

# **Market Model for trading procedures Continuous Trading with Auctions and Auction**

(Xetra<sup>®</sup> T7 - Release 12.0)

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## 1. Introduction

The document on hand exclusively describes the trading procedures “Continuous Trading” and “Auction” and is based on the General Terms and Conditions of Business of Wiener Boerse AG in the respective valid version. The market model serves as a basis for the rules and regulations; however, these may include further provisions and, in particular, exclude or restrict the use of order and quota types described in this market model.

The market model for the trading procedure “Continuous Auction” as well as detailed information on the organization of trading in Xetra® T7 on Wiener Boerse (Detailed specifications) can be found in separate documents.

Wiener Boerse AG uses Xetra® (Exchange Electronic Trading) since November 5<sup>th</sup>, 1999. Xetra® is a fully electronic trading system for trading on the cash market (equities, bonds and structured products).

As of July 31<sup>st</sup>, 2017, a part of the cash market trading (equities and ETFs) of Wiener Boerse was migrated to the modern trading architecture Xetra® T7. Since January 28<sup>th</sup>, 2019, all bonds, certificates and warrants on Wiener Boerse are tradable on Xetra® T7. The current version of Xetra® T7 (Release 12.0) was introduced on Wiener Boerse on November 20<sup>th</sup>, 2023.

The following market segments can be traded on the trading system Xetra® T7 of Wiener Boerse:

- equity market
- bond market
- structured products

## 2. Market Segmentation of Wiener Boerse

The market segmentation allocates the financial instruments traded on the markets of Wiener Boerse according to certain criteria into market segments. The market segmentation does not take into account whether financial instruments are admitted to listing on a regulated market (Official Market) or is traded on a Multilateral Trading System (Vienna MTF); these markets are used only as a criterion for the allocation to the different market segments.

The allocation criteria to the different market segments is determined particularly by

- Markets (Regulated Market or MTF)
- Type of financial instrument (shares, participation certificates, bonds, certificates etc)
- More stringent reporting, quality and disclosure requirements
- Liquidity Providing (Market Maker etc.)
- Trading system and type of trading

The obligations of issuers stipulated by the Stock Exchange Act are not be affected by the new market segmentation. The financial instruments traded on the markets of Wiener Boerse are grouped into the following segments<sup>1</sup>:

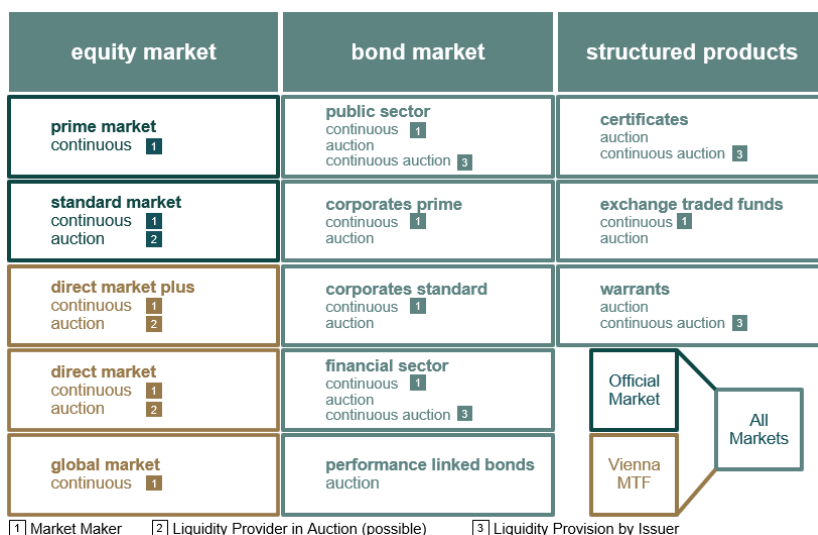


Figure 1: Market segmentation of Wiener Boerse

<sup>1</sup> In case shares are represented by certificates (such as ADCs - Austrian Depository Certificates, GDRs - Global Depository Receipts etc.), they are subject to the same terms and conditions that apply to the shares.

### 3. Basic principles of the Market Model

The market model defines the mechanism through which orders/quotes are matched and trades concluded under the trading system of Wiener Boerse. This includes price determination rules, the order of priority in which orders are executed through the trading system of Wiener Boerse, and the type and scope of information provided to market participants during trading sessions.

The following basic principles were laid down for the cash market of Wiener Boerse:

- An instrument may be traded in trading procedure “Continuous Trading with Auctions” or “Auction”.
- The market models are order-driven.
- Available order types on Wiener Boerse are: Market Order, Limit Order, Stop Order, Iceberg Order, Trailing Stop Order and One-cancels-the-other Order.
- Certain trading members (e.g. Market Makers) may also enter quotes.
- All whole-number (integer) order sizes are tradable, i.e. trading of fractions is not supported (Exception: minimum nominal value in the case of bonds).
- Orders/Quotes are executed according to price/time priority, except during Trade at Close where only time priority applies.
- Trading is anonymous, i.e. market participants cannot view their counterparties on the trading screen.
- Continuous trading starts with an opening auction; it may be interrupted by intraday auctions and ends with a closing auction, followed by Trade at Close in the case of price determination with turnover for the closing auction.
- During pre-trading and post-trading the order book is closed.
- During continuous trading the order book is opened (Limits and the per order accumulated order volumes are displayed)
- During the call of an auction, the order book remains open. In case of an uncrossed order book, the accumulated volumes at the best bid and best ask are displayed in addition to the best bid and ask limits. In case of a crossed order book the executable volume for the indicative auction price, the side of the surplus and the volume of the surplus are displayed.
- 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.
- Both the last price of an instrument that has been determined in an auction as well as the last traded price at all serve as a reference price.
- 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) 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 price determination several prices are possible, as a last resort the price closest to the reference price (last traded price) may be determined.
- At any point in time only one price will exist for any one instrument.
  - The accounting cut-off takes place daily after the post-trading phase.

## 4. Trading Participants

In order to participate in trading with securities (cash market) through Xetra® T7, it is necessary for the institution to become a member of Wiener Boerse and to have the required technical and human resources – for that purpose the admission requirements of Wiener Boerse AG have to be complied with.

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

### 4.1. Participants and User Identifications

Once admission has been granted, the exchange operating company registers the participant in the Xetra® T7 including the corresponding access rights and issues a participant's identification code (Member-ID). Thereafter the trading participant has to arrange the individual users and do the setup using unique user identification codes (User-ID's) in Xetra® T7. User identification codes with trading functions (so-called Trader-ID's) are authorized by Wiener Boerse AG only to persons of a trading participant, who are admitted as an exchange trader or a trader's assistant. The activation of trading specific rights has to be done by the exchange operating company and is required to enter, modify or delete orders and quotes. All other user identification codes entitle the holder only to make queries or are equipped with system administrative or clearing specific rights.

