


# Chapter 4

## Orders and Order Properties

# Orders


- Orders are instructions to trade that traders give to brokers and exchanges that arrange their trades.
  
- Orders always specify
  - The security to be traded
  - The quantity to be traded
  - The side of the order (buy or sell)

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- Orders may specify
    - Price specifications
    - How long the order is valid
    - When the order can be executed
    - Whether they can be partially filled or not



# Who uses orders?

- Traders that either do not have direct access to the markets, or do not have the time to monitor the markets use orders.
  - Have to anticipate what is going to happen.
  - Have to clearly delineate contingencies. Use standard orders to avoid mistakes.

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- Traders who use orders are at a disadvantage vis-à-vis professional traders.
    - Risk of misunderstandings
    - Conflicts of interest
    - Speed of reaction to changing market conditions
    - Cancellations can be time consuming
    - Access to order flow information

# Some important terms 1

- **Bid:** *buy order specifying a price (price is called the *bid*).*
- **Offer:** *sell order specifying a price (price is called *offer* or *ask*).*
- **Best Bid:** *standing buy order that bids the highest price bid.*
- **Best offer:** *standing sell order that has the lowest price offer.*

# Some important terms 2

- Dealers have an obligation to continuously quote bids and offers, and the associated sizes (number of shares), when they are registered market makers for the stock.
- Their quotes also have to be **firm** during regular market hours.

## Some important terms 3

- Public orders with a price limit can also become the market bid or offer if they are at a better price than those currently quoted by a registered market maker.
- The market's best bid and offer constitute the inside market, the best bid/ask, or the BBO. The best bid and offer across all markets trading an instrument is called the NBBO.



# Some important terms 4

- The difference between the best offer and the best bid is the bid/ask spread, or the inside spread (touch).
- Orders *supply* liquidity if they give other traders the opportunity to trade.
- Orders *demand* liquidity (immediacy) if they take advantage of the liquidity supplied by other traders' orders.




# What are agency/proprietary orders?

- Orders submitted by traders for their own account are proprietary orders.
  - Broker-dealers and dealers.
  
- Since most traders are unable to directly access the markets, most order are instead agency orders.
  - Presented by a broker to the market.

# Market orders

*Instruction to trade at the best price currently available in the market.*

- Immediacy
  - Buy at ask/sell at bid => pay the bid/ask spread
  - Price uncertainty
- Fills quickly but sometimes at inferior prices.

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- Used by impatient traders and traders who want to be sure that they will trade. It is usually thought that insiders use that type of order.
  - When submitting a market order execution is nearly certain but the execution price is uncertain.
  - Takes liquidity from the market in terms of immediacy. They then pay a price for immediacy which is the bid-ask spread.

# Market order: Example 1

Suppose that the quote is 20 bid, 24 offered.  
Suppose that the best estimate of the true value of the security is 22.

- A market buy order would be executed at 24 for a security worth 22.
- The price paid would be 24 and therefore the price of immediacy would then be 2.

# Market order: Example 2

- A market sell order would be executed at 20 for a security worth 22.
- The price received would be 20 and therefore the price of immediacy would then be 2.
- The price of immediacy is the bid-ask spread.



# Price improvement

- Price improvement is when a trader is willing to step up and offer a better price than that of the prevailing quotes (at order arrival).
- Who benefits from price improvement?
- Who loses from price improvement?



# Market impact

- Large market orders tend to move prices.
- Liquidity might not be sufficient at the inside quotes for large orders to fill at the best price.
- Prices might move further following the trade.
  - Information and liquidity reasons.



# Market impact: Example


- For example, suppose that a 10K share market buy order arrives in IBM and the best offer is \$100 for 5K shares.
- Half the order will fill at \$100, but the next 5K will have to fill at the next price in the book, say at \$100.02 (where we assume that there is also 5K offered).
- The volume-weighted average price for the order will be \$100.01, which is larger than \$100.00.

# Limit orders

- A limit order is an instruction to trade at the best price available, but only if it is no worse than the limit price specified by the trader.
  - For a limit buy order, the limit price specifies a maximum price.
  - For a limit sell order, the limit price specifies a minimum price.

# Limit orders: Examples

- If you submit a *limit buy order* for 100 shares (round lot) of Dell with *limit price of \$20*. This means that *you do not want to buy those 100 shares of Dell at a price above \$20*.
- If you submit a *limit sell order* for 100 shares (round lot) of Dell with *limit price of \$24*. This means that *you do not want to sell those 100 shares of Dell at a price below \$24*.

