Financial Trading

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Lecture 2
Order Types

Agenda and objectives of the lecture

- Agenda
  1. What are orders?
  2. What are the standard orders?
  3. What properties do they have?
  4. What is order book?
- Objectives
  1. Understand what orders are and why traders use them.
  2. Be able to identify the most common orders and their properties.
  3. Be able to describe the order book.

Motivation: Your order submission strategies affect your transaction costs and trading profits.

Relevant article

Article 2-A: Citadel Securities Sues SEC for Approving New Stock-Order Type

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Citadel Securities Sues SEC for Approving New Stock-Order Type

Citadel had earlier urged the SEC to reject IEX's proposal, arguing that the D-Limit would harm the integrity of the U.S. stock market

RECOMMENDED VIDEOS

1. Video: Mob Forces Way Into Capitol, Prompting Lockdown

Relevant article

Article 2-B: Payments to U.S. Brokers Surged Amid Meme-Stock and Options Boom

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MARKETS

Payments to U.S. Brokers Surged Amid Meme-Stock and Options Boom

Earnings from selling their customers' order flow to electronic trading firms rose 33% last year

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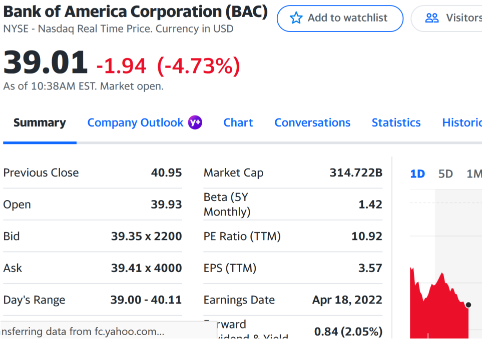
Terminology



- The reported "price" of a stock is the price at which the last trade occurred.

Terminology (cont.)

- The price specified in a buy order is called: the bid or the bidding price.
- The price specified in a sell order is called: the offer, offering, ask, or asking price.
- The highest bid price in the market is called the best bid.
- The lowest offer price in the market is called the best offer.
- The best bid and offer are also known as the market bid and market offer respectively.
- The best bid and offer available anywhere in the U.S. at a point in time is known as the National Best Bid and Offer (NBBO).

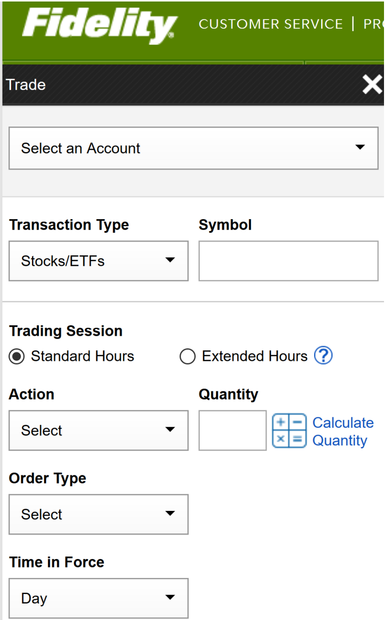
Terminology (cont.)

- The difference between the best ask and the best bid is the bid-ask spread.
- It is also known as the inside spread, since it is observed within the market.
- Once an order is accepted, the price at which the trade is executed is known as the trade price.
- To sell immediately, we agree to receive the bid price (hit the bid).
- To buy immediately, we need pay the ask price (lift the ask or lift the offer).

Trading orders

- Orders
  - Orders are instructions traders give to brokers and/or exchanges.
  - The instructions explain how their trades should be arranged.
  - The instructions are usually highly standardized to save time and avoid mistakes.
  - Orders can represent traders' interests even when they are not physically present.
- Order specifications
  - Orders always specify
    - Security to be traded
    - Quantity
    - Direction (buy or sell).
  - Orders may specify
    - Price conditions, method, timing, expiration, etc.

Order specifications (cont.)



Types of orders: Market order

- Market order: requests a trade immediately at the best available price.
- Properties of market order
  - A market is liquid when traders can trade when they want to without having much impact on price.
  - Traders demand immediacy when they try to trade in a hurry.
  - Market orders demand liquidity in the form of immediacy.
  - Market orders have market impact when dealers move prices to find liquidity.
  - Execution is near certain.
  - But the execution price is uncertain.
  - Transaction cost per trade is $1/2$ the spread.

The price of immediacy

- Suppose the quote is \$100 bid, \$102 offered.
- Given no further information, the best estimate of the "true" security value is \$101.
- A market order buyer who trades at 102 pays 101 for security value and \$1 for immediacy.
- A market order seller who trades at \$100 receives \$101 for security value and pays \$1 for immediacy.

Types of orders: Limit order

- Limit order: Specifies a price. The order will be executed only at this (or at a better) price.
- Example: a limit order to buy at $50 will be executed only at a price of $50 or lower.
- Example: a limit order to sell at $50 will be executed only at a price of $50 or higher.
- Terminology
  - Aggressively priced or marketable: executable.
  - At the market: best bid or ask.
  - Behind or away from the market: not executable.
  - In the market: between bid and ask.
- Standing limit orders wait for execution. Orders are placed in a limit order book.

