FE570 Financial Markets and Trading

Lecture 3. Markets, Orders and Order Properties

(Ref. Larry Harris - *Trading and Exchanges*)

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Outline

Market Structures:

- **Quote-driven Dealer Markets**
- **Order-driven Markets**
- **Brokered Markets**
- **Hybrid Markets**

- **Quote-driven Dealer Markets:** In pure quote-driven markets, dealers participate in every trade. Anyone who wants to trade must trade with a dealer. Either traders negotiate with the dealers themselves, or their brokers, acting as their agents, negotiate with the dealers. The dealers frequently trade among themselves, but public traders cannot trade with each other.
  - *Example:* If Barbara wants to buy a security, she must find a dealer who will sell it to her from his or her inventory. Likewise, if Saul wants to sell a security, he must find a dealer who will buy from him to add to his or her inventory. Although Barbara might be willing to buy the security directly from Saul, in a pure quote-driven market they generally cannot arrange such trades.
  - The Nasdaq Stock Market, the London Stock Exchange, the eSpeed government bond trading system, and the Reuters 3000 foreign exchange trading system are examples of quote-driven markets organized by a dealer association, an exchange, a broker, and an electronic data vendor.

- **Order-driven Markets:** In order-driven markets, buyers and sellers regularly trade with each other. These markets have trading rules that specify how they arrange their trades. Their order precedence rules determine which buyers trade with which sellers, and their trade pricing rules determine the trade prices.
  - *Auction Markets:* Most order-driven markets are auction markets. In an auction market, the trading rules formalize the process by which buyers seek the lowest available prices and sellers seek the highest available prices - *price discovery process*.
  - *Market Structures:* Order-driven market structures vary considerably. Some markets conduct *single-price auction* in which they arrange all trades at the same price following a market call. Other markets conduct *continuous two-sided auctions*, in which buyers and sellers can continuously attempt to arrange their trades at prices that typically vary through time. Still others conduct crossing networks, in which they match orders at prices taken from other markets.

- **Brokered Markets:** Brokers actively search to match buyers and sellers in *brokered markets*. Most searches start when their clients ask them to fill their orders. Brokers, however, also initiate many searches when they suggest trades to their clients.
  - The distinguishing characteristic of a brokered market is the broker's role in finding liquidity. In markets where traders usually do not make public offers to trade, brokers must search for traders who will make those offers. These markets are typically illiquid markets in which dealers will not normally trade.
  - Brokered markets are very common throughout the economy. They usually arise when the item traded is unique and when dealers will not hold inventories. The most important brokered securities markets are those for large blocks of stocks or bonds. Real estate markets and markets for going business concerns are additional examples of brokered markets.

- **Hybrid Markets** mix characteristics of quote-driven, order-driven, and brokered markets.
  - *The New York Stock Exchange* is essentially an order-driven market, but it requires its specialist dealers to offer liquidity if no one else will do so. The NYSE therefore has elements of quote-driven market.
  - *The Nasdaq Stock Market* is also a hybrid. Although it is essentially a quote-driven market, it requires its dealers to display, and in many circumstances to execute, public limit orders. The Nasdaq therefore has some elements of an order driven market.
  - Since brokers sometimes arrange large block trades in both these markets, they also have some characteristics of brokered markets.

Orders and Order Properties

- Market Orders
- Limit Orders
- Stop Orders
- Market-If-Touched Orders
- Tick-Sensitive Orders
- Market-Not-Held Orders

- **Market Order** is an instruction to trade at the best price currently available in the market. Market orders usually fill quickly, but sometimes at inferior prices. Impatient traders and traders who want to be certain that they will trade use market orders to demand liquidity.
  - *Market Orders Pay the Spread* The spread - actually half of the spread - is the price traders pay for immediacy when using market orders.
  - *Price Improvement* takes place when a trader is willing to step in front of the current best price to offer a better price to the incoming market order. This often happens when the spread is wide and the incoming market order is small.
  - *Market Impact* The price impact of a market order depends on the liquidity available in the market. (Example: large, liquid markets with many active traders, traders may routinely execute very large orders without much price impact).
  - *Execution Price Uncertainty* is due to quote changes that may occur between the submission of an order and its execution, and to the unpredictable price concessions that may be required to fill large orders.

- **A Limit Order** is an instruction to trade at the best price available, but only if no worse than the limit price specified by the trader. For buy orders, the trade price must be at or below the limit price. For sell orders, the price must be at or above the limit price.
  - *Limit Price Placement:* Traders classify limit orders by where they place their limit prices relative to the market. The market is the range of prices bounded above by the best offer (lowest price) and below by the best bid (highest price).

