

# Equity Trading

mthree Alumni Training





# Equity Trading

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## Objectives

This lesson looks at the equity trading business, including the topics:

- What is equity trading?
- Shares
- Types of equity trading
- Orderbooks
- Trading – algos and SOR
- HFT and market making



# Equity Trading

## Company Equity and Shareholders





# Equity Securities: Market Cap

A company's worth, or its total market value, is called its market capitalization – or **Market Cap**

$$\text{Outstanding Shares} \times \text{Stock Price} = \text{Market Cap}$$

- **Outstanding Shares:** Shares issued by a public company and are freely available to be bought by anyone
- **Restricted Stock:** Shares that can only be traded under SEC regulations
- **Floating Stock:** Shares currently available to trade
- The market cap is publicly available information. Companies are ranked in size – large cap, mid cap, small cap. Large cap stocks are referred to as blue chip companies.



# Dividends

Dividends are a distribution of a portion of a company's earnings – decided by the board of directors (can be cash or stock). These are typically paid twice a year.

- Investors invest in equities for two main reasons:
  - The capital value – share price
  - The dividend value – income

**Apple issued \$0.77 dividend on February 13, 2020.  
If you owned 500 shares, you would have received \$385**

Why pay dividends?

- If a company has 1000 shares outstanding and a share price of \$2 – its market cap is \$2000.
- If this company has \$10,000 in the bank, then in theory, it could be bought for \$2000 and liquidated, giving an \$8000 profit to new owner. The company would prefer to give the \$8000 away as dividends.



# Share Classes

## Ordinary Shares

Dividend:  
2nd after preferred  
shares

Can have more than  
one class of ordinary  
shares

Also called common  
stock

## Preference Shares

Receive dividend  
ahead of ordinary  
shares

Entitled to fixed  
amount of  
dividend every  
year

No voting rights

## Deferred Ordinary

Dividend payment  
deferred to after  
other share classes  
have received the  
minimum dividend

## Non-Voting Ordinary

No voting rights

Or voting rights  
restricted to  
certain  
circumstances

## Redeemable Shares

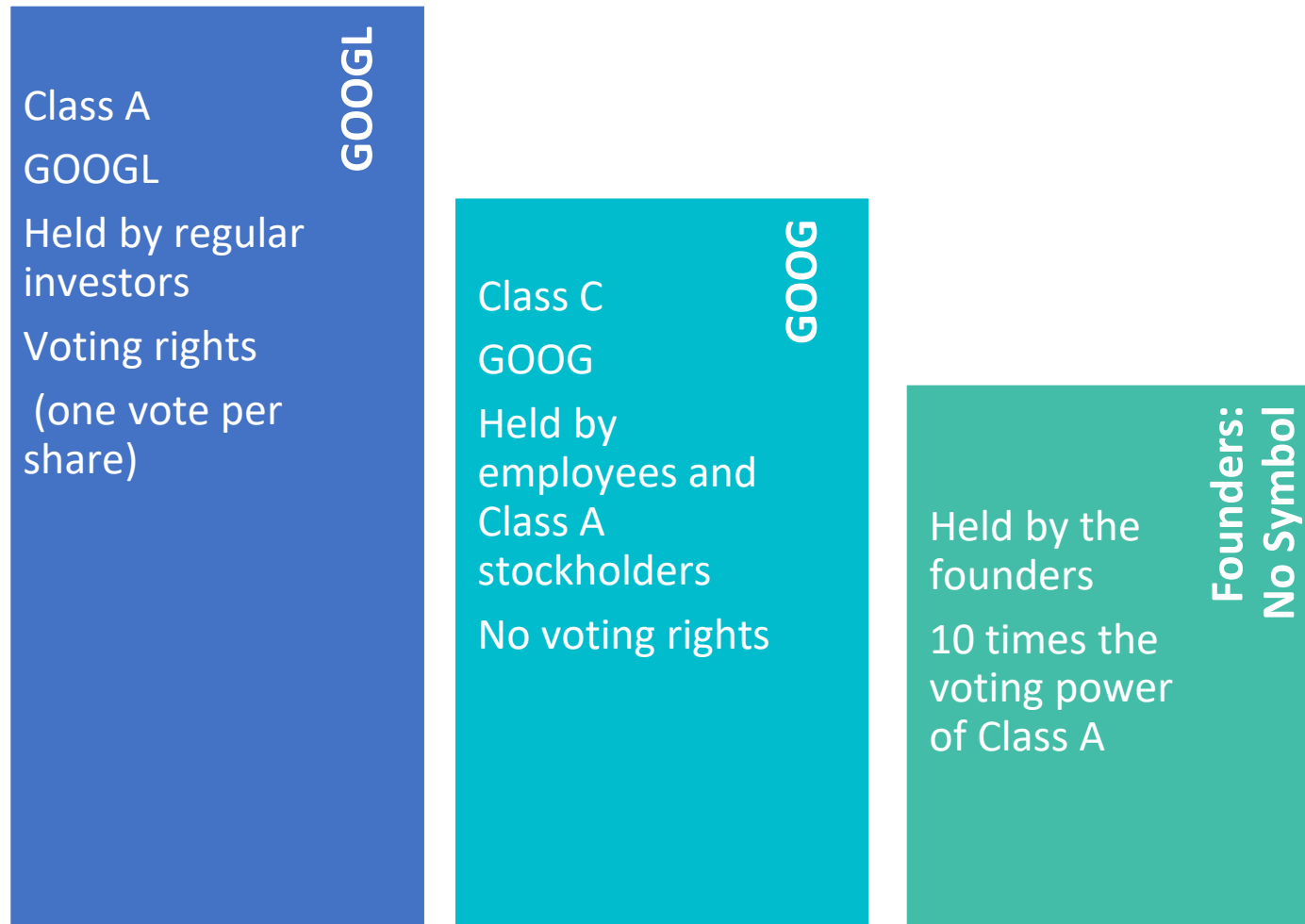
Company has  
an option to  
buy back the  
shares

