quantity	Limit **€**	Limit **€**	Quantity	Time
			Market	~~6000~~	9:01:00

The reference price is €2.00. It is higher than the highest bid limit. Both orders are executed at the highest bid limit of €1.99 (see rule 3, page 32).

Example 13: A limit order meets an order book with limit orders only on the other side of the order book.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:33:00	6000	1.99			

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:33:00	~~6000~~	1.99			

Incoming order: Ask order, limit €1.98, quantity 6,000 shares

The ask limit of the incoming order is lower than (or equal to) the highest bid limit of the order(s) resting on the book. Both orders are executed at the highest bid limit of the resting order, €1.99 (see rule 2, page 32).

Example 14: A limit order meets an order book with limit orders only on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			1.99	6000	9:33:00

Incoming order: Bid order, limit €2.00, quantity 6000 shares

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			1.99	~~6000~~	9:33:00

The bid limit of the incoming order is higher than (or equal to) the lowest ask limit. Both orders are executed at the lowest ask limit of the resting order, €1.99 (see rule 2, page 32).

Example 15: A limit order meets an order book with limit orders only on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:33:00	6000	1.99			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:33:00	6000	1.99	2.00	6000	10:01:00

Incoming order: Ask order, limit €2.00,quantity 6,000 shares

The highest bid limit is lower than the lowest ask limit.

The incoming ask order is entered in the order book. A price is not determined and no orders are executed (see rule 4, page 33).

Example 16: A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	1.96			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	~~6000~~	Market			
9:02:00	1000	1.96			

Incoming order: Ask order, limit €1.95, quantity 6,000 shares

The reference price is €2.00. It is higher than or equal to the highest bid limit and higher than or equal to the lowest ask limit.

The incoming ask order is executed against the bid market order in the order book at the reference price of €2.00 (see rule 3, page 32).

Example 17: A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
9:01:00	~~6000~~	Market			
9:02:00	1000	2.02			

Incoming order: Ask order, limit €1.99, quantity 6000 shares

The reference price is €2.00. The highest bid limit is higher than or equal to the lowest ask limit and higher than the reference price.

The incoming ask order is executed against the bid market order in the order book at the highest bid limit of €2.02 (see rule 3, page 32).

Example 18: A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
9:01:00	~~6000~~	Market			
9:02:00	1000	2.02			

Incoming order: Ask order, limit €2.03, quantity 6000 shares

The reference price is €2.00. The lowest ask limit is higher than the highest bid limit and the reference price.

The incoming ask order is executed against the bid market order in the order book at the lowest ask limit of €2.03 (see rule 3, page 32).

Example 19: A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	6000	9:01:00
			2.02	1000	9:02:00

Incoming order: Bid order, limit €2.03, quantity 6,000 shares →

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	~~6000~~	9:01:00
			2.02	1000	9:02:00

The reference price is €2.00. It is lower than or equal to the highest bid limit and lower than or equal to the lowest ask limit.

The incoming bid order is executed against the ask market order in the order book at the reference price of €2.00 (see rule 3, page 32).

Example 20: A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	6000	9:01:00
			2.02	1000	9:02:00

Incoming order: Bid order, limit €2.00, quantity 6,000 shares →

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			Market	~~6000~~	9:01:00
			2.02	1000	9:02:00

The reference price is €2.01. The highest bid limit is lower than or equal to the lowest ask limit and lower than the reference price.

The incoming bid order is executed against the ask market order in the order book at the highest bid limit of €2.00 (see rule 3, page 32).

Example 21: A limit order meets an order book with market orders and limit orders on the other side of the order book

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			Market	6000	9:01:00
			1.99	1000	9:02:00

Incoming order: Bid order, limit €2.03, quantity 6,000 shares →

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			Market	~~6000~~	9:01:00
			1.99	1000	9:02:00

The reference price is €2.00. The lowest ask limit is lower than the highest bid limit and the reference price.

The incoming bid order is executed against the ask market order in the order book at the lowest ask limit of €1.99 (see rule 3, page 32).

Example 22: A limit order meets an order book in which there are no orders.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time

Incoming order: Bid order, limit €2.00, quantity 6,000 shares →

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
10:01:00	6000	2.00			

The incoming bid order is entered in the order book. No price is determined and no orders are executed (see rule 4, page 33).

