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Market Model for the Trading Venue Xetra®

Version 1

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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: Xetra (MIC[2]: XETR) and 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 Xetra: auction, continuous trading and midpoint trading. 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 market participants during trading hours. The corresponding description of trading forms typically available on the trading venue 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 Market Model

The main trading model applied on the trading venue 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, market participants can enter quotes.

2. Trading in the trading model “Continuous Trading in connection with Auctions” starts with an opening auction, can be interrupted by an intraday auction and ends with a closing auction, followed by Trade-at-Close in the case of price determination with positive turnover for the closing auction.

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.

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

6. During continuous trading, the order book is open. During the call phase of an auction, the order book remains partially closed. The indicative auction price or the best bid and/or ask limit is displayed. Additional market imbalance information is displayed depending on the order book situation. 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.

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.

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) 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.

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

3 Market Participants

An FWB member firm is set up as a market participant. In order to trade in T7, a market participant must have set up a Trading Business Unit. The business logic of T7 makes use of the business unit rather than of the market 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) or 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 trader 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 market 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 during the whole trading day.

All market 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 Provider do not have minimum times for orders and quotes and cannot participate in auctions and 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. In case of "stressed market conditions" the requirements are relaxed. During "exceptional market conditions" the requirements are repealed.

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

[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.

Additionally, for each individual RFQ, market participants will be able to decide if their business unit ID is disclosed to the target market participants of the RFQ, i.e. to all market 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 flag 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.

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 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 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.

5.2.5 Midpoint Orders

The midpoint order allows market 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 8.1.2). 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 for Continuous Trading

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 deleted. If immediate and full execution is not possible, the order is rejected 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.

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. 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 or closing auction.

- *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.

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. For midpoint sweep orders, these trading restrictions 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.

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 and 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 both, Continuous Trading in connection with Auctions, as well as Midpoint Trading. 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 market 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, market 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 attribute CrossID.

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 market participant and are entered with the same CrossID. If this is the case the Self-Match Prevention Processing is started.

~~SMP processing is only offered in continuous trading, but not during a volatility interruption or a regular 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.

Per default, Self-Match Prevention is switched on for all members.

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).

If this is the case then the match is prevented and the potentially matching quantities are removed.

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).

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).

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".

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 market 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 calculate 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 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

Market participants can enter orders and quotes for preparing the actual trading day and modify or delete their existing orders and quotes. 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. During pre-trading no matching of orders is conducted.

6.2 Trading Phase

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

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

6.3 Post-trading Phase

After the trading phase, new orders can be entered and existing orders can be modified or deleted in the post-trading phase. 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 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. At the same time, price/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 remains partially closed during the auction's call phase. As information about the market situation, market participants obtain the indicative price with executable volumes plus a possible market surplus of the respective order book side (Market Imbalance Information). 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.

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 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 market 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 market 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 market participant which is not a counterparty of the transaction. Order information is only displayed to the counterparties of the transaction and to the third market 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. Market 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 market 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 market 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. Market participants can agree on a settlement date deviating from standard settlement period.

7.5 Trade at Close

Trade-at-Close is only triggered when the closing auction concluded with a price determination with a positive turnover. 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.

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 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 market 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)

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 closing auction with price determination with positive turnover, Trade-at-Close starts.

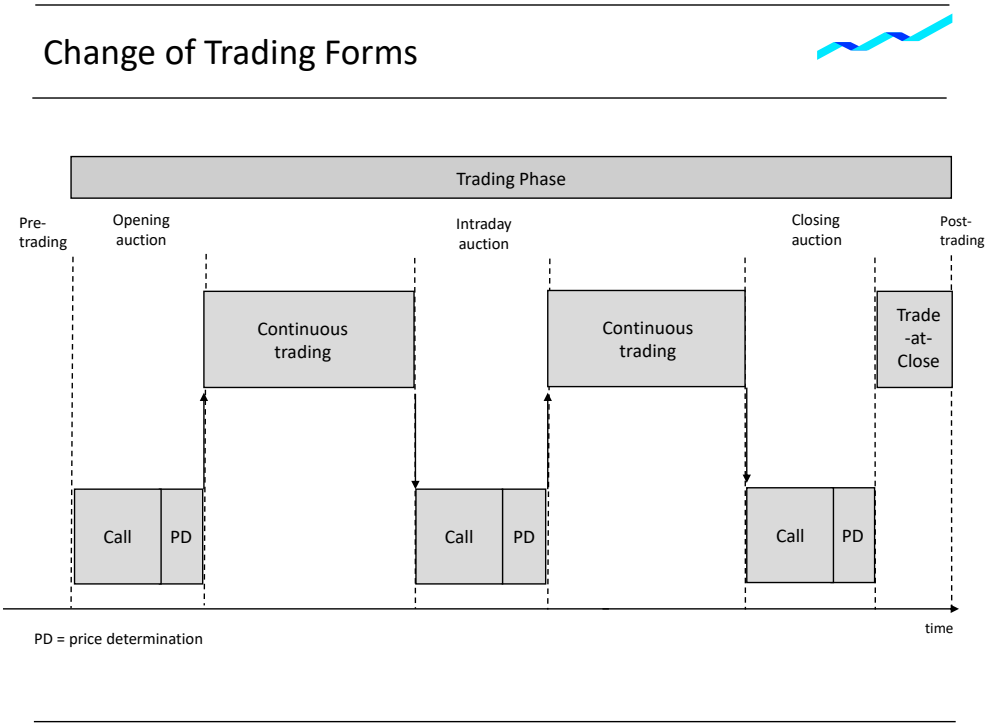


Figure 1: Change of trading forms

Market participants are informed via an auction plan about the time securities are called.

8.1.1 Opening Auction

An opening auction, comprising a call phase and price determination, 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 this auction 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. 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.

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

Information on the current order situation is provided continuously during the call phase in which the order book remains partially closed. 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.

During the call phase of the auction, additional market imbalance information is disseminated. 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.

The duration of the call phase can be varied depending on the security’s liquidity. The call phase has a random end after a minimum period in order to avoid price manipulation.