The first half of the Trader-ID – the trader sub group – may be mostly defined by the trading participant, the second half of the code – the Trader-Code – is issued by Wiener Boerse AG. In cases of arranging user identification codes for administrators respectively for order routing systems or order entry systems, these user groups will be defined by Wiener Boerse AG.

Wiener Boerse AG will define securities groups which will be made available to each participant. Participants have the option of adapting the access rights granted to their trading groups to their individual organizational needs. Changes to the access rights for each user identification code are made by the participants themselves

and recorded by Wiener Boerse AG. These changes are communicated to participants in standardized reports at the end of each trading session.

The users of Xetra® T7 may be classified into the following categories:

#### **4.1.1. Exchange Trader**

Exchange Traders are those physical persons that are authorized to place orders and to conclude dealings in the name of Members on the exchange or within the trading system and have been admitted as Traders to the exchange by the exchange operating company.

A trader may trade

- on behalf of clients („Agent Trader“, Account A) or
- on his or her own account („Proprietary Trader“, Account P) or
- on his or her own account on behalf of clients (“Riskless Principal“, Account R), and if applicable act
- as a liquidity provider („Market Maker“, Account M).

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.

#### **4.1.2. Other Users**

Users of the system who are not admitted to trading (incl. administrators for managing authorization rights for the users of the trading participant), personnel engaged in settlement, operating and supervisory functions, and users of information.

### **4.2. Liquidity Providers on Wiener Boerse**

Trading participants may act as Liquidity Providers, increasing securities liquidity by simultaneously offering to buy and sell, thereby improving the price quality of supported securities.. The market model includes different types of liquidity providers such as market makers or Liquidity Provider in the auction.

Typically, quotes are sent as pairs of buy and sell limits, also referred to as Double-Sided Quotes<sup>2</sup>. A quote in Xetra® 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

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<sup>2</sup> 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.



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.

Liquidity Providers have to provide double-sided quotes or orders for a certain minimum time. In case of "stressed market conditions" (SMC) the requirements are relaxed. During "exceptional market conditions" (EMC) the requirements are repealed.

## 5. Order types

All whole-number (integer) order sizes can be traded in Xetra® T7, i.e. trading of fractions is not supported. The minimum trading lot for Xetra® T7 in Vienna has been defined as one (Exception: minimum nominal value in the case of bonds). A change to an order will result in a new time priority if the limit is changed or if the change has a negative impact on the execution priority of other orders in the order book (e.g., increases in the volume of an existing order). If, however, the volume of an existing order is reduced, the original time priority remains valid.

Time priority changes	No change in time priority
▪ Limit ↑	▪ Quantity ↓
▪ Limit ↓	▪ Change in other fields:
▪ Quantity ↑	▪ Validity ↓
▪ Validity ↑	▪ Account
▪ Change of Stop Order	▪ Text
▪ Activation of an order with trading restriction	▪ Internal order number

Figure 2: Time priority (Timestamp) of an order

According to the order number concept, the number of an order remains unchanged when a new time priority is assigned.

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.

Xetra® 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. Order types

In Xetra® T7, all orders are anonymous. The trading participants cannot see who entered a specific order or quote into the order book.

### 5.1.1. Market Order and Limit Order

The Market Order and the Limit Order are counted among the basic order types in Xetra®. Both order types can be specified further through additional execution conditions, validity constraints and trading restrictions.

- Market Orders - are unlimited buy or sell orders to be executed at the next price that is determined.
- Limit Orders - are limited buy or sell orders to be executed at the set limit price or better.

### 5.1.2. Stop Orders

To support trading strategies, two different types of stop orders are available that are activated after a predefined price level (stop limit) is reached.

- Stop Market Order - When the stop limit is reached (or exceeded for stop buy orders or falls below it for stop sell orders), the stop order is automatically placed in the order book as a market order and may be executed immediately.
- Stop Limit Order - In the case of a stop-limit order, when the stop limit is reached (or exceeded for stop buy orders or if it falls below it for stop loss orders), the stop order is automatically placed in the order book as a limit order and may be executed immediately.

Any change to a stop order gives it a new time stamp.

### 5.1.3. 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"). Alternatively, solely a specific stop limit can be entered, upon which the absolute difference from the corresponding reference price is calculated and set accordingly.

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; 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, the trailing stop order is triggered.

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

#### **5.1.4. One-Cancels-Other Order**

A one-cancels-other order is an order that combines a limit order and a stop market order. If the limit order is fully executed or the stop market order is triggered, the respectively other order will be deleted. If the limit order is partially executed, the stop market order will be modified to match the remaining volume of the limit order.

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

#### **5.1.5. Iceberg Orders**

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

An iceberg order is specified by its mandatory limit, its overall volume and an initial peak volume. Optionally, a minimum and a maximum peak volume can be specified to trigger a 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 peak and maximum peak volume are not specified the initial peak volume is entered into the book. In auction trading, i.e. auctions, as well as volatility interruptions, iceberg orders contribute with their overall volume.

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

## 5.2. Execution restrictions

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

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

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

- A book-or-cancel order (BOC Order) is a limit order placed as resting liquidity in the order book in order to ensure passive execution. It will only be accepted and added to the order book if it is not immediately executable against a 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 is rejected without entry in the order book. Resting BOC orders are deleted when an auction or volatility interruption is triggered, as any trading volume executed in an auction or volatility interruption is classified as non-passive trading volume. During auctions and volatility interruptions, incoming BOC orders are rejected.

## 5.3. Validity restrictions

Further restrictions may be imposed to specify the period of time for which an order is valid. The market model provides the following options:

- Good-for-day (GFD) - This order is valid only for the current trading day.
- Good-till-date (GTD) - This order is valid only up until a specified date.
- Good-till-cancelled (GTC) - This order is valid until it has either been executed or cancelled.

## 5.4. Trading restrictions

Using the following restrictions, orders may be placed for trading in all auctions or in a specific auction only:

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

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

## **5.5. Execution restrictions for Trade at Close**

Only market orders and limit orders, of any validity, can participate in Trade at Close.

- Market orders and limit orders participating in Trade at Close can be assigned any of the following execution conditions: Immediate-or-Cancel (IOC), Fill-or-Kill (FOK) or Book-or-Cancel (BOC).
- Orders with the following trading restrictions cannot participate in Trade-at-Close: Opening auction only, Intraday auction only, Closing auction only and Auction only.

