

FREQUENTLY ASKED QUESTIONS

The NASDAQ Opening and Closing Crosses

Updated 6/9/10

Overview

Q: What are the NASDAQ Opening and Closing Crosses?

A: The NASDAQ Opening and Closing Crosses are price discovery facilities that cross orders at a single price. The crosses enable market participants to execute on-open and on-close interest and provide unparalleled transparency into the market open and market close. All nationally-listed securities are eligible for the Crosses. All new listings on NASDAQ are added to the Opening and Closing Crosses on the first day of trading.

Q: How do the Crosses work?

A: NASDAQ accepts on-open and on-close order types that are executable only during the Opening or Closing Cross, respectively.

- Leading up to the open and close, NASDAQ disseminates information about any order imbalance that exists among orders on the opening or closing book, along with an indicative opening or closing price.
- In the cross process, the opening or closing book and the NASDAQ continuous book are brought together to create a single NASDAQ opening or closing price.
- NASDAQ opening and closing prices are distributed to the consolidated tape immediately after the cross occurs.

Q: What are the current thresholds for establishing the NASDAQ opening and closing cross prices?

A: Today the opening and closing cross threshold is 10%.

Q: How do the thresholds work?

A: The threshold of 10% is utilized to calculate a price range for the cross. Then, 10% of the NASDAQ Best Bid and Offer (QBBO) midpoint is added to the NASDAQ Offer and subtracted from the NASDAQ Bid to establish the threshold price range.

For example, if the bid/offer is \$10.00 x \$11.00, then the midpoint equals 10.50. Multiply the midpoint by the threshold of 10%: $10\% \times 10.50 = 1.05$. This value is then added to the offer and subtracted from the bid to obtain the cross's threshold range:

- Bid: $\$10.00 - \$1.05 = \$8.95$
- Offer: $\$11.00 + \$1.05 = \$12.05$

Therefore in this example, the cross can occur within the prices of \$8.95 and \$12.05. This means \$8.95 is the lowest price at which it can occur and \$12.05 is the highest price at which the cross can occur. The threshold range is dynamic; as the NASDAQ Best Bid and Offer (QBBO) changes, the threshold price range changes.

Q: What time do the Crosses execute?

A: At 9:30 a.m., Eastern Time (ET)*, the opening book and the NASDAQ continuous book are brought together to create a single NASDAQ Opening Cross. NASDAQ opening prices are distributed to the consolidated tape immediately after the Opening Cross.

- Following the Opening Cross, regular market hours trading proceeds as usual.

At 4:00 p.m., the on-close book and the continuous book are brought together to create a single NASDAQ Closing Cross. NASDAQ closing prices are distributed to the consolidated tape immediately after the Closing Cross.

- Following the Closing Cross, after-hours trading proceeds as usual.

Q: How does the Opening (Closing) Cross affect the NASDAQ Official Opening (Closing) Price?

A: The Opening Cross sets the NASDAQ Official Opening Price (NOOP). If an issue does not have an Opening Cross, the NASDAQ Official Opening Price is determined by the first last-sale eligible trade reported at or after 9:30 a.m., when regular trading hours begin.

The Closing Cross sets the NASDAQ Official Closing Price (NOCP).

Both the NOOP and the NOCP are widely used throughout the industry.

Q: What information about opening and closing orders is disseminated leading up to the open and close?

A: Between 9:28 and 9:30 a.m. and 3:50 and 4:00 p.m., NASDAQ disseminates the following information every five seconds via the NASDAQ TotalView® data feed, the NASDAQ Workstation® and select market maker data distributors and service bureaus:

- **Near Indicative Clearing Price:** The crossing price at which orders in the NASDAQ opening / closing book and continuous book would clear against each other.
- **Far Indicative Clearing Price:** The crossing price at which orders in the NASDAQ opening / closing book would clear against each other.
- **Current Reference Price:** A price within the NASDAQ Inside at which paired shares are maximized, the imbalance is minimized and the distance from the bid-ask midpoint is minimized, in that order.
- **Number of Paired Shares:** The number of shares that NASDAQ is able to pair off at the current reference price.
- **Imbalance Shares:** The number of opening and closing shares that would remain unexecuted at the current reference price.
- **Imbalance Side:** The side of the imbalance: B = buy-side imbalance; S = sell-side imbalance; N = no imbalance; O = no marketable on-open or on-close orders in NASDAQ.

Order Types

Q: Which order types are eligible for the Crosses?

A:

Regular Hours Orders: Regular Hours orders are executable from 9:30 a.m. to 4:00 p.m.

- Executed from 9:30 a.m. to 4:00 p.m., and during the cross.