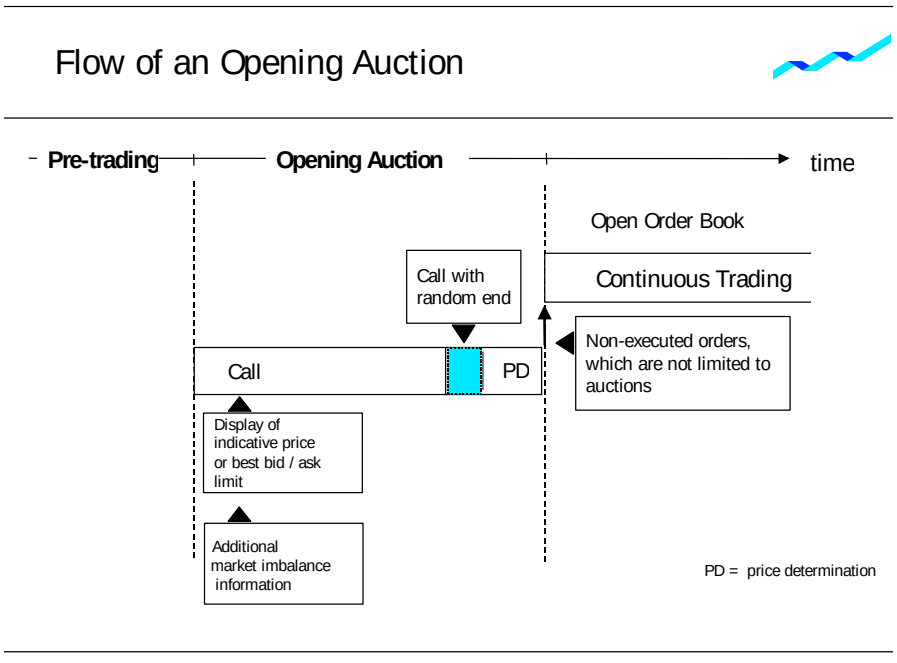


Figure 2: Flow of an opening auction

The call phase is followed by the price determination. The auction price is determined according to the principle of most executable volume on the basis of the order book situation at the end of the call phase. The auction price is the price with the most executable volume and the lowest surplus in the order book. If the order book situation is not clear, i.e. if there is more than one limit with the same executable volume, further criteria are taken into consideration for the determination of the auction price (see chapter 11).

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.

For designated instruments an auction price without turnover may be determined in the opening auction 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 opening auction, given it does not deviate too much from the dynamic or static reference price and/or designated sponsors are present in the order book. If these prerequisites are not fulfilled no price without turnover is determined.

8.1.2 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.

8.1.2.1 Continuous Trading Retail

Retail flagged orders from registered retail trading participants (RMO) are executable against the quotes / orders according to price / time priority. Depending on the trading form, the Xetra order book is open or partially open and 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 trading participants (RMO) are still unexecuted on the visible order book and become executable again against the quotes / orders of a retail liquidity provider, then they are matched against the quotes/orders of the retail liquidity provider. Orders and quotes from retail liquidity providers are not matched against each other. To ensure general orderbook consistency, orders and quotes, which cause crossed orderbook situations, will be improved to the best bid/ask on the other side of the order book. Orders and quotes from retail liquidity providers participate in Continuous Trading Retail, but not in other trading forms like auctions.

8.1.3 Intraday Auction

The start of an intraday auction interrupts continuous trading. Like opening auctions, the intraday auction features a call phase followed by the price determination. 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 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.

The order book is partially closed during the call phase. The market participants receive information on the indicative price (if available) or the best bid/ask limit. During the call phase of the auction, additional market imbalance information is disseminated. 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.

At the end of the auction, all market orders and limit orders which were not or only partially executed, are forwarded into 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.

For designated instruments an auction price without turnover may be determined in the intraday auction 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 intraday auction, given it does not deviate too much from the dynamic or static reference price and/or designated sponsors are present in the order book. If these prerequisites are not fulfilled no price without turnover is determined.

Continuous trading resumes after the end of the intraday auction.

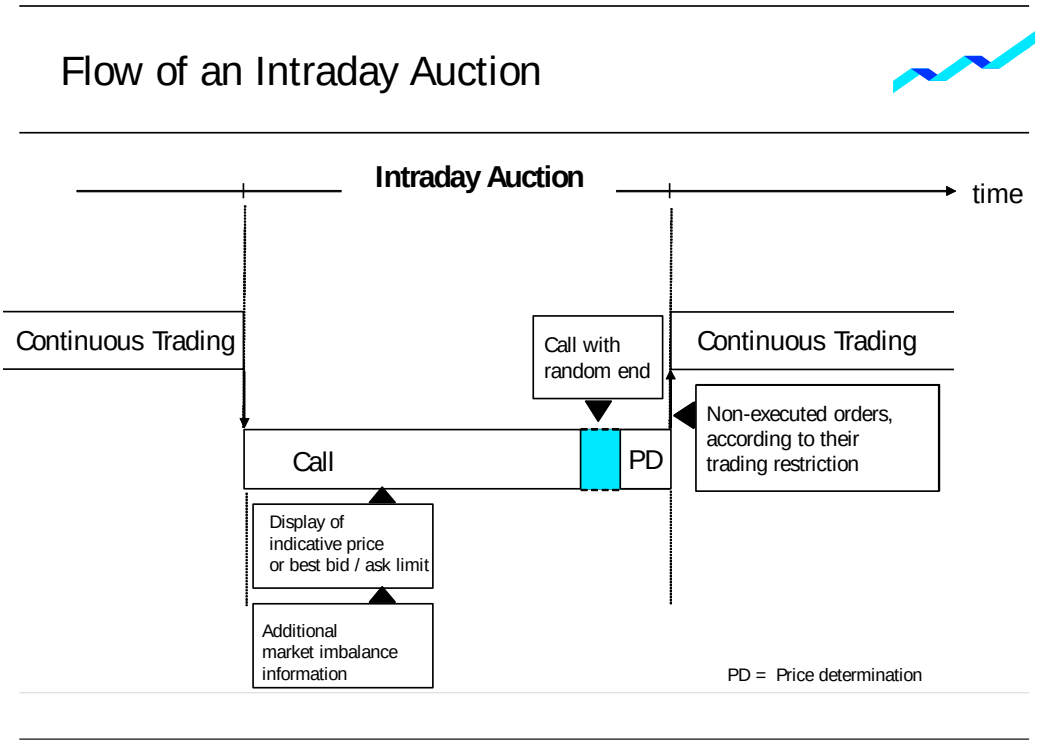


Figure 3: Flow of an intraday auction

8.1.4 Closing Auction

Continuous trading is followed by the closing auction. The closing auction also has a call phase and ends with the price determination.