## **5.6. Quotes**

Xetra<sup>®</sup> T7 allows participants registered as liquidity providers to enter quotes. A Quote is the simultaneous entry of limited buy and sell orders into Xetra<sup>®</sup> T7. Quotes are valid only for the day on which they are entered into the system.

## **5.7. Handling of orders in case of events affecting prices**

The exchange operating company may have orders deleted before expiry if this step is necessary and appropriate to ensure a well-functioning securities market in the interest of the national economy or to safeguard the legitimate interests of investors.

In other words, in the case of extraordinary price-influencing events (eg company news), the exchange operating company may suspend trading. If a suspension is made all existing orders and quotes in the trading system will be deleted (in case of interruption (Halt), only non-persistent orders are deleted).

Orders in the order book 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. Self Match Prevention (SMP)**

With the “Self Match Prevention” (SMP) functionality participants are able to avoid the execution of an order or quote against other orders or quotes from the same member in the same instrument. The Self Match Prevention (SMP) functionality can be used via the order attribute “CrossID” (optional) and is available for trading procedure Continuous Trading.

During Continuous Trading and Trade at Close, the trading system Xetra® T7 checks if orders/quotes which are executable against each other are from the same member and are entered with the same “CrossID”. If this is the case the Self Match Prevention Processing is started. Orders/quotes which become executable against each other during a volatility interruption or a regular auction will not be validated for the SMP criteria.

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

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

### 5.8.1. Self-Match Prevention - Process

If an incoming SMP order or quote with a “CrossID” is immediately executable it will be checked if a matching order or quote with the same “CrossID” which was submitted by a trader of the same member exists in the order book (sitting SMP-Order). The incoming SMP-Order will be allowed to match until it hits a sitting SMP-Order, i.e. it can match partially against other orders in the book with a higher priority than the sitting SMP-Order, even against sitting orders of the same member but with different “CrossID”. 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 decremented 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 decremented 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
  - until there are no further executable orders on this price level,
  - until it is fully executed or
  - until it hits another sitting SMP-Order on this price level.

In the latter case the described steps will be repeated. In case there is still quantity left from the incoming SMP-Order after matching on the respective price level has completed, it will not match further price levels but will be cancelled.

## 6. Trading

In Chapter 6, the trading phases and forms offered and trading procedures for Xetra® T7 Vienna are presented.

### 6.1. Trading Phases

Trading starts with the pre-trading phase followed by the trading phase and ends with the post-trading phase (see Figure 3 and Figure 4). The system is not available in the time between the post-trading phase and the pre-trading phase.

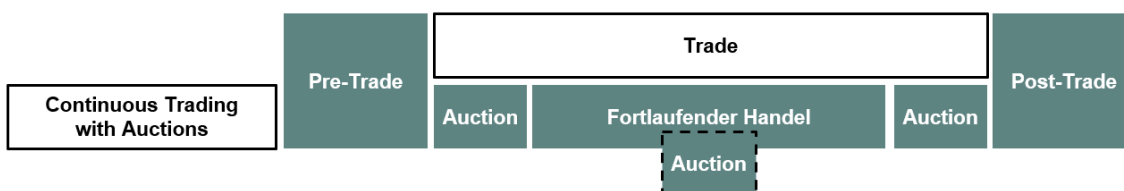


Figure 3: Trading procedure Continuous Trading with Auctions



Figure 4: Trading procedure Auction

While pre-trading and post-trading rules are the same for all instruments, procedures in the trading phase may differ.

#### 6.1.1. Pre-Trading phase

The pre-trading phase precedes the trading phase. During this time, market participants may enter orders and quotes in preparation of actual trading and change or delete their own orders or quotes. Orders entered by participants are confirmed by the exchange.

Market participants are not allowed to view the orders entered into the order book as the order book is closed during that phase. During pre-trading no matching of orders is conducted.

#### 6.1.2. Trading phase

During the trading phase, orders of any size may be traded in accordance with the rules applicable to the type of trading and the trading segment concerned. In some trading segments trading is continuous with an opening auction and a closing auction. Continuous trading can be interrupted by predefined intraday auctions.



In other trading segments all trading is through auction trading only. In Vienna, only one auction is held per trading day in these segments.

### **6.1.3. Post-Trading phase**

The end of the trading phase is followed by a post-trading phase, in which participants may enter orders and change or delete their orders that have not been executed. Market 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 taken into consideration in the respective trading form on the following trading day depending on possible execution restrictions and validity constraints. During post-trading no matching of orders is conducted.

## **6.2. Trading Forms**

The Xetra® T7 "Market Model" of Wiener Boerse supports the trading procedures auction trading and continuous trading as well as Trade at Close.

### **6.2.1. Auction**

Auction trading is possible for orders of any size. 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. BOC orders are deleted when an auction is triggered. During auctions, incoming BOC orders are rejected.

In auction trading, prices are determined according to the principle of executing as many orders as possible. At the same time, orders are ranked by price and time received, as a result of which not more than one order with an auction price limit or one unlimited order are partially executed. During the call of the auction, the order book is open. As information about the market situation, participants obtain the indicative price with executable volumes. In case no indicative auction price can be determined, the best bid and ask limit and the cumulated volume at these limits are displayed. Market participants are informed via an auction plan about the time the individual security is called.

### **6.2.2. Continuous Trading**

Any new incoming order (except for stop orders) is immediately checked to determine whether or not it can be executed right away. In continuous trading, orders are executed according to price and time entered. With this type of trading procedure 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.

### 6.2.3. Trade at Close

Trade at Close is only triggered when the closing auction concluded with price determination with a turnover. In this case market orders and limit orders with a price limit better than or equal to the closing auction price and for which the attribute Trade at Close was set participate in Trade at Close. During Trade at Close, new incoming market orders and limit orders with a price limit better than or equal to the closing auction price and for which the attribute Trade at Close was set will participate in Trade at Close. Stop orders, trailing stop orders, one-cancel-other orders and iceberg orders cannot participate in Trade at Close.

Matching can only take place at the closing auction price of the trading session for the relevant instrument. Each new incoming order 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 Trade at Close 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 to Trade-at-Close are not affected.

## 6.3. Trading procedures

Xetra® T7 supports the following trading procedures:

1. Continuous trading (with auctions);
2. Auction (several auctions or single auction).

### 6.3.1. Continuous Trading with Auctions

Trading starts with an opening auction. At the end of the opening auction, continuous trading is started. Continuous trading can be interrupted by one or more intraday auctions. At the end of continuous trading, the closing auction is initiated. In the case of closing auction with price determination with turnover, Trade at Close starts (see Figure 5).