*All times Eastern

- Includes Good-for-the-Day (DAY), Good-til-Canceled (GTC), Immediate-or-Cancel (IOC) and market orders.
- Limit Orders placed after 9:28 a.m. are treated as Imbalance-Only (IO) orders for the Opening Cross. If not fully executed in the cross, the orders are then returned to the order entering party.
- Market Orders placed after 9:28 a.m. will not be accepted.
- Firms may re-enter Limit and Market Orders after the Opening Cross is complete.

Quotes & Extended Hours Orders: Extended Hours orders are executable from 7:00 a.m. to 8:00 p.m.

- Eligible for the cross, except for extended immediate-or-cancel (IOX) orders.
- Quotes, extended day (X) and IOX orders can be executed during normal and extended hours.
- No market orders are accepted during extended hours (before 9:30 a.m., ET).

On-Open (OO) Orders (Opening Cross)

- Executed only during the Opening Cross.
- Market-on-Open (MOO) and Limit-on-Open (LOO) orders must be received prior to 9:28 a.m.

Imbalance-Only (IOs) Orders (Opening Cross)

- Executed only during the Opening Cross.
- Liquidity-providing orders that stabilize the crossing price.
- IO orders to buy (or sell) priced more aggressively than the 9:30 a.m. NASDAQ bid (or ask) are adjusted to the NASDAQ bid (or ask) prior to the execution of the cross.

On-Close Orders (Closing Cross)

- Allow investors to specifically request an execution at the closing price.
- Can be both Limit-on-Close (LOC) and Market-on-Close (MOC).
- Accepted beginning at 7:00 a.m.

Imbalance-Only Orders (IO) (Closing Cross)

- Provide liquidity to offset on-close order imbalances during the Closing Cross.
- Must be priced (limit); no market IO orders.
- Buy orders execute at or below the bid and sell orders execute at or above the offer.
- Re-priced to the best bid/ask (displayed or non-displayed) on the NASDAQ book prior to the execution of the Closing Cross.
- Accepted beginning at 7:00 a.m.

Q: What are IO orders in the Crosses? Why use an IO order when the continuous market is also being used for the Crosses?

A: IO orders provide liquidity and are intended to offset a buy/sell imbalance during the Closing Cross. IO orders do not add to an imbalance, nor do they establish the opening or closing price. They are executable only during the Opening and Closing Crosses. Prior to the Crosses, buy/sell IO orders are re-priced to the best bid and offer, respectively. Unlike continuous market orders, IO orders are not at risk for execution prior to market open/close and are not represented in a participant's position or the inside.

Q: Do paired shares include IO orders?

A: Yes. IO orders are included in the number of paired shares.

Q: Are extended day (X) order types “live” during regular trading hours?

A: Yes.

Q: Is short selling permissible at the Crosses?

A: Yes, subject to applicable short sale rules.

Q: Is the Manning Rule applicable to the Opening and Closing Crosses?

A: Yes. The Manning Rule and all other market rules that pertain to the regular trading day apply to the NASDAQ Opening and Closing Crosses. In particular, when determining its Manning Rule obligations, a market participant must consider executions that result from the Opening and Closing Crosses since those executions occur during normal trading hours.

Q: Does NASDAQ guarantee market-on-close (MOC) orders in the Closing Cross?

A: No, but NASDAQ ensures MOC orders in the cross in the same way that NASDAQ ensures market orders in the NASDAQ continuous market. The Closing Cross allows the entire industry to provide necessary liquidity guaranteed to offset any MOC imbalance.

Q: What is a “late” regular hours order?

A: A late regular hours order is an order received after 9:28 a.m. These orders are treated as Imbalance Only (IO) orders and do not participate in the determination of the crossing price. However, these orders do receive an execution in the cross if there is additional liquidity at the opening price, otherwise they are cancelled back to the customer.

Q: If a firm sends in a MOO/MOC or LOO/LOC order after the cut-off, is it rejected?

A: Yes. MOOs (MOCs) and LOOs (LOCs) entered after the cut-off at 9:28 a.m. (3:50 p.m.), are rejected at time of entry.

Q: If a firm sends in a MOO/MOC or LOO/LOC or IO orders that do not get executed, will they receive a cancellation message?

A: Yes. A cancellation message will be returned to the firm after the cross occurs.

Q: Which price is used to execute on-open (OO) / on-close (OC) orders? What happens for market and limit orders?

A: Special logic is used to arrive at the closing price. The algorithm takes into account all orders and quotes in the NASDAQ book and the inside prices at 4:00 p.m., ET. Imbalance only (IO) orders are re-priced to execute the NASDAQ inside price, and all inferior priced orders that are executed during the cross are price improved to the closing price. The closing price is based on the following steps:

1. Maximize the number of shares executed.
2. Minimize the imbalance of OC orders.
3. Minimize the distance from the 4:00 p.m. NASDAQ inside bid-ask midpoint.