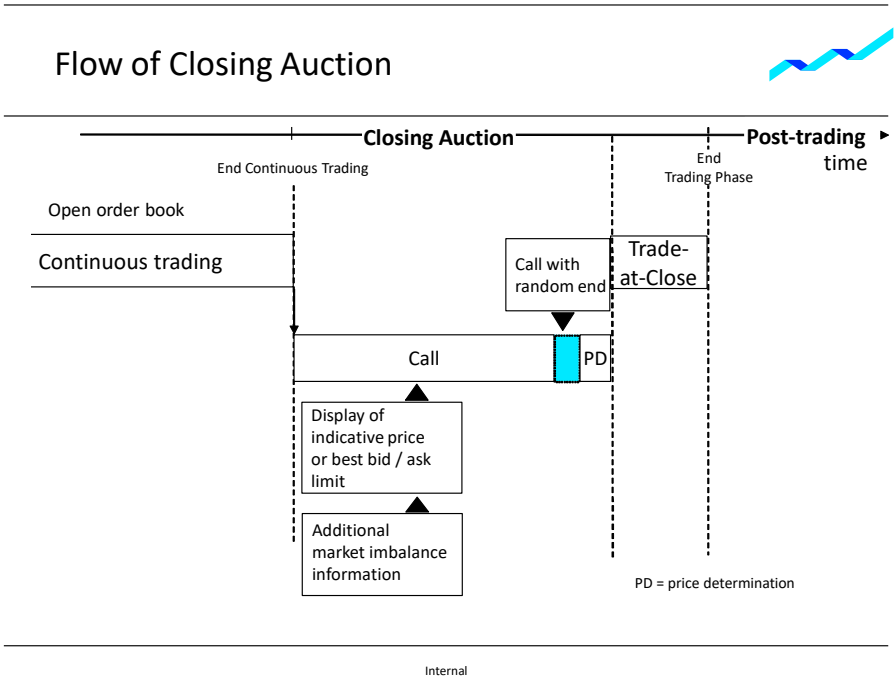


Figure 4: Flow of Closing Auction

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 intraday auction.

The order book is partially closed during the call phase. The market participants are given information on the indicative price (if available) or the best bid/ask limit. During the call phase of the auction, additional market imbalance information is disseminated. 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.

After price determination, non-executed or only partially executed orders are transferred 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.

For designated instruments an auction price without turnover may be determined in the closing auction 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 serve as reference price at the start of the next trading day. This auction price without turnover may be determined at the midpoint of the available best bid and best ask at the end of the closing auction, given it does not deviate too much from the dynamic or static reference price and/or designated sponsors are present in the order book. If these prerequisites are not fulfilled no price without turnover is determined.

8.1.5 Trade-at-Close

Trade-at-Close is triggered automatically after the termination of the closing auction if the latter concluded with price determination with 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) also consist(s) of two phases, i.e. call phase and 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.

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). Market 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, trading and post-trading phases (see chapter 6). However, executions only take place while the respective instrument is in continuous trading (see chapter 8.1.2).

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 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 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 midpoint order book are executed by determining the highest overall executable volume in the midpoint order book under consideration of volume/time priority and order-specific MAQs. Due to the MAQs, order book situations in which strict volume/time priority is disregarded may occur, e.g. for the purpose of optimizing the 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.

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.

Under both volatility interruption models, volatility interruptions can be initiated in two ways:

- The potential next price lies outside the ”dynamic” price range around the reference price (see Figure 5: 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.

- 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 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.

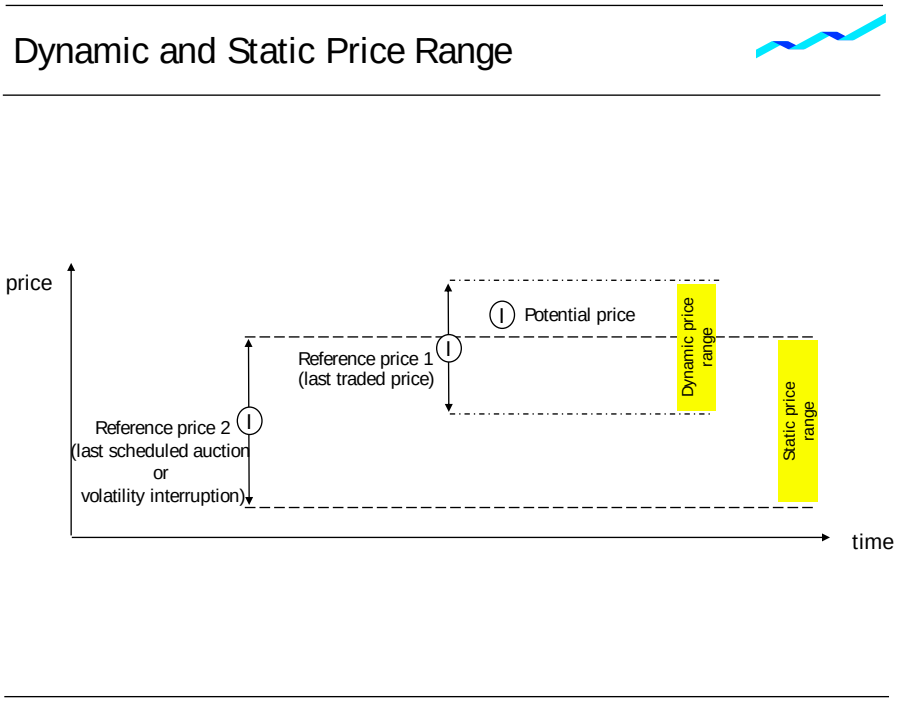


Figure 5: Dynamic and static price range

During continuous trading as well as at the end of an auction 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.

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. Market 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 intraday auction.

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.

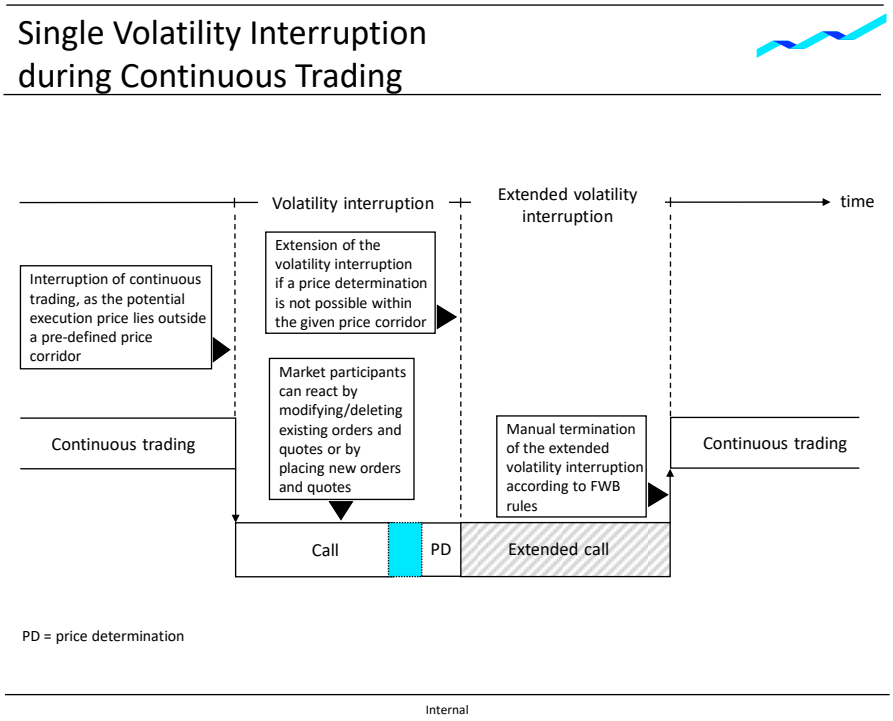


Figure 6: Single volatility interruption during continuous trading

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.