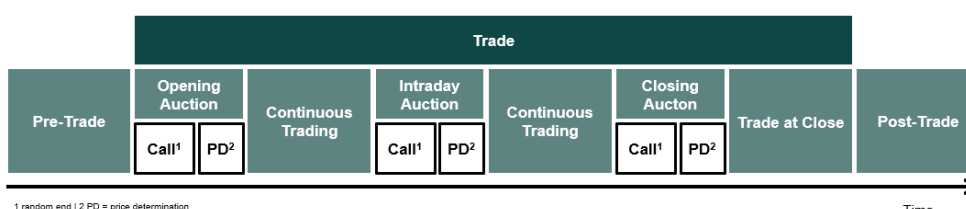


Figure 5: Continuous Trading with Auctions

### 6.3.1.1. Opening Auction

An opening auction, comprising a call and the price determination, is carried out prior to continuous trading (see Figure 6). All orders still valid from the previous day or which have already been entered on the current trading day, participate in this auction unless their execution is restricted to the closing auction. Quotes are also taking part in the opening auction. Iceberg orders are considered with their overall volume. All executable orders are matched in the opening auction, thus avoiding a "crossed order book" (i.e. no price overlapping of bid/ask orders) and initiating continuous trading.

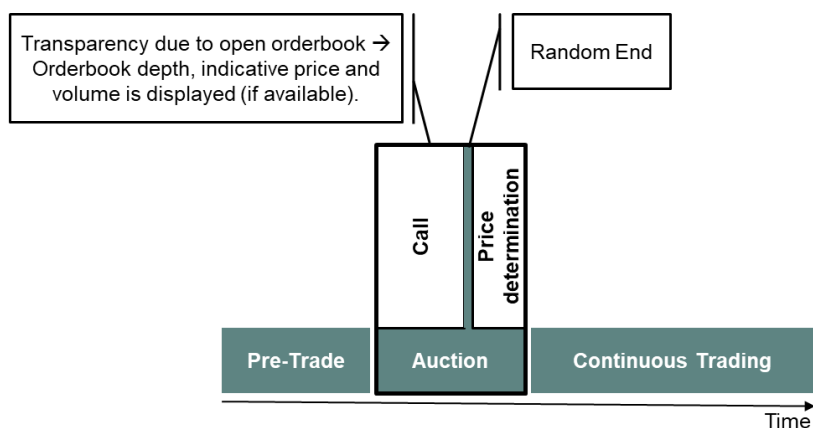


Figure 6: Sequence of an Auction

#### 6.3.1.1.1. Call

The opening auction starts with the call. Information on the current order situation is provided continuously during the call. The indicative auction price is displayed when orders are executable. This is the price that would be realized if the price determination was concluded at this time. If an indicative price cannot be determined, the best bid/ask limit is displayed.

In the call, when the order book is open, the depth of the market is displayed. If there are orders that can be matched, an indicative auction price is displayed.

The duration of the call may vary according to the liquidity of the securities in a trading segment. In order to avoid price manipulation, the call is ended at a random point in time after a certain minimum period.

#### 6.3.1.1.2. Price determination

The call is followed by the price determination. The auction price is determined on the basis of the order book situation at the end of the call according to the principle of executing as many orders as possible.

The auction price is the price at which the largest volume of orders can be executed, leaving the smallest possible surplus for each limit in the order book. The time priority rule ensures that of the orders with an auction price limit, not more than one order is partially executed. If existing orders cannot be matched, it is not possible

to determine an auction price. In this case, the best bid and/or ask limit(s) is/are displayed. As soon as the auction price has been determined, the market participants receive an execution confirmation showing the number of trades closed along with the execution price, time, and volume.

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

#### **6.3.1.2. Continuous Trading**

Continuous trading starts after the end of the opening auction. In continuous trading, the order book is open with limits and aggregate order volumes per limit being displayed. Any new incoming order and every new quote is examined immediately to determine whether it can be matched against orders on the opposite side of the market. Orders are executed according to price and time ranking. Furthermore, new orders are checked for Self Match Prevention.

Orders/Quotes may be executed in full, in one or several steps, in part, or not at all, thereby generating one or several transactions or none at all. Orders or parts of orders left unfilled may be entered into the order book and sorted by price and time priority.

As orders are sorted by price and time, buy orders with a higher limit take precedence over buy orders with lower limits. Conversely, sell orders with a lower limit take precedence over sell orders with higher limits. Time is used as a second criterion when several orders have the same limit. In this case, orders that were entered earlier take precedence. Market orders take precedence in the order book over limit orders. The rule of time priority also applies to market orders.

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

When two orders have been matched, the trading parties receive execution confirmations in a procedure analogous to the one followed in the opening auction.

#### **6.3.1.3. Intraday Auction**

An intraday auction interrupts continuous trading. The intraday auction consists – analogous to the opening auction – of a call and the price determination (see Figure 6). The process in intraday auction is similar to the

opening auction. All orders and quotes in the order book are matched automatically. This applies to orders and quotes remaining from the continuous trading procedure as well as to orders that were placed with the restriction Auction Only. 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.

After the intraday auction ends, continuous trading goes on.

#### **6.3.1.4. Closing Auction**

Continuous trading is followed by a closing auction consisting of a call and the price determination (see Figure 6) analogous to the opening and intraday 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. After price determination, non-executed or only partially executed orders are transferred to the next trading day according to their validity. Orders for which the attribute Trade at Close was set 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.

##### **6.3.1.4.1. Auction price without turnover**

For designated instruments an auction price without turnover may be determined in scheduled auctions in case there is no crossed order book situation. This auction price without turnover would not trigger stop orders or update trailing stop orders, but would update the reference price. This auction price without turnover may be determined at the midpoint of the available best bid and best ask at the end of the scheduled auction, given it does not deviate too much from the dynamic or static reference price and/or market makers are present in the order book. If these prerequisites are not fulfilled no price without turnover is determined.

##### **6.3.1.5. Trade at Close**

Trade at Close is triggered automatically after the termination of the closing auction if the latter concluded with price determination with 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 orders for which the attribute Trade at Close was set 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 for which the attribute Trade at Close was set 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 for which the attribute Trade at Close was set) 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 8.

### 6.3.2. Auction

If the trading of a security is limited to auctions, this/these auction(s) also consist(s) of a call phase and the price determination. 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 market participants about the time the individual securities are called.