11.2.2.2 Further examples

Partial execution of a market order. A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Incoming order: Ask order, limit €2.03, quantity 1000 shares

The reference price is €2.00. The lowest ask limit is higher than the highest bid limit and the reference price. The incoming ask order can only be partially executed against the bid market order in the order book, which is carried out at the lowest ask limit of €2.03 (see rule 3, page 32).

Initiation of a volatility interruption. A limit order meets an order book with market orders and limit orders on the other side of the order book.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:01:00	6000	Market			
9:02:00	1000	2.02			

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:01:00	6000	Market	2.20	1000	10:01
9:02:00	1000	2.02			

Incoming order: Ask order, limit €2.20, quantity 1000 shares

The reference price is €2.00 and the price range is +/- 2% of the last determined price. The limit of the incoming ask order is higher than the reference price and the highest bid. Therefore the executable price is €2.20. However this lies outside the pre-defined price range and an execution is not carried out. The ask order is entered in the order book and continuous trading is interrupted by a volatility interruption.

Functionality of iceberg orders.

In contrast to the previous examples, in this example an initial order book situation is presented which changes in various iterations to explain the functionality of iceberg orders. Orders at the same price level are displayed separately (in the trading system they may be distributed in an aggregated view per limit depending on the interface). Furthermore, for sake of clarity the peaks of an iceberg order are written in italics in the following examples. For reason of simplification only iceberg orders with constant peaks are shown in the example. If the optional functionality to set a minimum and a maximum peak is availed of, then the size of the next peak will be randomised.

An iceberg order is entered into the order book and meets limit orders only on the other side of the order book.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:01:00	6000	2.02	2.03	500	8:55:00
9:02:00	2000	2.01			

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:01:00	~~6000~~	2.02	2.01	*2000*	9:05:00
9:02:00	~~2000~~	2.01	2.03	500	8:55:00

Incoming order: Ask iceberg order, limit €2.01 overall volume 50,000 shares, peak 10,000 shares, time: 9:05:00

Remaining iceberg hidden	2.01	40000	9:05:00

The peak of the iceberg order is executed against the orders in the order book as far as possible (6,000 at € 2.02; 2,000 at € 2.01). The remaining peak of the iceberg order (2,000) is entered in the order book according to price/time priority with a remaining volume of 40,000 behind it.

A new bid market order meets the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			2.01	*2000*	9:05:00
			2.03	500	8:55:00

Iceberg	2.01	*40000*	9:05:00

Incoming order: Bid market order, quantity 5,000 shares, time: 9:07:00

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			2.01	~~*2000*~~ *7000*	~~9:05:00~~ 9:07:01
			2.03	500	8:55:00

Iceberg	2.01	~~40000~~ 30000	9:05:00

The incoming market order is executed against the peak (2,000) of the iceberg order at €2.01. Then the next peak of the iceberg order is introduced into the order book with a new time stamp (9:07:01). It is executed against the remaining part of the incoming order (3,000). The remaining peak of the iceberg order (7,000) is shown in the order book with a volume of 30,000 behind it.

Another iceberg order is entered into the order book.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
			2.01	*7000*	9:07:01
			2.03	500	8:55:00

Iceberg	2.01	30000	9:05:00

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
			2.01	*7000*	9:07:01
			2.01	*5000*	9:08:01
			2.03	500	8:55:00

Iceberg 1	2.01	30000	9:05:00
Iceberg 2	2.01	25000	9:08:01

Incoming order: Ask iceberg order, limit €2.01, overall volume 30,000 shares, peak 5,000 shares, time: 9:08:01

The peak of the iceberg order cannot be executed against orders on the other side of the book. The visible part (peak) of the iceberg order is entered into the order book according to price/time priority with a volume of 25,000 behind it.

A new bid market order meets the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			2.01	*7000*	9:07:01
			2.01	*5000*	9:08:01
			2.03	500	8:55:00

Iceberg 1	2.01	30000	9:05:00
Iceberg 2	2.01	25000	9:08:01

Incoming order: Bid market order, quantity 14,000 shares, time: 9:10:40

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			2.01	~~*7000*~~ *8000*	~~9:07:01~~ 9:10:42
			2.01	~~*5000*~~ *5000*	~~9:08:01~~ 9:10:42
			2.03	500	8:55:00

Iceberg 1	2.01	~~30000~~ 20000	9:05:00
Iceberg 2	2.01	~~25000~~ 20000	9:08:01

The incoming market order is first executed against the peak of iceberg order 1 at €2.01 with a volume of 7,000 (as that has an earlier timestamp).