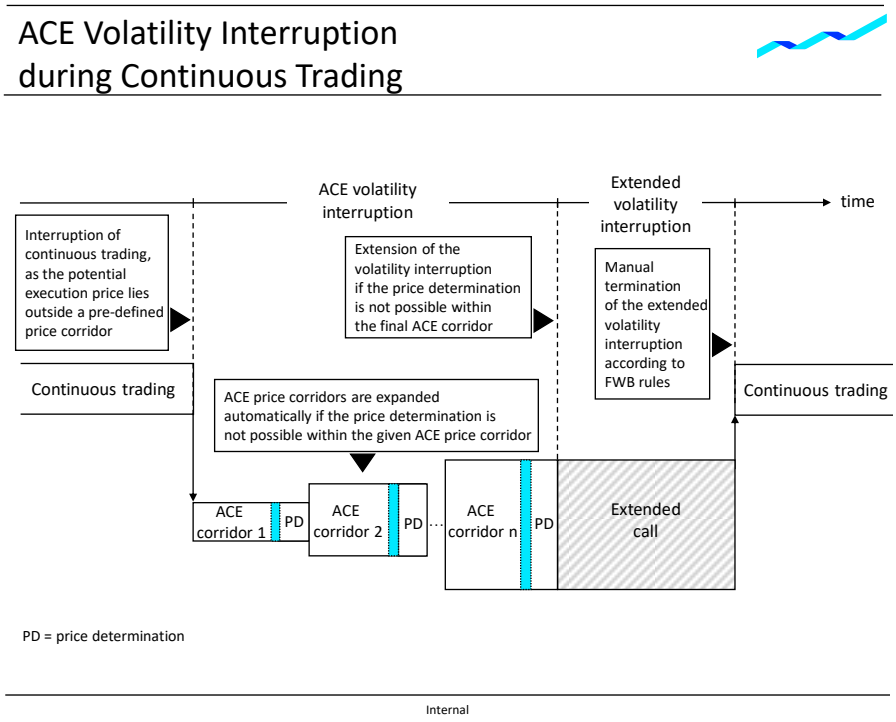


Figure 7: ACE volatility interruption during continuous trading

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 market participants. Iceberg orders participate with their full volume in volatility interruptions during auctions.

A volatility interruption initiates a limited extension of the call phase, allowing market participants to enter new orders as well as to modify or delete orders 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 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.

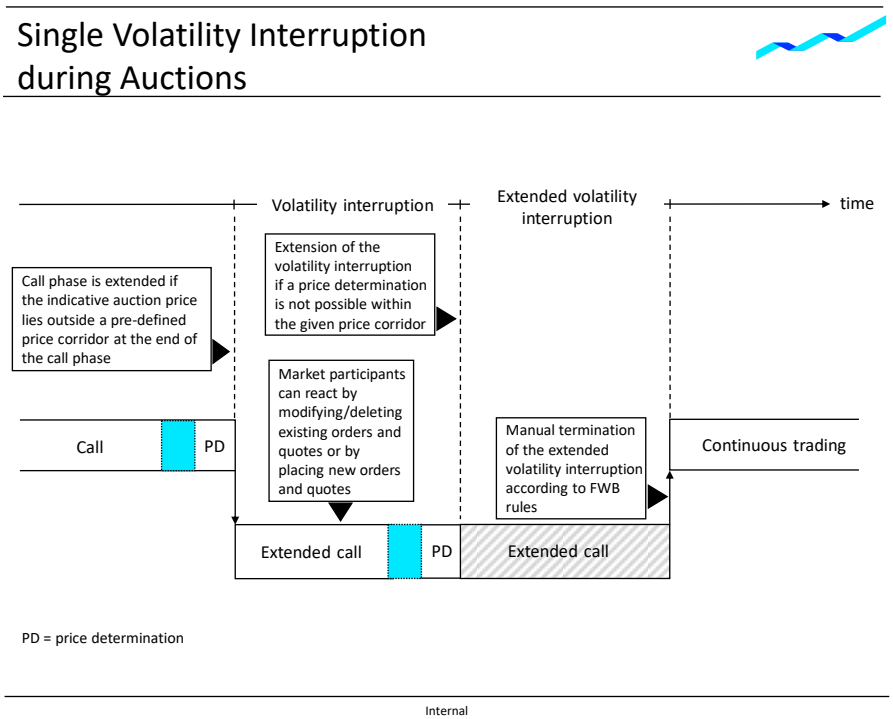


Figure 8: Single volatility interruption during auctions

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). 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.

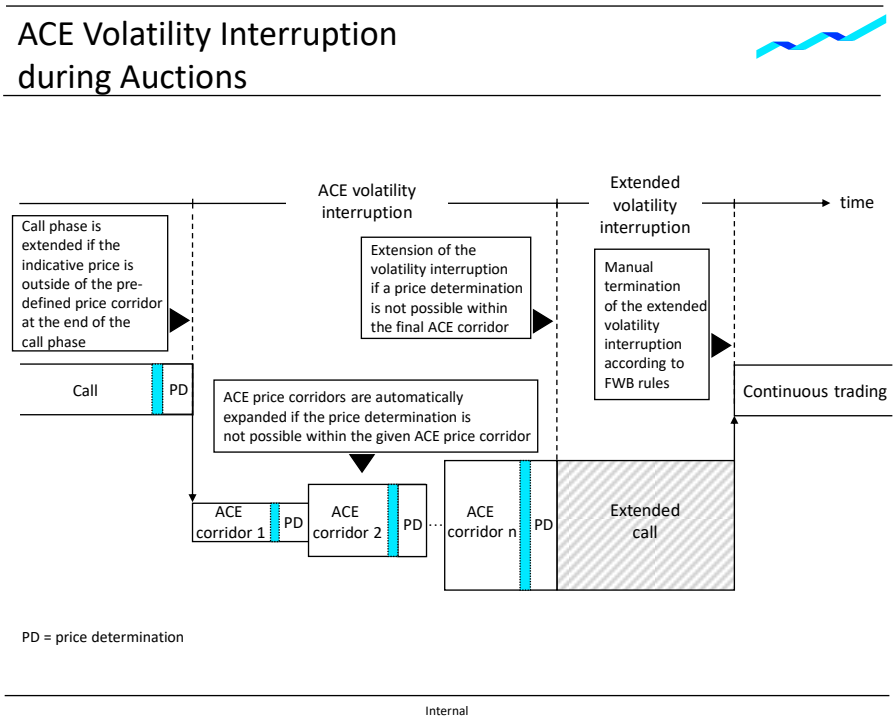


Figure 9: ACE volatility interruption during auctions

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.