## Non-Redeemable Preference

Preference shares  
that are also  
available  
redeemable

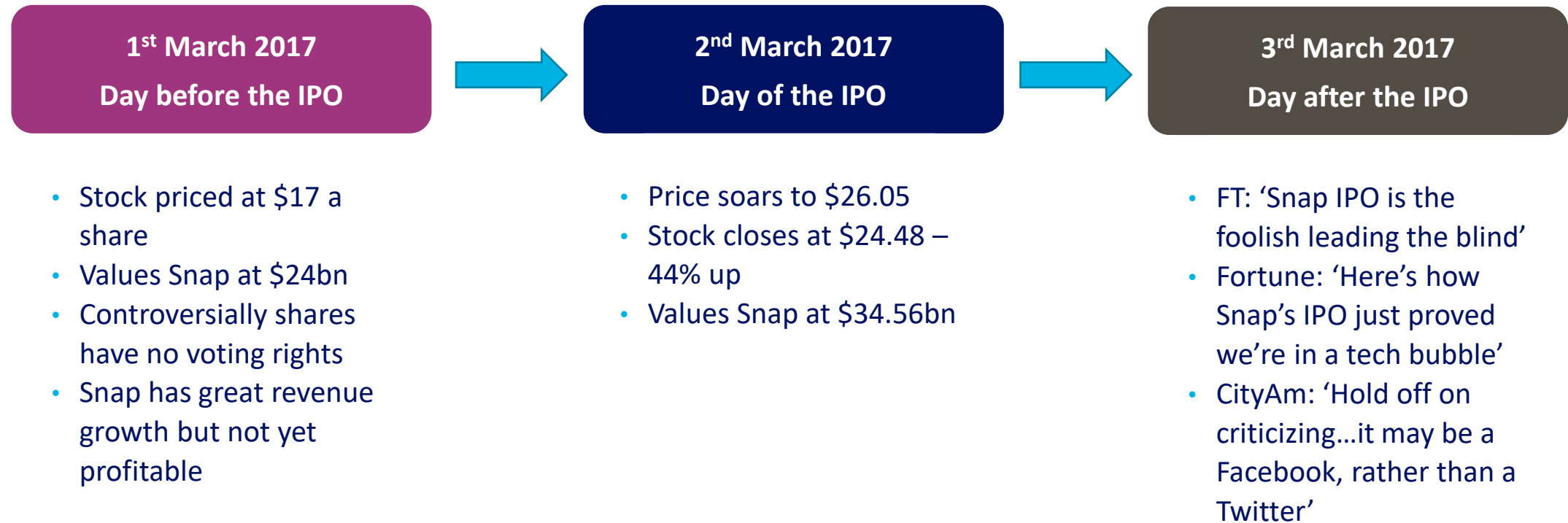


# Share Classes: Google





# Snapchat IPO Case Study







# Exercise

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What is the current share price of:

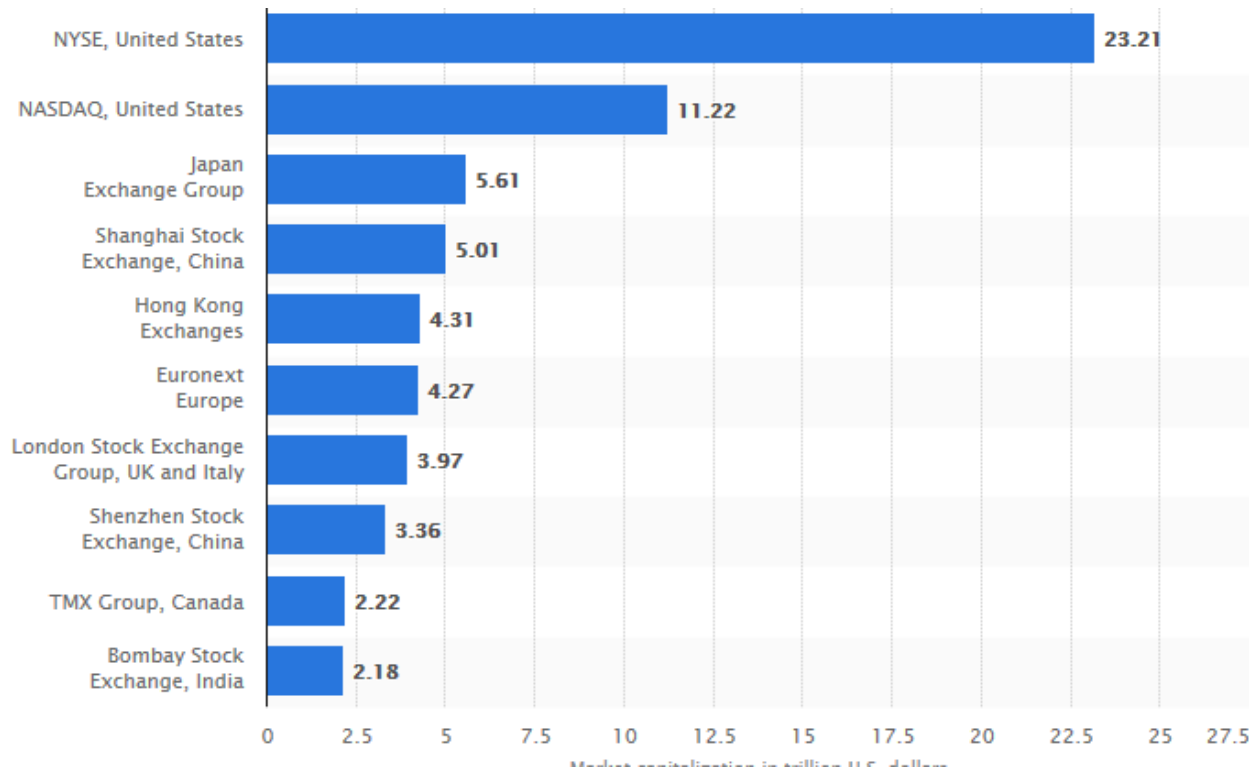
1. Snapchat
2. Facebook
3. Twitter

For each of the above – compare their IPO price and their previous close price



# Stock Exchanges

- Stock exchanges are electronic marketplaces for trading of shares
- Stocks are listed on one domestic exchange only (but can be listed at other venues)
- Companies pay a listing fee plus annual fees
- NYSE: New York Stock Exchange – physical exchange, auction market
- Nasdaq: Totally electronic, greater daily traded share volume





# The Fundamentals of Trading

- Buy low and sell high is one of the most famous sayings about making money in stock markets

**BUY LOW**

**SELL HIGH**

- The price of stocks follow a consistent pattern around business cycle and sentiment.
- Times of maximum fear are good times to buy; times of maximum business greed, the time to sell.

**BULL MARKET**

Condition of the market in which prices are rising or expected to rise – optimistic times of economic growth

**BEAR MARKET**

Condition of the market in which prices are falling or expected to fall – times typically shrouded in pessimism



# Why Invest in Equities?

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Why would you invest in equity?

Regular Income

Capital Growth

Long Term Investment

High Liquidity

Transparent  
Marketplace

Ownership Voting  
Rights



# Market Participants

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There are multiple people who participate in equity markets.

## Speculators

Day Traders  
Hedge Funds

HFTs – High Frequency Traders  
Individuals

## Investors

Long Term Capital Growth

Dividends

## Market Makers

Provide Liquidity



# A Market Index

A market index is a hypothetical portfolio of investment holdings which represents a segment of the financial market.

Aggregated price of a  
number of securities

Trend indicator

Performance  
benchmarks

## FTSE 100 Index

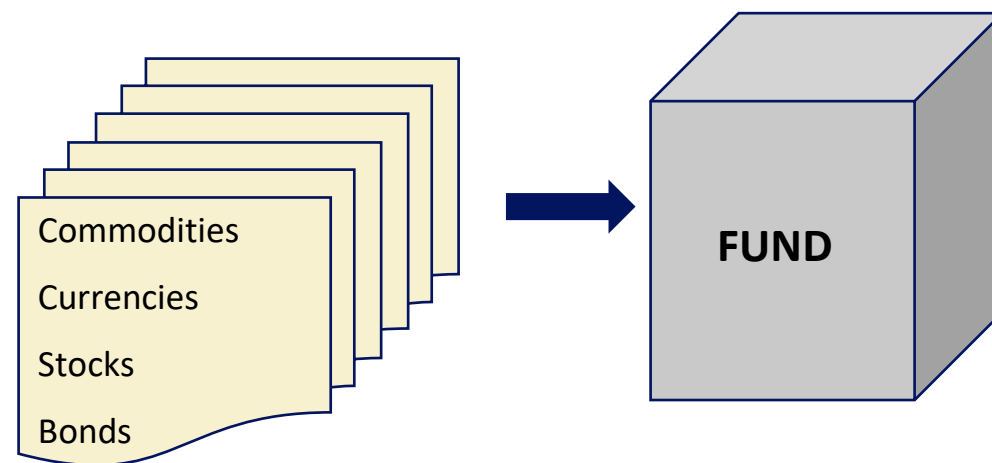
FTSE:FSI

PRICE (GBP) 7,007.97    TODAY'S CHANGE ↑39.12 / 0.56%    SHARES TRADED 168.74m    1 YEAR CHANGE ↓-6.44%    52 WEEK RANGE 6,536.53 - 7,903.50

Data delayed at least 15 minutes, as of Feb 01 2019 11:25 GMT.

## Sample of Constituents in FTSE100 Index

Code	Name	Cur	Price
ADM	ADMIRAL GRP	GBX	1,865.00
AAL	ANGLO AMERICAN	GBX	1,339.50
ANTO	ANTOFAGASTA	GBX	858.00
AHT	ASSTEAD GRP.	GBX	1,716.00
AZN	ASTRAZENECA	GBX	4,569.50
AV.	AVIVA	GBX	504.50
BAB	BABCOCK INTL	GBX	899.50
BA.	BAE SYS.	GBX	608.50
BARC	BARCLAYS	GBX	235.50



## ETF Funds:

Collection of securities which are bundled into a single financial product and traded just like stocks