The Closing Cross price determines the NOCP for each stock included in the Closing Cross. The closing price is the point where the imbalance of OC orders is satisfied,

using the continuous book (orders and quotes), the on-close book and imbalance-only (IO) orders.

Q: During the Closing Cross period, what happens to quotes and/or orders not marked as "on-close"?

A: These orders participate if executable at the closing price. Prior to the Closing Cross, orders not marked as "on-close" participate in the continuous market. When the closing process starts, these orders and/or quotes execute if they are priced better than the closing price. If they are priced at the closing price, and there is sufficient demand, they execute.

Imbalance Information Dissemination

Q: When does NASDAQ begin its dissemination of the Net Order Imbalance information?

A: 9:28 a.m. for the Opening Cross and 3:50 p.m. for the Closing Cross.

Q: Where can I access the Net Order Imbalance information for the open?

A: The Net Order Imbalance Indicator (NOII) information is available via the NASDAQ TotalView® data feed, the NASDAQ DataStore at data.nasdaq.com, the NASDAQ Workstation® and select market data distributors and service bureaus.

To view a guide on how to access NASDAQ Order Imbalance Indicator data through market data vendors and service bureaus and how to enter opening orders, visit www.NASDAQTrader.com/open.

Firms should check with their vendors and service bureaus for more information on how they can access the imbalance data.

Execution Priority

Q: If I enter an order or a quote that locks or crosses the inside prior to 9:30 a.m. does NASDAQ provide a warning?

A: No. If a quote will lock/cross the Inside, it will execute upon entry.

Q: If I enter an order or quote prior to 9:25 a.m. and it results in a locked or crossed market, how is it processed at 9:25 a.m.?

A:

- If the order is a systems hours order (live from 7:00 a.m. to 8:00 p.m.) the order will execute upon entry if the price locks/crosses the inside market.
- If the order is a regular hours order (live from 9:30 a.m. to 4:30 p.m.), it will be put into the Opening Cross book.
- If you enter a quote prior to 9:25 a.m. that will lock or cross the market, it will execute at 9:25 a.m., when quotes are opened systematically.
- If you open your quote prior to 9:25 a.m. and it locks/crosses the market, it will execute.

Q: What happens if I enter an order after 9:28 a.m.?

A: Orders entered after 9:28 a.m., but before the Opening Cross, will be handled in the following manner:

- Regular hours orders are entered into the Opening Cross book as IO orders. After the cross is executed, remaining unexecuted shares will be returned to the entering party.
- Quotes and extended hours orders continue to execute normally from 9:28 a.m. until the Opening Cross.

- MOO and LOO orders are rejected.
- IO orders are accepted.

Q: For orders on the continuous book and quotes priced more aggressively than the Opening Cross price, how does time affect execution priority?

A: These orders and quotes are executed in price/time priority. Orders priced more aggressively than the crossing price should be filled.

Q: What are the timeframes and restrictions for the canceling and entry of orders?

A: There are no additional restrictions for regular NASDAQ orders (IOC, DAY, and GTC) and quotes.

Beginning at 9:28 a.m., certain actions are restricted:

- **OC Orders** can be entered beginning at 7:00 a.m., but cannot be entered, canceled or modified after 9:28 a.m.
- **IO Orders** can be entered from 7:00 a.m., until market close but cannot be canceled after 9:28 a.m.

Beginning at 3:50 p.m., certain actions are restricted:

- **OC Orders** can be entered beginning at 7:00 a.m., but cannot be entered, canceled or modified after 3:50 p.m.
- **IO Orders** can be entered from 7:00 a.m., until market close but cannot be canceled after 3:50 p.m.

Q: How is the execution priority of IO orders determined after the re-pricing process of these orders is complete?

A: After they are re-priced, IO orders are treated the same as limit orders at the price to which they have been re-priced (i.e., time priority).

Other

Q: Do the Crosses access liquidity from other venues?

A: No. Only interest on the NASDAQ book is eligible to participate in the Crosses.

Q: Is there special processing for odd lot orders?

A: Odd lots follow regular NASDAQ processing.

Q: Can pegged and discretionary orders participate in the Closing Cross?

A: Yes, if they reside on the NASDAQ continuous book. On-close (OC) and imbalance-only (IO) orders cannot be pegged or discretionary.

More Information

For more information about the NASDAQ Crosses:

- Contact NASDAQ Market Sales at +1 800 846 0477 or sales@nasdaqomx.com.
- Visit www.NASDAQOMXTrader.com/open.

To subscribe to the NASDAQ Net Order Imbalance Indicator, visit the [NASDAQ OMX DataStore](#) or call your [Market Data Representative](#).

To view a guide on how to access NASDAQ Net Order Imbalance data through market data vendors and service bureaus and how to enter closing orders, visit NASDAQOMXTrader.com/openclose.