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 market participants on the last trading day, if required.

11 Illustration of Price Determination Processes

11.1 Auctions

11.1.1 Basic Matching Rules

The auction price is determined on the basis of the order book situation stipulated at the end of the call phase. Concerning the price determination in auctions, Iceberg orders are contributing with their overall volume like a limit order.

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.

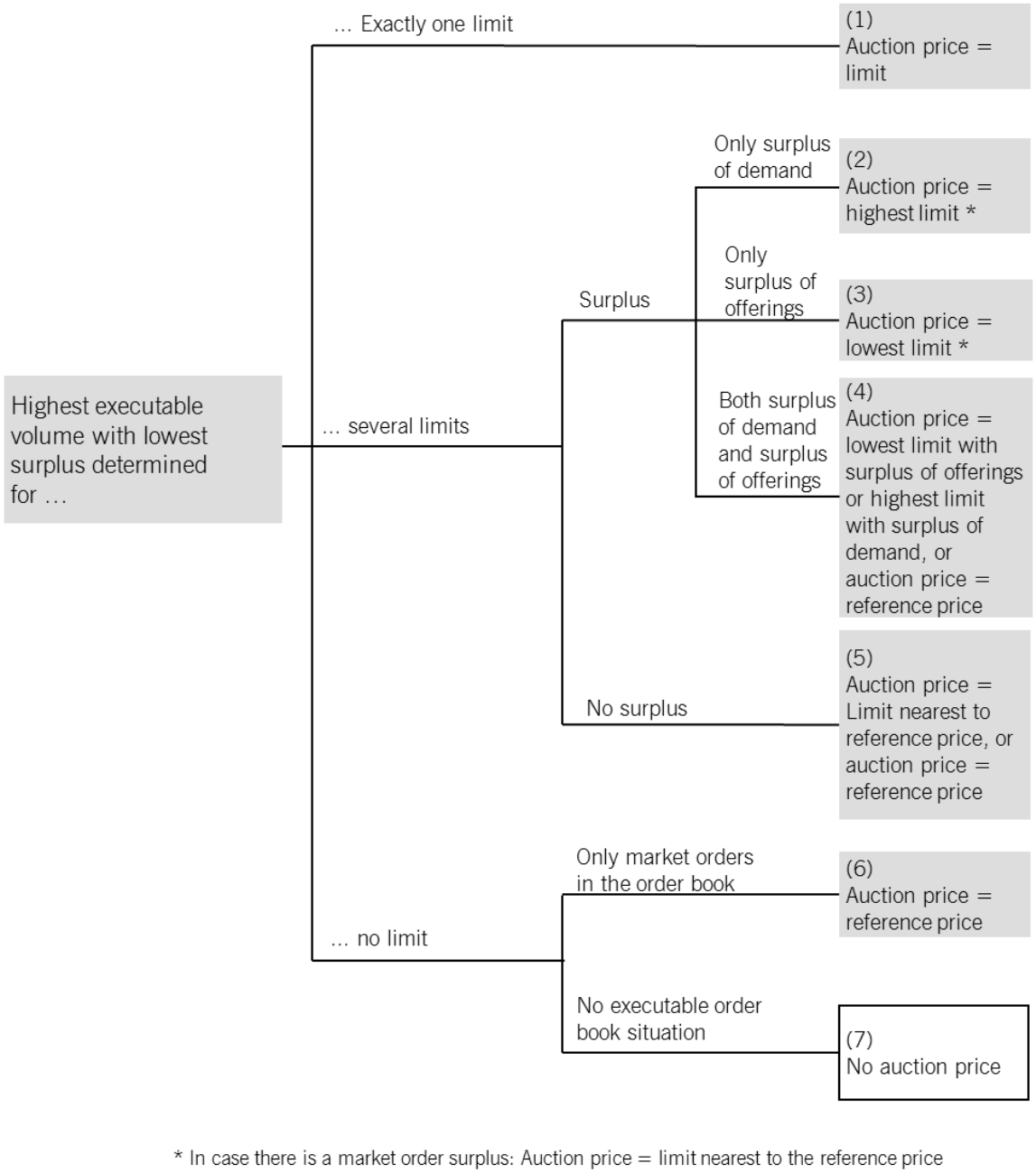


Figure 10: Price determination in auctions

11.1.2 Matching Examples

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

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.

11.2 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 is executed at the reference price (last traded price) as far as possible (see example 1).

Rule 2: If an incoming market order or limit order meets an order book with limit orders only on the other side, the highest bid limit or lowest ask limit, respectively, 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 is executed against the market orders in accordance with price/time priority with respect to non-executed bid market orders at the reference price or higher (at the highest limit of the executable orders) or at the reference price or lower (at the lowest limit of the executable orders) with respect to non-executed ask market orders.

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

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

Principle 2: If orders cannot be executed at the reference price, they are executed in accordance with price/time priority by means of price determination above or below the reference price (non-executed bid market orders or ask market orders) i.e. the price is determined by a limit within the order book or a limit of an incoming order.

