**T7 Release 15.0**

# Market Model for the Trading Venue Deutsche Börse Xetra

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# 1 Introduction

Frankfurter Wertpapierbörse (FWB; Frankfurt Stock Exchange) operates two separate venues for cash market trading in equities and a variety of other instruments including Exchange Traded Funds (ETFs), Exchange Traded Products (ETPs)[1], mutual funds, bonds, warrants, certificates and subscription rights: Deutsche Börse Xetra (MIC[2]: XETR) and Deutsche Börse Frankfurt (MIC: XFRA).

The document at hand describes the principles of order handling, order matching and price determination as offered by the different trading forms typically available on the trading venue Deutsche Börse Xetra: auction, continuous trading, midpoint trading, trade entry services, trade-at-close and request for quote. This includes the prioritization of orders, the different order types and the transparency level, i.e. the type and the extent of information available to trading participants during trading hours. The different trading forms are applied in several trading models that are available on the trading venue Deutsche Börse Xetra, namely "Continuous Trading in Connection with Auctions", "Several Auctions or One Auction", "Midpoint Trading" and "Retail Auction".

The corresponding description of trading forms typically available on the trading venue Deutsche Börse Frankfurt is given in a separate document.

The ultimate and legally binding terms for trading at the Frankfurter Wertpapierbörse are laid down in the rules and regulations of the exchange, especially the "Börsenordnung" (Exchange Rules for the Frankfurter Wertpapierbörse (FWB)) and the "Bedingungen für Geschäfte an der Frankfurter Wertpapierbörse" (Conditions for Transactions on the Frankfurter Wertpapierbörse (FWB)). The document at hand serves as basis for the rules and regulations, which nevertheless may contain additional provisions and in particular may exclude or restrict the use of order and quote types described in this document.

[1] Exchange Traded Products (ETPs) include Exchange Traded Commodities (ETCs) and Exchange Traded Notes (ETNs).
[2] MIC = market identifier code according to ISO 10383

## 2 Fundamental Principles of the Trading Model "Continuous Trading in connection with Auctions"

The main trading model applied on the trading venue Deutsche Börse Xetra is "Continuous Trading in connection with Auctions". This trading model follows the principles described below that have been determined in the market model design process:

1. The trading model is order-driven. Available order types are market orders, limit orders, stop orders, iceberg orders, trailing stop orders and one-cancels-other orders. In addition, trading participants can enter quotes.

2. A trading day on the trading venue Deutsche Börse Xetra begins with the pre-trading phase when participants can enter orders and quotes for preparing the actual trading day and modify or delete their existing orders and quotes. The pre-trading phase is followed by the Extended Xetra Retail Service in the trading model "Retail Auction" during the Retail Early phase. Further, trading activities continue in the trading model "Continuous Trading in connection with Auctions" that starts with an opening auction, can be interrupted by an intraday auction and ends with a closing auction. These scheduled auctions consist of a Call Phase, a Price Determination and the Auction Volume Discovery (AVD) Uncrossing. In the case of a price determination with positive turnover in the closing auction, it is followed by Trade-at-Close supported for selected instruments. After the closing auction and possibly Trade-at-Close (in case of selected instruments), the Extended Xetra Retail Service is offered during the Retail Late phase. The trading day is concluded with the post-trading phase when new orders can be entered, and existing orders can be modified or deleted.

3. All whole-number order sizes are tradable, i.e. trading of fractions is not supported.

4. Orders are executed according to price/time priority, except during Trade-at-Close where only time priority applies, during the Retail Auction where price/RLP/time priority applies and Auction Volume Discovery, where Broker Internalization and surplus-volume-time priority applies.

5. Trading is anonymous, i.e. trading participants cannot identify which trading participant entered an order pre-execution. As all securities tradable on the trading venue Deutsche Börse Xetra are processed through a central counterparty (CCP), the anonymity extends to the settlement layer.

6. The order book is open. During the call phase of an auction, including Retail Auctions, the indicative auction price, indicative executable volume, the side of the surplus and the volume of the surplus are displayed if there is a crossed order book situation. In case of an uncrossed order book, only the accumulated volumes on at least ten price levels are displayed. The market depth depends on the interface used. During Trade-at-Close, the order book displays the only possible transaction price – the closing auction price for the trading session and the relevant instrument –, the cumulated volumes and number of orders. During the retail pre-call phase in the Retail Auctions in Early and Late Retail trading, the orderbook is open. All Retail orders that are applicable for these auctions and all Retail Liquidity Provider quotes and orders will be displayed. Any other order will not be displayed.

7. Both the last price of a security that has been determined in an auction as well as the last traded price at all serve as a reference price. In special cases, an "Implied Reference Price" is calculated from order book data if the last traded price is too old.

8. The following aspects must be taken into consideration in order to ensure price continuity and price quality:

   – A volatility interruption takes place if the potential next price lies outside a pre-defined price range around one of the reference prices.
   – Market orders are executed at the reference price (last traded price) in continuous trading 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 non-executed market orders are in the order book in continuous trading which are matched against incoming limit orders.
   – If during an auction/ Retail Auction price determination several prices are possible, as a last resort the price closest to the reference price (last traded price) may be determined.

9. The accounting cut-off is carried out daily subsequent to the post-trading phase.

# 3 Trading Participants

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

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

- Traders
  Traders are individuals admitted for trading as mentioned above. A trader can act as agent trader (account A), as riskless principal trader (account R), as proprietary trader (account P), as liquidity provider ("Designated Sponsor" or "Market Maker", account M), as Retail Member Organization (account B) or as Retail Liquidity Provider (account L)[3]. Orders will be flagged accordingly. Three hierarchy levels of traders are distinguished. Besides the trader, who can only maintain own orders, there is the Head Trader, who can maintain own orders as well as orders of all other traders within the same trader group, and the 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 authorized for trading (they assign and maintain authorization rights for the member's personnel). This category also includes personnel in settlement, operation and compliance as well as information users.

[3] The B account is equivalent to agent account and the L account is equivalent to the proprietary account, but RMOs and RLPs are registered for the Retail Execution Program and send their orders and quotes within the constraints of this service.

# 4 Provision of Additional Liquidity by Liquidity Providers

In the trading model Continuous Trading in connection with Auctions trading participants may act in the role of a Xetra Liquidity Provider, Regulated Market Maker, Designated Sponsor or Retail Liquidity Provider, increasing a security's liquidity by simultaneously offering to buy and sell, thereby improving the price quality of supported securities. These roles entail different level of privileges and obligations: A Designated Sponsor is a Regulated Market Maker with stricter requirements. In a private agreement with Deutsche Börse a Designated Sponsor commits to stick to these requirements for particular instruments and in turn benefits from transaction fee reimbursement as specified in Xetra price list. Xetra Liquidity Providers commit to providing passive liquidity in defined instrument baskets on top of the respective order books (at best bid / best offer price levels; "BBO"). To fulfill their requirements, Xetra Liquidity Providers, Market Makers and Designated Sponsors can use both orders and quotes. A Retail Liquidity Provider is appointed by the DBAG to provide Retail Liquidity Orders and Quotes in continuous trading during the main trading hours as well as in the Retail Auction during the extended trading hours.

All trading participants can enter quotes. Typically, quotes are sent as pairs of buy and sell limits, also referred to as Double-Sided Quotes[4]. T7 supports also Single-Sided Quotes, where only a quote with a buy-limit or with a sell-limit is entered for an instrument. 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 instrument, but only one quote per session. If a quote is entered through a session that already has a quote on the same side of the same security's order book, then the old quote is replaced by the new one. Quotes entered into the system are good-for-day.

Designated Sponsors and Regulated Market Makers have to provide double-sided quotes or corresponding orders for certain minimum times during the trading form continuous trading. Furthermore, Designated Sponsors are obliged to participate in auctions and volatility interruptions. Retail Liquidity Providers acting in the main trading hours do not have minimum times for orders and quotes and cannot participate in auctions and volatility interruptions. In contrast, Retail Liquidity Providers appointed for the trading model Retail Auction active during the extended trading hours, have to provide valid quotes or corresponding orders for certain minimum times and are obligated to participate in volatility interruptions.

Depending on a security's liquidity, Deutsche Börse AG defines requirements for the minimum quantity, the maximum bid/ask spread, the maximum response time, and the minimum time the quote or order has to remain in the order book. These requirements must be met so that the liquidity provision can be included in the Designated Sponsor's performance measurement. With respect to Market Makers only minimum quantity and maximum bid/ask spread requirements are relevant. For RLPs appointed to provide liquidity in the Retail Auction during the extended trading hours, requirements for the minimum quantity, the maximum bid/ ask spread and the minimum quotation time are applicable. In case of "stressed market conditions" the requirements are relaxed. During "exceptional market conditions" the requirements are repealed.

[4] 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.

The Xetra Liquidity Provider scheme defines Best Bid/Best Offer (BBO) presence and other performance criteria that Xetra Liquidity Providers have to fulfil to benefit from incentives defined under the scheme. T7 flags BBO-setting orders and quotes and sends feedback to the submitter (see T7 Functional Reference, section 4.1.7 for details).

In the trading model Continuous Trading in connection with Auctions every trading participant can enter a request for quote (RFQ) in a security. Requesters can thereby decide who will be informed about their RFQ: either all trading participants, or Market Makers and Designated Sponsors, or only the Designated Sponsors of the instrument for which the RFQ is sent.

Additionally, for each individual RFQ, trading participants will be able to decide if their business unit ID is disclosed to the target trading participants of the RFQ, i.e. to all trading participants, or to Market Makers and Designated Sponsors, or only to the Designated Sponsors of the instrument.

# 5 Order Types

All whole-number order sizes can be traded in Xetra, i.e. trading of fractions is not supported.

An order modification leads to a new time priority if either the limit or the minimum acceptable quantity (MAQ, available for midpoint orders only) 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.

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 instrument.

For orders flagged as “lean”, the receipt of status information messages is restricted to the session, through which the order had been entered. Furthermore, only such information messages may be recovered via a retransmission request that is about executions and about events which were not solicited by the owner of 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. Orders that are entered through a high-frequency session must always be lean and non-persistent.

## 5.1 Basic Order Types

Two basic order types are admitted for price determination in the various trading forms:

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

Depending on the order types, orders can further have specific execution conditions, validity constraints, and trading restrictions.

## 5.2 Additional Order Types

### 5.2.1 Stop Orders

In order to support 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, except for the trading restriction "Main Trading Hours" (MTH) for RMO Orders, see chapter 5.5.

### 5.2.2 Trailing Stop Order

A trailing stop order is a stop market order with a dynamic stop limit that is adjusted in relation to a reference price. Dynamic stop limits can be entered as an initial stop limit supplemented by either an absolute or percentage difference from the corresponding reference price ("trailing amount").

The dynamic stop limit is continuously monitored and adjusted according to the following rule: If the reference price of a trailing stop sell (buy) order rises (falls) in such a way that the trailing amount is exceeded (falls below), the dynamic stop limit is increased (decreased) to maintain compliance with the trailing amount. If the reference price of a trailing stop sell (buy) order falls (rises), the dynamic stop limit is not adjusted. If the reference price of a trailing stop sell (buy) order matches or falls below (rises above) the dynamic stop limit or the stop price is reached, the trailing stop order is triggered.

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

### 5.2.3 One-Cancels-Other Order

A one-cancels-other order is an order that combines the behavior of a limit order and a stop market order. On entry, it first behaves like a regular limit order. Once the trigger condition is fulfilled, the OCO order behaves like a stop market order, i.e., it receives a new priority timestamp and is converted to an incoming market order. If the limit order is fully executed or the stop market order is triggered, the respectively other order behavior will not be applied anymore. If the order is partially executed with limit order behavior, the stop market order behavior will be modified to match the remaining volume.

Execution conditions and trading restrictions are not supported for one-cancels-other orders.

### 5.2.4 Iceberg Orders

In order to enable trading participants to enter large orders into the order book without revealing the full volume to the market during continuous trading, 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 randomization of the peak volume on peak replenishment. Minimum peak value and minimum overall value of iceberg orders are specified per security.

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 minimum and maximum peak volume is specified the new peak volume is randomized. If the minimum peak volume is set to e.g. 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 minimum and maximum peak volume are not specified the initial peak volume is entered into the book.

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.

In auction trading, i.e. auctions, as well as volatility interruptions, iceberg orders are fully displayed and contribute with their overall volume.

### 5.2.5 Midpoint Orders

The midpoint order allows trading participants to attain execution at the midpoint of the current bid/ask spread prevailing in the Xetra central limit order book, and only while the respective instrument is in continuous trading in the trading model Continuous Trading in connection with Auctions (see chapter 8, in particular 8.1.3). Midpoint trading takes place in a separate order book. Therefore, in principle, midpoint orders interact only with other midpoint orders. However, trading participants also have the possibility to use “midpoint sweep orders” which are first executed to the highest possible quantity in the Xetra Midpoint order book immediately upon entry, and then automatically transferred into the central limit order book with their remaining quantity.

## 5.3 Execution Conditions

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

- An *Immediate-or-Cancel Order (IOC Order)* is an order, which is executed to the fullest extent possible immediately upon entry. Non-executed parts of an IOC order are deleted without entry in the order book. The condition IOC is applied to midpoint sweep orders in the Xetra central limit order book only.

- A *Fill-or-Kill Order (FOK Order)* is an order, which is fully executed immediately or cancelled. If immediate and full execution is not possible, the order is cancelled without entry in the order book. A Fill-or-Kill midpoint sweep order will first try to find a full execution in the midpoint order book. If unsuccessful, the full quantity will be added as a regular order in the central limit order book where the FOK condition is validated again. Therefore, midpoint sweep orders with “FOK” will never be partially executed, neither in the midpoint order book nor in the central limit order book.

Only in continuous trading, limit orders can alternatively be assigned the following execution condition:

- 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 sitting 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 will be 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. Midpoint orders with a BOC condition are automatically rejected by the trading system. For midpoint sweep orders, the BOC condition is only relevant for any full or remaining order quantity that enters the central limit order book.

## 5.4 Validity Constraints

The validity of orders can be determined by means of further constraints. To this effect, the market model offers the following variations.

- *Good-for-day (GFD):* Order only valid for the current exchange trading day.
- *Good-till-date (GTD):* Order only valid until an exchange trading day specified by the order submitter.
- *Good-till-cancelled (GTC):* Order only valid until it is either executed or deleted by the submitter or the system.

## 5.5 Trading Restrictions

By means of the following restrictions, it is possible to generally assign market and limit orders to all auctions scheduled in the auction plan or in particular to the opening, intraday or closing auction. The orders are displayed during the auction call phase and participate in the auction price determination.

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

For midpoint sweep orders, the trading restrictions mentioned above do not prevent a potential immediate execution in the midpoint order book. They are relevant only once the order, with its full or remaining quantity, enters the central limit order book. Midpoint orders with these trading restrictions are automatically rejected by the trading system.

Furthermore, it is possible to assign market and limit orders to the “Auction Volume Discovery (AVD) Uncrossing” consisting of the Broker Internalization Matching (only if also sent with a „Broker Internalization ID”) and the Auction Surplus + AVD Matching taking place immediately after the respective auction price determination by using the following trading restrictions:

- *AVD opening auction only:* Order is only valid in opening auctions (AVD Uncrossing)
- *AVD intraday auction only:* Order is only valid in intraday auctions (AVD Uncrossing)
- *AVD closing auction only:* Order is only valid in closing auctions (AVD Uncrossing)

Orders that use any of the aforementioned trading restrictions are only activated and considered for matching during the respective auction(s). With the activation either at the beginning of the call phase or with the AVD Uncrossing, respectively, a new time priority is assigned to the order. Among the activated orders the sequence of time priority corresponds to the sequence of order entry.

Orders with one of the AVD trading restrictions can only be "Good-for-day" (GFD). The AVD trading restrictions are not available for midpoint orders and midpoint sweep orders.

Additionally, the following trading restriction is available for RMO orders trading in the Xetra Retail Trading Service:

- *Main Trading Hours (MTH):* Order is only valid during the main trading hours

RMO orders that have this trading restriction can only be executed during the main trading hours. Stop orders with this trading restriction can only be triggered during the main trading hours.

In midpoint trading only, market midpoint orders and limit midpoint orders (but not sweep orders) can be assigned with the following trading restrictions:

- *Midpoint-Book-Only (MBO)* is a trading restriction for midpoint limit orders and midpoint market orders that ensures that the respective order is not executed immediately upon entry, even if a matching resting order is available on the counter side. Instead, the MBO-Order is written into the order book and may be passively executed in subsequent midpoint matches.
- A *Counterparty-Resting-Time* (CRT) Order is a midpoint limit order or midpoint market order that can only be executed against "CRT-eligible" orders on the counter side. CRT-eligible orders are midpoint orders which have been, at the time of the potential execution, resting passively on the midpoint order book for at least a defined uninterrupted time period (the "Minimum Marketable Resting Time" - MMRT) and, in case of limit midpoint orders, with a limit that allows for execution at every valid midpoint price during that period. An interruption of an order's marketable resting time takes place when
    - Midpoint trading is interrupted or ended
    - The order's limit price is modified or the current Midpoint price changes and as a result the order is no longer marketable at the prevailing (new) Midpoint price
    - The current Midpoint price changes and moves out of the volatility boundaries or no best bid and / or best ask limit is available in the CLOB

The two trading restrictions MBO and CRT can also be applied simultaneously.

## 5.6 Execution conditions for Trade-at-Close

Only market orders and limit orders, of any validity, can participate in Trade-at-Close. This includes midpoint sweep orders, if transferred to the central limit order book. Midpoint orders cannot participate in Trade-at-Close.

Market orders and limit orders participating in Trade-at-Close can be assigned any of the following execution conditions: IOC order, FOK order or BOC order.

Orders with the following trading restrictions cannot participate in Trade-at-Close: Opening auction only, Intraday auction only, Closing auction only, Auction only, AVD opening auction only, AVD intraday auction only, and AVD closing auction only.

## 5.7 Handling of Orders in Case of Events Affecting Prices

The exchange can interrupt or suspend trading in the event of extraordinary events affecting prices (e.g. company news). Such suspensions and interruptions are generally valid for Continuous Trading in connection with Auctions, Midpoint Trading as well as the Retail Auction. In case of suspension, orders existing in the system are deleted. In case of interruption, only non-persistent orders are deleted. Trading interruptions due to extraordinary events are different from volatility interruptions that are described in chapters 9.2.1 and 9.2.2.

Orders in the order books are deleted in the event of profits or a corporate action and/or an exchange at the end of the last trading day on which such security was last traded including the claim (cum-day) or, at the latest, at the start of trading on the trading day on which such security is traded excluding the claim (ex-day).

## 5.8 Cross Request

Crossings and pre-arranged trades in continuous trading are only allowed if the market has been informed in advance via the 'Cross Request' functionality detailing the instrument and quantity. Corresponding orders have to be entered into the open order book within 5 to 35 seconds after notifying the market. However, there is no guarantee that these orders will in fact be executed against each other. Any other trading participant, who has been informed by the Cross Request, can enter orders in the order book which in turn can be executed against the orders designated for the crossing. Crossings and pre-arranged trades during volatility interruptions, extended volatility interruptions as well as during auctions scheduled in the auction plan do not require prior notification of the market with a Cross Request in the trading model Continuous Trading in connection with Auctions.

Cross requests are not available for Midpoint Trading.

In the trading model auction (s. Auction7.1) there is in general no obligation for prior notification of crossings and pre-arranged trades.