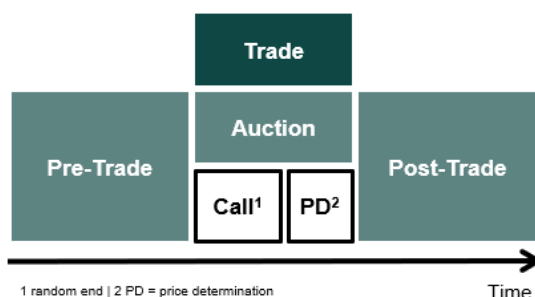


Figure 7: Single intraday Auction

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.

## 6.4. Stressed Market Condition (SMC)

The Exchange Operating Company shall set out the parameters to identify stressed market conditions (SMC) in terms of significant short-term changes of price and volume. SMC will only affect liquid equities / ETFs (as defined in accordance with MiFIR Article 2 (1) (17)) that are tradable on in trading procedure "Continuous Trading with Auctions".

SMC occurs as soon as both market conditions - short-term price and volume changes - are met and takes one hour. If both market conditions are met repeatedly within this hour, SMC starts again.

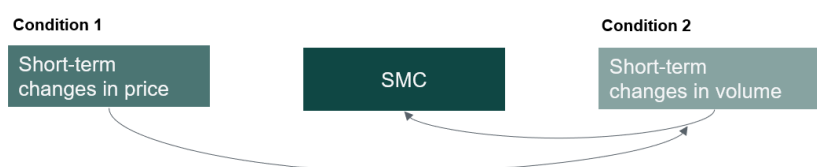


Figure 8; Market conditions for SMC

Condition 1 (short-term changes in price) is met if the price of the potential trade is outside the double bandwidth for an "Extended Volatility Interruption".

Condition 2 (short-term changes in volume) is met if the volume of the potential trade is at least 5 times higher than the average amount of a trade of the last year in the respective instrument.

If both market conditions occur simultaneously, an SMC phase is triggered in the respective instrument.

If condition 1 + 2 is fulfilled → SMC

Figure 9: SMC gets triggered

The beginning and end of SMC will be announced through the trading system (Newsboard). To improve liquidity during SMC, the exchange operating company will set for Market Makers divergent size and spread commitments and announce them separately.

## 6.5. Exceptional Market Condition (EMC)

An exceptional circumstance (= Exceptional Market Condition - EMC) is for instance:

- Extreme volatility - Trigger for EMC if > 50 % of shares and ETFs tradeable in Continuous Trading with Market Making are in a volatility interruption at the same time
- War, industrial action, civil unrest, cyber sabotage
- Disorderly trading conditions (Significant delay performance of trading system or Multiple erroneous orders/transactions)
- Trading Participant has problems to maintain prudent risk management practices (eg Technological issues, Problems risk management or Short selling restrictions)

- For non-equity instruments, if FMA temporarily suspends the pre-trade transparency requirements (MiFIR Art. 9(4))

Once EMC occurs, the obligation to provide liquidity (for Liquidity Provider) is cancelled.

The exchange operating company will communicate the beginning and end of EMC through the trading system (Newsboard).

## **6.6. Dividend Payments and Corporate Actions**

In the case of dividend payments, price markdowns and corporate actions (e.g., ex-rights trading and stock splits), orders contained in the Xetra® order book are treated in the following way: Automatic deletion of all existing orders by Wiener Boerse in the course of the day-end processing before the ex-rights trading day.



## 7. Safeguards in the Market Model

Xetra® T7 includes the safety mechanisms:

- volatility interruption
- extended volatility interruption

A volatility interruption can occur in auctions and continuous trading. 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 reference prices. The volatility interruption can be triggered in two ways:

- If the indicative execution price is outside the dynamic price corridor on either side of the reference price. The reference price (reference price 1) for the dynamic price corridor is the most recent price of a security that was determined in an auction or in continuous trading. The reference price is adjusted in continuous trading whenever an incoming order has been matched against orders in the order book and executed to the extent that this was possible.
- If the indicative execution price is outside the additionally defined static price corridor. The wider static price corridor defines the maximum deviation – in absolute numbers and/or as a percentage – from another reference price, which is the last price determined in an auction held during the current trading session. If this price has not been determined, the most recent price determined on one of the previous trading days is used instead.

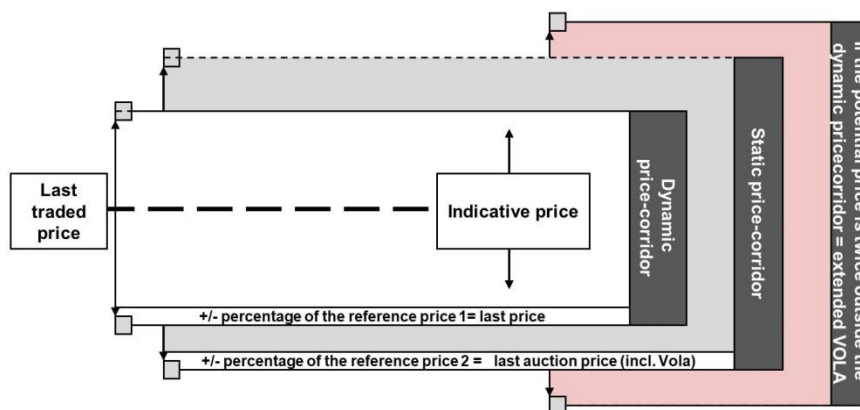


Figure 10: Dynamic and static price corridor

The static and dynamic price ranges are stipulated individually for each security and define the maximum percentage or absolute deviation (symmetrically positive and negative) of the respective reference price in a security (Wiener Boerse does not publish the values of the corridors).

## 7.1. Volatility Interruption in 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 (exception: fill-or-kill orders). Market participants are made aware of this market situation.

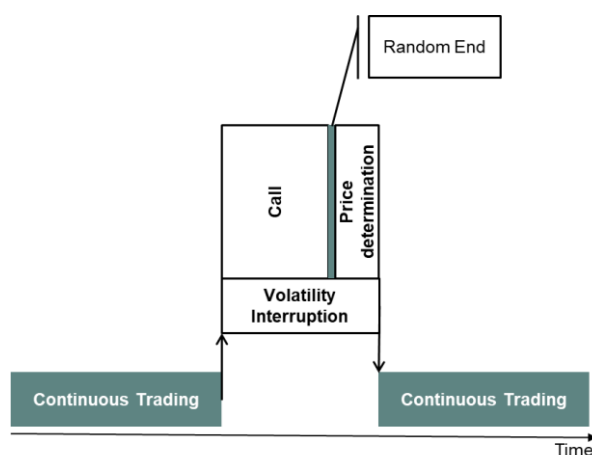


Figure 11: Volatility Interruption in Continuous Trading

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

The volatility interruption consists of a call and the price determination. After a minimum duration, the call in general ends randomly. However, if the potential execution price lies outside of a defined range, which is wider than the dynamic price range, the call will be extended until the volatility interruption is terminated manually. Alternatively, the extended volatility interruption will be ended automatically once there is no longer an executable order book situation.