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- If the limit order is executable (marketable), than the broker (or an exchange) will fill the order right away.
  - If the order is not executable, the order will be a standing offer to trade.
    - Waiting for incoming order to obtain a fill.
    - Cancel the order.
  - Standing orders are placed in a file called a limit order book.

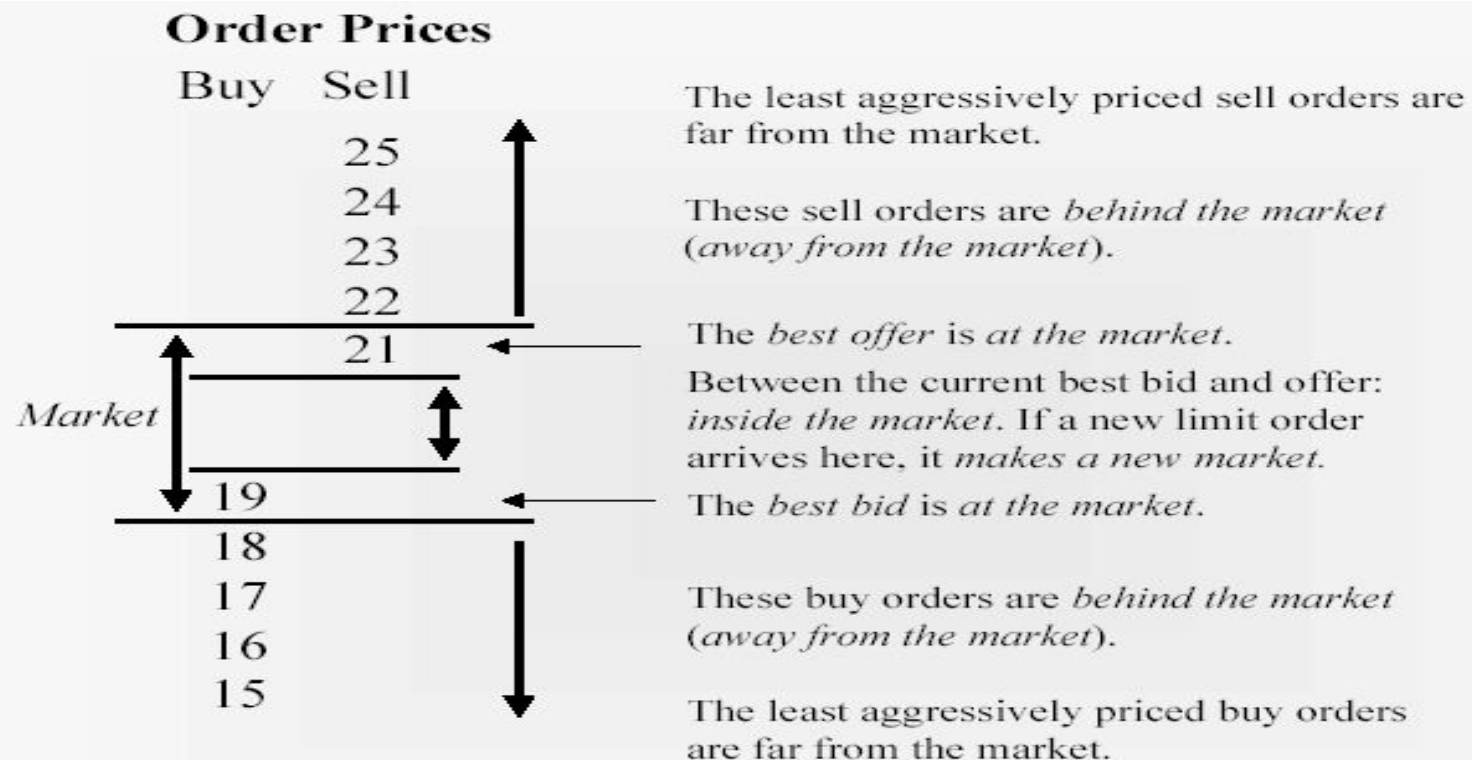
# Limit price placement: (from very aggressive to least aggressive)

- **Marketable limit order:** order that can immediately execute upon submission (limit price of a buy order is at or above the best offer),
- **At the market limit order:** limit buy order with limit price equal to the best bid and limit sell order with limit price equal to the best offer,
- **Behind the market limit order:** limit buy order with limit price below the best bid and limit sell order with limit price above the best offer.