## 5.9 Self-Match Prevention

Since the legal situation in the origin country of several members does not allow crossing at the same member level, neither intended nor unintended crossings, Deutsche Börse offers "Self-Match Prevention (SMP)". With the "Self-Match Prevention (SMP)" functionality, trading participants 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. Self-Match Prevention is available in the trading model Continuous Trading in connection with Auctions only.

### 5.9.1 Overview

The Self-Match Prevention functionality can be used via the optional order attributes CrossID and the Cross Match Instruction.

During continuous trading and Trade-at-Close, the trading system checks whether orders/quotes which are executable against each other are from the same trading business unit of a trading participant and are entered with the same CrossID. If this is the case the Self-Match Prevention Processing is started in accordance with the applicable Cross Match Instruction.

SMP processing is not offered during a volatility interruption, regular auction or retail auction.

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 processing even if the incoming order and the sitting order have the same CrossID and are entered by the same Business Unit.

By default, Self-Match Prevention is switched on for all members and uses the Cross Match Instruction "Cancel Passive".

By entering different values in the CrossID field, members have the flexibility to define different rules for orders and quotes.

### 5.9.2 SMP Process

If an incoming SMP order or quote with a CrossID is immediately executable, it will be checked if a matching order or quote exists with the same CrossID which was submitted by a trader of the same trading business unit (sitting SMP-Order). The Cross Match Instruction of the incoming order triggers the respective SMP process:

Cross Match Instruction "Cancel Aggressive": The incoming order will be deleted and the order with identical CrossID shown in the order book will remain without reducing its quantity.

Cross Match Instruction "Cancel Passive": The resting order(s) with identical CrossID shown in the order book will be deleted and the incoming order will not be reduced in quantity.

Cross Match Instruction "Cancel Aggressive and Passive": If this is the case then the match is prevented and the potentially matching quantities are removed for both orders. As soon as the incoming SMP-Order would match against a sitting SMP-Order at a certain price level, the following procedure is triggered:

- If the incoming SMP-Order's (remaining) quantity is equal to the quantity of the first sitting SMP-Order it hits, the incoming order is cancelled and the sitting order gets deleted as well.
- If the incoming SMP-Order's (remaining) quantity is smaller than the quantity of the first sitting SMP-Order it hits, then the incoming SMP-Order will be cancelled. The quantity of the sitting SMP-Order will be reduced by the incoming order's quantity.

- If the incoming SMP-Order's quantity is greater than the quantity of the first sitting SMP-Order it hits, the incoming order's (remaining) quantity will be reduced by the sitting SMP-Order's quantity and the sitting order is deleted. The incoming SMP-Order's then remaining quantity will match against other executable sitting orders on all acceptable price levels until it is fully executed or until it hits another sitting SMP-Order. In the latter case the described steps will be repeated. In case there is still quantity left from the incoming SMP-Order after all matching it will remain in the orderbook (except IOC orders).

The SMP Instruction "Cancel Aggressive and Passive" is not supported for Fill-or-Kill orders.

## 5.10 Midpoint Self-Cross Prevention

In Midpoint Trading, orders from the same business unit and with the same CrossID are subject to the Midpoint Self-Cross Prevention (Midpoint SCP) processing (see next sub-chapter). Midpoint SCP can be triggered at all times when trading participants can enter midpoint orders, also outside of continuous trading. Midpoint sweep orders only trigger the Midpoint SCP process in case they are in principle executable at the current midpoint price. For example, if a midpoint sweep limit order with a matching CrossID is entered and the limit is below (for buy orders) or above (for sell orders) the current midpoint price, the sweep order is transferred directly to the central limit order book in the trading model Continuous Trading in connection with Auctions without triggering the Midpoint SCP Process.

Regardless whether that order has triggered the Midpoint SCP Process, whenever a midpoint sweep order with a CrossID is transferred to the central limit order book in the trading model Continuous Trading in connection with Auctions, it may also trigger an SMP Process in the CLOB (see section 5.9.2).

The Cross Match Instruction (see section 5.9.2) is not relevant for Midpoint Self-Cross Prevention.

### 5.10.1 Midpoint SCP Process

Resting midpoint orders are automatically deleted with their full quantity as soon as another midpoint order or a marketable midpoint sweep order with the same CrossID from the same business unit and a "crossed" limit is entered on the other side of the midpoint order book or is modified in a way that leads to a crossed limit with the respective resting midpoint order. The quantity of the incoming (including modified) order remains unchanged and is executable against any midpoint orders from other business units, other trading participants, or the same business unit but marked for Midpoint SCP with a different CrossID or not marked at all.

The automatic deletion of the affected resting midpoint orders takes place irrespective of a potential actual execution against the incoming or modified order, i.e. the Midpoint SCP process does not take any order attributes other than the limits, nor the overall order book constellations, nor the current trading phase into account. In particular, the Midpoint SCP process is also triggered in case the incoming or modified order is passively written into the midpoint order book afterwards or if the incoming order has the execution condition "Immediate-or-Cancel", or the trading restriction "Midpoint-Book-Only" and / or "Counterparty-Resting-Time".

Incoming market orders trigger the deletion of all resting midpoint orders with the same CrossID and from the same business unit on the other side of the midpoint order book.

Resting midpoint market orders are deleted whenever a midpoint order or executable midpoint sweep order (with any limit, with the same CrossID and from the same business unit) is entering the midpoint book on the other side.

## 5.11 Pre-Trade Risk Limits

The Pre-Trade Risk Limits (PTRL) functionality allows trading participants, Clearing Members and the Exchange to set limits for long/short positions of a product that will be checked prior to the acceptance of an order or quote. In case a limit is breached, the incoming order or quote will be rejected.

Limits will be set as notional value, i.e. the quantity multiplied by a PTRL reference price per product. The PTRL reference price will be determined at the time of order/quote entry or modification and used as reference for the PTRL consumption calculation of open orders/quotes. Once an execution takes place, the execution price will be used to determine the PTRL consumption of the executed orders/quotes and the PTRL reference price will be used to reduce the open order/quote PTRL consumption.

The PTRL calculates in real-time how much of a given limit has already been consumed by incoming transactions and executions throughout the trading day.

For Xetra, the application scope is on-book trading (both, central limit order book and midpoint book combined):

- Per product.
- For each trade direction (buy and sell).

The PTRL consumption for a trade direction (buy or sell) consists of two components, being:

- The aggregated limit of all open orders and quotes per trading direction, and
- The netted position of all the trades relative to the trading direction.

The following parties can define PTRL thresholds:

- The exchange, for all business units.
- Clearing Members, for their own trading business unit, and for business units of their related clients (i.e. Non-Clearing Members, applicable for General Clearing Members only).
- Trading Business Units, for different user risk groups. Please note, that completed trades stay with the previous user risk group when the user risk group changes.

If an order or quote leads to the situation that the current PTRL consumption plus the incoming transaction's applicable limit would be exceeding the consumption limit, then this incoming order or quote is rejected.

Intraday changes to any PTRL definitions become effective immediately. When Pre-Trade Risk Limits are set for the first time by a Xetra Trading or a Xetra Clearing Member, these limits will become effective the next business day.

In case of a Market Reset, the restated orders are re-accumulated as open limits of the respective trading sides. Trade Reversals do not cause an update of the net position.

# 6 Trading Phases

A trading day begins with the pre-trading phase followed by the Retail Early trading phase, the main trading phase, the Retail Late trading phase and the post-trading phase. The system is not available for trading between the post-trading and pre-trading phase.

The pre-trading phase and the post-trading phase are the same for all securities whereas the course of the trading phase may vary from security to security. Individual securities may be traded in different trading models and at differing trading hours. Details regarding potential definition of trading models during the main trading phase are given in chapter 8.

## 6.1 Pre-trading Phase

Trading participants can enter orders and quotes for preparing the actual trading day and modify or delete their existing orders and quotes. Trading participants do 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 Retail Early Trading Phase

During this phase the Extended Xetra Retail Service is available. Only orders from RMOs and quotes/ orders from RLPs can be executed during the Retail Early according to the trading model Retail Auction. Details regarding the trading model Retail Auction are provided in Chapter 8.4.

Non-retail trading participants can enter orders and quotes for preparing the actual trading day and modify or delete their existing orders and quotes during the Retail Early as during the pre-trading.

## 6.3 Main Trading Phase

Individual securities can be traded in different trading models in the main trading phase. During the main trading hours orders are matched according to the respective trading form. Details regarding potential trading models applicable during the main trading phase are given in chapter 8.

Particular trading model information specific to subscription rights trading is given in chapter 10.

## 6.4 Retail Late Trading Phase

During this phase the Extended Xetra Retail Service is available. Only orders from RMOs and quotes/ orders from RLPs can be executed during the Retail Late according to the trading model Retail Auction. Details regarding the trading model Retail Auction are provided in Chapter 8.4.

Non-retail trading participants can enter new orders and modify or delete their existing orders for preparing the following trading day during the Retail Late as during the post-trading.

## 6.5 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. Trading participants do 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 are accepted if they fit the respective trading form on the following trading day with regards to possible execution restrictions and validity constraints. During post-trading no matching of orders is conducted.

# 7 Trading Forms

Generally, the market model includes the trading forms auction, continuous trading, midpoint trading and Trade-at-Close for on-exchange trading. These trading forms can be combined to different trading models, which are described in chapter 8. Additionally, a functionality for off-book trading, a functionality to enter OTC transactions and a request for quote functionality are provided.

## 7.1 Auction

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. Resting BOC orders are deleted when an auction is triggered. During auctions, incoming BOC orders are rejected.

The price in auctions is determined according to the principle of most executable volume (for the Retail Auction – the modified principle of most executable volume). At the same time, price/time priority (for the Retail Auction – price/RLP/time priority) is valid so that the maximum of one order, which is either limited to the auction price or is unlimited, can be partially executed. The order book is open during an auction. During the call phase, the indicative auction price, indicative executable volume, the side of the surplus and the volume of the surplus (Market Imbalance Information) are displayed if there is a crossed order book situation. In case of an uncrossed order book, only the accumulated volumes at each price level are displayed. Trading participants are informed via an auction plan about the time the individual security is called. The Retail Auction is scheduled during the extended trading hours. Conditions for the retail call triggering during the Retail Auction are explained in more detail in Chapter 8.4.

Scheduled Auctions in the trading model “Continuous Trading in Connection with Auctions” (i.e. all Opening Auctions, Intraday Auctions and Closing Auctions) have an Auction Volume Discovery (AVD) Uncrossing after the regular auction processing. The AVD Uncrossing consists of two distinct steps. The first step is the Broker Internalization matching and the second step is the general AVD matching, which also includes the eligible surplus from the previous regular auction matching (more details in Chapters 8.1.1, 8.1.2, 8.1.4 and 8.1.5). In the AVD Uncrossing, qualifying orders from the auction surplus as well as AVD orders are executed at the previously determined auction price. The AVD uncrossing is not a separate phase but a part of the general price determination process at the end of an auction (although AVD orders do not participate in the auction call phase and price determination).

## 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.

## 7.3 Midpoint Trading

Each new incoming midpoint order (except for "Midpoint-Book-Only", stand-alone or in combination with "Counterparty-Resting-Time") and midpoint sweep order is immediately checked whether it is executable against orders on the other side of the Xetra midpoint order book, potentially also in combination with other resting orders on the same side as the incoming order. The execution price in the midpoint order book is always the current midpoint of the Xetra bid/ask spread in the central limit order book during continuous trading. Retail Liquidity Provider quotes (see chapters 3 and 4) are not considered for the determination of the midpoint price.

## 7.4 T7 Entry Service (TES) based Trading Phases

All trading participants have the possibility to execute off-book transactions with bilaterally agreed price and quantity in T7 using the T7 Entry Service (TES Type LIS) and to enter OTC transactions in T7 using the T7 Entry Service (TES Type OTC).

### 7.4.1 Off-Book Trading (T7 Entry Service – TES Type LIS)

TES Type LIS is designed to execute pre-arranged off-book transactions under the rules of the exchange (on-exchange off-book). Off-book transactions are required to be above a minimum volume defined by the FWB management board (large-in-scale). The volume and the quantity of the transaction is validated against risk limits defined by the trading participant. The transaction price is checked for a maximum deviation from the reference price to ensure price quality. Post-trade publication is ensured by the exchange.

In principle, off-book transactions can be executed in all instruments available for on-book trading in T7. Order information for off-book transactions can be entered by traders and other TES enabled users. Additionally, order information can be entered by a third trading participant which is not a counterparty of the transaction. Order information is only displayed to the counterparties of the transaction and to the third trading participant who entered the order information (if applicable).

Entered order information for off-book transactions has to be approved by traders of both counterparties of the transaction. The approval process can take place manually or automatically. Subsequently, the orders are matched and both counterparties receive a trade confirmation generated by the system. Unconfirmed order information is automatically deleted by the system at the end of off-book trading. T7 transmits all executed off-book transactions to the settlement systems for subsequent clearing and settlement processing.

It is not possible to execute cross trades using TES Type LIS. Trading participants can agree on a settlement date deviating from standard settlement period. TES Type LIS prices do not update the reference price for on-book trading.

### 7.4.2 OTC (T7 Entry Service – TES Type OTC)

TES Type OTC is designed to enter pre-arranged transactions to initiate clearing and settlement via FWBs post-trade infrastructure. OTC transactions can be entered for any volume. Entries are not subject to any validations regarding volume, quantity or price. Post-trade transparency has to be ensured by the respective trading participants.

In principle, OTC transactions are possible for all instruments available for on-book trading in T7. OTC transactions can be entered by traders and other TES enabled users. Additionally, OTC transactions can be entered by a third trading participant which is not a counterparty of the transaction.

Entered OTC transactions have to be approved by traders of both counterparties of the transaction. The approval process can take place manually or automatically. Subsequently, both counterparties receive a trade confirmation generated by the system. Unconfirmed transactions are automatically deleted by the system at the end of off-book trading. T7 transmits the approved OTC transactions to the settlement systems for subsequent clearing and settlement processing.

It is not possible to enter cross trades using TES Type OTC. Trading participants can agree on a settlement date deviating from standard settlement period.

## 7.5 Trade at Close

Trade-at-Close is triggered after the AVD Uncrossing if the closing auction concluded with a price determination with a positive turnover. It is available for selected instruments. During the period, existing and new incoming market orders and limit orders, as well as midpoint sweep orders that are transferred to the central limit order book, with a price limit better than or equal to the closing auction price and which have opted-in will participate in Trade-at-Close. Stop orders, trailing stop orders, one-cancel-other orders, iceberg orders and midpoint orders cannot participate in Trade-at-Close. Orders with any of the trading restrictions described in Chapter 5.5 to participate in auctions only or in an AVD Uncrossing only do also not participate in Trade-at-Close.

Matching can only take place at the closing auction price of the trading session for the relevant instrument. For each new incoming order it is immediately checked whether it is executable against orders on the opposite side of the order book. The execution of orders during Trade-at-Close follows time priority only. In this trading form, the order book is open. The closing auction price – the only execution price possible – and accumulated order volumes and the number of orders in the book are displayed.

Orders not participating in Trade-at-Close are not affected.

## 7.6 Xetra EnLight

### 7.6.1 Basic Request for Quote Workflow

A member (requester) initiates a Request for Quote (RFQ) event by sending an RFQ to one or several registered market makers (respondents) specifying instrument, quantity, settlement period and optionally a side. Optionally, requesters can disclose their clients to the respondents.

Requesters are able to define a maximum duration of the RFQ event in which respondents can enter quotes and requesters can accept quotes. The duration has to be equal to or less than a maximum duration defined by the system.

In principle RFQ events can be initiated for all instruments available for on-book trading in T7. Only traders are able to enter RFQs. RFQs are only transparent to the selected respondents.

Respondents registered for the specific ISIN may respond to the RFQ by sending a quote or reject the RFQ. The quote has to be of the same quantity as the RFQ. The limits of the quote are validated for a maximum deviation from the best bid and ask limit of the Continuous Trading in connection with Auctions orderbook to ensure price quality. In case there is no valid best bid and/or best ask limit (e.g. in auctions) the reference price is used to validate for the maximum deviation. Quotes are always firm and can be continuously updated. Additionally, responders can define a time after which quotes are automatically deleted. If the side of the RFQ was specified by the requester the respondent may only enter a quote with the respective side matching the RFQ (if the RFQ is a bid the quote has to be an ask and vice versa). Quotes are only transparent to the requester.

RFQs and quotes are required to be above a minimum volume defined by the FWB management board. The volume and the quantity of the RFQ and the quotes are validated against risk limits defined by the trading participant.

The requester can accept the best quote. In case more than one quote provides the best bid/ask the quote to be executed is randomly assigned by the system. Additionally, requesters can select a quote manually, even if the quote is inferior. The requester is able to enter a limit when accepting the best quote. The potential price is checked for a maximum deviation from the best bid and ask limit of the Continuous Trading in connection with Auctions orderbook to ensure price quality. In case there is no valid best bid and/or best ask limit (e.g. in auctions) the reference price is used to check for the maximum deviation.

After accepting a quote, the trade is executed and the requester and the respondent who submitted the selected quote receive a deal confirmation and subsequently a trade confirmation. The remaining open quotes expire automatically upon execution of the trade. RFQ prices do not update the reference price for on-book trading.

Running RFQ events can expire in case the requester cancels the event, the requester accepts a quote or the maximum duration is up.

### 7.6.2 Smart Request for Quote

In addition to the regular RFQ, members are able to send RFQs to other members which are registered as Smart Respondents. Smart Respondents receive RFQs if their execution probability calculated for the specific ISIN is high. The execution probability for the members in the specific ISIN is calculated based on trade and post-trade data. Smart Respondents are not transparent to the requester and vice versa.

### 7.6.3 AutoEx

The AutoEx functionality allows requesters to pre-define conditions for accepting a quote already while the RFQ is initiated. Potential conditions are a limit and / or minimum number of quotes available for execution. Additionally, a quote collection duration can be defined. The limit can be specified as a dedicated limit or as a reference price (pegged limit). As reference price the best bid, best ask and the midpoint of the respective Continuous Trading in connection with Auctions orderbook at the end of the quote collection window can be selected by the requester. Only a dedicated limit can be updated during the quote collection duration. In this case the quote collection duration is not restarted.

After the quote collection duration ends, the system validates if both conditions for AutoEx are fulfilled. If the AutoEx conditions are met, the best quote is automatically accepted by the system. In case there is more than one best quote available, the quote to be accepted is randomly selected by the system. Manual selection is not possible. If the conditions are not met, the RFQ event expires.

# 8 Trading Models

The following trading models are available for securities on Xetra:

- Continuous Trading in connection with Auctions (an opening auction, intraday auction, and a closing auction)
- Auction (several auctions or a single auction)
- Midpoint Trading (only in combination with Continuous Trading in connection with Auctions)
- Retail Auction (available only for the Extended Xetra Retail Service during the extended trading hours)

## 8.1 Continuous Trading in Connection with Auctions

The trading phase 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. At the end of continuous trading, the closing auction is initiated. In the case of a closing auction with price determination with positive turnover, Trade-at-Close starts for selected instruments.