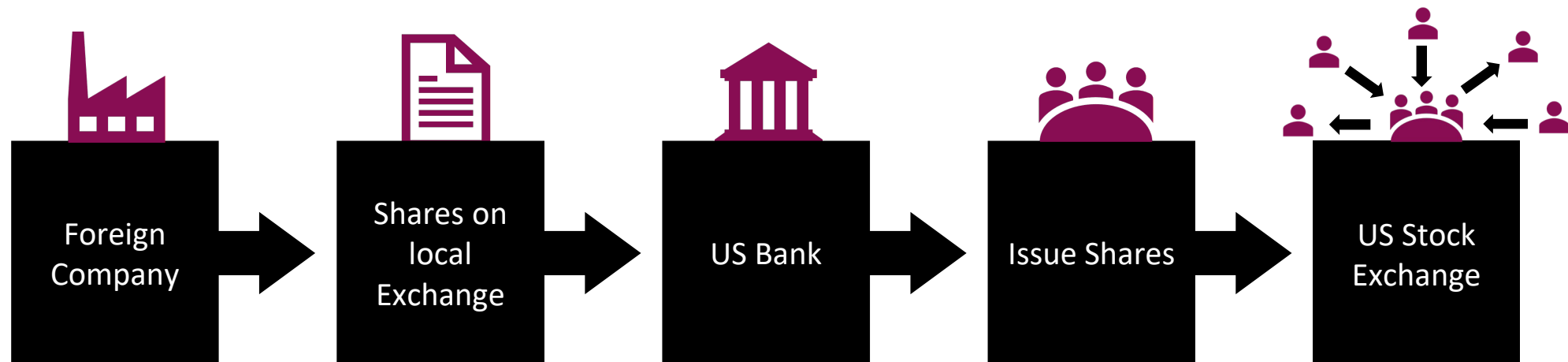


# Example Indexes

Ticker	Provider	Locality	Filter	Size Limit	Weighting
NDQ	Nasdaq	National	Equities (non-financial companies)	100 (largest companies)	Adjusted Market Cap
NDXE	Nasdaq	National	Equities (non-financial companies)	100 (largest companies)	Market Cap (Equal)
MID	S&P	National	Mid Cap (derived from Dow Jones)	400	
OMXS30	Nasdaq	National (Stockholm)		30 most traded companies	Market Cap
DRG	Nasdaq	Global	Pharmaceutical	All companies larger than \$75m	Market Cap

# American Depositary Receipts (ADRs)

- ADRs are a way of investing in a foreign company on a US stock exchange.
- An ADR is a certificate issued by a US bank representing shares in a foreign stock.
- An ADR can be one share or multiple shares.
- Avoids currency exchange issues: dividends will be converted into US dollars.
- It also means foreign companies can attract US investors without having to list on a US exchange.







# Exercise: Market Crashes

Stock markets are built on the confidence of the inherent value of stocks. There have been several times over the last 100 years where we have seen stock markets crash.

- For each crash below:
  - What happened?
  - What was the underlying cause?





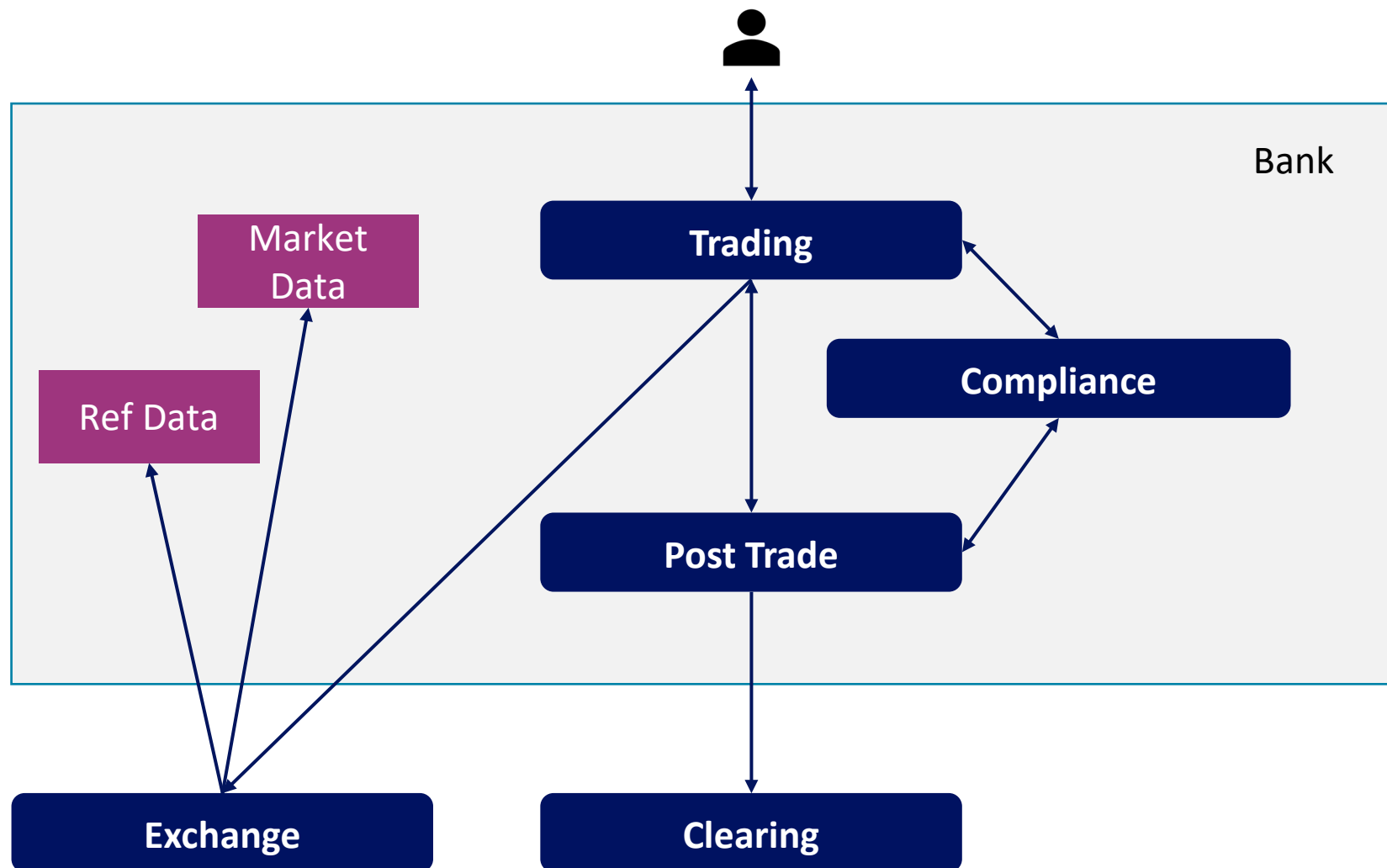
# Circuit Breakers

First put in place after Black Monday in 1987, **circuit breakers** are measures used to curb panic selling on US Stock exchanges.