LIMIT PRICE PLACEMENT	BUY ORDERS	SELL ORDERS
Above the best offer	Marketable	Behind the market
At the best offer	Marketable	At the market
Between the current best bid/offer	In the market	In the market
At the best bid	At the market	Marketable
Below the best bid	Behind the market	Marketable

- **Standing Limit Orders** are trading options that offer liquidity. Since traders can choose whether they want to trade with a standing limit order, standing limit orders are options to trade. In particular, sell limit orders are call options that give other traders opportunities to buy when traders want to buy. Buy limit orders likewise are put options that give other traders opportunities to sell when they want to sell. The option strike prices are the limit prices.
  - **The Expected Compensation for Offering Liquidity:** The compensation that limit order traders hope to receive for giving away free trading options is a better price. Buyers who submit standing limit orders hope to buy at the bid. Sellers likewise hope to receive the ask instead of the lower bid.
  - **The Risks of Using Standing Limit Orders:** Traders face two risks when using standing limit orders. The first is *execution uncertainty*. When prices move away from their orders, limit order traders fail to trade and wish that they had. The second risk that the traders face when using standing limit orders is that they may trade and subsequently regret it - *ex post regret*.

- **Stop Order** instruction stops an order from executing until price reaches a stop price specified by the trader. Traders attach stop instructions to their orders when they want to buy only after price rises to the stop price or sell only after price falls to the stop price. Orders with stop instructions are call stop orders.
  - *Stop Orders and Limit Orders:* Novices often confuse stop orders with limit orders because both specify price conditions. The difference lies in the purpose of the specified price. A stop instruction provides for the activation of an order when the market price reaches or passes a specified stop price. In contrast, a limit order can be executed only at a price equal to or better than a specified limit price.
  - *Stop Orders and Liquidity:* Stop orders accelerate price changes. Prices often change because traders on one side of the market demand more liquidity than is available. When these price changes activate stop orders, the stop orders unfortunately contribute to the one-sided demands for liquidity.

- **Market-If-Touched Order (MIT)** is a market order that is activated when price reaches (touches) some preset *touch price*. In contrast to stop orders, traders submit market-if-touched orders to buy when prices fall to their touch prices or to sell when prices rise to their touch prices.

ORDER TYPE	MARKET PRICE ON SUBMISSION	WHEN THE ORDER CAN TRADE	TRADE PRICE
Standing limit sell order with a $5 limit price	Below $5	After price rises to or above the limit price	At or above the limit price
Market stop sell order with a $5 stop price	Above $5	After price falls to the stop price	Whatever the market will bear after the order is activated
Limit-stop sell order with a $5 limit price and a $5 stop price	Above $5	After price falls to the stop price and is at or above the limit price	At or above the limit price
Market-if-touched sell order with a $5 touch price	Below $5	After price rises to or above the touch price	Whatever the market will bear after the order is activated

- **Tick-sensitive order** is conditioned on the last market price change. Traders classify prices by their relation to previous prices. A *buy downtick order* can be filled only on a downtick or zero downtick price. The trade price must be lower than the last different price. Likewise, a *sell uptick order* can be filled only on an uptick or zero uptick.
  - *Market Impact* The tick condition ensures that tick-sensitive orders have no market impact. A broker holding a buy downtick order cannot bid up prices to encourage sellers. Instead, the broker must wait until someone is willing to trade at a price lower than the last different price. Since tick orders cannot have market impact, traders cannot use them to demand liquidity.
  - *Dynamic Limit Order* Tick-sensitive orders are essentially limit orders with dynamically adjusting limit prices. A buy downtick order implements the following equivalent limit order strategy: Submit a buy limit order just below the last different price. If price rises, raise the limit price to a price just below the new price. If price falls, leave the limit price alone.

Example

- **Example 1** Julie wants to buy 100 shares of GE stock if its price drops to $19.25. What order would she submit to accomplish her objective?
- **Example 2** John would like to buy Night Capital Group only if its price rises to $12, and then only if he can buy it for less than $13.5. What order would he submit to accomplish his objective?
- **Example 3** You want to buy Bank of America at less than the ask price, but you are not available to cancel and resubmit your orders if prices rise. To achieve your objectives, what type of order you would submit to your broker?

- **Validity and Expiration Instructions:** Traders specify *validity and expiration instructions* to indicate when their orders are valid and when their orders expire.

INSTRUCTION TYPE	DESCRIPTION
Open orders	are orders that have not yet been executed or canceled.
Good orders	are orders that can be executed.
Day orders	are valid for the trading day on which traders submit them. They expire when the market closes if they have not been filled.
Good-till-cancel orders	are valid until the trader expressly cancels them.
Good-until orders (GTW, GTM)	are good until a date specified by the trader. (Not all brokers accept this order instruction)
Immediate-or-cancel orders (IOC)	are orders that are valid only when they are presented to the market.
Good-after orders	are good only after some specified date. (Very rare).
Market-on-open orders	are market orders that a broker can fill only at the beginning of the trading session. Traders use these orders primarily in markets that open with a single price auction.
Market-on-close orders	are market orders that a broker can fill only at the close of the trading session. Traders use these orders in hoping to trade at the closing price.