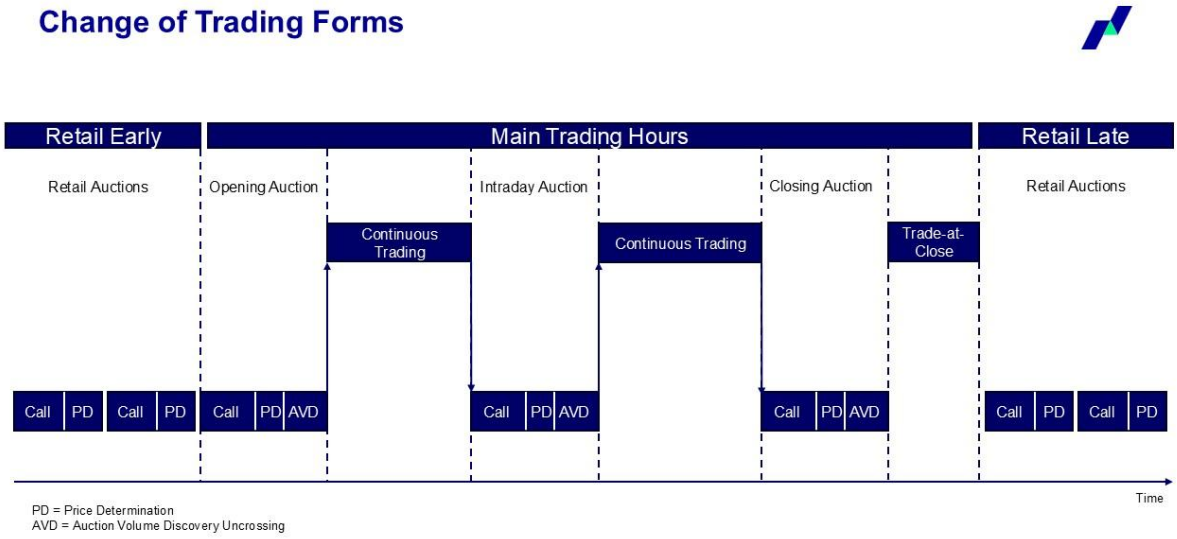



Figure 1: Change of trading forms

Trading participants are informed via an auction plan about the time securities are called during the Main Trading Hours.

### 8.1.1 Scheduled Auctions (Opening Auction, Intraday Auction, Closing Auction)

The three types of scheduled auctions in the trading model "Continuous Trading in Connection with Auctions" all work in the same way. They take place at different times during the trading day, and it is possible for trading participants to enter orders designated for each of them or for all scheduled auctions within the order validity period. Such orders will only participate in the respective auction(s), but not in other trading phases.

A scheduled auction comprises of a call phase, the price determination and the AVD Uncrossing.

The auction begins with a call phase. Trading participants can enter orders and quotes in this phase as well as modify or delete their own existing orders and quotes.

The current order book situation on all price levels is disseminated continuously during the call phase. Iceberg Orders are shown with their total volume. The market depth that is visible to the trading participant depends on the market data interface being used. In addition, the indicative auction price is displayed when orders are executable, i.e. if there is a crossed order book situation. This is the auction price that would be realized if the price determination was concluded with this state of the order book at this time.

Furthermore, in case of a crossed order book during the call phase, the executable volume for the indicative auction price, the side of the auction surplus (bid or ask, if any) and the volume of the surplus are displayed.

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

At the end of the call phase, all participating executable orders are matched in the price determination of the auction, thus resolving the crossed order book situation (i.e. no more price overlapping of bid/ask orders after the execution). The resulting auction price is the price at which the overall executed volume is maximized and the auction surplus is minimized. If there is more than one price limit meeting the beforementioned criteria, further criteria will be taken into consideration for the determination of the auction price. Time priority ensures that the maximum of one order limited to the auction price or unlimited is partially executed, but of course the auction surplus may comprise more than one order.

All executable orders that could not be matched with their full quantity due to lack of liquidity on the other side of the order book are part of the auction surplus (market imbalance) and participate in the subsequent AVD Uncrossing, if not opt-ed out, together with all orders that are designated to AVD Uncrossing in the respective auction. AVD Orders are activated with the AVD Uncrossing and executed immediately at the previously determined auction price. The resulting trades from the auction price determination and the AVD Uncrossing are published with the same execution time stamp. However, in case the determined auction price would be outside the static or dynamic volatility range, the activation of AVD Orders and the AVD Uncrossing would be shifted to the end of the triggered volatility interruption or the subsequent extended volatility interruption (see chapter 9.2.2), based on the respective price determination. Therefore, AVD orders are not included in the order book information that is disseminated during the call phase of the auction or subsequently triggered volatility interruption, respectively.

In the AVD Uncrossing, AVD Orders from the same trading participant that are marked with identical Broker Internalization IDs are executed against each other with highest priority. Remaining AVD Orders, including remaining quantities from AVD Broker Internalization matching, are matched with the auction surplus (if available; trading participants also have the possibility to opt out from the AVD Uncrossing for their orders that participate in the call phase and might become part of the surplus) and against other AVD Orders.

AVD Orders can also be entered, modified or deleted during the call phase or any time before on the same trading day, but they are only activated immediately after the auction price determination. They do not participate in the auction price formation and therefore they are not reflected in the disseminated order book situation during the call phase.

AVD Orders that cannot be executed are deactivated at the end of the respective auction and do not participate in any other trading phases. All other market orders and limit orders which were not or only partially executed, are forwarded to the next possible trading phase according to their trading restrictions. Iceberg orders are transferred to continuous trading with only their respective peak shown in the order book.

For details of price determination and matching rules in auctions, including the AVD Uncrossing, see chapter 11.1.

For designated instruments an auction price without turnover may be determined in case there is no crossed order book situation at the end of the call phase. This auction price without turnover would not trigger any stop orders nor update any trailing stop orders, but would update the reference price. An AVD Uncrossing would not be triggered in such a case either. This auction price without turnover may be determined at the midpoint of the available best bid and best ask at the end of the auction, given it does not deviate too much from the dynamic or static reference price and/or designated sponsor quotes are present in the order book. If these prerequisites are not fulfilled no price without turnover will be determined.

### 8.1.2 Opening Auction

An opening auction is carried out prior to continuous trading. All orders still valid from the previous day or which have already been entered on the current trading day participate in the auction call phase and price determination unless their execution is restricted to the intraday auction or the closing auction. Quotes are also taking part in the opening auction. Iceberg orders are considered with their overall volume. AVD Orders dedicated to the opening auction (“OA AVD Orders”) do not take part in the auction call phase, but the AVD Uncrossing. Continuous trading starts after the end of the opening auction.

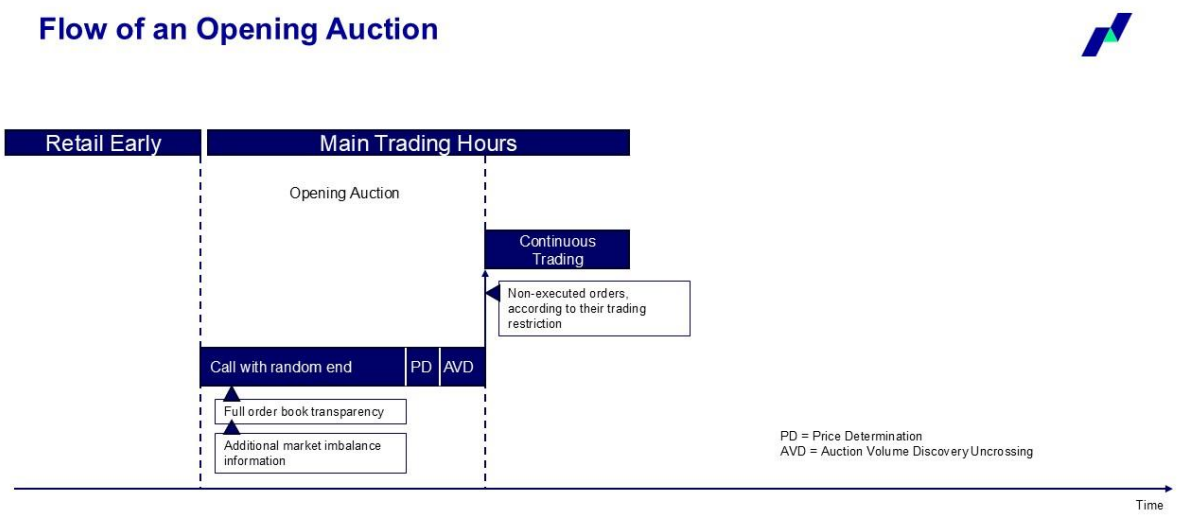



Figure 2: Flow of an opening auction

### 8.1.3 Continuous Trading

Continuous trading is started after the termination of the opening auction.

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 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 none at all, one or more trades. 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 orders with lower limits. Vice versa, sell orders with a lower limit take precedence over 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.

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

#### 8.1.3.1 Continuous Trading Retail during the Main Trading Hours

Retail flagged orders from registered Retail Member Organizations (RMO) are executable against the quotes / orders according to price / time priority. The quotes / orders of the liquidity providers are displayed to the market (dedicated data product via CEF). If the retail flagged orders from registered Retail Member Organizations (RMO) are still unexecuted on the visible order book and become executable again against the quotes / orders of a Retail Liquidity Provider (RLP), then they are matched against the quotes/orders of the Retail Liquidity Provider (RLP). Orders and quotes from Retail Liquidity Providers (RLP) are not matched against each other. To ensure general order book consistency, orders and quotes, which cause crossed order book situations, will be improved to the best bid/ask on the other side of the order book. Orders and quotes from Retail Liquidity Providers (RLP) participate in Continuous Trading Retail, but not in other trading forms like auctions during the Main Trading Hours.

### 8.1.4 Intraday Auction

The start of an intraday auction interrupts continuous trading. The intraday auction features a call phase followed by the price determination and an AVD Uncrossing (see chapter 8.1.1 for details). All orders and quotes in a security are automatically concentrated in one order book. This is valid for those orders and quotes which were taken over from continuous trading as well as for those which were entered in the order book for auctions only, for intraday auctions only or were entered during the call phase of the intraday auction. All iceberg orders entered in the order book are also taking part in the intraday auction with their full volume. Resting BOC orders are deleted at the start of the intraday auction. Orders that are designated to the intraday auction AVD Uncrossing ("IA AVD Orders") only participate in the AVD Uncrossing. In the exceptional case of more than one intraday auction on the same trading day, unexecuted AVD Orders designated for intraday auctions will only participate in later intraday auctions as well in the respective AVD Uncrossing.

Continuous trading resumes after the end of the intraday auction.

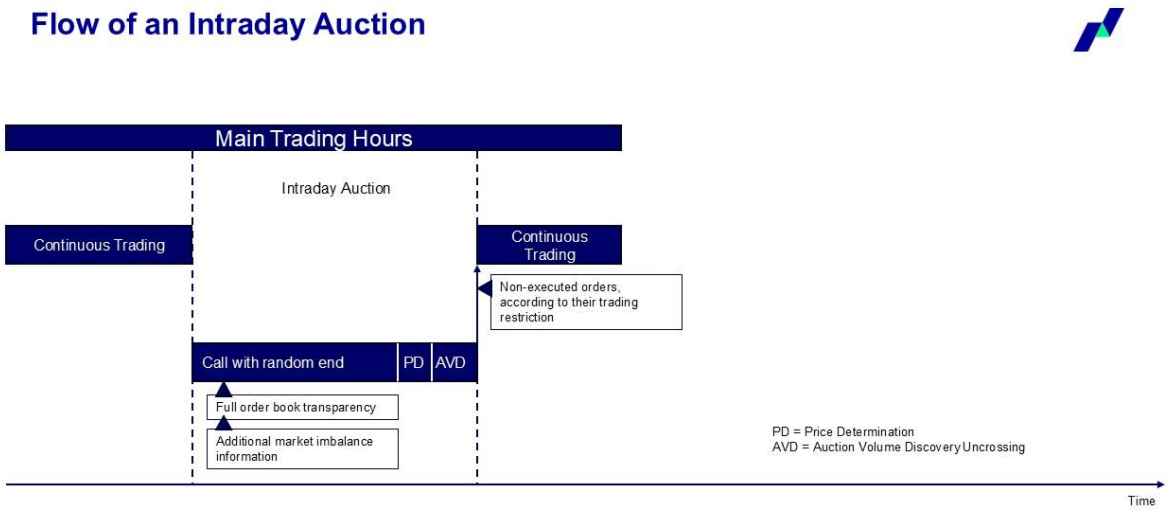



Figure 3: Flow of an intraday auction

### 8.1.5 Closing Auction

Continuous trading is followed by the closing auction. The closing auction also has a call phase and ends with the price determination and an AVD Uncrossing (see chapter 8.1.1 for details).

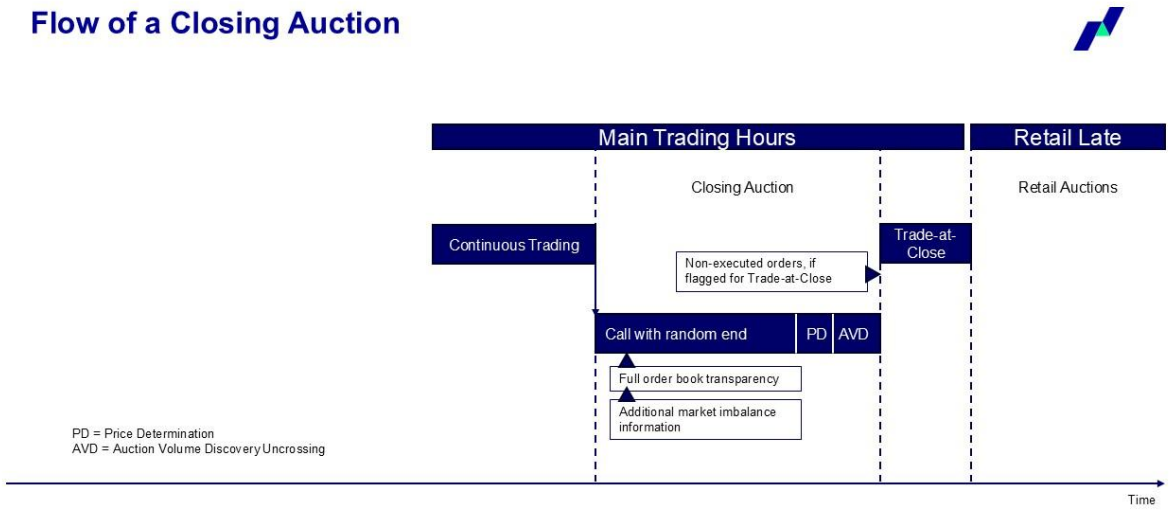



Figure 4: Flow of Closing Auction

In the closing auction, all available orders are concentrated in one order book. This applies to orders and quotes taken over from continuous trading as well as to 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 are also taking part in the closing auction with their full volume. Resting BOC orders are deleted at the start of the closing auction. Orders that are designated to the closing auction AVD Uncrossing (“CA AVD Orders”) only participate in the AVD Uncrossing.

After price determination, non-executed or only partially executed orders (except for AVD Orders) are transferred either to the Retail Late (for RMO orders not restricted to MTH) or to the next trading day according to their validity. Orders which are opted in and fulfill the criteria are transferred to Trade-at-Close. 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 the trading day.

### 8.1.6 Trade-at-Close

Trade-at-Close is triggered for selected instruments automatically after the termination of the closing auction if the latter concluded with price determination with positive turnover. During Trade-at-Close the order book is open, thus displaying the only possible matching price – the closing auction price - and the accumulated order volumes and the number of orders in the book. Note that because Trade-at-Close has a fixed end time, potential volatility interruptions and extended volatility interruptions might exceed the end time; in that case the Trade-at-Close will not take place for the relevant instrument.

Participation to Trade-at-Close is conditional to an opt-in flag set up to True on a Trader ID level and/or on order level. After the closing auction, unexecuted market orders and limit orders with price limit better or equal to the closing auction price and which are opted in will roll over from the closing auction to Trade-at-Close. New orders (only market orders and limit orders with price limit better than or equal to the closing auction price and which are opted in) can be entered during Trade-at-Close to participate in the session. Each 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 time priority only since matching takes place at a single price: the closing auction price. Hence the price limit attached to the limit orders determines if the order can participate or not to Trade-at-Close but does not subsequently infer on the execution priority. Similarly, market orders do not have priority over limit orders in the order book as time priority applies identically to all orders. Orders can either be executed fully, partially or not at all, thus generating none at all, one or more trades. Orders, which were not or only partially executed, are entered into the order book and sorted according to time priority.

Stop orders, trailing stop orders, one-cancel-other orders and iceberg orders cannot participate in Trade-at-Close. Orders not participating in Trade-at-Close are not affected.

Rules for order matching during Trade-at-Close are described in more detail in chapter 11.

## 8.2 Several Auctions or One Auction

If the trading of a security is limited to auctions, this/these auction(s) consist(s) of two phases, i.e. call phase and price determination. AVD Uncrossing is not offered in this trading model. In contrast to the procedure for the opening auction or intraday auction during continuous trading, orders which have not been executed remain in the order book until the next auction. Continuous trading does not take place. An auction plan informs trading participants about the time the individual securities are called.

The auction price cannot be determined if no orders are executable. In this case, the best bid/ask limits are displayed along with the accumulated volumes at these limits and the remaining orders are transferred to the next auction according to their validity.

## 8.3 Midpoint Trading

Selected, eligible instruments that are tradable on Xetra in the trading model "Continuous Trading in connection with Auctions" (see chapter 8.1), are also available for Midpoint Trading.

Orders in the Xetra Midpoint order book are not displayed – it is "dark". Pre-trade transparency is omitted under a Reference Price Waiver according to MiFIR Article 4(1) a). Trading participants can enter midpoint orders and midpoint sweep orders to participate in Midpoint Trading. Midpoint orders and Midpoint sweep orders can be entered during the pre-trading, Retail Early, main trading, Retail Late and post-trading phases (see chapter 6). However, executions only take place while the respective instrument is in continuous trading (see chapter 8.1.3).

Midpoint orders can only be executed in the Xetra Midpoint order book, whereas midpoint sweep orders are immediately executed in the Xetra Midpoint order book to the largest possible extent and their remaining quantity is automatically transferred to the central limit order book in the trading model "Continuous Trading in connection with Auctions". Midpoint orders can be assigned a "minimum acceptable quantity" (MAQ) by the trading participant. Partial executions of an order below its MAQ are prevented.

Every execution in the Xetra Midpoint order book takes place at the current Midpoint between the best bid and the best offer (BBO) price level taken from the central limit order book for the same instrument at the exact time of the execution. Optionally, midpoint orders and midpoint sweep orders can be entered with a limit, which, in contrast to other order types, is not considered for price determination but only serves as cap (floor) limiting the price at which a buy (sell) order may be executed in the Xetra Midpoint order book. For midpoint sweep orders, if transferred to the central limit order book, the limit is considered for price determination as described in chapter 8.1.

Order processing and matching for Midpoint Trading and Continuous Trading in connection with Auctions is synchronized in the sense that midpoint sweep orders are processed fully (potential immediate execution in the Xetra Midpoint book, automated transfer into and potential immediate execution of remaining quantity in the central limit order book, and potential update of the Midpoint price) before the next incoming order – to the Xetra Midpoint order book or directly to the central limit order book – is processed.