## Market Microstructure Seminar - T&E Chapter 4

<b>Limit Price Placement</b>	<b>Buy Orders</b>	<b>Sell Orders</b>
Above the best offer	Marketable	Behind the market
At the best offer	Marketable	At the market
Between the best bid and best offer	In the market	In the market
At the best bid	At the market	Marketable
Below the best bid	Behind the market	Marketable

# Market Microstructure Seminar - T&E Chapter 4




# A standing limit order is a trading option that offers liquidity

- A limit sell order is a call option and a limit buy order is a put option. Their strike prices are the limit prices.
- A limit order is not an option contract (not sold).
- The option is good until cancelled or until the order expires.
- The value of the implicit limit order option increases with maturity.



# Why would anyone use limit orders?

- The compensation that limit order traders hope to receive for giving away free trading options is to trade at a better price.
- However, options might not fill (execution uncertainty).
  - Chasing the price.

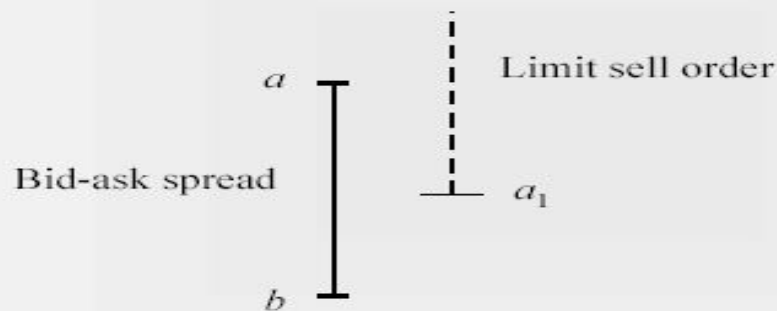
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- Limit order traders might also regret having had their order filled (adverse selection)...
    - What could cause a limit order to regret obtaining a fill?
    - How would this fact affect strategies involving limit orders?

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### *Compensation for offering liquidity:*

Assume for simplification that all orders are for one share and that the trader wants to sell 1 unit of share.

- Case 1: limit order's price is in between the bid-ask spread.



In that case the limit order submitted competes with the current best offer as its limit price is below the best offer. It creates a new market.

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The new market is then

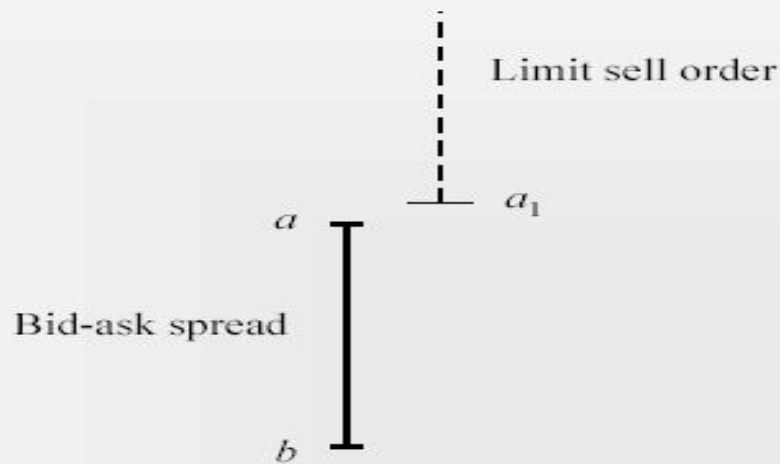


Now assume that a buy order arrives to the market. Assume further that it can be immediately executed (market order or a limit order whose limit price is above the best offer,  $a_1$ ). The price received by the limit order is  $a_1$ .

Now consider the situation where the same trader had sent a market sell order instead of a limit sell order. He would have sold at  $b$  which was the prevailing best bid at that time. Now, as  $a_1$  is greater than  $b$ , the trader gets a better price. That difference in price is the reward from submitting liquidity to the market.

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- Case 2: limit order's price is above the best offer.



In that case, that order is behind the market and awaits market movements.

# Stop orders

- Activates when the price of the stock reaches or passes through a predetermined limit (*stop price*). When the trade takes place the order becomes a *market order* (conditional market order).
- Buy only after price rises to the stop price.
- Sell only after price falls to the stop price.

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- Stop orders are typically used to close down losing positions (stop loss orders: **sell orders**).
  - Mainly used on market orders and few on limit orders.




Example: Suppose that the market for Dell is currently 20 bid, 24 offered.