Before the next peak of this iceberg order is introduced, the peak of iceberg order 2 at the same limit is executed (5,000) due to time priority.

A new peak of the first iceberg order is introduced into the order book with a new time stamp (9:10:42) and a remaining volume of 20,000 behind it.

A new peak of the second iceberg order is introduced into the order book with the same time stamp (9:10:42) and a remaining volume of 20,000 behind it.

Then the remaining part of the incoming order (2,000) is executed against the new peak of iceberg order 1. The remaining part of this iceberg order (8,000) is shown in the book with a volume of 20,000 behind it.

Another limit order is entered into the order book.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
			2.01	*8000*	9:10:42
			2.01	*5000*	9:10:42
			2.03	500	8:55:00

Iceberg 1	2.01	20000	9:05:00
Iceberg 2	2.01	20000	9:08:01

Bid Time	Volume	Limit €	Limit €	Volume	**Ask** Time
			2.01	*8000*	9:10:42
			2.01	*5000*	9:10:42
			2.01	2000	9:13:13
			2.03	500	8:55:00

Incoming order: Ask limit order, limit €2.01, quantity 2,000 shares, time: 9:13:13

Iceberg 1	2.01	20000	9:05:00
Iceberg 2	2.01	20000	9:08:01

The new limit order cannot be executed against orders on the other side of the order book. It is entered into the order book according to price/time priority.

A new bid market order meets the order book.

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			2.01	*8000*	9:10:42
			2.01	*5000*	9:10:42
			2.01	2000	9:13:13
			2.03	500	8:55:00

Iceberg 1	*2.01*	*20000*	*9:05:00*
Iceberg 2	*2.01*	*20000*	*9:08:01*

Incoming order: Bid market order quantity 23,000 shares, time: 9:15:00

Bid Time	Quantity	Limit €	Limit €	Quantity	Ask Time
			2.01	~~*8000*~~ *2000*	~~9:10:42~~ 9:15:01
			2.01	~~*5000*~~ *5000*	~~9:10:43~~ 9:15:01
			2.01	~~2000~~	~~9:13:13~~
			2.03	500	8:55:00

Iceberg	2.01	~~20000~~ 10000	9:05:00
Iceberg	2.01	~~20000~~ 15000	9:08:01

The incoming bid market order is first executed against the lowest ask limit on the other side of the order book which is represented by a peak (8,000) of iceberg order 1 at €2.01.

Before the next peak of the iceberg order is introduced, all other peaks and limit orders at the same limit have to be executed. Therefore, the next peak (5,000) and the next limit order (2,000) in the order book are executed against the incoming order.

A new peak of iceberg order 1 is introduced into the order book with a new time stamp (9:15:01) and a remaining volume of 10,000 behind it.

A new peak of iceberg order 2 is introduced into the order book with a new time stamp (9:15:01) and a remaining volume of 15,000 behind it.

The remaining volume (8,000) of the incoming order then is executed against the new peak of iceberg order 1 at €2.01. A remaining peak of this iceberg order of 2,000 is shown in the order book.

Example showing the functionality of the randomised peak of iceberg orders.

An iceberg order is entered into the order book with functionality to set a minimum and a maximum peak and meets limit orders only on the other side of the order book.

Bid Time	Volume	Limit €	Limit €	Volume	**Ask** Time
9:01:00	6000	3.02	3.03	500	8:55:00
9:02:00	2000	3.01			

Bid Time	Volume	Limit €	Limit €	Volume	**Ask** Time
9:01:00	~~6000~~	3.02	3.01	*2000*	9:05:00
9:02:00	~~2000~~	3.01	3.03	500	8:55:00

Incoming order: Ask iceberg order, limit €3.01 overall volume 50,000 shares, minimum peak 10,000 shares, maximum peak 30,000 shares, time: 9:05:00

Remaining iceberg hidden	3.01	40000	9:05:00

Randomised peak of 10,000 shares was entered on to the order book and is executed against the orders in the order book as far as possible (6,000 at €3.02; 2,000 at €3.01). The remaining peak of the iceberg order (2,000) is entered in the order book according to price/time priority with a remaining volume of 40,000 behind it.