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

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

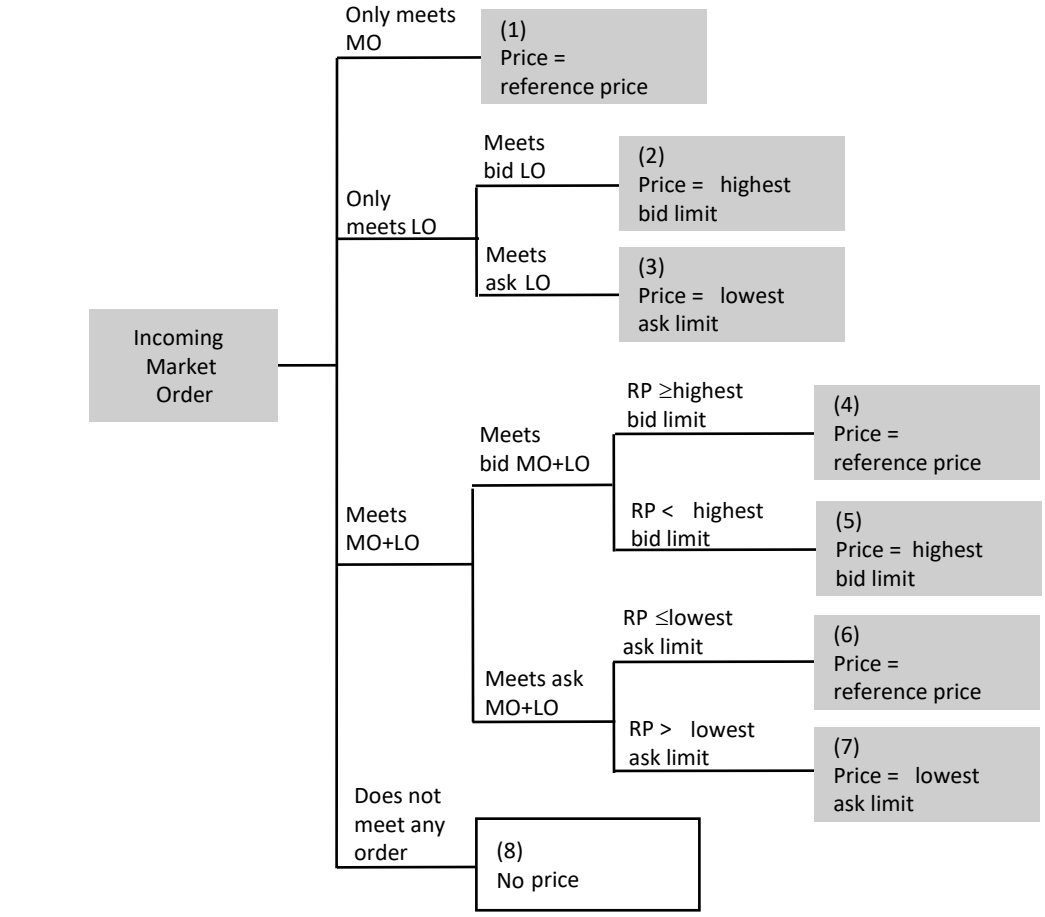


Figure 11: Incoming Market Order

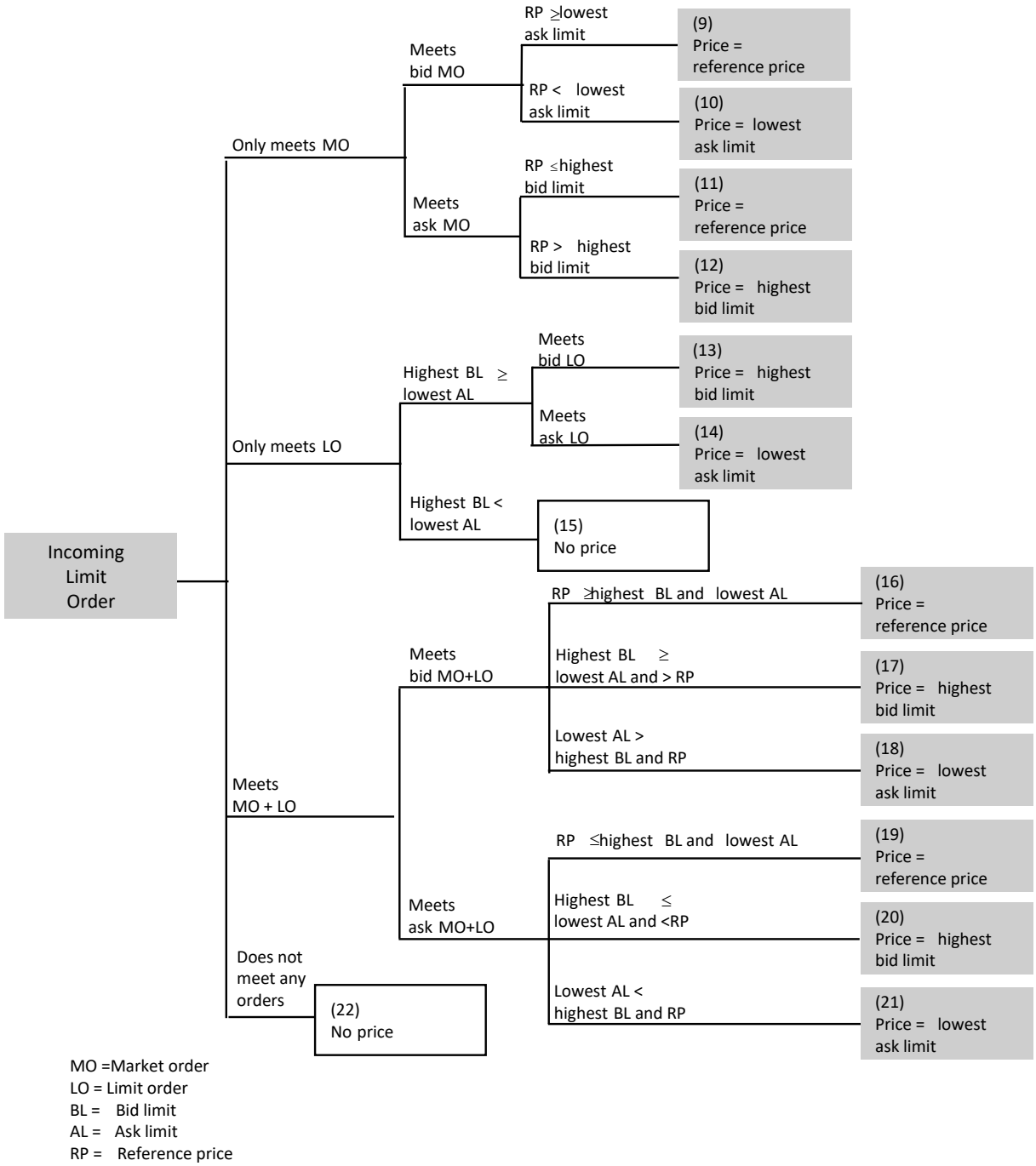


Figure 12: Incoming Limit Order

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			

Incoming order:
Ask market order,
quantity 6000 shares

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			

Incoming order:
Ask market order,
quantity 6000 shares

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

<u>Example 3:</u> 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.

<u>Example 4:</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	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).

<u>Example 7:</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 € 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).

<u>Example 8:</u> 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

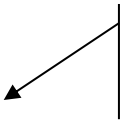
Bid					**Ask**
Time	Quantity	Limit	Limit	Quantity	Time
10:01	6000	Market			

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			



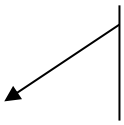
Incoming order:
Ask order, limit € 195,
quantity 6000 shares

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).

<u>Example 13:</u> 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.