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

## 7.2. Volatility Interruption during an Auction

A volatility interruption is initiated if the potential auction price at the end of the call lies outside the dynamic and/or static price range. Volatility interruptions in an auction are indicated to the market participants. Iceberg orders participate with their full volume in volatility interruptions during auctions. A volatility interruption initiates a limited extension of the call, allowing market participants to enter new orders as well as to modify or delete

orders in the order book. After a minimum duration, the call in general ends randomly. However, if the potential execution price lies outside of a defined range, which is wider than the dynamic price range (extended dynamic price range), the call will be extended until the volatility interruption is terminated manually according to Wiener Boerse AG exchange rules. In an opening auction this extended volatility interruption will be ended automatically once there is no longer an executable order book situation

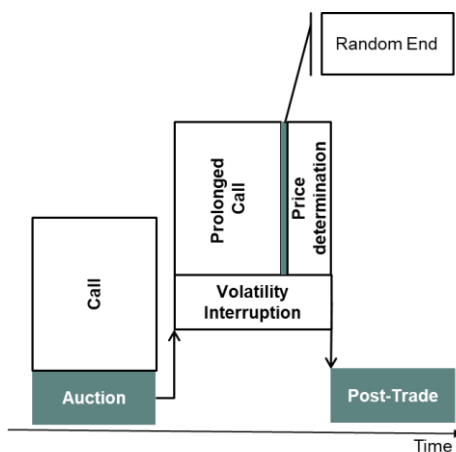


Figure 12: Volatility interruption during an Auction

. 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.

### 7.3. Extended Volatility Interruption

If, at the end of the volatility interruption, the indicative auction price still remains outside the dynamic/static price corridor and additionally outside the double dynamic price corridor price determination cannot be carried out automatically. The call is extended until the volatility interruption is terminated manually according to the trading rules of Wiener Boerse AG.

## 8. Rules of Price Determination

In chapter 8, the rules of price determination (matching rules) for trading procedures Continuous Trading and Auction are described.

### 8.1. Auction Price Determination

The auction price is determined on the basis of the order book situation stipulated at the end of the call. For this purpose, all relevant limits in the order book, including all tick size levels according to the liquidity band, are used. Concerning the price determination in auctions, Iceberg orders are contributing with their overall volume like a limit order.

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. 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.

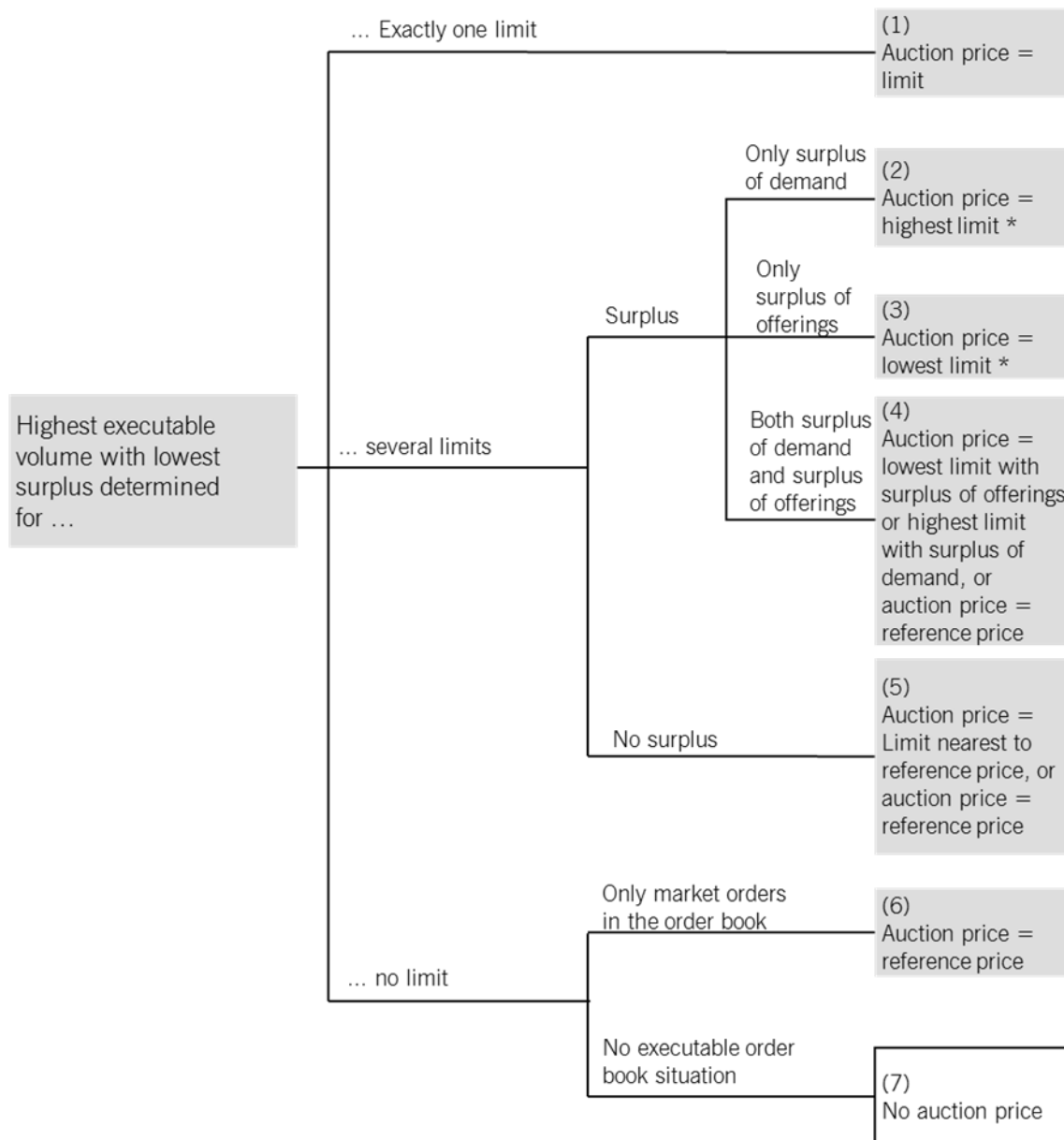
In both cases, the reference price is considered for stipulating the auction price:

- 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).

