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onExchange Order Types and Matching Logic

Order Entry and Execution[1]

A. Overview

onExchange matches orders using a price-time algorithm that prioritizes bids and offers first by best price, and second by earliest time. The quantity and price of each and every limit order entered into the onExchange system is visible to all market participants upon order entry. Market participants are able to view information about active orders from all Traders via public order view windows. They also provide information on full market depth. Authorized Traders' (AT) public order view windows could contain all (or a subset) of the entries displayed on the public order view for the contracts that they were authorized to trade. Subscribers' public order view windows could contain a display of all of the contracts that their ATs may trade.

B. Types of Orders

OnExchange's trading system permits entry of market, limit and stop orders. A market order is an order to buy or sell a futures contract at whatever price was obtainable at the time the order was submitted to a centralized market for execution. A limit order is an order that specifies a price limit or other condition, such as time of an order. A "stop order" type is triggered when the market reaches a pre-specified price level.

onExchange limit orders system default to day orders, but may also be specified by the trader entering the order as good until cancelled (GTC), good until a specified time and/or date, or fill-or-kill.

The system also accepts all-or-none and hit-or-take contingent orders. An "all-or-none order" is an order that must be executed in its entirety when entered into the onExchange system, or else, if not immediately executed, the order is cancelled. A "hit-or-take order" is a limit order at the best or offer price for the currently available quantity. Any unfilled quantity is cancelled immediately.

The system also supports "stop" and "stop-limit" orders. Both of these order types are triggered when a designated price is elected. This election can be by a trade, or alternatively by a bid or an offer, at the "stop price." The election protocol will be selected as part of the contract market specification.

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[1] The format and text in this section is adapted largely from the Division of Trading and Markets system review of a designated contract market.

When a stop price is elected, the stop order becomes a market order to buy or sell at the stop price. As with all market orders, any unfilled quantity is cancelled. A stop-limit order is elected in the same manner as a stop order. However, it also contains a separately specified limit price. A stop- limit order functions like a limit order when the stop price is elected. Any unfilled quantity stays on the order book at the limit price.

For example, a 50-lot buy stop order with a stop price of 210 is elected when the market trades 210. The order book contains 33 lots offered at 210, which are matched with the stop order. The remaining 17 lots for which there are no contra 210 offers are canceled.

When entering a stop-limit order, in addition to specifying a stop price that triggers the order, the trader also specifies a limit price. The limit price may be the same as the stop price or not. For example, a 50-lot buy stop-limit order with a stop price of 15 and a limit price of 18 is elected when the market trades 15. The order book contains 33 lots offered at 15 , which are matched with the stop-limit order. The 33 lots are matched at 15, leaving 17 lots unfilled.

The order book also contains a 7 lots offered at 16, 3 lots at 17, 2 lots at 18 and 25 lots at 19. The limit price on the stop-limit order is 18, so 12 of the remaining 17 lots are filled as follows: 7 lots at 16, 3 lots at 17 and 2 lots at 18. Five lots are left unfilled because the remaining offers on the order book are priced at 19, which is above the limit order price. The order book would now show 5 lots bid 18 and 25 lots offered at 19.

onExchange has proposed also to permit counterparties to enter into bona-fide Exchange of Futures for Physicals ("EFPs") and Exchange for Swaps ("EFSs") through the Exchange.

C. Trade-Matching Algorithm

The specific system entry and trade-matching requirements for each type of order are established by onExchange BOT Rule 4.02. The algorithm, as it relates to various types of orders, operates as follows:

1. Limit Order Algorithm

a. All limit orders entered into the onExchange system identify quantity and price, as well as the time period during which the order remains open. An order's life is designated as either good-until-filled, day order or a good-until-date order. Unfilled good-until-filled orders remain open until filled or canceled. Unfilled day-trade orders are canceled at the end of the day. Unfilled good-until-date orders remain on the onExchange system until executed, canceled, or the specified calendar date triggering the order's cancellation had been reached.

b. onExchange limit orders are filled and executed in the sequence in which they are received on an "or better" price basis. As such, limit orders are recorded and logged into the server as they are received and are assigned order entry times. Therefore, if a limit order to buy is entered at a price that is greater than the best "offer to sell," that

limit order acts like a market order until all available "offers to sell" that are at or below the limit price are filled or the quantity of the order is filled.

c. A limit order having the best price is assigned price priority. If more than one order have the best price, then the first-entered best price order is executed first based on time priority.

d. An order does not lose time priority if an order with a better price is subsequently entered into the onExchange system; that order does, however, lose price priority.

e. Example:

Assume limit bids are placed at the following times, prices, and quantities:

Trader	Time	Bid Vol	Bid Price	Ask Price	Offer Vol	Type
A	9:00	3	72.00			Limit
B	9:01	2	72.05			Limit
C	9:02	1	72.10			Limit

- In this scenario, Trader C's order has price priority over the orders of Traders A and B, and Trader B's order has price priority over Trader A's order.

Further assume that at 9:03 Trader D enters a limit offer at 72.00 for four contracts. The onExchange System executes the following transactions.

Parties	Time	Price	Quantity
C – Buys, D – Sells	9:03	72.10	1
B – Buys, D – Sells	9:03	72.05	2
A – Buys, D – Sells	9:03	72.00	1

- Trader D's limit offer of four is executed at 72.00 or better. Following the rules of price/time priority, Trader C's bid for one contract at the highest price, 72.10, is matched against Trader D's limit offer of four contracts.