<u>Example 14:</u> 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

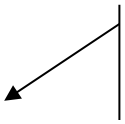
Bid					**Ask**
Time	Quantity	Limit	Limit	Quantity	Time
			199	~~6000~~	9:33

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.

<u>Example 15:</u> 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



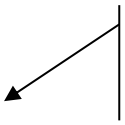
Incoming order:
Ask order, limit € 200,
quantity 6000 shares

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.

<u>Example 16:</u> 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			



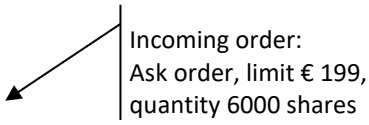
Incoming order:
Ask order, limit € 195,
quantity 6000 shares

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).

<u>Example 17:</u> 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			

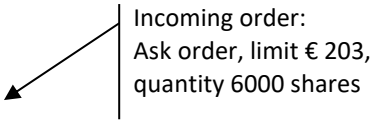


The reference price is € 200. The highest bid limit is higher than or equal to the lowest ask limit and higher than the reference price.
The incoming ask order is executed against the bid market order in the order book at the highest bid limit of € 202 (see principle 2).

<u>Example 18:</u> 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).

<u>Example 19:</u> 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).

<u>Example 20:</u> 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).

<u>Example 21:</u> 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).

<u>Example 22:</u> 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			

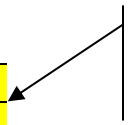
The incoming bid order is entered into the order book. A price is not determined and no orders are executed.

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			



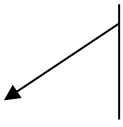
Incoming order:
Ask order, limit € 203,
quantity 1000 shares

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 contrary 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
		Iceberg	201	40000	9:05:00

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

Bid Time	Quantity	Limit	Limit	Quantity	Ask Time
			201	*2000*	*9:05:00*
			203	500	8:55:00
		iceberg	201	40000	9:05:00

Incoming order:
Bid market order,
quantity 5000 shares,
time: 9:07:00

Bid Time	Quantity	Limit	Limit	Quantity	Ask Time
			201	~~*2000*~~ *7000*	~~*9:05:00*~~ *9:07:00*
			203	500	8:55:00
		iceberg	201	~~40000~~ 30000	9:07:00

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.

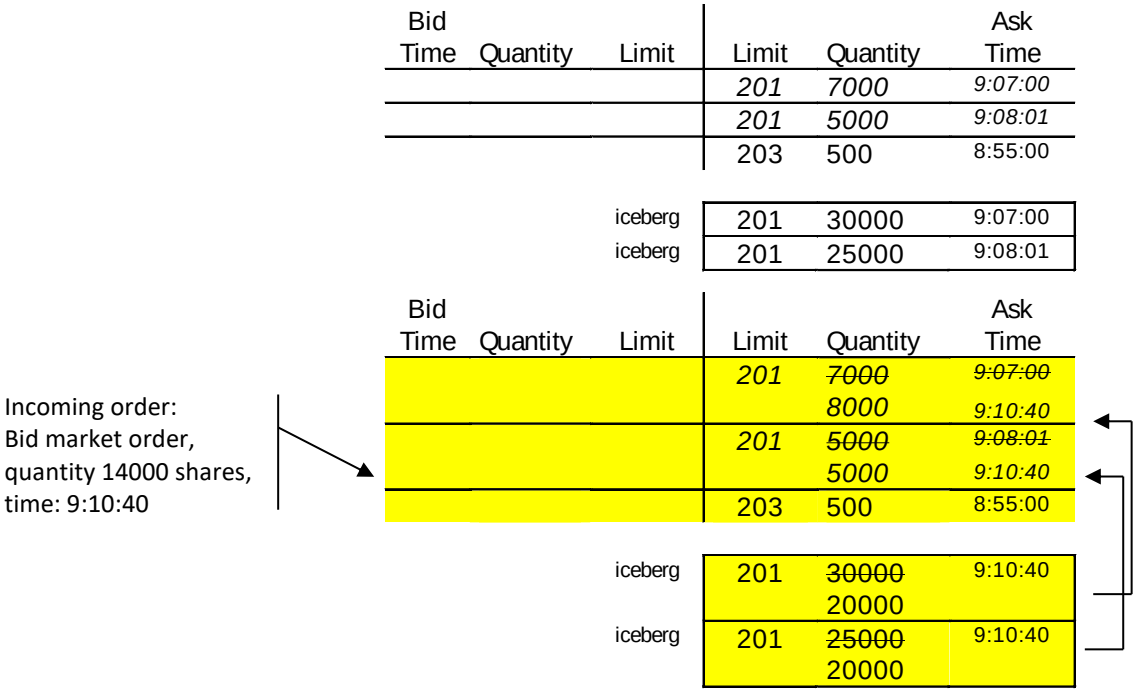
Bid Time	Quantity	Limit	Limit	Quantity	**Ask** Time
			201	7000	9:07:00
			203	500	8:55:00
		iceberg	201	30000	9:07:00

Bid Time	Quantity	Limit	Limit	Quantity	**Ask** Time
			201	7000	9:07:00
			201	5000	9:08:01
			203	500	8:55:00
		iceberg	201	30000	9:07:00
		iceberg	201	25000	9:08:01

Incoming order:
Ask iceberg order, limit € 201,
overall quantity 30000 shares,
peak 5000 shares,
time: 9:08:01

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

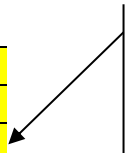
Then the remaining part of the incoming order (2000) is executed against the new peak of the first iceberg order. The remaining part of this iceberg order (8000) is shown in the book with a volume of 20000 behind it.

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.

Bid Time	Quantity	Limit	Limit	Quantity	Ask Time
			201	*8000*	*9:10:40*
			201	*5000*	*9:10:40*
			201	2000	9:13:13
			203	500	8:55:00
		iceberg	201	20000	9:10:40
		iceberg	201	20000	9:10:40

Incoming order:
Bid market order,
quantity 23000 shares,
time: 9:15:00

Bid Time	Quantity	Limit	Limit	Quantity	Ask Time
			201	~~*8000*~~ *2000*	~~*9:10:40*~~ *9:15:00*
			201	~~*5000*~~ *5000*	~~*9:10:40*~~ *9:15:00*
			201	~~2000~~	~~9:13:13~~
			203	500	8:55:00
		iceberg	201	~~20000~~ 10000	9:15:00
		iceberg	201	~~20000~~ 15000	9:15:00

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.

Example 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. 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				

Incoming **retail** order: Sell market order, quantity 250 shares

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				

Incoming **retail** order: Sell market order, quantity 50 shares

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				

Incoming **RLP quote:** bid limit 198; ask limit 199, quantity 200 shares

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 or midpoint sweep order is checked immediately for executability against midpoint orders on the other side of the order book whose execution takes place according to volume/time priority under consideration of the MAQ.