Orders in the Xetra Midpoint order book are executed by determining the highest overall executable volume under consideration of volume/time priority and order-specific MAQs, as well as the individual marketable resting times of executable midpoint orders if midpoint orders with CRT trading restrictions are involved. Due to the MAQs and CRT trading restrictions, matching allocations in which strict volume/time priority is disregarded may occur, e.g. for the purpose of optimizing the overall executable volume or for releasing an executable order book situation blocked by an individual MAQ. Midpoint matching is triggered by both, incoming midpoint and midpoint sweep orders, as well as changes of the BBO in the central limit order book that change the prevailing Midpoint price. Midpoint matching is only performed while the instrument is in continuous trading (in the trading model "Continuous Trading in connection with Auctions") and a Midpoint price can be determined that is within the pre-defined price ranges at which no volatility interruption is triggered (see also chapter 9). Otherwise, midpoint orders can be entered but they are neither executed, nor do they trigger a volatility interruption; sweep orders are transferred directly to the central limit order book in the trading model Continuous Trading in connection with Auctions.

Trades concluded in Midpoint Trading are published immediately. They do not lead to a new reference price. Therefore, they do not trigger stop orders, either.

Trading participants can use “Midpoint Self-Cross Prevention” (see chapter 5.10) to preclude situations where crossed orders in the Midpoint book (also if currently not executable) exist from the same business unit and the same ID.

## 8.4 Retail Auction

The Retail Auction is a mini-auction trading model that is available for the Extended Xetra Retail Service during the extended trading hours (i.e. the Retail Early and Late trading phases). In general, all instruments tradable on Xetra are eligible for the Extended Xetra Retail Service. Retail orders from members registered as Retail Member Organizations (RMOs) and quotes/ orders from members registered as Retail Liquidity Providers (RLPs), if not restricted to MTH, can be executed during the extended trading hours. All other orders cannot participate. Each instrument must be supported by at least one RLP. There can be more than one RLP providing liquidity for one instrument. RMO orders can be executed against RLP quotes/ orders and other RMO orders. RLP orders/ quotes can only be executed against RMO orders.




Figure 5: Overview of a Trading Day

The Retail Early and Late trading phases consist of a series of interchanging retail pre-call and retail call phases. A retail call phase is triggered by a crossed orderbook situation and ends after a pre-defined duration plus random end. After the end of the retail call, the system switches back to the retail pre-call (i.e. after the price determination or if the order book is not crossed anymore). There can be none, one or several auctions per day and per instrument. During the retail pre-call and the retail call, RMO orders and RLP quotes/ orders are transparent and can be entered, deleted or modified.

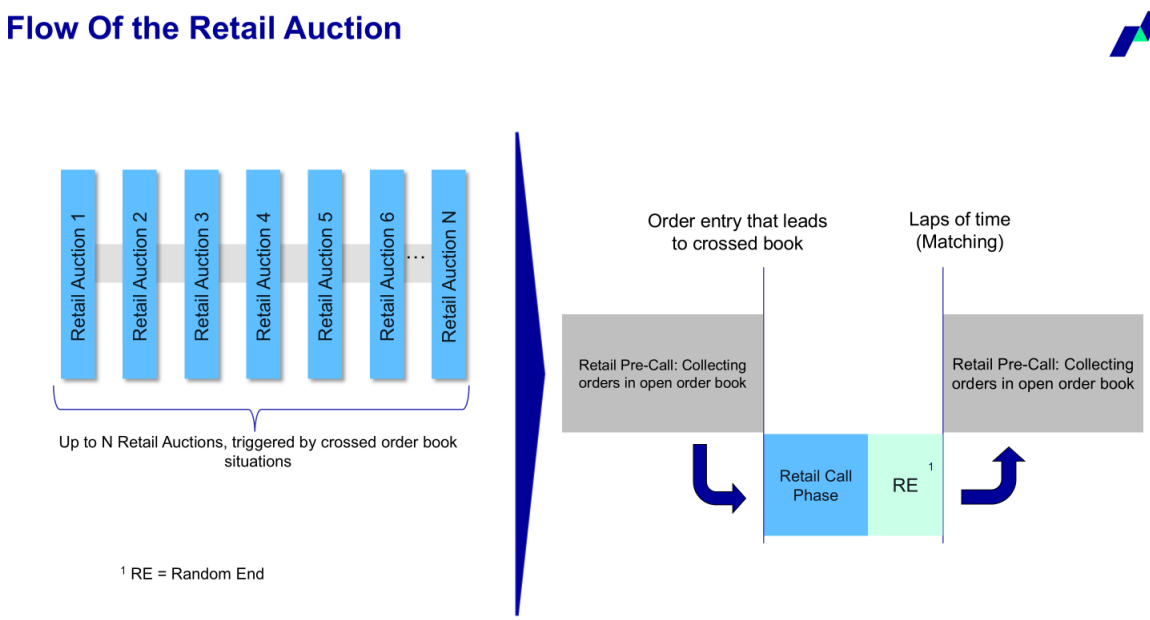



Figure 6: Flow of the Retail Auction

Matching in the Retail Auction always requires the availability of the respective RLP orders/ quotes. The retail auction price is the price with the highest executable order volume and the lowest surplus at or within the RLP quote spread (the modified principle of the highest executable volume). RMO orders and RLP orders/ quotes are executed according to price/RLP/time priority. Rules for the price determination during the Retail Auction are described in more detail in chapter 11.

In the retail pre-call phase Bid/ Ask limits of RMO orders and RLP orders/quotes with the respective accumulated volumes are displayed to the market (no explicit distinction between RMO orders and RLP orders/ quotes). The market depth depends on the interface used. In the retail call phase (incl. the retail volatility interruption) the order book is open. Additionally, the indicative auction price, the potentially executable quantity, the side and the volume of the surplus are disclosed if matching at or within the RLP quote spread is possible. If matching is not possible, the existing RMO Orders and RLP quote(s)/ order spread(s) is (are) accumulated and displayed per price level. Further, a volatility indicator is displayed if during the retail call phase the indicative auction price lies outside the respective boundaries. Retail Auction prices are Xetra prices marked with the retail flag.

RMO orders not executed during the extended trading hours will be transmitted to the next trading phase (e.g. the main trading phase or the Retail Early) and can be executed there.

The execution conditions IOC, FOK and BOC are not available in the Retail Auction. AVD Uncrossing is also not available in the Retail Auction.

# 9 Safeguards

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

A volatility interruption can occur in auctions and continuous trading. The subsequent section 9.1 details the fundamental principles of the safeguards before section 9.2 details the implementation in the specific trading forms.

## 9.1 Fundamental principles of the safeguards

The volatility interruption shall strengthen the price continuity of determined prices. Therefore, trading is interrupted by an additional unscheduled auction price determination according to the principle of most executable volume in case the potential next price would deviate too much from previously determined references prices. There are two volatility interruption models available for the trading model Continuous Trading in connection with Auctions: the Single Volatility Interruption Model and the Automated Corridor Expansion (ACE) Volatility Interruption Model. Each of the two volatility interruption models can be assigned to each instrument for each trading phase individually.

Volatility interruptions can be initiated in two ways:

- The potential next price lies outside the ”dynamic” price range around the reference price (see Figure 7: Dynamic and Static Price Range). The reference price (reference price 1) for the dynamic price range is the last traded price of a security, 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 only after an incoming order has been matched as far as possible against orders in the order book. Executions in the Midpoint order book do not lead to an adjustment of the reference price and do not trigger volatility interruptions. However, Midpoint executions outside the dynamic price range are prevented by the trading system. As a special case, in the ACE Volatility Interruption model only, the dynamic price range in the closing auction uses an “Implied Reference Price” (as reference price 1) if the last traded price is older than a defined “calculation period”. In that case, the time-weighted average of all mean values of best bid and best offer prices that have been displayed in the order book during the calculation period serves as the reference price, provided that, during the calculation period, the respective instrument has been constantly traded in continuous trading and a best bid and best ask limit was simultaneously available in the order book for a minimum fraction of the time.

- The potential next price lies outside the ”static” price range, which has been defined additionally. This wider static price range defines the maximum percentage or absolute deviation of an additional reference price (reference price 2) which generally 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 last traded price determined on a previous trading day, not including Midpoint trades, is taken as 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. Midpoint executions outside the static price range are prevented by the trading system.

The static and dynamic price ranges define the maximum percentage or absolute deviation (symmetrically positive and negative) of the respective reference price in a security. In the Single Volatility Interruption Model the static and dynamic price ranges are stipulated and published individually for each security, in the ACE Volatility Interruption Model these price ranges as well as the specific percentages used for the expansion of the ACE price corridors are specified and published for different security clusters.

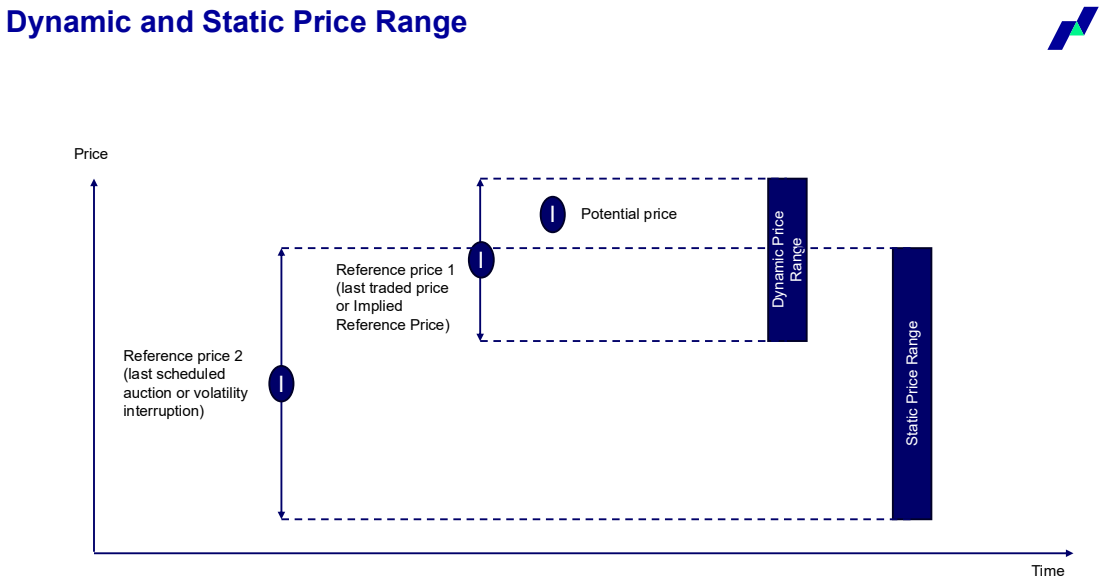



Figure 7: Dynamic and Static Price Range

During continuous trading as well as in auctions the potential execution price is checked against the volatility interruption requirements. If the respective requirements are met, a single volatility interruption or an ACE volatility interruption is initiated in continuous trading or is attached to the call phase of the auction. The AVD Uncrossing at the end of the opening, intraday, or closing auction takes place after the price determination of the subsequent volatility interruption instead. The auction price is also the price determined in the volatility interruption, not the price that triggered the volatility interruption.

## 9.2 Implementation of safeguards in respective trading forms

### 9.2.1 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 a reference price. Incoming orders are (partially) executed until the next potential execution price leaves the price corridor. Executions of orders with the execution condition IOC or FOK outside the price ranges do not take place either; the whole order (for Fill-Or-Kill), respectively the remaining quantity (for Immediate-Or-Cancel), is cancelled. In this case, no volatility interruption is triggered. Trading participants are made aware of this market situation. Under both the Single Volatility Interruption Model and the ACE Volatility Interruption Model, 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 determinations according to the principle of most executable volume, iceberg orders participate with their full volume in volatility interruptions. Resting BOC orders are deleted at the start of the volatility interruption.

Both single volatility interruptions and ACE volatility interruptions consist of a call phase and a price determination. However, the Single Volatility Interruption Model and the ACE Volatility Interruption Model differ in the way volatility interruptions are processed when the potential execution price lies outside a pre-defined price corridor at the end of the call phase.

Under the Single Volatility Interruption Model, the call phase has a pre-defined minimum duration and a random end. A price determination will take place at the end of the call phase if the potential execution price lies inside a pre-defined price corridor that is wider than the dynamic price range. If a price determination is not possible within the given price corridor, the volatility interruption is extended until it is terminated manually according to FWB exchange rules (extended volatility interruption). The volatility interruption may be terminated automatically if there is no longer an executable order book situation at the end of the duration of the volatility interruption or during an extended volatility interruption.

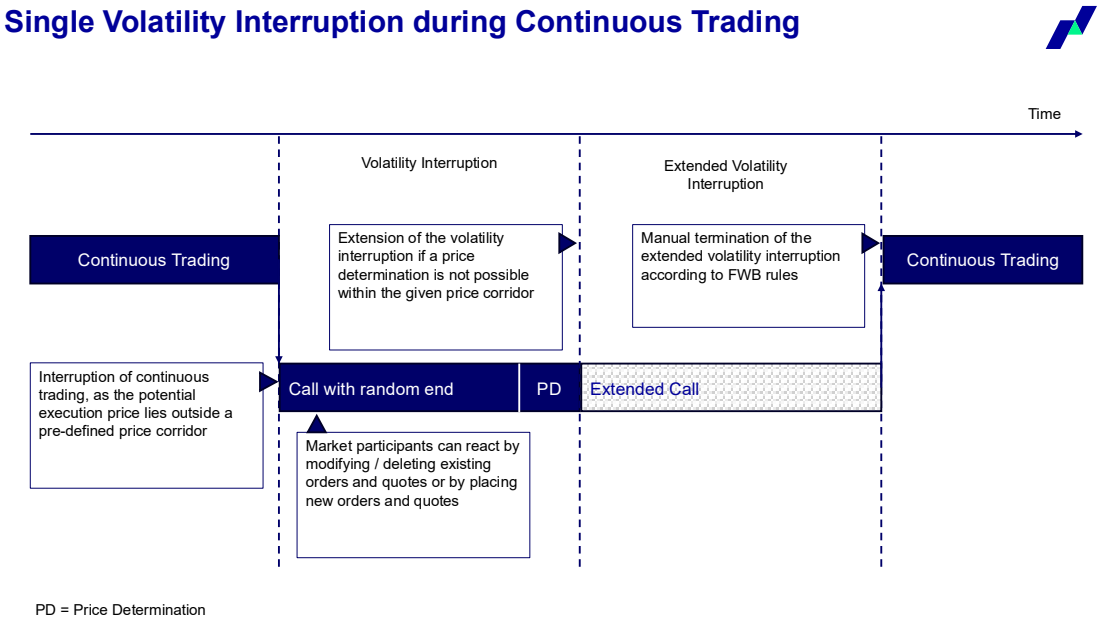



Figure 8: Single volatility interruption during continuous trading

Under the ACE Volatility Interruption Model, the call phase consists of one or more subsequently expanding price corridors, each with a pre-defined minimum duration and a random end. A price determination will take place at the end of the call phase if the potential execution price lies inside a pre-defined ACE price corridor. Otherwise, the volatility interruption is automatically extended by the duration of another price corridor, provided that the maximum number of price corridors for the instrument has not been reached yet. If a price determination is not possible within the final price corridor assigned to the instrument, the volatility interruption is extended until it is terminated manually according to FWB exchange rules (extended volatility interruption). The volatility interruption may be terminated automatically if there is no longer an executable order book situation at the end of the duration of an ACE price corridor or during an extended volatility interruption. Furthermore, in order to ensure a high price quality, the FWB Management Board may define additional criteria for a price determination at the end of the duration of an ACE price corridor.

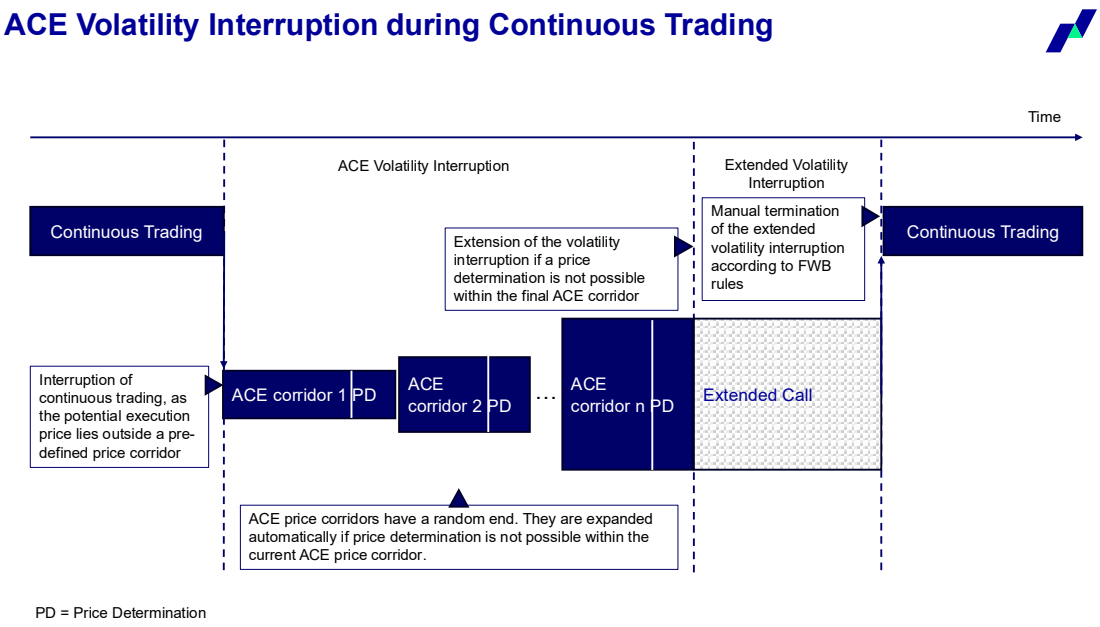



Figure 9: ACE volatility interruption during continuous trading

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

### 9.2.2 Volatility Interruption During Auctions

Under both the Single Volatility Interruption Model and the ACE Volatility Interruption Model, 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 trading participants. Iceberg orders are displayed and participate with their full volume in volatility interruptions during auctions.

A volatility interruption initiates a limited extension of the call phase, allowing trading participants to enter new orders as well as to modify or delete orders in the order book. Under the Single Volatility Interruption Model, the extension of the call phase has a pre-defined minimum duration and a random end. A price determination will take place at the end of the extended call phase if the potential execution price lies inside a pre-defined price corridor that is wider than the dynamic price range. If a price determination is not possible within the given price corridor, the volatility interruption is further extended until it is terminated manually according to FWB exchange rules (extended volatility interruption). The AVD Uncrossing takes place after the price determination, using that price, of the volatility interruption or the extended volatility interruption, respectively. The volatility interruption may be terminated automatically if there is no longer an executable order book situation at the end of the duration of the volatility interruption or during an extended volatility interruption. In that case, the AVD Uncrossing is skipped.