- **Quantity Instructions:** Traders specify quantity instructions to indicate whether their brokers can arrange multiple trades to fill their large orders. They usually do so to minimize the costs that they pay to clear and settle their trades.

  The most common quantity instructions are all-or-none instructions and minimum-or-none (minimum acceptable quantity) instructions. Brokers must fill all-or-none orders all at once. They can arrange multiple trades to fill minimum-or-none orders, but each trade must be larger than a minimum size that the trader specifies. In some markets, these two instructions are also known as all-or-nothing and minimum acceptable quantity instructions.

- **Other Order Instructions:**
  - *Spread Orders* Traders issue spread instructions when they want to buy one instrument and simultaneously sell another instrument. The two instruments usually are closely related.
  - *Display Instructions* Traders give display instructions when they want to specify how their brokers should display unfilled portions of their standing limit orders. These instructions typically tell brokers to show no more than some maximum quantity. Traders restrict the display of their orders when they fear that showing their full sizes would cause the market to move away from them.
  - *Substitution Orders* Traders give substitution orders to their brokers when they want to invest or divest a specified amount by trading any of several securities. The brokers then use their discretion to choose which securities to trade, based on which ones appear to provide the best prices.
  - *Special Settlement Instructions* Traders attach special settlement instructions to their orders when they want nonstandard settlement.

- Information Collection Systems
- Information Distribution Systems
- Ticker Symbols
- Order Routing Systems
- Order Presentation Systems

Information Collection Systems

- Most markets collect information about instrument values, transactions, who has traded, who wants to trade, and the terms on which they are willing to trade. They present some information to their traders, they sell some to data vendors, and they save most for regulatory purposes.

- Markets with electronic trading systems can easily collect any market information they want because all information is already in electronic form. In contrast, floor-based markets, telephonic markets, and other manually operated markets must create special collection is quite expensive.

- Many over-the-counter dealer markets have no formal organization. Market data vendors often try to collect market information from the dealers in these markets. Either the dealers provide the information for a fee, or they provide their

Information Distribution Systems

- Markets distribute the information they collect to their members and to the public. In most markets, members can access more information than can unaffiliated traders. They also may obtain it faster.

- Market data systems report trades and quotes to the public. Markets sell this information to various data vendors, who repackage it for distribution to the public. Customers may buy real-time services or time-delayed services.

- Customers who subscribe to real-time services can receive data as it is generated, but they must pay additional fees to the exchanges for these services.

- Customers who subscribe to time-delayed services receive the data with a constant 5-, 10-, 15-, or 20-minute delay.

Ticker Symbols

- Exchanges and data vendors use ticker symbols to identify trading instruments. The naming conventions vary by exchange, country, instrument class, and data vendor.
- In the United States, listed common stocks have ticker symbols consisting of one to three letters. The one-letter symbols are rare, and therefore coveted for the special status they convey. Exchanges usually reserve them for largest firms.
- Ticker symbols for U.S. futures contracts generally consist of a one- or two-character code that indicates the commodity followed by a number that indicates the expiration year and a letter that indicates the delivery month. Month code are Jan.-F; Feb.-G;March-H;Apri.-J;May-K;Jun.-MJul.-N;Aug.Q;Sept.-U;Oct.-V;Nov.-X;Dec.-Z. Example: LC2Z is for 2002 live cattle futures contract with December delivery.

Order Routing Systems

- Order-routing systems transmit orders. Customers use them to send orders to their brokers and dealers, brokers use them to send customer orders to dealers and to exchanges, dealers use them to send orders to other dealers, and exchanges use them to send orders to other exchanges.

- Order-routing systems should be fast and accurate. Traders demand fast systems because they do not want to miss trading opportunities and because they value their time. They need accurate systems because mistakes obviously can be very costly.

- Which order-routing systems traders use depends on how often they trade, on how large their trades are, etc. Every innovation in telecom has increased competition among traders and has led to market consolidation.

Order Presentation Systems

- Order presentation systems reveal information about orders and quotes to the traders who arrange trades. Markets use several technologies to present this information.

- Markets with scree-based trading systems present the orders on computer screens. These systems are becoming more common as electronic communications technologies become cheaper. Some screen-based trading systems broadcast all information presented to all participants.

- Bulletin boards are information systems upon which people post indications of interest. An indication of interest (IOI) - also known as an order indication - is an expression of interest in trading.