- Suppose that you place a stop loss order for 1,000 shares of Dell at a stop price of 15.
- Suppose that after having placed that order, the market falls to: 13 bid, 15 offered. *The bid price passed your stop price.*
- Your order is then executed at 13 provided there is enough quantity at that price.
- The stop price may not be the price at which you are executed, as above.



# Difference between stop orders and limit orders

- The difference lies in their relation with respect to the order flow.
- A stop loss order transacts when the market is falling and it is a sell order. Therefore such an order takes liquidity away from the market (it must be accommodated so it provides impetus to any downward movement).

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- A limit order trades on the opposite side of the market movement. If the market is rising, the upward movement triggers limit sell orders.
  - Outstanding limit orders provide liquidity to the market.

# Market-if-touched (MIT) orders

- Market-if-touched (MIT) orders become a market order when price reaches some preset touch price.
  - Buy when market falls to the touch price.
  - Sell when market rises to the touch price.
  - How are MIT orders different from regular limit orders?
  - Do MIT orders demand or supply liquidity?

# Tick-sensitive orders

- Traders who want to condition their orders on the last price change submit tick-sensitive orders.
  - Uptick = current price is above the last price
  - Downtick = current price is below the last price
  - Zero-tick = current price is the same as last price



# Tick-sensitive orders

- Do tick-sensitive orders demand or supply liquidity?
- How do tick-sensitive orders compare to limit orders?
- How are tick-sensitive orders affected by the minimum price-increment?

# Order validity and expiration instructions

- Day orders (DAY)
- Good-till-cancel (GTC) orders
- Good until orders
- Good-this-week (GTW) orders, good-this-month (GTM) orders
- Immediate-or-cancel (IOC) orders
- Fill-or-kill (FOK) orders, good-on-sight orders
- Good-after-orders
- Market-on-open (MOO) orders
- Market-on-close (MOC) orders



# Quantity instructions

- All-or-none (AON) orders
- Minimum-or-none (MON) orders
- All-or-nothing, and minimum acceptable quantity instructions

# Other order instructions

- Spread orders
- Display instructions
  - Hidden/Ice-berg/reserve orders
- Substitution orders

## Special settlement instructions


- Regular-way settlement
- Cash settlement
- How do these affect the cost of trading?





# Short sale: *sale of a security that you do not own*

- To sell it, you must borrow it from someone who owns it. You get some cash from the sale of the security but you remain indebted to the lender for the security.
- <http://www.investopedia.com/university/shortselling/>

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- The trader engaging in such a strategy expects the security to decline in value.
  - As, if it is the case, he will be able to buy back the security at the a price lower than the price at which he sold.
  - The profit margin comes from that difference in prices.

# Short sale - Initial conditions

Z Corp	100 Shares
50%	Initial Margin
30%	Maintenance Margin
\$100	Initial Price

Sale Proceeds	\$10,000
Margin & Equity	5,000
Stock Owed	10,000

# Short sale - Maintenance margin

Stock Price Rises to \$110

Sale Proceeds	\$10,000	
Initial Margin	5,000	
Stock Owed	11,000	
Net Equity	4,000	
Margin % (4000/11000)		36%

# Short sale - Margin call

How much can the stock price rise before a margin call?

$$(\$15,000^* - 100P) / (100P) = 30\%$$

$$P = \$115.38$$

\* Initial margin plus sale proceeds

# Margin trading

- <http://www.investopedia.com/university/margin/>
- Using only a portion of the proceeds for an investment.
- Borrow remaining component.
- Margin arrangements differ for stocks and futures.

# Stock margin trading

- Maximum margin
  - Currently 50%
  - Set by the Fed
- Maintenance margin
  - Minimum level the equity margin can be
- Margin call
  - Call for more equity funds

# Margin trading - Initial conditions

X Corp      \$70

50%          Initial Margin

40%          Maintenance Margin

1000         Shares Purchased

## Initial Position

Stock    \$70,000    Borrowed    \$35,000

Equity                                    \$35,000



# Margin trading-Maintenance margin

Stock price falls to \$60 per share

New Position

Stock	\$60,000	Borrowed	\$35,000
		Equity	25,000

Margin% =  $\$25,000 / \$60,000 = 41.67\%$

# Margin trading - Margin call

How far can the stock price fall before a margin call?

$$(1000P - \$35,000)^* / 1000P = 40\%$$

$$P = \$58.33$$

$$* 1000P - \text{Amount Borrowed} = \text{Equity}$$