A new bid market order meets the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			3.01	*2000*	9:05:00
			3.03	500	8:55:00

Iceberg	3.01	40000	*9:05:00*

Incoming order: Bid market order, quantity 15,000 shares, time: 9:07:00

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			3.01	~~*2000*~~ *11000*	~~9:05:00~~ 9:07:01
			3.03	500	8:55:00

Iceberg	*3.01*	~~40000~~ 15000	9:07:01

The incoming market order is executed against the peak (2,000) of the iceberg order at €3.01. Then the next randomised peak of the iceberg order is introduced for 25,000 shares into the order book with a new time stamp (9:07:01). It is executed against the remaining part of the incoming order (14,000). The remaining peak of the iceberg order (11,000) is shown in the order book with a volume of 15,000 behind it.

A new bid limit order meets the order book.

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
			3.01	*11000*	9:07:01
			3.03	500	8:55:00

Iceberg	3.01	15000	9:07:01

Incoming order: Bid limit order, quantity 30,000 shares, limit €3.01, time: 9:10:00

Bid Time	Quantity	Limit **€**	Limit **€**	Quantity	**Ask** Time
09:10:00	4000	3.01	3.01	~~*11000*~~ ~~*15000*~~	~~9:07:01~~ ~~9:10:01~~
			3.03	500	8:55:00

Iceberg	3.01	~~15000~~	9:10:01

The incoming limit order is executed against the peak (11,000) of the iceberg order at €3.01. Then the next randomised peak of the iceberg order is introduced for the remaining 15,000 shares into the order book with a new time stamp (9:10:01). It is executed against the remaining part of the incoming order (19,000). Remaining 4000 shares of the limit order are placed on the order book with a limit of €3.01.

Example showing the functionality of book-or-cancel order

A limit ask order with the execution condition book-or-cancel meets an order book with limit orders on the other side.

Bid Time	Volume	Limit €	Limit €	Volume	**Ask** Time
9:01:00	6000	2.00			
9:02:00	1000	1.99			

Bid Time	Volume	Limit €	Limit €	Volume	**Ask** Time
9:01:00	6000	2.00			
9:02:00	1000	1.99			

Incoming ask limit order for 5,000 shares with BOC restriction with limit price €1.98

As the BOC condition requires that the order has to be placed as resting liquidity into the open limit order book, this order will be rejected by the system as it is immediately executable against visible limit orders on the bid side. Therefore there is no change to the order book.

Example showing the functionality of Fill-or-Kill order

A limit order with the execution condition Fill-or-Kill meets an order book with limit orders on the other side.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:02:00	5000	2.02			
9:03:00	2000	2.01			

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:02:00	5000	2.02			
9:03:00	2000	2.01			

Incoming ask limit order for 8,000 shares with FOK restriction with limit price €2.01

As the FOK condition requires that the order be executed immediately and in full or not at all, this order will be rejected by the system as it is not immediately executable against orders on the bid side as the cumulative volume on the bid side is insufficient to fill the incoming order. Therefore there is no change to the order book.

Example showing the functionality of Immediate-or-Cancel order

A limit order with the execution condition immediate-or-cancel meets an order book with limit orders on the other side.

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:02	5000	2.02			
9:03	2000	2.01			

Bid Time	Volume	Limit **€**	Limit **€**	Volume	**Ask** Time
9:02:00	5000	2.02			
9:03:00	2000	2.01			

Incoming ask limit order for 8,000 shares with IOC restriction with limit price € 2.01

As the IOC condition requires that the order is executed immediately and fully or as fully as possible, this order will be executed with 5,000 shares at a price of €2.02, 2,000 shares at a price of €2.01, and the remaining 1,000 shares are deleted without entry to the order book.

11.2.2.3 Basic Matching Rules for Self Match Prevention

Initial order book with orders sorted according to their price/time priority looks as follows:

Self Match prevention – a new sell order meets a resting buy order with the same Cross ID from the same member.