These circuit breakers have been updated over the years to apply to both individual securities and market indices

- For individual securities (can include ETFs), circuit breakers can be triggered if the price increases or decreases
- For indices:
  - Level 1 circuit breakers - a 7% decline in the S&P 500 index from the previous closing price
  - Level 2 circuit breakers – a drop of 13%
  - Level 3 circuit breakers – a drop of 20%
- For level 1 and 2 circuit breakers, trading is halted for 15 mins (unless after 3.25pm when trading is allowed to continue)
- Level 3 halts trading for the remainder of the day

# Sales and Trading – Typical Setup





# Data Categories

There are various types of data important to equity trading:

- Client
- Reference
  - Costs
  - Symbology
  - Trading Calendar
  - Index Constituents, Weightings, Rebalances
  - Fundamental data
  - Corporate Actions
- News
  - Positive/Negative
  - Analyst recommendations
- Order and Execution(fills, rejects, cancels)
- Market (trades, quotes)

**Expiries:** Triple witching is the quarterly expiration of stock options, index futures and index options on the same day – four times a year on the 3rd Friday of March, June, September, and December



# Stock Identifiers

- There are multiple ways to identify a stock (instrument). When instruments are traded electronically, they can use the following identifiers:

## Instrument Code/Ticker

The main identifier of an instrument; does not list where it is traded  
e.g., AAPL

## RIC (Reuters Identity Code)

The Reuters-specific identity code: shows where the primary listing is  
e.g., AAPL.N

## Bloomberg ID

Bloomberg ID for an instrument  
e.g., AAPL:US

## SEDOL

Stock exchange daily official list – 7 characters  
e.g., B0YQ5W0

## ISIN

International securities identification number: 12 characters  
e.g., US0378331005

## CUSIP

Committee on uniform securities identification procedures  
e.g., 037833100



# Types of Equity Trading

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## Low Touch

Dealing with trading electronically (e-trading):

- On exchange trading
- High speed (low latency)
- Transparent
- Standardized
- Facilitates algorithmic trading, high frequency trading and direct market access

## High Touch

Can refer to traditional cash trading – verbal agreements

- OTC (over the counter) trading
- Agreement to make a trade – often verbally
- May take several days to settle
- Off exchange
- Flexible
- Facilitates complex deals



# A Day in the Life of Trading

Traditional markets like NYSE have multiple phases. These are split up into auctions (open and close) and continuous trading.

## Opening Auction

- Orders can be entered as early as 7.30am EST (NYSE) – these are market on open (MOO) orders or limit on open (LOO)
- Reference price is the previous day's closing price

## Continuous Trading

- Continuous trading on NYSE opens at 9.30am
- Orders are placed onto the orderbook throughout the day and matched on price

## Closing Auction

- Orders can be entered as early as 7.30am EST also – these are market on close (MOC) orders or limit on close (LOC)
- At 3.58pm EST orders can no longer be cancelled – market closes at 4.00pm



# Order Types

Here are some of the most common order types:

## Market

Execute order regardless of price

## Limit

Execute order at a specific price

## On Open

Execute order in the opening auction

## On Close

Execute order in the closing auction

## Hidden Limit

A limit order where price and volume is not displayed

## Min Execution Size

Hidden order that executes when the minimum volume is met

## IOC

Immediate or Cancel – execute part or all of the order immediately else cancel

## FOK

Fill or Kill –execute the full order immediately or not at all



# What is an orderbook?

This is an orderbook: it shows live what orders in a stock are active on an exchange .

- **Bid** – the maximum price a buyer is willing to pay for the stock
- **Ask** – the minimum price a seller is willing to sell their stock for
- **Spread** – the difference between the highest bid price and the lowest ask price
- **Consolidated order book** – there may be multiple buyers/sellers at each level of the orderbook and it is consolidated into one view
- **MPID** – market participant ID
- **BBO/NBBO** – best bid and offer (national best bid and offer)
- **Liquidity** – ease of converting security into cash

**NASDAQ BOOKVIEWER** Export Help

GOOG GET STOCK

Last Match: **576.53** 10:58:01.135

Current stock: **GOOG**

Today's Activity: Orders 57,513 Volume 285,290

Filter: >> Aggregate By: Price MPID

BUY ORDERS				SELL ORDERS			
TIME	MPID	SHARES	BID	ASK	SHARES	MPID	TIME
10:58:01.021	NSDQ	300	576.42	576.52	80	NSDQ	10:58:01.367
9:30:13.227	CDRG	75	576.40	576.58	100	NSDQ	10:58:01.367
10:45:35.954	UBSS	500	576.40	576.67	100	NSDQ	10:58:00.289
10:58:00.901	NSDQ	10	576.37	576.73	100	TMBR	10:58:00.223
10:58:00.899	NSDQ	10	576.38	576.74	100	NSDQ	10:58:01.369
10:58:00.225	NSDQ	8	576.28	576.80	100	NSDQ	10:58:01.213
9:30:13.227	CDRG	2	576.25	576.85	100	NSDQ	10:58:00.225
9:37:01.074	AUTO	30	576.20	576.85	100	NSDQ	10:58:01.138
10:56:18.648	NITE	100	576.20	576.86	100	NSDQ	10:57:40.157
10:58:00.400	NSDQ	22	576.12	576.87	22	NSDQ	10:58:01.367
10:58:00.175	NSDQ	22	576.10	576.88	8	NSDQ	10:58:01.368
10:58:34.266	NSDQ	50	576.08	576.89	22	NSDQ	10:58:01.136
10:58:01.136	NSDQ	22	576.08	576.90	10	NSDQ	10:58:01.369
10:58:01.136	NSDQ	22	576.06	576.91	10	NSDQ	10:58:00.623
10:57:13.883	NSDQ	100	576.05	576.91	22	NSDQ	10:58:01.137