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

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



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

Figure 13: Price determination in Auctions

## 8.2. Examples of Matching in Auctions

The following examples are given to clarify the basic matching rules in auctions.

**Please note:** In the examples, price determination is carried out using exemplary order book situations assuming a tick size of 1€. The „additional example 4“ also shows how the price determination for a tick size of € 0.01.

### ■ 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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
200	200		202	500	700	
200	400		201	300	700	
300	700		200		700	100
	700	100	199		600	
	700	100	198		600	200
	700	300	197		400	400

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
400	400		202	100	500	
200	600	100	201		500	
	600	100	200		500	
	600	100	199		500	300
	600	400	198		200	200

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
500	500	200	Market		300	
	500	200	202		300	
	500	200	201		300	
	500	200	200		300	
	500	200	199		300	300

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
300	300		202	300	600	
200	500		201	100	600	
	500		200	100	600	
	500		199	100	600	400
	500	300	198		200	200

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
300	300		202	200	500	
	300		201	200	500	
	300		200	200	500	
	300		199	200	500	
	300		Market	200	500	500

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
100	100		Market	100	200	
	100		201	100	200	
	100		200	100	200	100
100	200	100	199		100	
	200	100	198		100	
	200	100	Market		100	100

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.



■ Additional example → Tick Size € 0,01:

There are several possible limits and there is both an ask surplus and a bid surplus.

Bid				Ask		
Quantity	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
100	100		Market	100	200	
	100		201,00	100	200	
	100		200,00	100	200	100
100	200	100	199,00		100	
	200	100	198,00		100	
	200	100	Market		100	100

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

- a) If the reference price is € 200 or above (e. g. € 202,00), the auction price will be € 199,99.
- b) If the reference price is € 199 or below (e. g. € 198,00), the auction price will be € 199,01.

■ Example 5:

There are several possible limits and no surplus on hand.

Bid				Ask		
Quantity	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
100	100		Market	100	200	
	100		202	100	200	100
	100		201		100	
	100		200		100	
	100		199		100	
100	200	100	198		100	
	200	100	Market		100	100

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
900	900	100	Market		800	
	900	100	Market		800	800

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	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
			201		80	80
80	80		200			
80	160		199			

It is not possible to determine an auction price. In this case, the highest visible bid limit (€ 200) and the lowest visible ask limit (€ 201) are published.

■ Example 8:

Partial execution of an order within the opening auction.

Buy				Sell			
Time	Quantity	Accumulated Quantity	Surplus	Limit	Surplus	Accumulated Quantity	Quantity
09:00	300	600	200	200		400	400
09:01	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.

### 8.3. Price Determination in Continuous Trading

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

Orders can be executed fully in one or more steps, partially or not at all. Thus, each new incoming order may generate 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 No. 1: If an incoming market order meets an order book with market orders only on the other side, this market order is executed at the reference price (last traded price) as far as possible (see example 1).
- Rule No. 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 No. 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 is executed against the market orders in accordance with price/time priority with respect to non-executed bid market orders at the reference price or higher (at the highest limit of the executable orders) or at the reference price or lower (at the lowest limit of the executable orders) with respect to non-executed ask market orders.

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

- Principle No. 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 No. 2: If orders cannot be executed at the reference price, they are executed in accordance with price/time priority by means of price determination above or below the reference price (non-executed bid market orders or ask market orders) i.e. the price is determined by a limit within the order book or a limit of an incoming order.