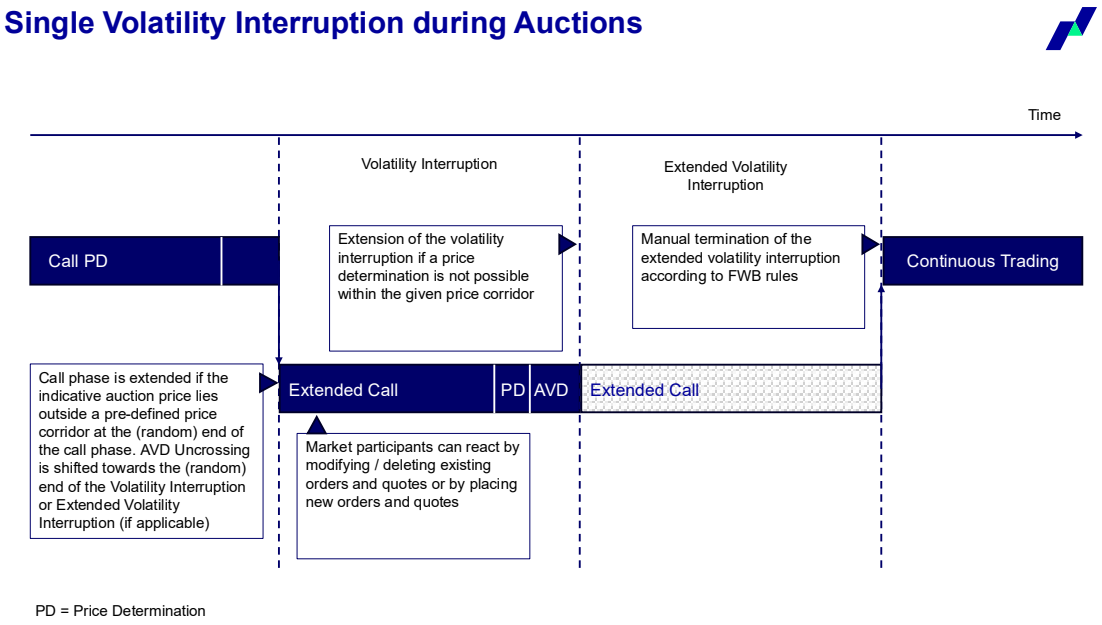



Figure 10: Single volatility interruption during auctions

Under the ACE Volatility Interruption Model, the extension of the call phase consists of one or more subsequently expanding price corridors, each with a pre-defined minimum duration and a random end. A price determination will take place at the end of the call phase if the potential execution price lies inside a pre-defined ACE price corridor. Otherwise, the volatility interruption is automatically extended by the duration of another price corridor, provided that the maximum number of price corridors for the instrument has not been reached yet. If a price determination is not possible within the final price corridor assigned to the instrument, the volatility interruption is extended until it is terminated manually according to FWB exchange rules (extended volatility interruption). In the ACE Volatility Interruption Model, the AVD Uncrossing takes place immediately after the last price determination, based on that volatility auction price. The volatility interruption may be terminated automatically if there is no longer an executable order book situation at the end of the duration of an ACE price corridor or during an extended volatility interruption. Furthermore, in order to ensure a high price quality, the FWB Management Board may define additional criteria for a price determination at the end of the duration of an ACE price corridor.

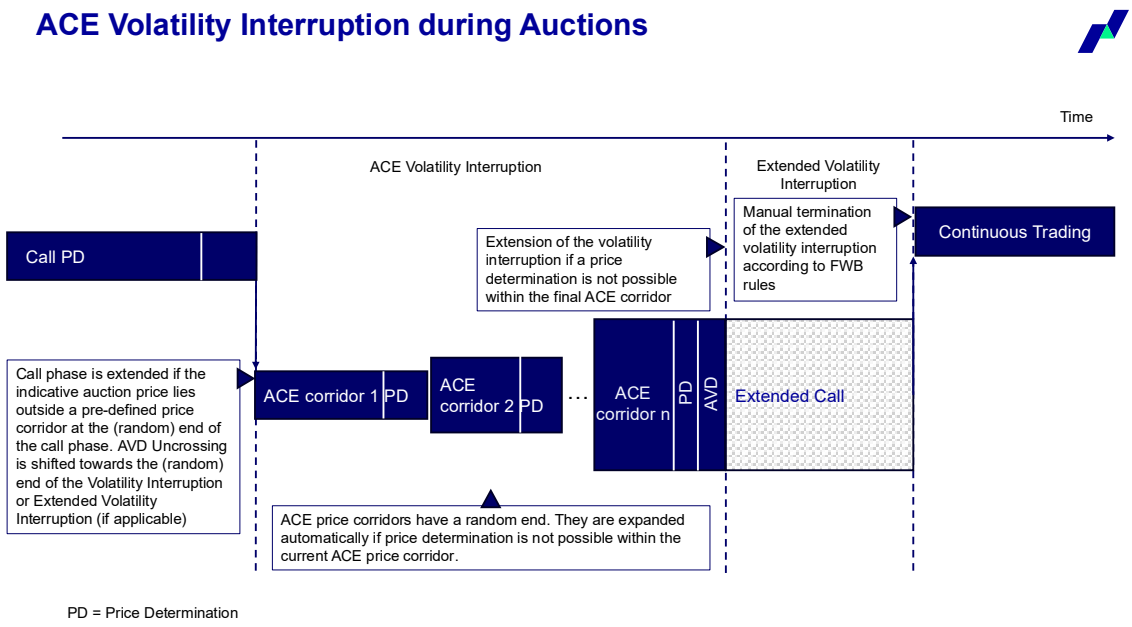



Figure 11: ACE volatility interruption during auctions

All non-executed or partially executed market and limit orders are transferred to the next possible trading form according to their order sizes and trading restrictions.

### 9.2.3 Retail Volatility Interruption

During the Extended Xetra Retail Service only the retail volatility interruption is supported. A retail volatility interruption is initiated if the potential auction price at the end of the retail call phase lies outside the dynamic and/or static price range. Volatility interruptions in the Retail Auction are indicated to the trading participants. The retail volatility interruption initiates a limited extension of the call phase, allowing trading participants to enter new orders as well as to modify or delete orders in the order book. The extension of the call phase has a pre-defined minimum duration and a random end. A price determination will take place at the end of the extended call phase irrespective of the volatility boundaries if the potential execution price lies at or within the RLP quote/ order spread. There is no extended volatility interruption in the Retail Auction.

# 10 Trading of Subscription Rights

In general, the trading of subscription rights takes place in the trading model Continuous Trading in connection with Auctions or in the trading model Auction according to the procedures outlined in chapter 8, whereas on the last trading day of the subscription right trading might end ahead of the regular trading hours.

Irrespective of the trading model, at the end of the second to last trading day all orders remaining in the order book will automatically be deleted and have to be re-entered by trading participants on the last trading day, if required.

# 11 Illustration of Price Determination Processes

## 11.1 Auctions during the Main Trading Hours

### 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. AVD Orders do not participate in the auction call phase and the price determination.

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

- The auction price is stipulated 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 stipulated 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 (the Implied Reference Price is only used to determine the dynamic price corridor during the closing auction. It is not used in other auctions nor for any price determination). This may be the case

- If there is a bid surplus for one part of the limits and an ask surplus for another part (see example 4),
- If there is no surplus for all limits (see example 5).

In the first case, the lowest limit with an ask surplus or the highest limit with a bid surplus is chosen for further price determination.

In both cases, the reference price is considered for stipulating 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).

All market orders and orders with a limit that allows for execution at the determined auction price that are present in the order book at the end of the auction call phase are matched at the determined auction price to the highest possible overall quantity using price-time priority. Remaining executable orders are part of the auction surplus.

All executable AVD Orders are matched at the determined auction price in the AVD Uncrossing according to the following priority:

- "AVD Broker Internalization Matching": Orders from the same trading business unit that are marked with identical Broker Internalization IDs are matched according to volume-time priority.

- "AVD + Surplus Matching": Remaining AVD Orders, including remaining quantities from AVD Broker Internalization matching, are matched with the auction surplus (with priority, if available; trading participants also have the possibility to opt out from the AVD Uncrossing for their orders that participate in the call phase and might become part of the surplus) and against other AVD Orders with volume-time priority.

An auction price cannot be determined if orders are not executable against one another. In this case, all bid and ask limits (if available) are displayed (see example 7). No AVD Uncrossing takes place in this case. Only for the purpose of updating the reference price, an "auction price without turnover" may be determined (see chapter 8.1.1)

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.

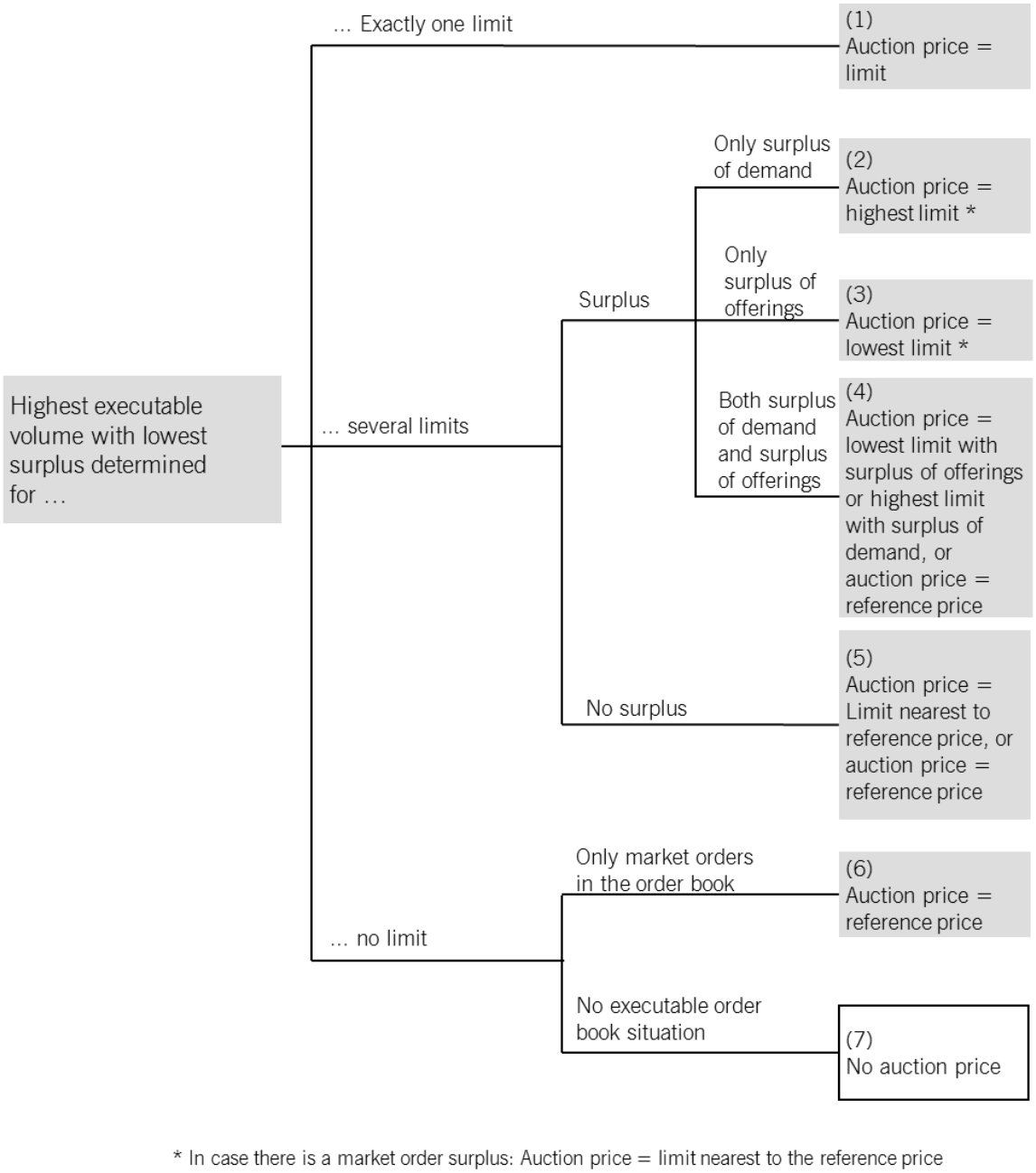



Figure 12: Price determination in auctions

### 11.1.2 Matching Examples Auction Price Determination

The following examples are given to clarify the basic matching rules for the auction price determination. In the examples, price determination is carried out using exemplary order book situations assuming a tick size of 1€.

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

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Limit | 200 | 200 | | 202 | 500 | 700 | | |
| Limit | 200 | 400 | | 201 | 300 | 700 | | |
| Limit | 300 | 700 | | 200 | | 700 | 100 | Limit |
| | | 700 | 100 | 199 | | 600 | | |
| | | 700 | 100 | 198 | | 600 | 200 | Limit |
| | | 700 | 300 | 197 | | 400 | 400 | Limit |

Corresponding to this limit, the auction price is fixed at € 200.

*Example 2a: There are several possible limits and there is a surplus on the bid.*

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Limit | 400 | 400 | | 202 | 100 | 500 | | |
| Limit | 200 | 600 | 100 | 201 | | 500 | | |
| | | 600 | 100 | 200 | | 500 | | |
| | | 600 | 100 | 199 | | 500 | 300 | Limit |
| | | 600 | 400 | 198 | | 200 | 200 | Limit |

Corresponding to the highest limit, the auction price is fixed at € 201.

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

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Market | 500 | 500 | 200 | Market | | 300 | | |
| | | 500 | 200 | 202 | | 300 | | |
| | | 500 | 200 | 201 | | 300 | | |
| | | 500 | 200 | 200 | | 300 | | |
| | | 500 | 200 | 199 | | 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 € 199 or below, the auction price will be € 199.

b) If the reference price is above € 199, the auction price will be the reference price.

*Example 3a: There are several possible limits and there is a surplus on the ask.*

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Limit | 300 | 300 | | 202 | 300 | 600 | | |
| Limit | 200 | 500 | | 201 | 100 | 600 | | |
| | | 500 | | 200 | 100 | 600 | | |
| | | 500 | | 199 | 100 | 600 | 400 | Limit |
| | | 500 | 300 | 198 | | 200 | 200 | Limit |

Corresponding to the lowest limit, the auction price is fixed at € 199.

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

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Limit | 300 | 300 | | 202 | 200 | 500 | | |
| | | 300 | | 201 | 200 | 500 | | |
| | | 300 | | 200 | 200 | 500 | | |
| | | 300 | | 199 | 200 | 500 | | |
| | | 300 | | Market | 200 | 500 | 500 | Market |

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 € 202 or above, the auction price will be € 202.

b) If the reference price is below € 202, the auction price will be the reference price.

*Example 4: There are several possible limits and there is both an ask surplus and a bid surplus.*

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Market | 100 | 100 | | Market | 100 | 200 | | |
| | | 100 | | 201 | 100 | 200 | | |
| | | 100 | | 200 | 100 | 200 | 100 | Limit |
| Limit | 100 | 200 | 100 | 199 | | 100 | | |
| | | 200 | 100 | 198 | | 100 | | |
| | | 200 | 100 | Market | | 100 | 100 | Market |

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

a) If the reference price is € 200 or above, the auction price will be € 200.

b) If the reference price is € 199 or below, the auction price will be € 199.

*Example 5: There are several possible limits and no surplus on hand.*

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Market | 100 | 100 | | Market | 100 | 200 | | |
| | | 100 | | 202 | 100 | 200 | 100 | Limit |
| | | 100 | | 201 | | 100 | | |
| | | 100 | | 200 | | 100 | | |
| | | 100 | | 199 | | 100 | | |
| Limit | 100 | 200 | 100 | 198 | | 100 | | |
| | | 200 | 100 | Market | | 100 | 100 | Market |

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 € 200, the auction price will be € 200.

b) If the reference price is € 201 or above, the auction price will be € 201.

c) If the reference price is € 199 or below, the auction price will be € 199.

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

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| 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 orders in the order book which are not executable.*

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| | | | | 201 | | 80 | 80 | Limit |
| Limit | 80 | 80 | | 200 | | | | |
| Limit | 80 | 160 | | 199 | | | | |

It is not possible to determine an auction price. The order book is open, all orders are published.

*Example 8:* Partial execution of an order within the opening auction

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| Limit 9:00 | 300 | 600 | 200 | 200 | | 400 | 400 | Limit |
| Limit 9:01 | 300 | | | | | | | |

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

### 11.1.3 Matching Examples AVD Uncrossing

The following examples are given to clarify the basic matching rules for the AVD Uncrossing. Note that the order information that is shown in the examples is not actually disseminated to trading participants. It is shown for illustrative reasons only. All participating AVD Orders are activated with the AVD Uncrossing and might be executed immediately upon activation. Any remaining quantities are de-activated immediately. All AVD trades have the same time stamp as the respective auction price determination (except for cases where the resulting auction price triggers a volatility interruption).

*Example 1:* No auction surplus, Broker Internalization Matching with remaining quantity

The following AVD Orders have been submitted for the AVD Uncrossing, whereas the asterisk indicates that the order is marked with identical Broker Internalization IDs by the respective trading business unit ("Member"). The auction price is € 200. No orders from the auction surplus participate in AVD Uncrossing (either because no auction surplus exists or all orders from the auction surplus are excluded from AVD Uncrossing be means of an "Opt-Out" on trading business unit level).

| Bid | | | | Ask | |
|---|---|---|---|---|---|
| | Member | Quantity | Limit | Quantity | Member |
| | ABCFR | 50 | 202 | | |
| | JKLFR | 70 | 201 | | |
| | ABCFR | 100* | 200 | 20* | XYZFR |
| | | | 199 | 150* | ABCFR |
| | | | 198 | | |
| | XYZFR | 20* | 197 | | |

AVD Broker Internalization Matching:

- On the bid, the AVD order with a limit of price of € 197 from member XYZFR is not executable at the auction price of € 200. The order is not activated. Therefore, the 20 on the ask from the same member are not executable in the AVD Broker Internalization Matching.

- The 150 on the ask from member ABCFR is partially executed against 100 on the bid that are marked with the same Broker Internalization ID. The remaining quantity of 50 is not executed against ABCFR's other order on the bid with limit price € 202 in this step, as that one is not marked with a Broker Internalization ID.

- AVD Orders from different trading business units that are (by coincidence) marked with identical Broker Internalization IDs are not matched in this step. The same applies for AVD Orders from the same trading business unit but with different Broker Internalization IDs (see Example 2 below).

AVD + Surplus Matching (no surplus orders available):

- The following set of AVD orders is considered for the AVD + Surplus Matching (see above, reduced by non-executable orders as per their limit price and executions from AVD Broker Internalization Matching):

| Bid | | | | Ask | |
|---|---|---|---|---|---|
| | Member | Quantity | Limit | Quantity | Member |
| | ABCFR | 50 | 202 | | |
| | JKLFR | 70 | 201 | | |
| | | | 200 | 20* | XYZFR |
| | | | 199 | 50* | ABCFR |
| | | | 198 | | |
| | | | 197 | | |

- JKLFR's order has the highest volume-time priority on the bid. It is executed against ABCFR's and XYZFR's orders on the ask.
- ABCFR's AVD Order with quantity 50 and limit price € 202 is de-activated without execution.

*Example 2:* Auction surplus, non-identical Broker Internalization IDs

The following AVD Orders have been submitted for the AVD Uncrossing, whereas the different symbols (*, #, §) indicate that orders are marked with different Broker Internalization IDs by the respective trading business unit ("Member"). The auction price is € 201. ABCFR's order on the bid with limit price € 201 (in bold) is from the auction surplus resulting from the auction price determination.

| Bid | | | | Ask | |
|---|---|---|---|---|---|
| | Member | Quantity | Limit | Quantity | Member |
| | DEFFR | 30# | 203 | | |
| | GHIFR | 120 | 202 | | |
| | **ABCFR** | **100** | 201 | | |
| | | | 200 | 100* | ABCFR |
| | | | 199 | 20 | JKLFR |
| | | | 198 | 30§ | DEFFR |

AVD Broker Internalization Matching:

- DEGFR has executable buy and sell AVD Orders marked for AVD Broker Internalization, but using different Broker Internalization IDs (# and §) – no execution in this step.
- ABCFR has a sell AVD Order marked for AVD Broker Internalization and a buy order not marked for broker preferencing (in fact the order from the auction surplus; orders participating in the auction call phase and auction price determination can never be marked with a Broker Internalization ID) – no execution in this step.