( 4512 More ) ( 3357 More ) [Show More](#)

As of 10:58:01.506 Powered by NASDAQ TotalView

Orders: Ask=Sell Bid=Buy

Spread=Best Ask - Best Bid

*Cancel*

Ask	1150	93.05
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*New Order*

Ask	100	93.03
Ask	20000	92.99

Bid	500	93.03
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Bid	7	93.01
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Type	Size	Price
Ask	1150	93.05
Ask	2205	93.04
Ask	300	93.03
Ask	7658	92.99

Spread= 0.01 One sided book

Bid	100	93.03
Bid	349	93.02
Bid	857	93.01
Bid	5136	93.00
Bid	5900	92.99

*Best Ask*

*Best Ask*

*Best Bid*

*Best Bid*

Trade	300	93.03
Trade	100	93.03
Trade	12342	92.99672



# Short and Long Positions

On the trading floor, you will often hear “I’m long this stock” or “I am shorting this name.”

## Long

- Taking a long position
- Buying shares with the expectation they will increase in value
- Maximum loss: the amount of money you invested
- Maximum gain: unlimited

## Short

- Short selling/Taking a short position
- Selling shares that you have borrowed with a contract in place (locate) that you will buy them back later – hopefully at a cheaper price!
- Maximum loss: unlimited



# Basis Points and Ticks

You will frequently hear the words basis points and ticks while on a trading floor.

## Basis Points

Often referred to as BIPS

1 BIP is 1/100 of a % point

For example: an interest rate of 5% is 50 BIPs higher than a rate of 4.5%

100 BIPs is 1%

## Stock Ticks

A tick is the smallest change in price valid for that stock

e.g., 1 cent tick (for USD); 1 pence tick (for GBP)



# Listing on Multiple Venues

- Cross listing is the process of listing common shares on a different exchange than the primary exchange (original stock exchange).
- Firms may list on multiple exchanges to gain more of an overseas investment base. This also means the company can be traded across different hours of the day.
- As well as listing on multiple exchanges, electronic trading has given rise to the ATS.

## **ATS: Alternate Trading System**

- A venue to match buy and sell orders but not regulated as an exchange
- Also known as multilateral trading facilities (Europe), electronic communication networks (ECNS) and cross networks
- Most are registered and regulated as broker dealers.
- Some ATS are LIT venues – the orderbook is visible to the public
- Some ATS are Dark venues (or dark pools) – there is no transparency here