BID						ASK
Time	Volume	Member/Cross I.D.	Limit €	Member/Cross I.D.	Volume	Time
			2.11	XYZFR/5566	100	9:04:00
			2.10		50	9:05:00
9:01:00	50		2.09			
9:03:00	20	XYZFR/9987	2.08			
9:04:00	500		2.08			
9:05:00	10	ABCFR/1234	2.07			
9:06:00	50	ABCFR/9987	2.07			
9:07:00	5		2.07			
9:08:00	10		2.06			
9:09:00	40	ABCFR/9987	2.06			

A new sell order with quantity 650 and limit €2.06 from member ABCFR with CrossID "9987" is entered into the order book.

This order matches according to price/time priority first with Buy Order (50 @ €2.09), then with Buy Order (20 @ €2.08) which has the same CrossID but was entered by a different member, and then with Buy Order (500 @ €2.08).

Then it matches with Buy Order (10 @ €2.07) which was entered by a trader of ABCFR but with a different CrossID. A quantity of 70 shares remains from the incoming Sell Order.

The remaining quantity of the incoming SMP-Order now hits the resting SMP Buy Order (50 @ €2.07) and the conditions for Self Match Prevention (same member, same CrossID) are fulfilled. As the (remaining) quantity of the incoming SMP-Order is bigger, the resting order is deleted and the quantity of the incoming order is decreased by the same quantity so that its remaining quantity is 20.

The incoming Sell SMP Order is now checked for executions on the same price level where SMP was triggered and Buy Order (5 @ €2.07) gets executed. The remaining quantity of incoming Sell Order (15 @ €2.06) is deleted afterwards since no further matching on the same price level is possible.

The order book after the executions is as follows:

BID						ASK
Time	Volume	Member/Cross I.D.	Limit €	Member/Cross I.D.	Volume	Time
			2.11	XYZFR/5566	100	9:10:00
			2.10		50	9:11:00
9:08:00 9:09:00	10 40	ABCFR/9987	2.06			

12 Determination of the Official Closing Price on the ISE

The ISE uses the following method for determining the Official Closing Price each day for all security traded on ISE T7:

- If a security is traded in the closing auction the auction price will be the Official Closing Price (with a cut off time of 17:00 Irish time for potential extended conclusion of closing auctions).
- If there are trades during the opening auction or during continuous trading for a security on the day, but the security does not trade in the closing auction or the closing auction is extended beyond 17:00, the Last Traded Price previous to 16:30 will be the Official Closing Price. Off order book on exchange trade reports submitted via ISE Xetra are considered in this calculation.
- If there are no trades for a security on a particular day, the Official Closing Price defaults to the previous day's Official Closing Price.

This price determination will occur at 17:00 Irish time and is published via the Deutsche Börse Consolidated Exchange Feed (CEF) within 5 minutes of determination for all securities which have traded on the day.

12.1 RELEVANT DEFINITIONS

Official Closing Price: As outlined above.

Last Traded Price: The last traded price of the day. This can occur in any of the trading phases and is determined using the latest trade time stamp. It may be an order book or an off order book trade (reported via ISE Xetra).

Total Turnover: The sum total of the consideration (trade volume * trade price) for every valid trade executed on the day, including off order book trades (reported via ISE Xetra) reported during post-trading.

Total Volume: The sum total of trade volume for every valid trade executed on the day, including off order book trades (reported via ISE Xetra) reported during post-trading.

Market Capitalisation: Calculated as: shares in issue * Official Closing Price.

Daily High and Low Prices: Determined per security as the Highest / Lowest valid trade price executed on the day, including off order book trades (reported via ISE Xetra) reported during post-trading.

12.2 EXAMPLE OF OFFICIAL CLOSING PRICE DETERMINATION

Instrument	Day (T-1) Official Closing Price	Opening Auction	Continuous Trading	Closing Auction	Post-trading	Day (T) Official Closing Price
A	**10**	11	12, 13, 14	15	16, 17	**15**
B	**20**	21	22, 23, 24	25		**25**
C	**30**	31	32, 33, 34		35	**34**
D	**40**	41	42, 43, 44			**44**
E	**50**	51		52	53	**52**
F	**60**	61		61		**61**
G	**70**	71			62	**71**
H	**80**	81				**81**
I	**90**		91, 92, 93	94	95	**94**
J	**100**		101, 102, 103	104		**104**
K	**110**		111, 112, 113		114	**113**
L	**120**		121, 122, 123			**123**
M	**130**			131	132	**131**
N	**140**			141		**141**
O	**150**				151	**150**
P	**160**					**160**