AVD + Surplus Matching:

- ABCFR's buy order (100 shares) is from the auction surplus and therefore has priority over all other orders. It is executed against the order(s) with the highest volume-time priority on the ask, which is also an order of ABCFR with the same quantity in this case. The resulting execution and trade confirmations for each of the two orders indicate a trade of the type "AVD + Surplus Matching" – not an AVD Broker Internalization match, and not a regular auction match.

- GHIFR's AVD Order on the bid (120 shares) gets a partial execution of 50 against DEFFR's AVD Order on the ask (quantity 30) and JKLFR's AVD Order on the ask (quantity 20). The remaining quantity (70 shares) of GHIFR's AVD Order is deactivated.

- DEFFR's AVD Order on the bid is not executed due to its lower volume-time priority among the AVD Orders on the bid and no remaining quantity on the ask and therefore it is also deactivated.

## 11.2 Continuous Trading

### 11.2.1 Basic Matching Rules

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. Midpoint sweep orders that are transferred to the central limit order book are treated like new incoming orders in the matching rules for continuous trading.

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

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 will be 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, 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
- if an incoming limit order meets an order book with market orders only on the other side (see examples 9, 10, 11, 12), or
- if an incoming 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 will be 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. Note that, like in auctions, the Implied Reference Price is not used for price determination.

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 will be 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 will be 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.

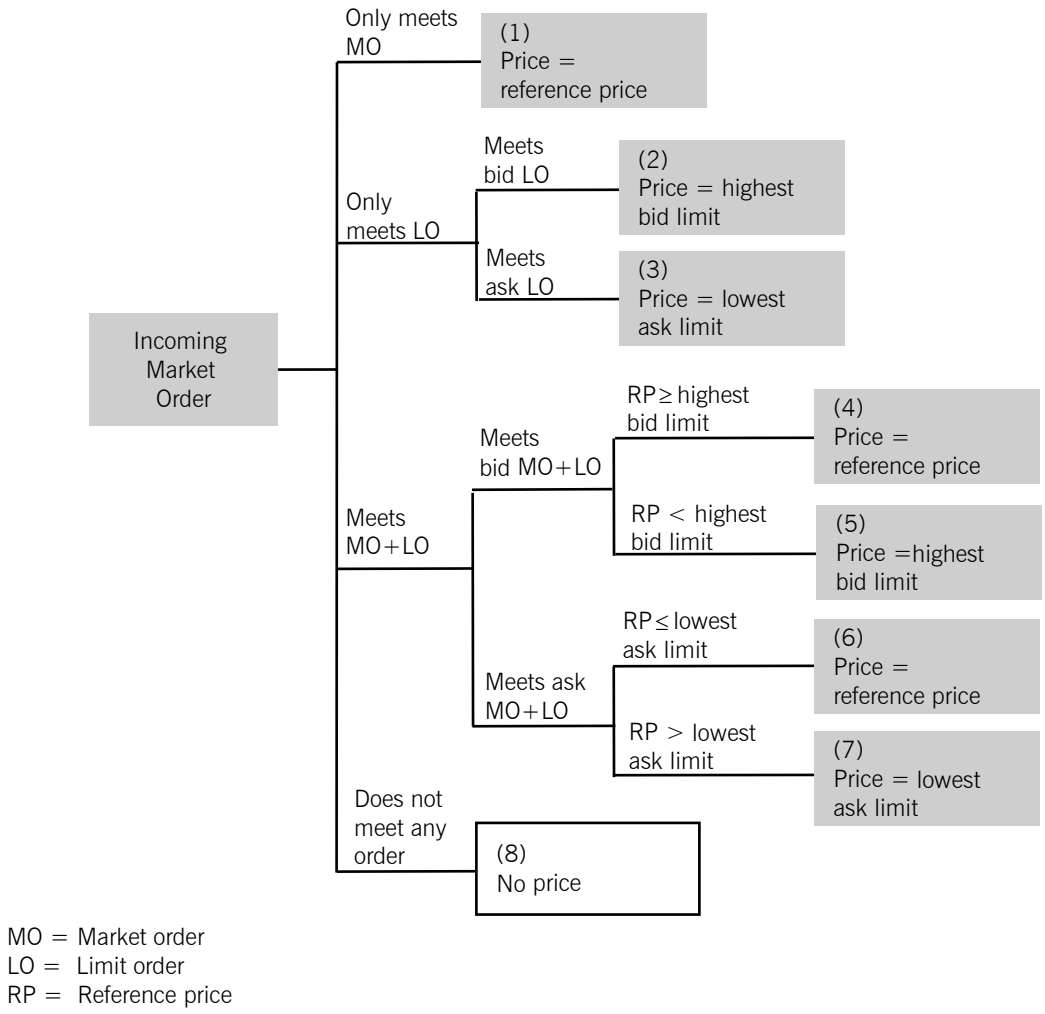



Figure 13: Incoming Market Order

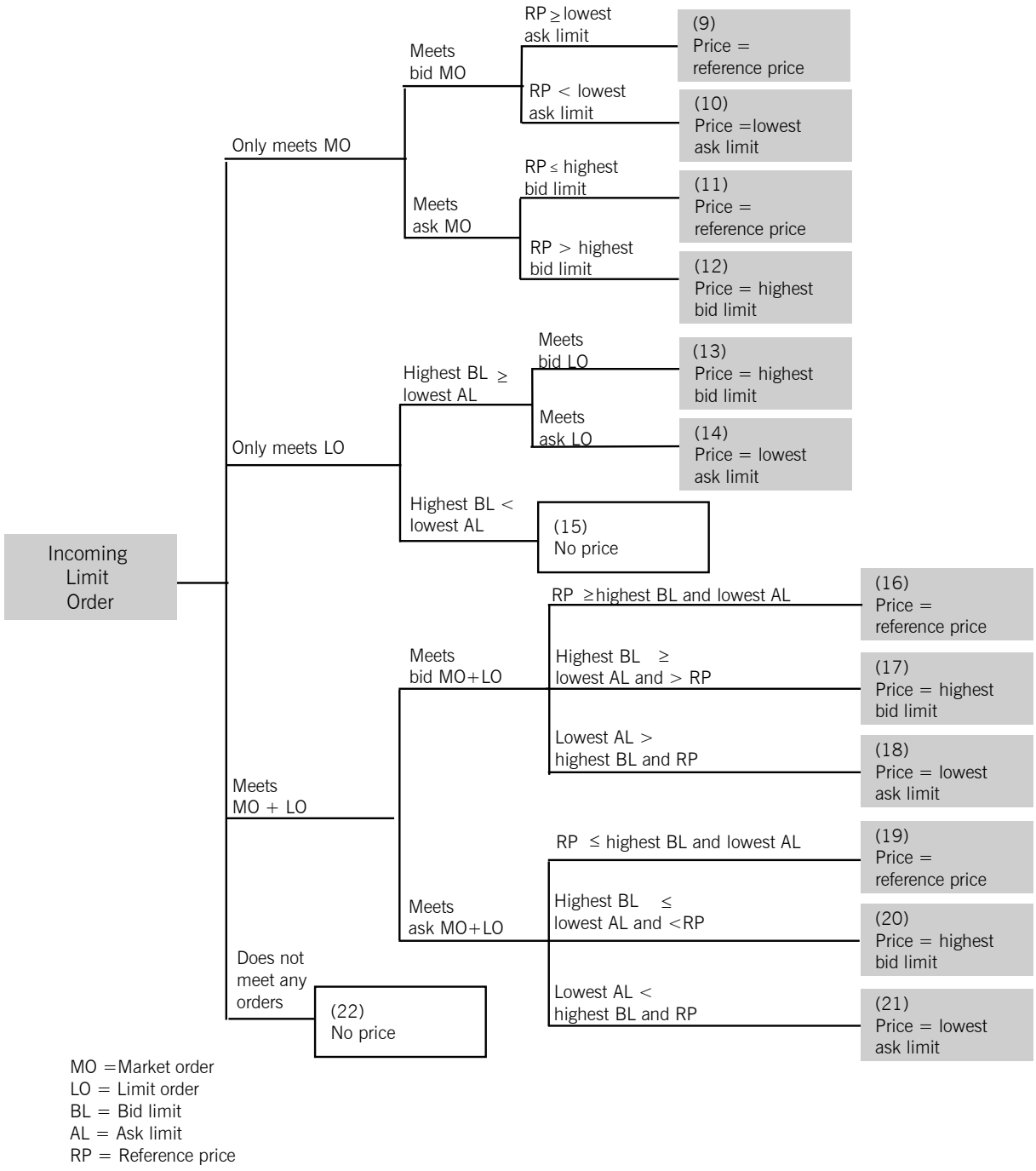



Figure 14: Incoming Limit Order

### 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.

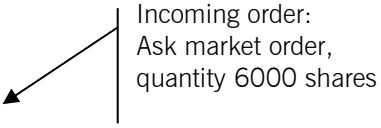
The following examples are meant to clarify the basic matching rules for continuous trading by carrying out the price determination using exemplary order book situations assuming a tick size of 1 €.

#### 11.2.2.1 Matching Examples for Basic Matching Rules

*Example 1: A market 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 |
| 9:01 | 6000 | Market | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |

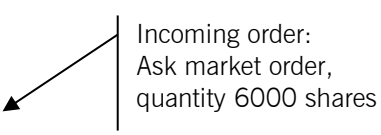



The reference price is € 200.
Both market orders are executed at the reference price of € 200 (see principle 1).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | 200 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | 200 | | | |




Both orders are executed at the highest bid limit of € 200.

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

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 200 | 6000 | 9:01 |

Incoming order:
Bid market order,
quantity 6000 shares

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 200 | ~~6000~~ | 9:01 |
| | | | | | |

Both orders are executed at the lowest ask limit of € 200.

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

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 195 | | | |

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |
| 9:02 | 1000 | 195 | | | |

Incoming order:
Ask market order,
quantity 6000 shares

The reference price is € 200. It 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 € 200 (see principle 1).

*<u>Example 5:</u> A market order meets an order book with market orders and limit orders on the other side of the order book.*

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 202 | | | |

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |
| 9:02 | 1000 | 202 | | | |

Incoming order:
Ask market order,
quantity 6000 shares

The reference price is € 200. 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 € 202 (see principle 2).

*<u>Example 6:</u> A market order meets an order book with market orders and limit orders on the other side of the order book.*

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | 6000 | 9:01 |
| | | | 202 | 1000 | 9:02 |

Incoming order:
Bid market order,
quantity 6000 shares

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | 202 | 1000 | 9:02 |

The reference price is € 200. 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 € 200 (see principle 1).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | 6000 | 9:01 |
| | | | 202 | 1000 | 9:02 |

Incoming order:
Bid market order,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | 202 | 1000 | 9:02 |

The reference price is € 203. 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 € 202 (see principle 2).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | | | |

Incoming order:
Bid market order,
quantity 6000 shares

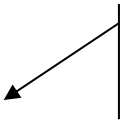
| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 10:01 | 6000 | Market | | | |
| | | | | | |

The incoming bid market order is entered in the order book. A price is not determined and no orders are executed.

*Example 9: 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 |
| 9:01 | 6000 | Market | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |



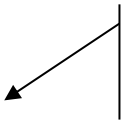
Incoming order:
Ask order, limit € 195,
quantity 6000 shares

The reference price is € 200. It is higher than or equal to the lowest ask limit.
Both orders are executed at the reference price of € 200 (see principle 1).

Example 10: 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 |
| 9:01 | 6000 | Market | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |



Incoming order:
Ask order, limit € 203,
quantity 6000 shares

The reference price is € 200. It is lower than the lowest ask limit.
Both orders are executed at the lowest ask limit of € 203 (see principle 2).

*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 |

Incoming order:
Bid order, limit € 203,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | | | |

The reference price is € 200. It is lower than or equal to the highest bid limit.
Both orders are executed at the reference price of € 200 (see principle 1).

*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 |

Incoming order:
Bid order, limit € 199,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | | | |

The reference price is € 200. It is higher than the highest bid limit.
Both orders are executed at the highest bid limit of € 199 (see principle 2).

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

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:33 | 6000 | 199 | | | |

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:33 | ~~6000~~ | 199 | | | |

Incoming order:
Ask order, limit € 198,
quantity 6000 shares

The highest bid limit is higher than or equal to the lowest ask limit.
Both orders are executed at the highest bid limit of € 199.

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

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 199 | 6000 | 9:33 |

Incoming order:
Bid order, limit € 200,
quantity 6000 shares

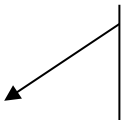
| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 199 | ~~6000~~ | 9:33 |

The highest bid limit is higher than or equal to the lowest ask limit.
Both orders are executed at the lowest ask limit of € 199.

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:33 | 6000 | 199 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:33 | 6000 | 199 | 200 | 6000 | 10:01 |



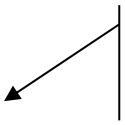
Incoming order:
Ask order, limit € 200,
quantity 6000 shares

The highest bid limit is lower than the lowest ask limit.
The incoming ask order is entered into the order book. A price is not determined and no orders are executed.

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 196 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |
| 9.02 | 1000 | 196 | | | |



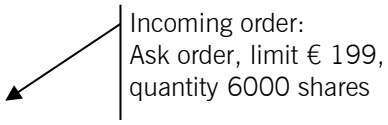
Incoming order:
Ask order, limit € 195,
quantity 6000 shares

The reference price is € 200. 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 € 200 (see principle 1).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 202 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |
| 9:02 | 1000 | 202 | | | |

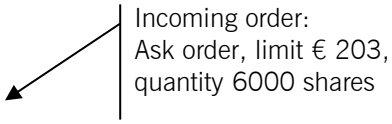



The reference price is € 200. The highest bid limit is higher than or equal to the lowest ask limit and higher than the reference price.
The incoming ask order is executed against the bid market order in the order book at the highest bid limit of € 202 (see principle 2).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 202 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | ~~6000~~ | Market | | | |
| 9:02 | 1000 | 202 | | | |




The reference price is € 200. 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 € 203 (see principle 2).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | 6000 | 9:01 |
| | | | 202 | 1000 | 9:02 |

Incoming order:
Bid order, limit € 203,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | 202 | 1000 | 9:02 |

The reference price is € 200. 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 € 200 (see principle 1).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | 6000 | 9:01 |
| | | | 202 | 1000 | 9:02 |

Incoming order:
Bid order, limit € 200,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | 202 | 1000 | 9:02 |

The reference price is € 201. 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 € 200 (see principle 2).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | 6000 | 9:01 |
| | | | 199 | 1000 | 9:02 |

Incoming order:
Bid order, limit € 203,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | Market | ~~6000~~ | 9:01 |
| | | | 199 | 1000 | 9:02 |

The reference price is € 200. 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 € 199 (see principle 2).

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

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | | | |

Incoming order:
Bid order, limit € 200,
quantity 6000 shares

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 10:01 | 6000 | 200 | | | |

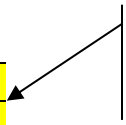
The incoming bid order is entered into the order book. A price is not determined and no orders are executed.

#### 11.2.2.2 Further Examples

*Example:* Partial execution of a market order.
A limit order meets an order book in which there are market orders and limit orders on the other side of the order book.

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 202 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 5000 | Market | | | |
| 9:02 | 1000 | 202 | | | |



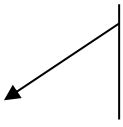
Incoming order:
Ask order, limit € 203,
quantity 1000 shares

The reference price is € 200. 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 € 203 (see principle 2).

*Example: Initiation of a volatility interruption*
A limit order meets an order book in which there are market orders and limit orders on the other side of the order book.

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | | | |
| 9:02 | 1000 | 202 | | | |

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01 | 6000 | Market | 220 | 1000 | 10:01 |
| 9:02 | 1000 | 202 | | | |



Incoming order:
Ask order, limit € 220,
quantity 1000 shares

The reference price is € 200 and the price range is +/- 2% of the last determined price. The limit of the incoming ask order 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 an auction.

Examples showing the functionality of iceberg orders

In contrast to the previous examples, in the following an initial order book situation which changes in various iterations is provided 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. Depending on the parameters set at iceberg order submission the size of the next peak may be randomized in reality. An iceberg order is entered into the order book and meets limit orders only on the other side of the order book.

| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01:00 | 6000 | 202 | 203 | 500 | 8:55:00 |
| 9:02:00 | 2000 | 201 | | | |

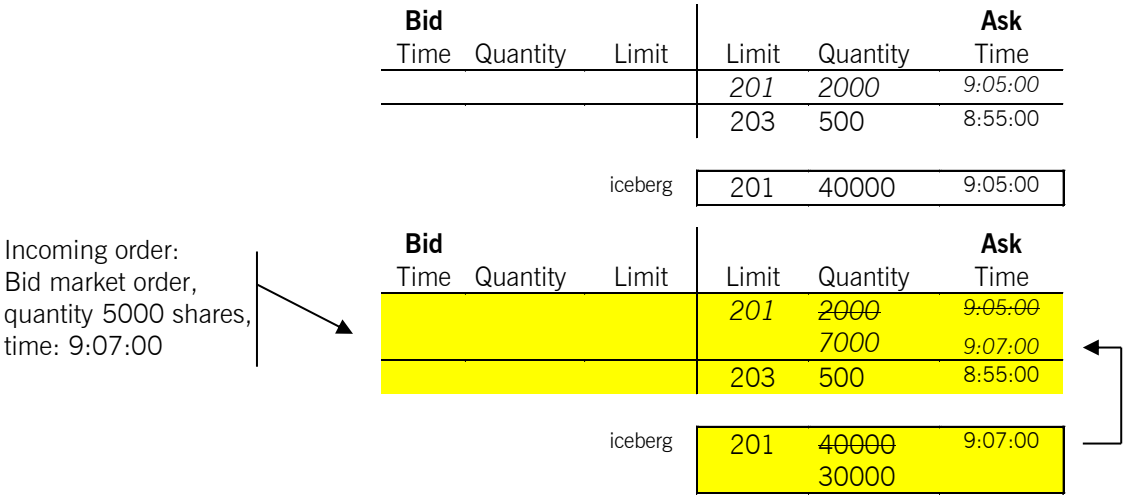
| **Bid** | | | | | **Ask** |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 9:01:00 | 6000 | 202 | 201 | 2000 | 9:05:00 |
| 9:02:00 | 2000 | 201 | 203 | 500 | 8:55:00 |

Incoming order:
Ask iceberg order, limit € 201
overall quantity 50000 shares,
peak 10000 shares,
time: 9:05:00

| | | | |
|---|---|---|---|
| Iceberg | 201 | 40000 | 9:05:00 |

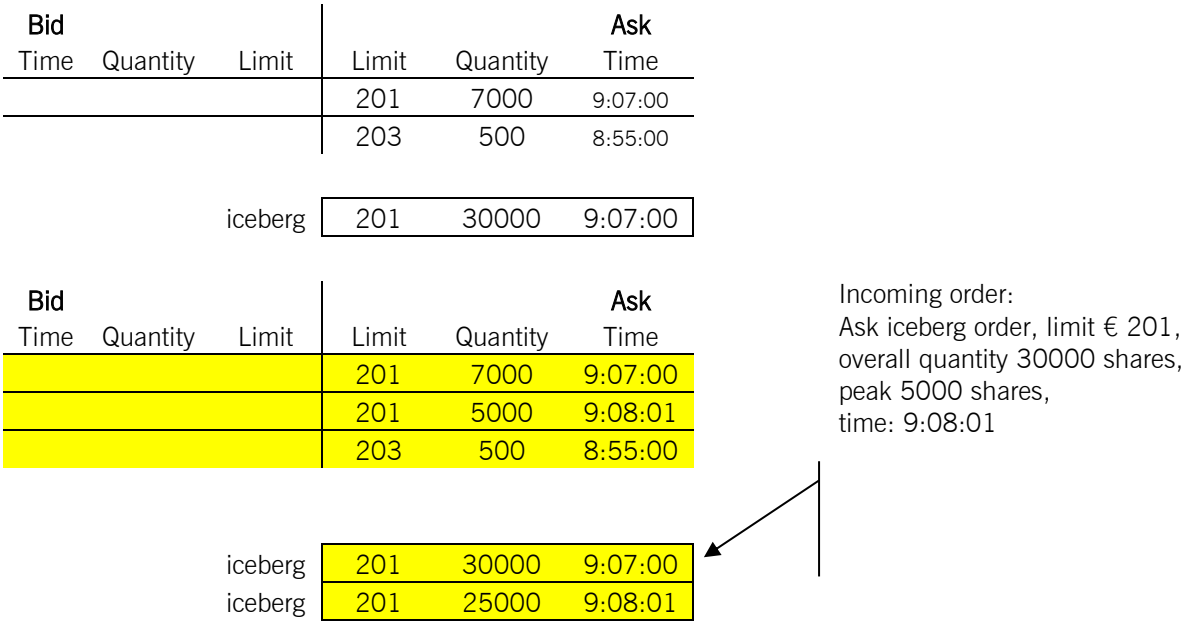
The peak of the iceberg order is executed against the orders in the order book as far as possible (6000 at € 202; 2000 at € 201). The remaining peak of the iceberg order (2000) is entered into the order book according to price/time priority with a remaining non-visible volume of 40000 behind it.