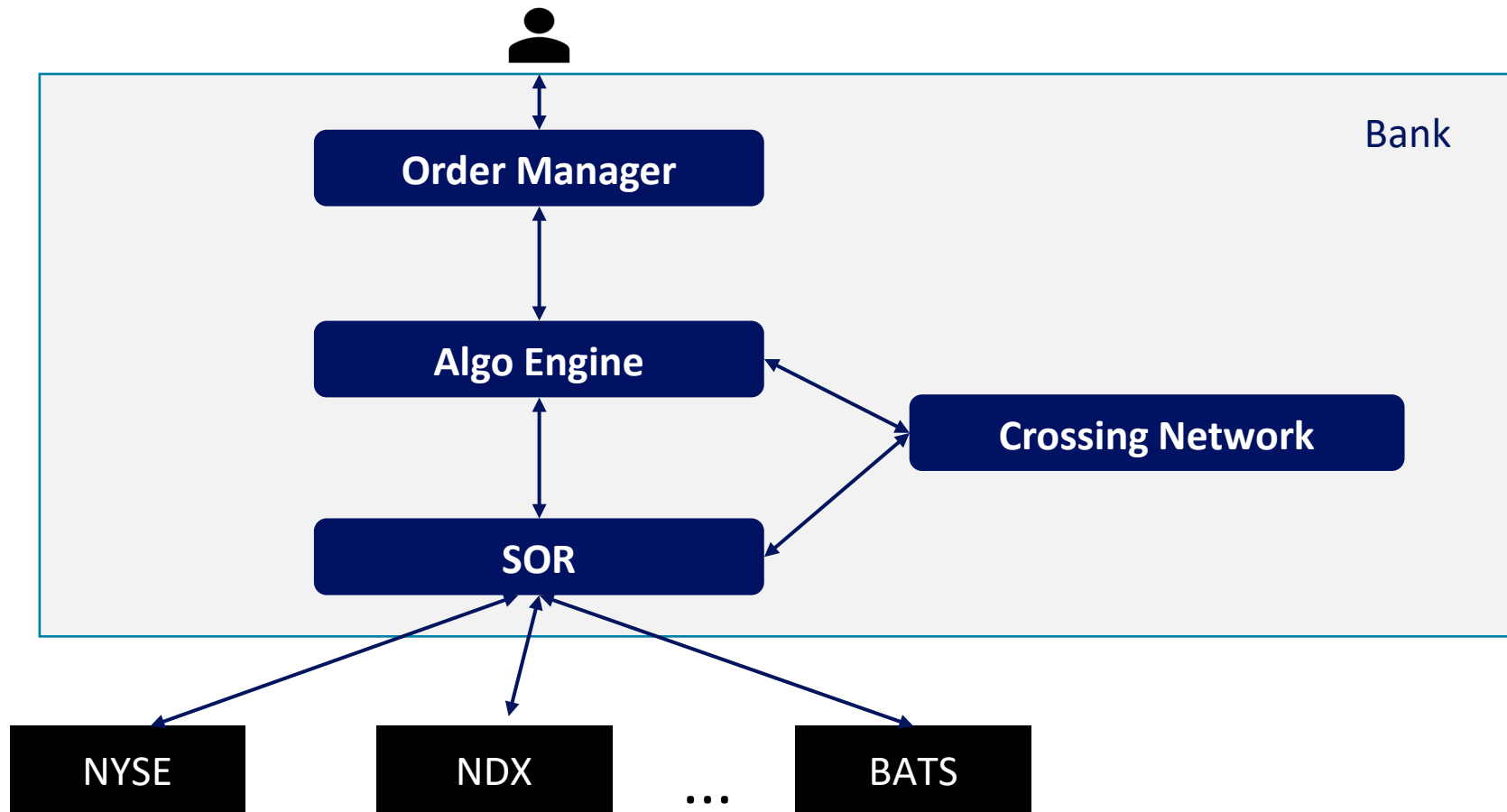
# Multilateral Trading Facilities

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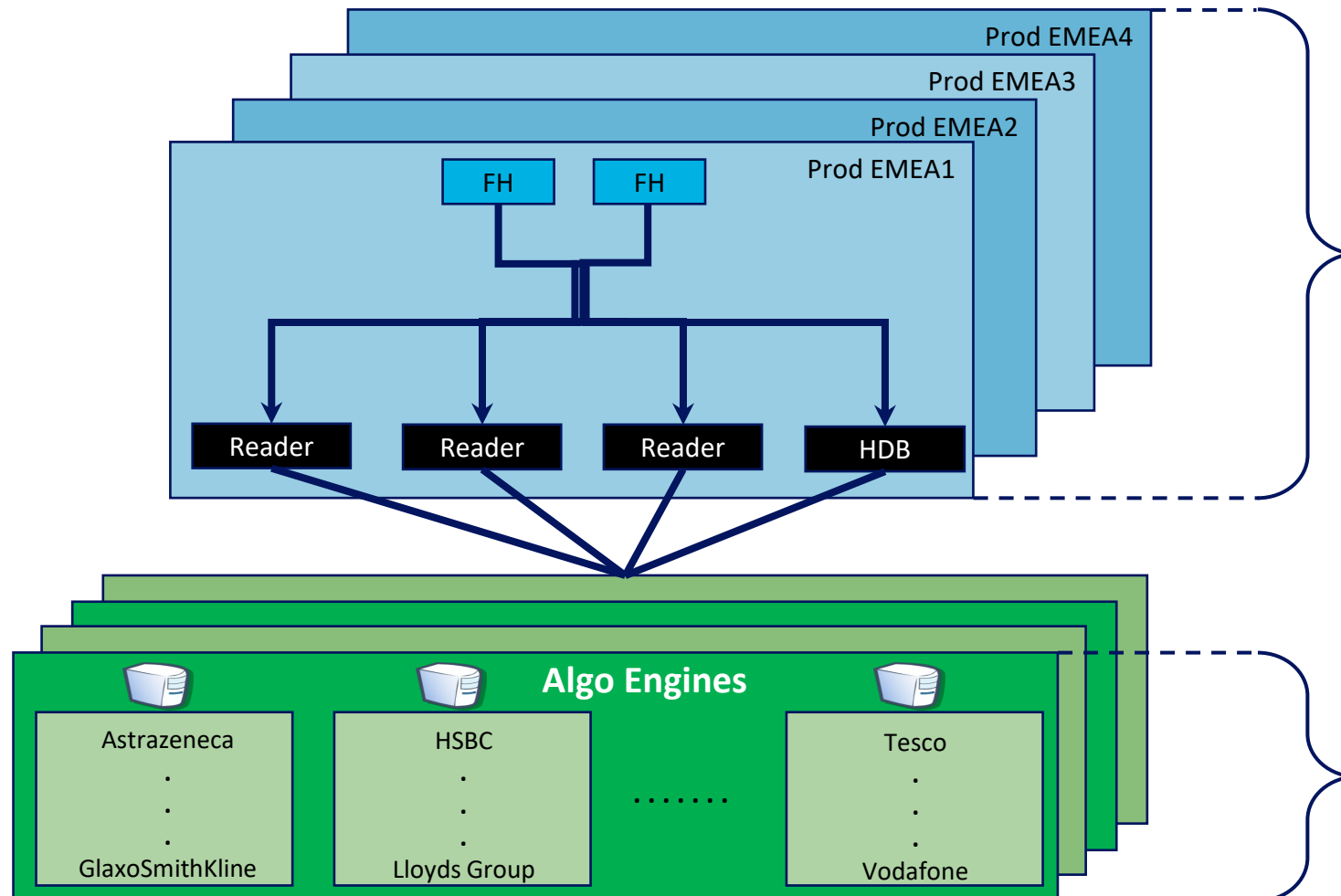
- MTFs – Multilateral Trading Facility is a term originating in Europe for a trading system that facilitates the exchange of financial instruments between multiple parties.
- This includes instruments that may not have an official market (and across a variety of securities)
- Usually controlled by approved market operators or large investment banks.
- MTFs are regulated by MIFID II and are similar to ATS in the US.



# Typical Electronic Trading Setups



# Trading System – Load Balancing



## Replication

Market data is replicated across multiple servers to improve availability and speed of data access.

## Sharding

Algo engines manage load by trading different groups of instruments.





# Algorithmic Trading

Algorithmic trading allows you to execute orders in a programmatic way around variables such as price, timing, and volume. Below are some example of common strategies.

