

other problems affecting the reliability of its disseminated quotes. Any decision to remove a market or its quotes from NBBO calculation will be promptly communicated to the affected market and duly recorded by the Exchange.

Rule 6.45A Priority and Allocation of Trades for CBOE Hybrid System

This rule establishes the priority principles applicable to Hybrid and provides for the allocation of trades. The rules of priority and order allocation procedures set forth in this rule shall apply only to option classes designated by the Exchange for trading on the CBOE Hybrid System. For those classes not trading on the Hybrid System, CBOE Rule 6.45 will govern. This section has four main parts:

- Allocation of Incoming Electronic Orders
- Allocation of Orders Represented in the Trading Crowd
- Interaction of Market Participant's Quotes and/or Orders with Orders in Electronic Book
- Quotes Interacting with Quotes

A. Allocation of Incoming Electronic Orders

Electronic orders will be allocated using UMA, the Exchange's Ultimate Matching Algorithm. In UMA, any market participant (defined as an in-crowd market maker, in-crowd floor broker, or DPM for the class) who enters a quotation that is represented in the disseminated CBOE best bid or offer

("BBO") shall be eligible to receive allocations of incoming electronic orders for up to the size of its quote. If the number of contracts represented in the disseminated quote is less than the number of contracts in an incoming electronic order(s), the incoming electronic order(s) shall only be entitled to receive a number of contracts up to the size of the disseminated quote. The balance of the electronic order will be eligible to be filled at the refreshed quote either electronically or manually and, as such, may receive a split price execution (as provided in CBOE Rule 6.13).

Priority of Orders in the Electronic Book

Public customer orders in the electronic book have priority. Multiple public customer orders in the electronic book at the same price are ranked based on time priority. If a public customer order(s) in the electronic book matches, or is matched by, a market participant quote, the public customer order(s) shall have priority and, the balance of the electronic order, if any, will be allocated via UMA.

If pursuant to CBOE Rule 7.4(a) the appropriate FPC determines to allow certain types of broker-dealer orders to be placed in the electronic book, then for purposes of this rule, the cumulative number of broker-dealer orders in the electronic book at the best price shall be deemed one "market participant" regardless of the number of broker-dealer orders in the book. The allocation

due the broker-dealer orders in the electronic book by virtue of their being deemed a "market participant" shall be distributed among each broker-dealer order comprising the "market participant" via UMA. For example, if there were five BD orders in the book for a cumulative 100 contracts, those five BD orders would be deemed "one market participant" for 100 contracts. The allocation of incoming orders among the five BD orders in the book would be done pursuant to UMA.

Operation of the Allocation Algorithm

When a market participant is quoting alone at the disseminated CBOE BBO and is not subsequently matched in the quote by other market participants prior to execution, it will be entitled to receive incoming electronic order(s) up to the size of its quote. In this respect, market participants quoting alone at the BBO have priority.

When more than one market participant is quoting at the BBO, inbound electronic orders shall be allocated pursuant to UMA. UMA is an algorithm that allocates orders based on two separate yet important aspects: parity (*i.e.*, multiple participants quoting at the best price) and depth of liquidity (*i.e.*, relative size of each market participant's quote).⁸ Each of these components is described in greater detail below.

The UMA formula is as follows:

Allocation Algorithm

$$\frac{\text{Incoming Order Size} * (\text{Equal Percentage based on number of market participants quoting at BBO})}{(\text{Component A})} + \frac{(\text{Pro-rata Percentage based on size of market participants quotes})}{(\text{Component B})}$$

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Component A: This is the parity component of UMA. In this component, UMA treats as equal all market participants quoting at the relevant best bid or best offer (or both). Accordingly, the percentage used for Component A is an equal percentage, derived by dividing 100 by the number of market participants quoting at the best price. For instance, if there were four market participants quoting at the best price, each is assigned 25% for Component A (or 100/4). This component rewards and incents market participants that quote at a better price than do their counterparts even if they quote for a smaller size.

Component B: This size pro-rata component is designed to reward and incent market participants to quote with size. As such, the percentage used for Component B of the Allocation Algorithm formula is that percentage that the size of each market participant's quote at the best price represents relative to the total number of contracts in the disseminated quote. For example, if the disseminated quote represents the quotes of market makers X, Y, and Z who quote for 20, 30, and 50 contracts respectively, then the percentages assigned under Component B are 20% for X, 30% for Y, and 50% for Z.

Final Weighting: The final weighting, which shall be determined by the appropriate FPC, shall be a weighted average of the percentages derived for Components A and B multiplied by the size of the incoming order. Initially, the weighting of components A and B shall be equal, represented mathematically by the formula: $((\text{Component A Percentage} + \text{Component B Percentage}) / 2) * \text{incoming order size}$. The final weighting shall apply uniformly across all options under the jurisdiction of the appropriate FPC.⁹ Changes made to the weighting of Components A and B shall be announced to the membership in

⁸ UMA operates electronically and, as such, only market participants that are represented in the disseminated quote will participate in the allocation of incoming electronic orders. Multiple

incoming orders will execute in accordance with CBOE Rule 8.51, Firm Disseminated Market Quotes.

⁹ While the initial weighting of Components A and B will be equal, the rule allows the appropriate FPC to adjust the weighting percentages, which it

would do if it believed such modifications would further enhance market participants' incentives to quote competitively or reduce disincentives to quote competitively, in accordance with the terms of the Order.