Appendix

Examples of Pre-Opening Matching Algorithm

Example 1:

Rule 1: (Maximum tradeable quantity) The execution price will be the price that can generate the largest tradeable volume possible. The table below shows different tradeable quantities on different hypothetical execution prices. On each hypothetical execution price, buy orders may be matched only if the bid price is greater than or equivalent to such price, and sell orders only if the offer price is lower than or equivalent to such price. The **Aggregate Bid/Offer Quantity** at a given price is the aggregate size of buy/sell orders that satisfy the abovementioned condition.

The **Quantity Remaining** is the remaining volume of the Aggregate Bid/Offer Quantity after order matching. This should equal the difference between the aggregate size of the buy orders and the sell orders at a given price.

Bid		Offer		
Quantity	**Price**	**Quantity**	**Price**	
10	102	30	100	
40	101	10	101	
30	100	20	102	
20	99	10	103	
Hypothetical Execution Price	**Aggregate Bid Quantity**	**Aggregate Offer Quantity**	**Tradeable Quantity**	**Quantity Remaining**
102	10	60	10	50
101	50	40	40	10
100	80	30	30	50

The price of 101 is the single price with the maximum tradeable quantity and therefore is taken as the execution price.

Example 2:

Rule 2: (Minimum quantity remaining) The execution price will be the price with the lowest quantity remaining if there is more than one price satisfying Rule 1.

Bid		Offer		
Quantity	**Price**	**Quantity**	**Price**	
10	102	30	100	
20	101	10	101	
30	100	20	102	
20	99	10	103	
Hypothetical Execution Price	**Aggregate Bid Quantity**	**Aggregate Offer Quantity**	**Tradeable Quantity**	**Quantity Remaining**
102	10	60	10	50
101	30	40	30	10
100	60	30	30	30

In this example, two prices (i.e. 101 and 100) generated the same tradeable quantity. However, the price of 101 yields a lower quantity remaining and hence is taken as the execution price.

Example 3:

Rule 3: (Remaining quantity direction) If there are more than one price satisfying Rules 1 and 2 and the remaining quantities are all on the same side (either buy side or sell side), the execution price will be the lowest (highest) of these prices when the remaining quantities are on the sell (buy) side.

Bid		Offer		
Quantity	**Price**	**Quantity**	**Price**	
10	103	10	99	
10	102	30	100	
0	101	0	101	
0	100	20	102	
20	99	10	103	
Hypothetical Execution Price	**Aggregate Bid Quantity**	**Aggregate Offer Quantity**	**Tradeable Quantity**	**Quantity Remaining**
103	10	70	10	60
102	20	60	20	40
101	20	40	20	20
100	20	40	20	20
99	40	10	10	30

Since the remaining quantities at both 100 and 101 are on the sell side, it means that there is a greater supply than demand and the algorithm will choose the lower price (i.e. $100) as the execution price.

Example 4:

Rule 4: (Last traded price) If there are more than one price satisfying Rules 1 and 2 and the remaining quantities are on different sides, the execution price will be the price nearest to the last traded price.

Bid		Offer		
Quantity	**Price**	**Quantity**	**Price**	
10	102	30	100	
20	101	10	101	
10	100	20	102	
20	99	10	103	
Hypothetical Execution Price	**Aggregate Bid Quantity**	**Aggregate Offer Quantity**	**Tradeable Quantity**	**Quantity Remaining**
102	10	60	10	50
101	30	40	30	10
100	40	30	30	10

In such scenario, the algorithm continues to choose the price that is the closest to the last traded price.

For example, if the last traded price of the previous continuous trading session is 100.25, then the execution price will be 100 which is closer to 100.25 than 101. If the last traded price is 100.75, then the execution price will be 101. If the last traded price is 100.5 which has the same distance to 101 and 100, the execution price will be 100.5.