## VWAP

**Volume Weighted Average Price** – use historical data to split an order to achieve average market price (  $(\text{number of shares bought} * \text{share price}) / \text{total shares bought}$  )

## TWAP

**Time Weighted Average Price** e.g. split this order up evenly over the next two hours

## POV

**Percentage of Volume** – take % of volume until done

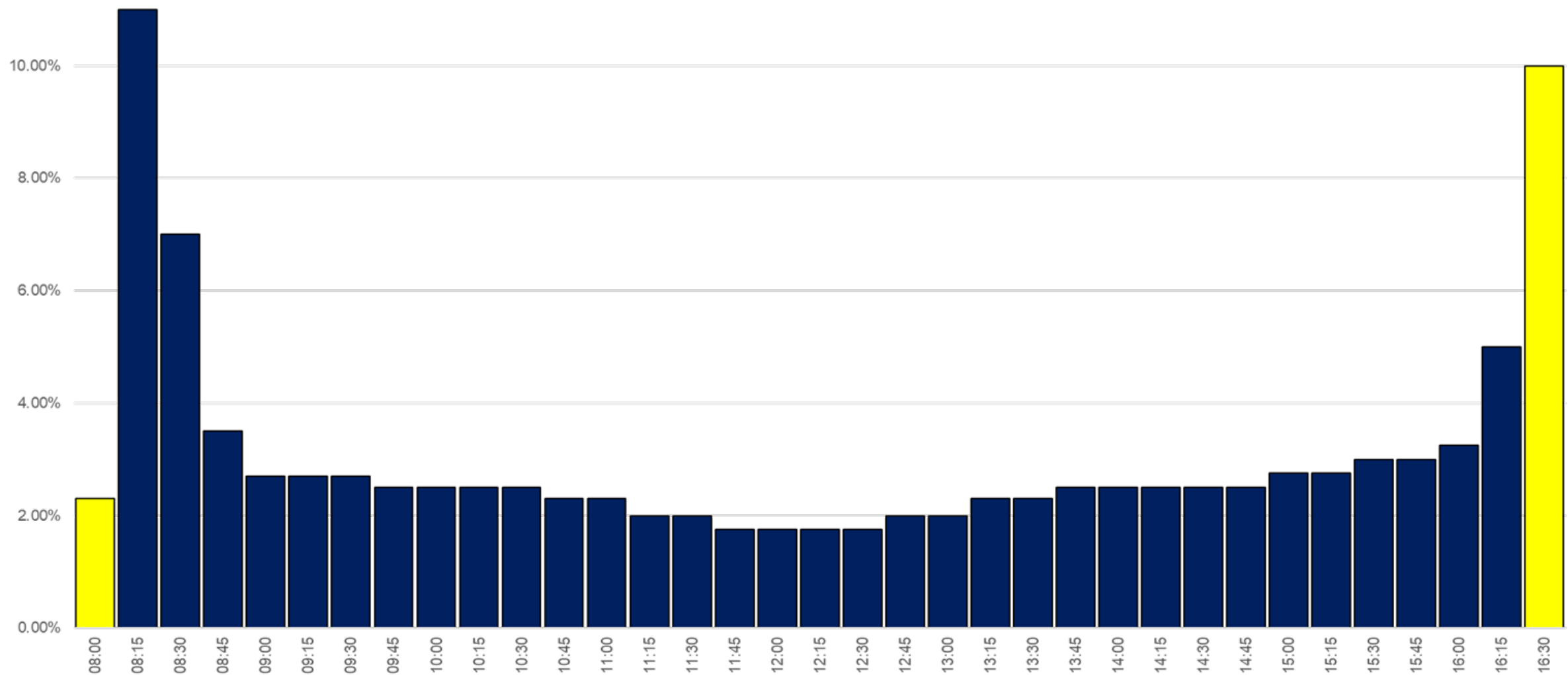
## IS

**Implementation Shortfall** – Trade more when the price is favorable, less when not

**Requirements:** Historical trading data as well as live market data to make decisions



# Example VWAP Curve





# Dark Pool

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A private exchange or forum for trading where the orderbook is not visible. Often also referred to as a crossing network. Most big trading companies have their own dark pool.

- It costs money to trade on an exchange: if you have two separate traders at Morgan Stanley, one selling Apple and one buying Apple, why send to the exchange and pay a fee?
- An internal crossing network or dark pool allows you to trade (cross) with no fees.
- Banks have access to other companies' dark pools.
- Dark pools came about to facilitate placing large orders without impacting the market price.



# Smart Order Routing

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Once an algo has decided it wants to trade a certain number of shares, the order will usually be sent to a smart order router (SOR) so that it can be sent to the exchange that has the best price for that stock at the time.

- Liquidity varies across multiple exchanges
- SOR will also consider dark pools – strategies will vary
- Aim to find the best price as quickly as possible
- Will have a consolidated orderbook feed via market data to know where to send the order



# HFT – High Frequency Trading

High frequency trading is an automated trading platform that allows for large numbers of orders to transact at extremely high speeds.

Uses Algorithms

High Speed

Low Latency

- Orders are usually sent as limit orders and cancelled immediately if they do not trade.
- Technology is constantly being analyzed to bring down the time it takes to make a trading decision and execute on the exchange (low latency trading).

## Co-location (Colos)

- Some exchanges allow HFT firms to locate their servers directly next to the exchange servers for a high fee.



# Market Making

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A lot of banks have a market-making desk.

- Market makers trade principally (i.e., use the bank's own accounts) to enter and adjust quotes to buy, sell, execute and clear orders on an exchange.
- Primary goal is to profit on the bid-ask spread
- Aims to keep the financial markets liquid
- Market makers commit to continuously quote prices for a set of securities.