- Trader B's bid for two contracts at 72.05 is then be matched against the remaining three contracts of Trader D's offer. Two of Trader D's contracts are matched, and one remains.

- One of Trader A's bid of three contracts at 72.00 is matched against the remaining contract of Trader D's limit offer. The unfilled portion of A's limit bid is retained on the order book.

Although Trader A's bid meets the terms of the limit offer (at 72.00 or better), and has time priority, it does not have price priority over B's and C's respective orders, and is the last to be matched.

2. Market Order Algorithm

a. A market order (also called an "at best" order) is filled at the best price(s) available in the market at the time of order entry. A market order is rejected by the onExchange system if, at the time of the order's entry, no opposite limit order existed in the relevant contract and contract month. Accordingly, market orders only match with pending limit orders and could not be matched with other market orders. Each market order is filled to the quantity available at the time the order is entered and any unfilled portion of the market order is cancelled immediately.

b. By definition, a market order has price priority over any pending limit order(s) on the same side of the market because its assigned price(s) is determined by the price(s) of pending limit order(s) on the opposite side of the market at the time of entry.

c. Example:

Assume limit offers are placed at the following times, prices, and quantities:

Trader	Bid Vol	Bid Price	Ask Price	Offer Vol	Time	Type
A			72.00	3	10:01	Limit
B			71.95	2	10:03	Limit
C			71.95	1	10:02	Limit
D			71.85	1	10:04	Limit

Next, assume that at 10:05 Trader E entered a market order to buy three contracts. The onExchange system executes the following transactions:

Parties	Price		Quantity
E – Buys, D – Sells	71.85	10:05	1
E – Buys, C – Sells	71.90	10:05	1
E – Buys, B – Sells	71.95	10:05	1

- Trader E's market order is matched with the pending limit offers according to their price priority. Accordingly, Trader E's order to buy three contracts is first matched against Trader D's limit offer of one contract at 71.85.

- One of Trader E's two remaining contracts is then matched against Trader C's limit offer of one contract at 71.90.

- Trader E's remaining contract is then matched against one of Trader B's limit offers of two contracts at 71.95.

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Trader E's market order is matched against Trader B's, C's and D's respective offers even though each of these limit offers was entered after Trader A's limit offer of three contracts for 72.00 because they each have price priority over Trader A's offer.

- The remaining unfilled quantity of Trader B's limit offer and the entirety of Trader A's limit offer remains in the onExchange system and is eligible for matching. If Trader E's bid only had been partially filled, the remaining, unfilled portion is have been canceled automatically.

3. All-or-None Qualifiers

a. An all-or-none order can be a market or limit order with the additional qualification that, if it cannot be matched for its entire quantity, the entire order it is cancelled. An all-or-none order must specify quantity and only could be matched against corresponding limit orders.

b. Example:

Assume that limit bids and offers are placed at the following prices, times and quantities:

Trader	Time	Bid Vol	Bid Price	Ask Price	Offer Vol	Type
A	11:56	5	1.45			Limit
B	11:57			1.50	10	Limit
C	11:58			1.55	10	Limit
D	11:59			1.50	10	Limit

Further, assume that at 12:00 Trader E enters a all-or-none buy order at 1.55 for 30 contracts. The onExchange system executes the following transactions in order:

Parties	Time	Price	Quantity
E – Buys, B – Sells	12:00	1.50	10
E – Buys, D – Sells	12:00	1.50	10
E – Buys, C – Sells	12:00	1.55	10

- Trader E's all-or-none buy order of 30 contracts at 1.55 entered at 12:00 is immediately matched and executed in its entirety opposite Traders B, C and D. If, however, Trader E's all-or-none 30 bid at 1.55 did not have priority or if the prevailing offers were not sufficient to fill 30 contracts, then Trader E's entire order is automatically canceled.

Because Trader E entered a all-or-none limit order, Trader E's order is executed on an "or better" basis with ten contracts opposite Trader B at 1.50, ten contracts opposite Trader D at 1.50 and ten contracts opposite Trader C at 1.55.

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4. Fill-or-Kill Qualifier

a. A fill-or-kill qualifier specifies that an order is to be executed in whole or in part immediately upon entry into the trading system.

b. In contrast to an all-or-none order, which must be executed immediately in whole upon entry into the onExchange system or the entire order is canceled, only that portion of an fill-or-kill order that was not immediately executed upon entry is canceled.

c. Example 1:

Assume limit bids and offers were placed at the following prices, times and quantities:

Trader	Time	Bid Vol	Bid Price	Ask Price	Offer Vol	Type
A	11:00	20	1.50			Limit
B	11:01	30	1.60			Limit

Further, assume that at 11:02 Trader C entered FOK buy order at 1.55 for forty contracts.

While Trader C's fill-or-kill buy order at 1.55 has price priority over Trader A's limit order at 1.50, Trader C's order is immediately cancelled because there was no prevailing offer in the onExchange system at the price designated in Trader C's order.

d. Example 2:

Assume that the pending orders do not change from Example 1 except that at 11:03 Trader C enters a FOK sell order at 1.60 for 40 contracts.

The onExchange system executes the following transaction:

Parties	Time	Price	Quantity
C – Buys, B – Sells	11:03	1.60	30

Trader C's FOK buy order is matched with Trader B's limit offer of 30 contracts at 1.60.The unfilled portion of Trader C's FOK sell order, the remaining 10 contracts, are then canceled immediately.