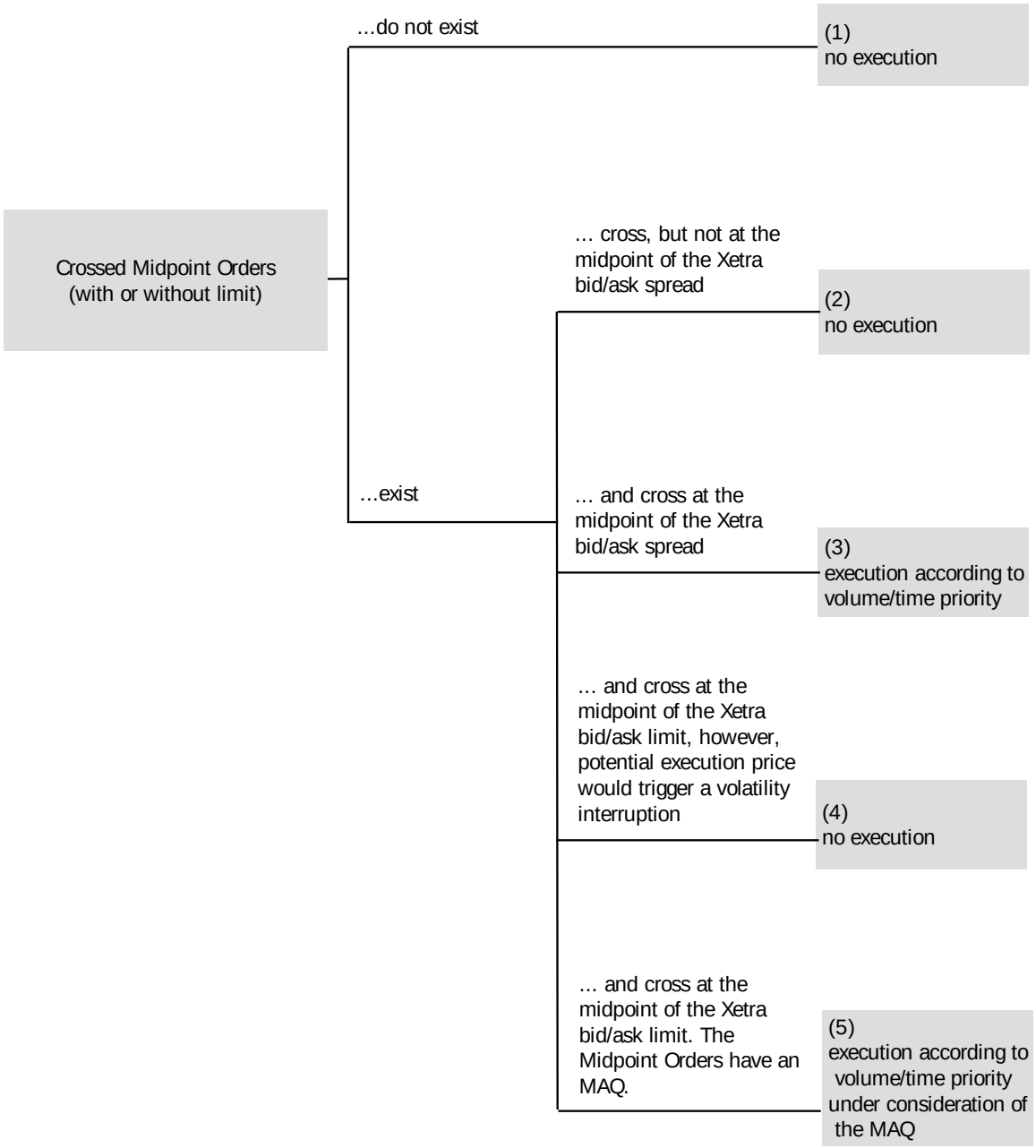
The execution price is always the midpoint of the currently available Xetra bid/ask spread in continuous trading. Midpoint and midpoint sweep orders may be executed fully in one or more steps, partially or not at all, thereby generating no, one, or many trades.

Non-executed or only partially executed midpoint orders are entered in the 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 is 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.

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.



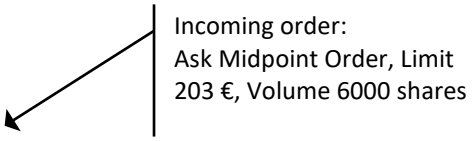
11.3.2 Matching examples

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 Time	Volume	Midpoint Order Limit	Midpoint Order Limit	Volume	Ask Time
9:01	6000	200			

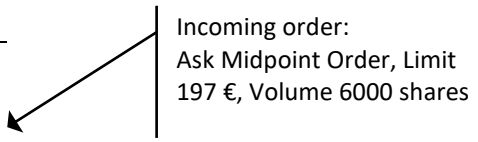
Bid Time	Volume	Midpoint Order Limit	Midpoint Order Limit	Volume	Ask Time
9:01	6000	200	203	6000	9:05



Although the highest bid limit exceeds the Xetra midpoint, 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 flagged as a midpoint sweep order, it is 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. 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			

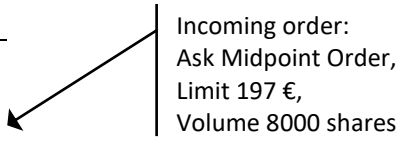


Bid Time	Volume	Midpoint Order Limit	Midpoint Order Limit	Volume	Ask Time
9:01	6000	198	197	6000	9:05

Although the highest bid limit is higher than the lowest ask limit, it does not exceed the Xetra midpoint. 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 flagged as a midpoint sweep order, it is 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 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

The highest bid limit exceeds the Xetra midpoint and is higher than the lowest ask limit, with the latter being below the Xetra 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 flagged as a midpoint sweep order, the remaining quantity of 2000 shares is 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. 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			

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

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

The highest bid limit exceeds the Xetra midpoint (199.50) and is higher than the lowest ask limit, with the latter being below the Xetra 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 Xetra Midpoint (199.50) and is higher than the lowest ask limit which is below the Xetra 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.

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 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.

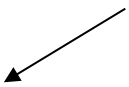
At the end of the Trade-at-Close session, non-executed orders either remain in the order book with their initial price limit/entry time or are deleted if GFD. Orders which did not participate in Trade-at-Close are not affected.

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

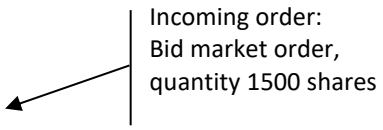
Bid					**Ask**
Time	Quantity	Limit	Limit	Quantity	Time
17:37	1000	63			

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			



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.

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