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

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

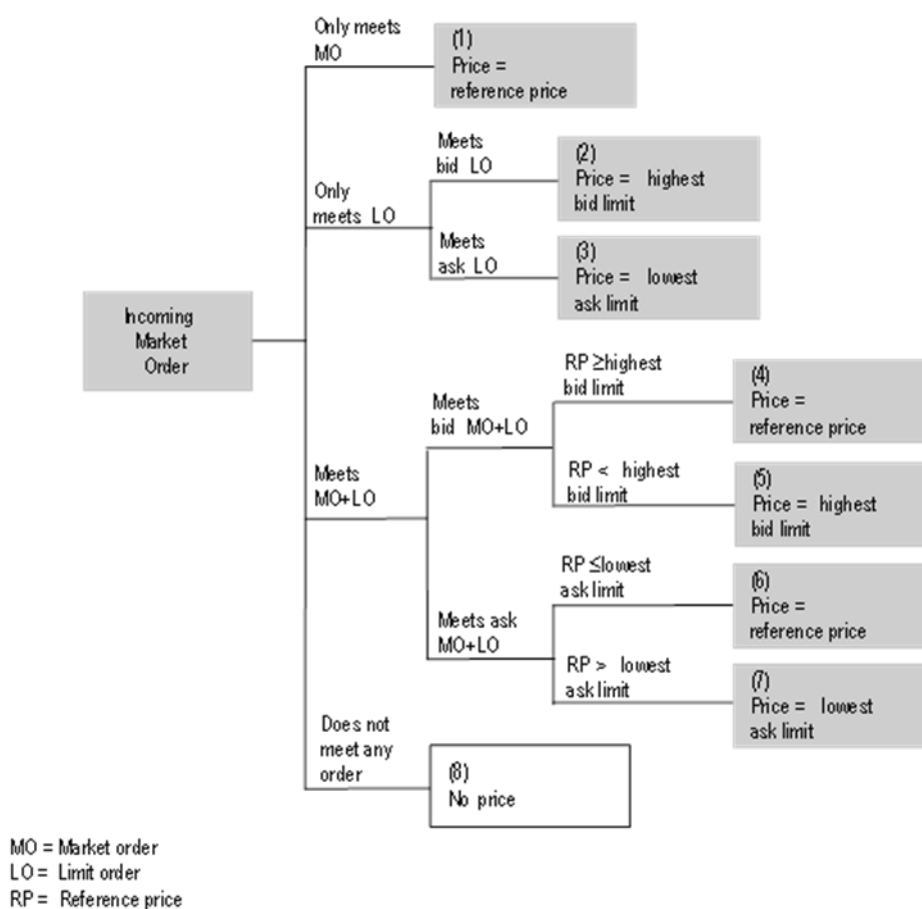


Figure 14: Incoming Market Order

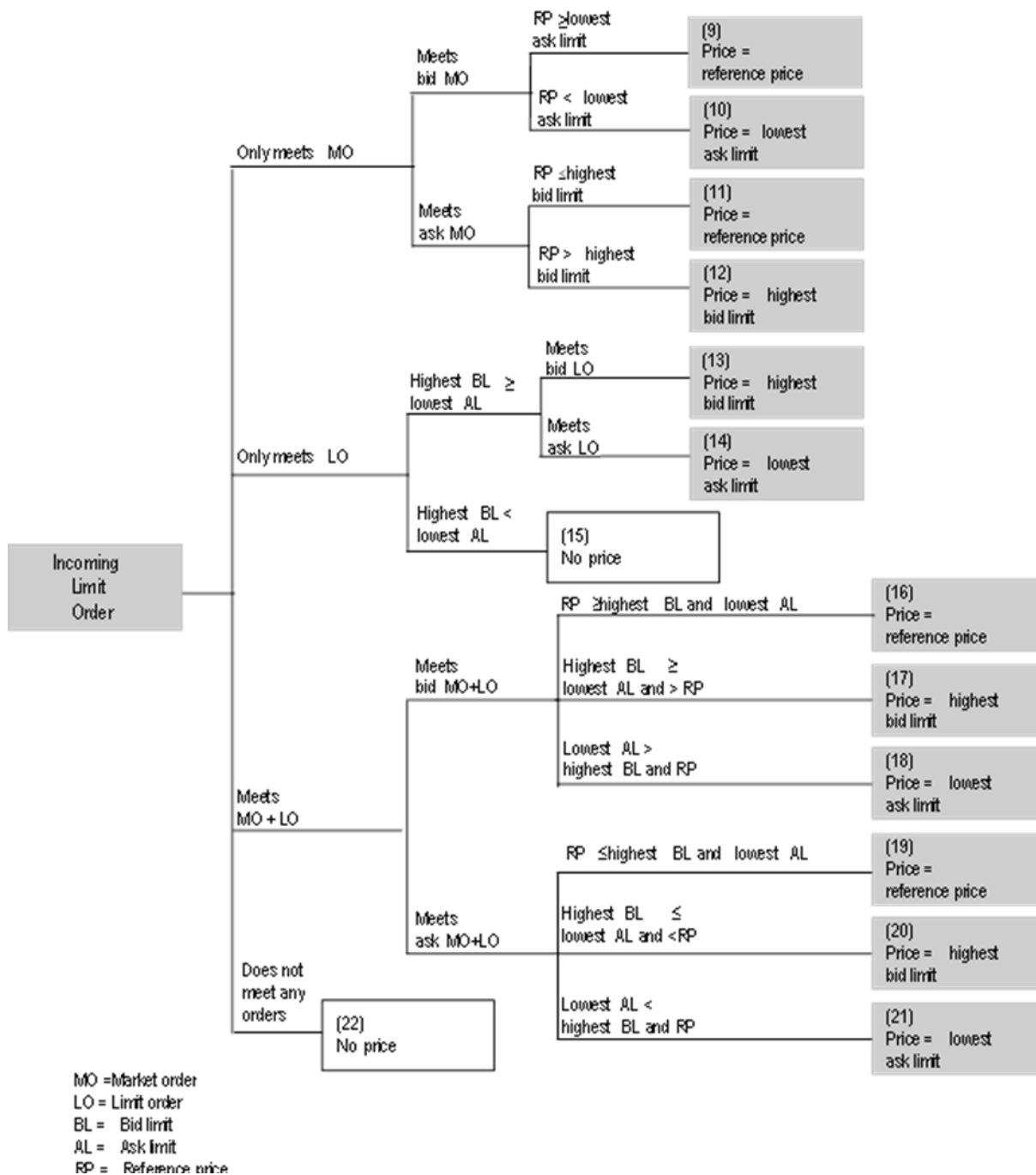


Figure 15: Incoming Limit Order

## 8.4. Example of Matching in Continuous Trading

This chapter is subdivided into two sections: the first section provides matching examples that cover the order book situations mentioned in the figures presented above. In the second section 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 €.

### ■ Example 1:

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

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			

Sell-Order  
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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	200			

Sell-Order  
6000 @ Market

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
			200	6000	09:01

Buy-Order  
6000 @ Market

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			
09:02	1000	195			

Sell-Order  
6000 @ Market

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).



■ Example 5:

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

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			
09:02	1000	202			

Sell-Order  
6000 @ Market

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).

■ Example 6:

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

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
			Market	6000	09:01
			202	1000	09:02

Buy-Order  
6000 @ Market

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; display: inline-block;">                     Buy-Order 6000 @ Market                 </div>			Market	6000	09:01
			202	1000	09:02

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; display: inline-block;">                     Buy-Order 6000 @ Market                 </div>					

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			

Sell-Order  
6000 @ 195 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			

Sell-Order  
6000 @ 203 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
			Market	6000	09:01

Buy-Order  
6000 @ 203 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
			Market	6000	09:01

Buy-Order  
6000 @ 199 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	199			

Sell-Order  
6000 @ 198 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
			199	6000	09:01

Buy-Order  
6000 @ 200 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	199			

Sell-Order  
6000 @ 200 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			
09:02	1000	196			

Sell-Order  
6000 @ 195 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			
09:02	1000	202			

Sell-Order  
6000 @ 199 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
09:01	6000	Market			
09:02	1000	202			

Sell-Order  
6000 @ 203 €

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; width: fit-content; margin: 10px auto;">                     Buy-Order 6000 @ 203 €                 </div>			Market	6000	09:01
			202	1000	09:02

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; width: fit-content; margin: 10px auto;">                     Buy-Order 6000 @ 200 €                 </div>			Market	6000	09:01
			202	1000	09:02

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; width: fit-content; margin: 10px auto;">                     Buy-Order 6000 @ 203 €                 </div>			Market	6000	09:01
			199	1000	09:02

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.

Buy			Sell		
Time	Volume	Limit	Limit	Volume	Time
<div style="border: 2px solid red; padding: 5px; width: fit-content; margin: 10px auto;">                     Buy-Order 6000 @ 200€                 </div>					

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

## 8.5. Price determination in Continuous Trading

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

Non executed limit order after closing auction for which the attribute Trade at Close was set 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	Volume	Limit	Limit	Volume	Time
			63	3000	17:35

Trade at Close starts with non-executed orders (for which the attribute Trade at Close was set) 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 (Bid with Limit 64 € and Volume 4000) - for which the attribute Trade at Close was set - enters the order book.

Bid			Ask		
Time	Volume	Limit	Limit	Volume	Time
17:37	1000	63			

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 Market Order (Bid with Volume 1500) - for which the attribute Trade at Close was set - enters the order book.

Bid			Ask		
Time	Volume	Limit	Limit	Volume	Time
17:38	2500	63			

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.

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