Limit order properties

- No guarantee that the order will be executed. Some price uncertainty.
- If price runs away from a limit order, the ultimate execution price may be very different from the limit price.
- Standing limit orders supply liquidity by allowing others to trade when they want.
- Limit orders earn the bid/ask spread, if they execute.
- Marketable limit orders limit price impact, if they execute.
- Limit orders allow traders to profit from future contingencies.

Limit orders are "options"

- Standing limit buy orders are put options.
- Standing sell orders are call options.
- The limit price is the strike price.
- The option is good until canceled or until the order expires.
- The option belongs to the first trader who exercises it.
- Like other options, the value of the implicit limit order option increases with volatility and maturity and it depends on the stirk price (i.e., the limit price).
- The spread is the premium that compensates traders for offering (writing) limit orders.

Types of orders: Stop order

- Stop Order or Stop-loss Order - specifies a price.
  1. A stop buy order becomes a market order when the stock is traded at or higher than the specified stop price.
  2. A stop sell order becomes a market order when the stock is traded at or lower than the specified stop price.
- Example: a stop order to sell at $40 is issued when the market price is $55. The order becomes a **market order** once the specified price has been struck.
- Useful to close out positions when market conditions become unfavorable.
- Insurance from drastic changes.
- Contribute to momentum and thus can be destabilizing.
- Stop orders do not have to be executed at stop prices-prices can jump past stops

Who is responsible for handling a stop order?

- In late 2015, NASDAQ and the NYSE said that they would stop accepting stop orders.
- Stop order functionality is still available.
- A broker can simulate the strategy by monitoring trades and submitting a market or limit order when indicated.
- InteractiveBrokers offers stop orders (with variations).

Types of orders: Stop-limit order

- Stop-Limit Order - combines a **limit order** and a **stop order**.
- Two prices are specified - the stop price and the limit price.
- Order becomes a limit order once a bid or offer is made at a price equal to or less favorable than the stop price.
- If the stop price and the limit price are equal, the order is called a stop-and-limit order.
- Example: Suppose the market price is $35, a stop-limit order to buy is issued with a stop price of $40 and a limit price of $41.
- Once a bid or offer at $40, the stop-limit becomes a limit order at $41.

Types of orders

- Market-if-touched orders
  - Market-if-touched orders trigger a market order if a certain price is touched.
- Market not-held order
  - This is a market order that the investor does not want executed immediately.
- Many other orders exist and commonly used.

Additional order instructions

- Validity (expiration) instructions
- Quantity instructions
- Timing instructions
- Execution instructions

Additional order instructions (cont.)

- Validity instructions: Validity instructions indicate how long the order remains open (good).
  - Good-till-cancel orders remain open indefinitely.
  - Good-until orders specify an expiration date.
  - Day orders expire at day-end.
- Quantity instructions restrict how large orders can be broken into small trades.
  - All-or-none orders must be completely filled.
  - Minimum partial fill restrictions.

Timing instructions

- Timing instructions restrict the execution window.
    - Market-on-close orders.
    - Some mutual funds like to trade at closing prices.
    - Market-on-open orders.
- Execution instructions tell the broker how to arrange the trade.
    - Market-not-held is a market order that the broker need not immediately execute or expose. The broker is expected to use discretion to find the best price.

Trends in order type and design

- Traditionally: exchanges have competed to offer complex order types.
- Recently: NYSE Arca (owned by ICE) has eliminated some order types, like stop orders.
- An exchange's introduction or a new order type, elimination of an existing type, or modifications must be approved by the SEC.

Order book

- Limit orders are not always executed.
- A limit order book (LOB) at any point in time contains the details of those limit orders which are currently valid, but which have not been executed thus far due to the unavailability of a suitable match.
- In the earlier days this record was physically maintained in the form of a book of orders.
- These days everything is in electronic form.
- The limit order book is the central structure for many trading venues.

How does the order book and data look like?

Bank of America on March 7th, 2022.

BK OF AMERICA CORP COM			
	TOP OF BOOK		
	Shares	Price	Time
ASKS	800	39.1800	10:35:56
	1,221	39.1700	10:35:53
	1,201	39.1600	10:35:53
	918	39.1500	10:35:53
	700	**39.1400**	10:35:52
BIDS	300	**39.1300**	10:35:52
	1,303	39.1200	10:35:46
	739	39.1100	10:35:45
	1,220	39.1000	10:35:45
	1,271	39.0900	10:35:44

Can you have access to order book?

- Generally yes, for the right price.
- As an example, there are several levels of subscribers to Nasdaq quotation system.
  - Level 1: inside quotes.
  - Level 2: receives all quotes but they cannot enter quotes.
  - Level 3: dealers can see and post quotes.

Why you may want to have access to order book?

- An order book shows the buy and sell prices in real-time (constantly being updated).
- It allows market participants to make informed decisions. Moreover, it helps market participants understand the market trends and dynamics over time.
- Because you can see who are placing orders to buy a stock, when they are placing it, and how much of they want, the order book is one of the best ways to see the real-time supply and demand of a stock.
- Books have too much transparency, large orders can tip their hand too much by putting it on book.

Questions for class discussion

- When should a trader use a limit order as opposed to a market order?
- Under what circumstances would a trader use a stop buy order?
- What can you learn from a limit order book?
- Given that you know that order books are public, how do you place your order if you have private information about a stock?
- Would you be willing to pay if you can hide your order from the traders who have access to order book?
- Optional: Order book for Bitcoin: Please click here.