*A new bid market order meets the order book.*



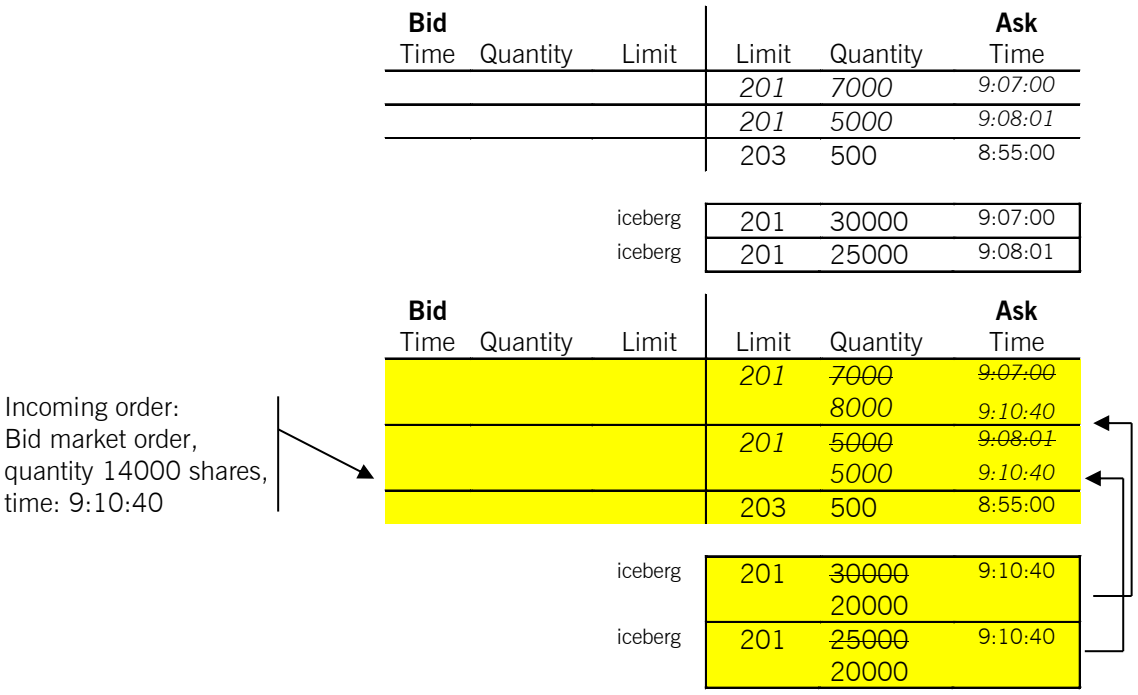

The incoming market order is executed against the peak (2000) of the iceberg order at € 201. Then the next peak of the iceberg order (again with a volume of 10000 in this example) is introduced in the order book with a new time stamp (9:07:00). It is executed against the remaining part of the incoming order (3000). The remaining peak of the iceberg order (7000) is shown in the order book with a non-visible volume of 30000 behind it.

Another iceberg order is entered into the order book.




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 25000 behind it.

*A new bid market order meets the order book.*




The incoming market order first is executed against the peak of the iceberg order at € 201 with a volume of 7000.

Before the next peak of this iceberg order is introduced, the peak of the iceberg order at the same limit is executed (5000).

A new peak of the first iceberg order is introduced in the book with a new time stamp (9:10:40) and a remaining volume of 20000 behind it.

A new peak of the second iceberg order is introduced in the book with a new time stamp (9:10:40) and a remaining volume of 20000 behind it.

Then the remaining part of the incoming order (2000) is executed against the new peak of the first iceberg order. The remaining part of this iceberg order (8000) is shown in the book with a volume of 20000 behind it.

*Another limit order is entered into the order book.*

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 201 | 8000 | 9:10:40 |
| | | | 201 | 5000 | 9:10:40 |
| | | | 203 | 500 | 8:55:00 |

| | | | |
|---|---|---|---|
| iceberg | 201 | 20000 | 9:10:40 |
| iceberg | 201 | 20000 | 9:10:40 |

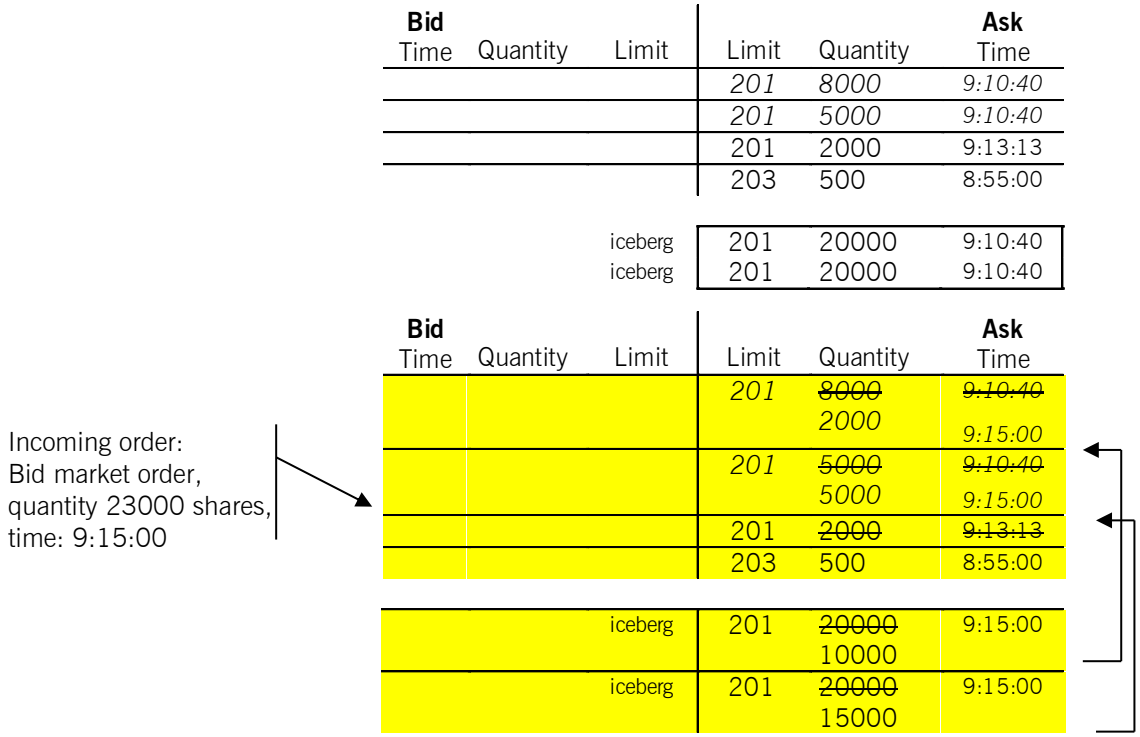
| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 201 | 8000 | 9:10:40 |
| | | | 201 | 5000 | 9:10:40 |
| | | | 201 | 2000 | 9:13:13 |
| | | | 203 | 500 | 8:55:00 |

Incoming order:
Ask limit order, limit € 201,
quantity 2000 shares,
time: 9:13:13

| | | | |
|---|---|---|---|
| iceberg | 201 | 20000 | 9:10:40 |
| iceberg | 201 | 20000 | 9:10:40 |

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

*A new bid market order meets the order book.*




The incoming bid market order first is executed against the lowest ask limit on the other side of the order book which is represented by a peak (8000) of an iceberg order at € 201.

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 (5000) and the next limit order (2000) in the order book are executed against the incoming order.

A new peak of the first iceberg order is introduced in the order book with a new time stamp (9:15:00) and a remaining volume of 10000 behind it.

A new peak of the second iceberg order is introduced in the order book with a new time stamp (9:15:00) and a remaining volume of 15000 behind it.

The remaining volume (8000) of the incoming order then is executed against the new peak of the first iceberg order at € 201. A remaining peak of this iceberg order of 2000 is shown in the order book.

*Examples for Self-Match Prevention*

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

**Bid** **Ask**

| Time | Quantity | Mbr/Cross ID | Limit | Limit | Mbr/CrossID | Quantity | Time |
|---|---|---|---|---|---|---|---|
| 9:01 | 50 | | 209 | 210 | | 50 | 9:05 |
| 9:03 | 20 | XYZFR/9987 | 208 | 211 | XYZFR/5566 | 100 | 9:04 |
| 9:04 | 500 | | 208 | | | | |
| 9:05 | 10 | ABCFR/1234 | 207 | | | | |
| 9:06 | 50 | ABCFR/9987 | 207 | | | | |
| 9:07 | 5 | | 207 | | | | |
| 9:08 | 10 | | 206 | | | | |
| 9:09 | 40 | | 206 | | | | |

A new sell order with quantity 675 and limit 206 from member ABCFR with CrossID "9987" is entered at 9:10 into the order book.

This order matches according to price/time priority first with Buy Order (50@209), then with Buy Order (20@208) which has the same CrossID but was entered by a different member and afterwards with Buy Order (500@208).

After Buy Order (10@207) is matched, which was entered by a trader of ABCFR as well but with a different CrossID, a quantity of 95 shares remains from the incoming Sell Order.

The remaining quantity of the incoming SMP-Order now hits the sitting SMP Buy Order (50@207) and the conditions for Self-Match Prevention (same member, same CrossID) are fulfilled.

Case 1: incoming SMP-Order has Cross Match Instruction "Cancel Aggressive Order":

The remaining quantity (95 shares) of the incoming SMP-Order is deleted. All other orders remain. The resulting order book situation is as follows:

**Bid** **Ask**

| Time | Quantity | Mbr/Cross ID | Limit | Limit | Mbr/CrossID | Quantity | Time |
|---|---|---|---|---|---|---|---|
| | | | | 210 | | 50 | 9:05 |
| | | | | 211 | XYZFR/5566 | 100 | 9:04 |
| 9:06 | 50 | ABCFR/9987 | 207 | | | | |
| 9:07 | 5 | | 207 | | | | |
| 9:08 | 10 | | 206 | | | | |
| 9:09 | 40 | | 206 | | | | |

Case 2: incoming SMP-Order has Cross Match Instruction "Cancel Passive Order":

The sitting SMP Buy Order (50@207) is deleted. Then, the incoming SMP-Order matches with the remaining buy orders (5@207, 10@206 and 40@206). The remaining quantity (40 shares) of the incoming SMP-Order is written into the order book. The resulting order book situation is as follows:

**Bid** **Ask**

| Time | Quantity | Mbr/Cross ID | Limit | Limit | Mbr/CrossID | Quantity | Time |
|---|---|---|---|---|---|---|---|
| | | | | 210 | | 50 | 9:05 |
| | | | | 211 | XYZFR/5566 | 100 | 9:04 |
| | | | | 206 | ABCFR/9987 | 40 | 9:10 |

Case 3: incoming SMP-Order has Cross Match Instruction "Cancel Aggressive and Passive":

As the (remaining) quantity of the incoming SMP-Order is bigger, the sitting order is deleted and the quantity of the incoming order is reduced accordingly to 45. It continues to match with sitting orders 5@207, 10@206 and 40@206 until it is fully executed.

The sitting Sell Orders with the time stamp from 9:05 and 9:04 stay unchanged and of the Buy Order with the time stamp 9:09 a quantity of 10 remains:

**Bid** **Ask**

| Time | Quantity | Mbr/Cross ID | Limit | Limit | Mbr/CrossID | Quantity | Time |
|---|---|---|---|---|---|---|---|
| | | | | 210 | | 50 | 9:05 |
| | | | | 211 | XYZFR/5566 | 100 | 9:04 |
| 9:09 | 10 | | 206 | | | | |

Examples showing the functionality of Xetra Retail matching

*Incoming retail (RMO) market order with RLP quote and another limit order on a different price level*

**Bid** **Ask**

| Time | Type | Qty | Limit | Limit | Qty | Type | Time |
|---|---|---|---|---|---|---|---|
| | | | | 204 | 500 | RLP | 9:25 |
| 9:25 | RLP | 200 | 200 | | | | |
| 9:10 | LO | 50 | 199 | | | | |

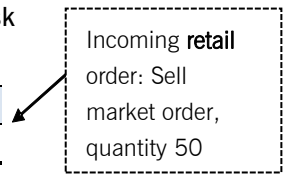



200 shares of the sell market order are executed against the bid of the Retail Liquidity Provider (RLP) quote at a price of €200 and 50 shares are executed against the limit order (LO) at a price of €199.

*Incoming retail (RMO) market order with RLP quote and another limit order on the same price level (Price-/Time-priority)*

**Bid** **Ask**

| Time | Type | Qty | Limit | Limit | Qty | Type | Time |
|---|---|---|---|---|---|---|---|
| | | | | 204 | 500 | RLP | 9:25 |
| 9:10 | LO | 50 | 200 | | | | |
| 9:25 | RLP | 200 | 200 | | | | |

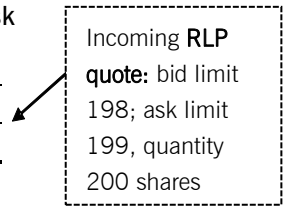



50 shares of the sell market order are executed against the sitting buy limit order at a price of €200 due to price-/time-priority.

*Incoming RLP quote with a retail limit order on the opposite side*

**Bid** **Ask**

| Time | Type | Qty | Limit | Limit | Qty | Type | Time |
|---|---|---|---|---|---|---|---|
| | | | | 202 | 500 | LO | 9:25 |
| | | | | | | | |
| 9:15 | RLO | 50 | 200 | | | | |




50 shares of the retail buy limit order are executed against the ask of the RLP quote at a price of €200. Remaining parts of the RLP-quote enter the order book:

**Bid** **Ask**

| Time | Type | Qty | Limit | Limit | Qty | Type | Time |
|---|---|---|---|---|---|---|---|
| | | | | 202 | 500 | LO | 9:25 |
| | | | | | | | |
| ~~9:15~~ | ~~RLO~~ | ~~50~~ | ~~200~~ | | | | |
| | | | | 199 | 150 | RLP 9:27 | |
| 9:27 | RLP | 200 | 198 | | | | |

## 11.3 Midpoint Trading

### 11.3.1 Matching rules

An incoming midpoint sweep or midpoint order (except for trading restriction “Midpoint-Book-Only”, stand-alone or in connection with “Counterparty-Resting-Time”) is checked immediately for executability against midpoint orders on the other side of the order book. The execution takes place according to volume/time priority under consideration of MAQs and the resting orders’ marketable resting time in case midpoint orders with trading restriction “Counterparty-Resting-Time” are involved.

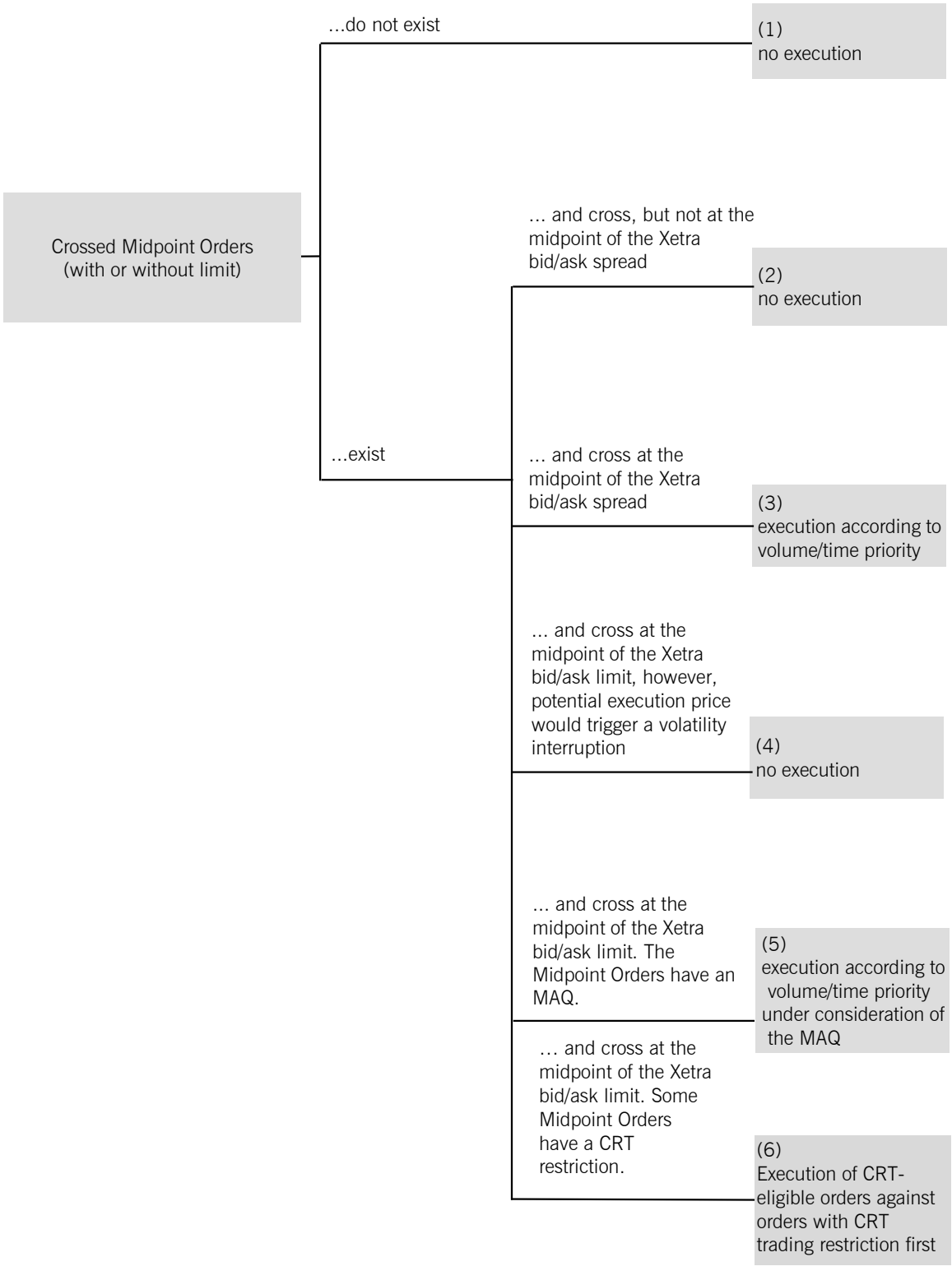
The execution price is always the Midpoint of the currently available Xetra bid/ask spread in continuous trading. Midpoint and midpoint sweep orders may be executed fully in one or more steps, partially or not at all, thereby generating no, one, or many trades.

Non-executed or only partially executed midpoint orders are entered in the Xetra Midpoint order book and sorted according to volume/time priority. Non-executed or only partially executed midpoint sweep orders are transferred automatically to the central limit order book of the trading model Continuous Trading in connection with Auctions for immediate execution or passive entry, as the case may be.

Volume/time priority under consideration of the MAQ regulates that the midpoint order with the currently highest volume at the moment of execution is executed first. If various midpoint orders with the same volume priority exist, the midpoint order with the oldest time stamp will be executed first. Due to the MAQ, strict volume/time priority is disregarded in particular situations, e.g. for the purpose of optimizing the executable volume or for releasing a crossed order book which would otherwise be blocked by a specific MAQ. Crossed, however non-executable midpoint orders may occur, as execution prices are limited to the Midpoint of the currently available Xetra bid/ask spread in continuous trading, and due to the MAQ. The trading system automatically checks for new execution possibilities of such orders whenever a new midpoint or midpoint sweep order comes in (incoming orders can also be executed in combination with other resting orders on the same side, provided that sufficient executable volume is available on the other side) and when a new Midpoint price results from either a change in the best bid / best ask or from the start / resumption of continuous trading.

In case a midpoint order carries the CRT trading restriction, execution of such order is only possible if all matching orders on the other side individually fulfill the minimum marketable resting time (MMRT) defined by the exchange (and, if relevant, jointly fulfill the MAQ of that order). Once a resting midpoint order achieves the MMRT, it becomes “CRT-eligible”. However, the event of a resting midpoint order becoming CRT-eligible does not trigger an immediate check for midpoint execution possibilities. The execution of midpoint orders with CRT trading restriction against CRT-eligible orders takes place with the next regular midpoint opportunity detection. In that case, orders with CRT trading restriction have priority over other midpoint orders to ensure that the resulting matching allocation is the same as if they had matched directly when CRT-eligibility of the counter order(s) was achieved.

The following figure gives an overview of possible order book situations of Midpoint orders (including Midpoint sweep orders) while the instrument is in continuous trading in the trading model Continuous Trading in connection with Auctions. Numbers in brackets refer to the corresponding example for the rule. Incoming midpoint orders with MBO trading restriction do not participate in immediate executions. In subsequent matching events they are treated as any other resting midpoint order, thus no special example is provided for MBO.



### 11.3.2 Matching examples

The following examples are given to clarify the basic matching rules for midpoint orders while the instrument is in continuous trading through illustration of exemplary order book situations.

*Example 1: A midpoint limit order meets an order book with midpoint limit orders only on the other side. Due to their limit, they are not executable.*
*The currently available Xetra best bid / best ask spread is 197 – 202 (Midpoint = 199.50)*

| **Bid** | | Midpoint | Midpoint | | **Ask** |
|---|---|---|---|---|---|
| Time | Volume | Order Limit | Order Limit | Volume | Time |
| 9:01 | 6000 | 200 | | | |

| **Bid** | | Midpoint | Midpoint | | **Ask** |
|---|---|---|---|---|---|
| Time | Volume | Order Limit | Order Limit | Volume | Time |
| 9:01 | 6000 | 200 | 203 | 6000 | 9:05 |




Although the highest bid limit exceeds the Midpoint price, it is lower than the lowest ask limit. Therefore, the incoming ask midpoint order is entered in the Midpoint order book. No orders are executed. If the incoming order is a midpoint sweep order, it will be automatically transferred to the central limit order book instead.

*Example 2: A midpoint limit order meets an order book with midpoint limit orders only on the other side. The midpoint orders cross, but not at the Midpoint price. Therefore, they are not executable. The currently available Xetra best bid / best ask spread is 197 – 202 (Midpoint = 199.50)*

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 6000 | 198 | | | |

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 6000 | 198 | 197 | 6000 | 9:05 |

Incoming order: Ask Midpoint Order, Limit 197 €, Volume 6000 shares

Although the highest bid limit is higher than the lowest ask limit, it does not exceed the Midpoint price. The incoming ask midpoint order is entered in the order book. No orders are executed. There are crossed midpoint orders which are however not executable at the Midpoint of the currently available Xetra bid/ask spread. If the incoming order is a midpoint sweep order, it will be automatically transferred to the central limit order book instead.

*Example 3: A midpoint limit order meets an order book with midpoint limit orders only on the other side. The midpoint orders cross at the Midpoint price and are executed. The currently available Xetra best bid /best ask spread is 197 – 202 (Midpoint = 199.50)*

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 6000 | 200 | | | |

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | ~~6000~~ | 200 | 197 | 2000 | 9:05 |

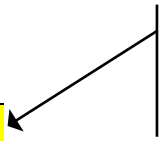
Incoming order: Ask Midpoint Order, Limit 197 €, Volume 8000 shares

The highest bid limit exceeds the Midpoint price and is higher than the lowest ask limit, with the latter being below the Midpoint. The order book is crossed at the Midpoint of the currently available Xetra best bid / best ask spread. Therefore, 6000 shares are executed at 199.50. 2000 remaining shares of the incoming ask midpoint order are entered in the order book. If the incoming order is a midpoint sweep order, the remaining quantity of 2000 shares will be automatically transferred to the central limit order book instead.

*Example 4: A midpoint limit order meets an order book with midpoint limit orders only on the other side. The midpoint orders cross at the Midpoint price. However, the potential execution price would trigger a volatility interruption. No execution takes place.*
*The currently available Xetra best bid / best ask spread is 197 – 202, The Midpoint (199.50) is outside the dynamic respectively static price range.*

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 6000 | 200 | | | |

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 6000 | 200 | 199 | 6000 | 9:05 |
| | | | | | |



Incoming order:
Ask Midpoint Order, Limit 199 €,
Volume 6000 shares

The highest bid limit exceeds the Midpoint price (199.50) and is higher than the lowest ask limit, with the latter being below the Midpoint. The order book is crossed at the Midpoint of the currently available Xetra bid/ask spread. However, the potential execution price of 199.50 would trigger a volatility interruption. Therefore, the incoming midpoint order is entered in the order book and no execution takes place. No volatility interruption is triggered.

*Example 5: A midpoint limit order with MAQ meets an order book with midpoint limit orders only on the other side. One of them has an MAQ. The midpoint orders cross at the Midpoint. In order to release the order book crossed at the Midpoint, strict volume/time priority is disregarded. Execution takes place at the Midpoint.*
*The currently available Xetra best bid / best ask spread is 197 – 202; Midpoint 199,50*

| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 5000 | 201 | | | |
| 9:02 | 4000 (3000 MAQ) | 200 | | | |

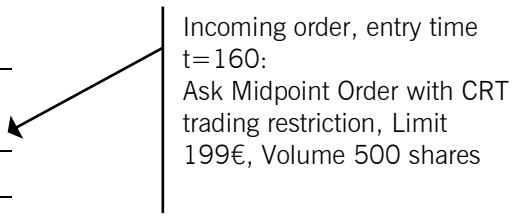
| Bid Time | Volume | Midpoint Order Limit | Midpoint Order Limit | Volume | Ask Time |
|---|---|---|---|---|---|
| 9:01 | 2000 | 201 | | | |
| 9:02 | 1000 (1000 MAQ) | 200 | | | |

Incoming order:
Ask Midpoint Order,
Limit 199 €, Volume 6000 shares, MAQ 6000 shares

The highest bid limit exceeds the Midpoint price (199.50) and is higher than the lowest ask limit which is below the Midpoint. The order book is crossed at the currently available Midpoint of the Xetra bid/ask spread. Full execution of the largest bid order is not possible, although its priority is higher due to its higher volume. The reason is that its volume does not fulfill the MAQ of the incoming ask midpoint order and the remaining volume of the incoming ask midpoint order does not suffice to fulfill the MAQ of the second bid midpoint order. To optimize the executable volume, the incoming ask midpoint order is executed against the MAQ (3000 shares) of the bid midpoint order with lower priority and against 3000 shares of the bid midpoint order with higher priority. As the remaining volume (1000) of the midpoint order with MAQ falls below the initially defined MAQ (3000) after this partial execution, an MAQ equal to the remaining quantity will be considered for the next Midpoint execution. This does not lead to a new time stamp, because an actual modification of the order does not take place. Thus, the MAQ 1000 which is displayed in the final Midpoint order book situation above is for illustrative purposes only.

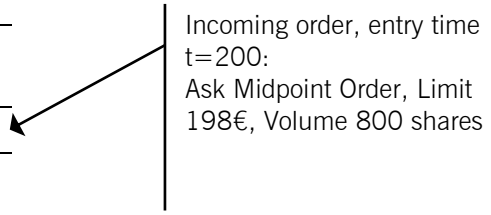
*Example 6: A midpoint limit order with CRT trading restriction is entering the book. It is executed immediately against resting midpoint orders on the other side that are already "CRT-eligible", i.e. they have achieved the MMRT at the moment of the match. It is not executed against other resting midpoint orders, despite the fact that their limit crosses the current Midpoint price. No execution takes place at the moment where additional midpoint orders become CRT-eligible. In the next matching event, "new" CRT-eligible orders are being executed against the midpoint order with the CRT trading restriction with priority over remaining orders.The currently available Xetra best bid / best ask spread is 197 – 202; Midpoint 199,50. The Minimum Marketable Resting Time is 100ms. Time stamps are shown in milliseconds (ms). All order entry times are within the same second and the Midpoint price does not change during this period.*

| Bid | | Midpoint | Midpoint | | Ask |
|---|---|---|---|---|---|
| Time | Volume | Order Limit | Order Limit | Volume | Time |
| 80 | 1000 | 201 | 199 | 400 (CRT) | 160 |
| 50 | ~~100~~ | 200 | | | |




At the order entry time (160ms) incoming order with the CRT trading restriction, the resting buy order for 100 shares has already achieved CRT-eligibility (since t=150ms). It is executed immediately. After 20 milliseconds (t=180), the buy order for 1000 shares also becomes CRT-eligible. No execution takes place at this moment.

| Bid | | Midpoint | Midpoint | | Ask |
|---|---|---|---|---|---|
| Time | Volume | Order Limit | Order Limit | Volume | Time |
| 80 | ~~1000~~ | 201 | 199 | ~~400~~ ~~(CRT)~~ | 160 |
| | | | 198 | 200 | 200 |




The incoming sell order is larger than the resting sell order with the CRT trading restriction. However, matching of the CRT order against the (newly) CRT-eligible resting buy order has priority. Only the remaining 600 shares of the buy order are matched against the incoming sell order. This way it is ensured the resulting allocation of the match is the same as if an additional match had already been triggered at the moment the buy order became CRT-eligible.

## 11.4 Trade-at-Close

### 11.4.1 Matching Rules

Trade-at-Close is triggered automatically if the closing auction concluded with a price determination with positive turnover. However, because the session has a fixed end time, potential volatility interruptions and extended volatility interruptions might go over this time, resulting in Trade-at-Close not taking place for the relevant instrument for the trading session. Matching is done only at single price: the closing auction price of the current trading session for the relevant instrument.

If opted in, only market orders and limit orders with a price limit better than or equal to the closing auction price will participate in Trade-at-Close.

Following the closing auction, non-executed market orders and limit orders with a price better than or equal to the closing auction price and opted in will roll over automatically from the closing auction to Trade-at-Close. New orders can also be entered during Trade-at-Close: market orders and limit orders with a price better than or equal to the closing auction price and opted in will participate in Trade-at-Close.

Each new incoming order is immediately checked for execution against orders on the opposite side of the order book which will be executed according to time priority. Market orders and limit orders are ranked according to time priority only. The price limit attached to the limit orders determines if the order can participate or not in Trade-at-Close but does not subsequently infer on the execution priority. Market orders do not have priority over limit orders.

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

At the end of the Trade-at-Close session, non-executed orders either remain in the order book with their initial price limit/entry time or are deleted if GFD (except for RMO orders that are eligible for the Retail Late trading phase). Orders which did not participate in Trade-at-Close are not affected.

### 11.4.2 Matching Examples

*Example: Non executed limit order after closing auction which is opted in then rolls over to Trade-at-Close.*

The closing auction price is € 63. This will be the transaction price for all trades during Trade-at-Close.

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| | | | 63 | 3000 | 17:35 |

Limit order non executed in the closing auction:
Ask limit order,
price limit € 63,
quantity 3000 shares

Trade-at-Close starts with non-executed and opted in orders transferred from the closing auction. Here one order with a price limit of € 63 qualifies (price equal to the closing auction price) and participates to Trade-at-Close.

*A limit order enters the order book*

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 17:37 | 1000 | 63 | | | |

Incoming order:
Bid limit order
price limit 64
quantity 4000 shares

The incoming bid limit order is executed against the ask limit order at closing auction price (€ 63). The remaining 1000 shares enter the book showing € 63 as price limit.

*A bid market order enters the order book*

| Bid | | | | | Ask |
|---|---|---|---|---|---|
| Time | Quantity | Limit | Limit | Quantity | Time |
| 17:38 | 2500 | 63 | | | |

Incoming order:
Bid market order,
quantity 1500 shares

The incoming bid market order enters the book and adds to the existing order in the book. Cumulated size is 2500 and displayed price is € 63. The bid market order for 1500 shares will come second in time priority for execution compared to the bid limit order previously entered. The number of orders (2) is also displayed.

## 11.5 Retail Auction

### 11.5.1 Matching Rules

The Retail Auction price is determined on the basis of the order book situation stipulated at the end of the call phase according to the modified principle of the highest executable volume. Thus, the retail auction price is the price with the highest executable order volume and the lowest surplus calculated as described for auctions in the Chapter 11.1.1 with an additional requirement that this price must be determined at or within the RLP quote/ order spread. Price determination in the Retail Auction always requires the presence of at least one RLP quote or order. Matching outside the RLP quote or RLP order limits is not possible.

If more than one RLP quote/ order is available, the lowest limit on the bid or ask side and the highest limit on the ask or bid side will define the RLP outer boundaries (Note: this also covers scenarios where RLP orders/ quotes are available only on one side of the order book).

RMO orders can be executed against RLP quotes/ orders and other RMO orders (not restricted to MTH) at or within the RLP spread.

RLP orders/ quotes can only be executed against RMO orders. In case of an incoming RLP quote/ order or modification/ deletion of a quote/ order that would lead to a crossed quote or zero-spread quote situation, RLP quotes/ orders are adjusted in the direction of the reference price in a way that RLP quotes/ orders are not crossed anymore.

During the allocation of executed quantities, a strict price/RLP/time matching priority is followed.

An auction price cannot be determined if orders are not executable at or within the RLP quote/ order spread. In this case, the best bid and ask limits of RLP quotes/ orders (if available) are displayed.

### 11.5.2 Matching Examples

Example 1: Matching RLP vs. RMO at the RLP quote spread

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| | | 0 | | Market | 175 | 175 | | |
| | | 0 | | 198 | 175 | 175 | 100 | RLP |
| RLP | 100 | 100 | 25 | 197 | | 75 | | |
| | | 100 | 25 | 196 | | 75 | 75 | RMO |
| | | 100 | 100 | Market | | 0 | | |

According to the modified principle of the highest executable volume and the lowest surplus, the Retail Auction price is determined at €197 with a quantity of 75. The RMO order is executed against an RLP.

Example 2: Matching RLP vs. RMO according to the price/RLP/time priority

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| | | 0 | | Market | 175 | 175 | | |
| | | 0 | | 198 | 175 | 175 | 100 | RLP |
| RMO 8:30 | 100 | | | | | | | |
| RLP 8:31 | 100 | 200 | 125 | 197 | | 75 | | |
| | | 200 | 125 | 196 | | 75 | 75 | RMO |
| | | 200 | 200 | Market | | 0 | | |

According to the price/RLP/time priority, the RMO sell order is matched with its full quantity of 75 against an RLP at a price of €197.

Example 3: Matching RMO vs. RMO

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| | | 0 | | Market | 175 | 175 | | |
| | | 0 | | 199 | 175 | 175 | 100 | RLP |
| RMO | 75 | 75 | | 198 | | 75 | | |
| RLP | 100 | 175 | 100 | 197 | | 75 | | |
| | | 175 | 100 | 196 | | 75 | 75 | RMO |
| | | 175 | 175 | Market | | 0 | | |

The Retail Auction price is determined at €198 with a quantity of 75. Here RMO orders are matched against each other.

Example 4: RLP orders on one side of the orderbook and an RMO order on the other side

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| | | 0 | | Market | 200 | 200 | | |
| RLP1 | 100 | 100 | | 199 | 100 | 200 | | |
| | | 100 | | 198 | 100 | 200 | | |
| RLP2 | 250 | 350 | 150 | 197 | | 200 | | |
| | | 350 | 150 | 196 | | 200 | 200 | RMO |
| | | 350 | 350 | Market | | 0 | | |

The Retail Auction price is determined at €197 with a quantity of 200. The RMO order is matched against RLP1 (100 shares) and RLP2 (the remaining quantity of 100 shares).

Example 5: Matching of two RMO market orders at the RLP spread

| Bid | | | | | | | | Ask |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Acc. Quantity | Surplus | Limit | Surplus | Acc. Quantity | Quantity | |
| RMO | 200 | 200 | | Market | | 200 | | |
| | | 200 | | 199 | | 200 | | |
| RLP1 | 100 | 300 | 100 | 198 | | 200 | | |
| RLP2 | 250 | 550 | 350 | 197 | | 200 | | |
| | | 550 | 350 | 196 | | 200 | | |
| | | 550 | 350 | Market | | 200 | 200 | RMO |

The Retail Auction price is determined at €198 with a quantity of 200. RMO orders are executed against each other.

# 12 Document History and Change Log

A revised version of this document is published with each T7 Release. Changes from previous versions usually address newly introduced or amended features of the Xetra market model in the current release, but may also concern (unchanged) legacy features, e.g. to improve clarity and completeness as needed. This change log was first introduced with the T7 R13.1 version, i.e. it does not include previous versions.

| Date | Release | Changes |
|---|---|---|
| 29 Oct 2024 | T7 13.0 | |
| 05 May 2025 | T7 13.1 | No new features |
| 01 Oct 2025 | T7 14.0 | Introduction of a new trading model “Retail Auction” for the Extended Xetra Retail Service; SMP Enhancements; Implied Reference Price; Publication of Single Volatility Interruption price range parameters |
| 04 May 2026 | T7 14.1 | Introduction of new trading restriction variations of “Auction Volume Discovery” (AVD); Enhanced transparency of auction call phases (market depth depending on market data interface) |
| 23 October 2026 | T7 15.0 | Introduction of “Counterparty Resting Time” and “Midpoint Book Only” for Xetra Midpoint |