

Equity Trading

mthree Alumni Training



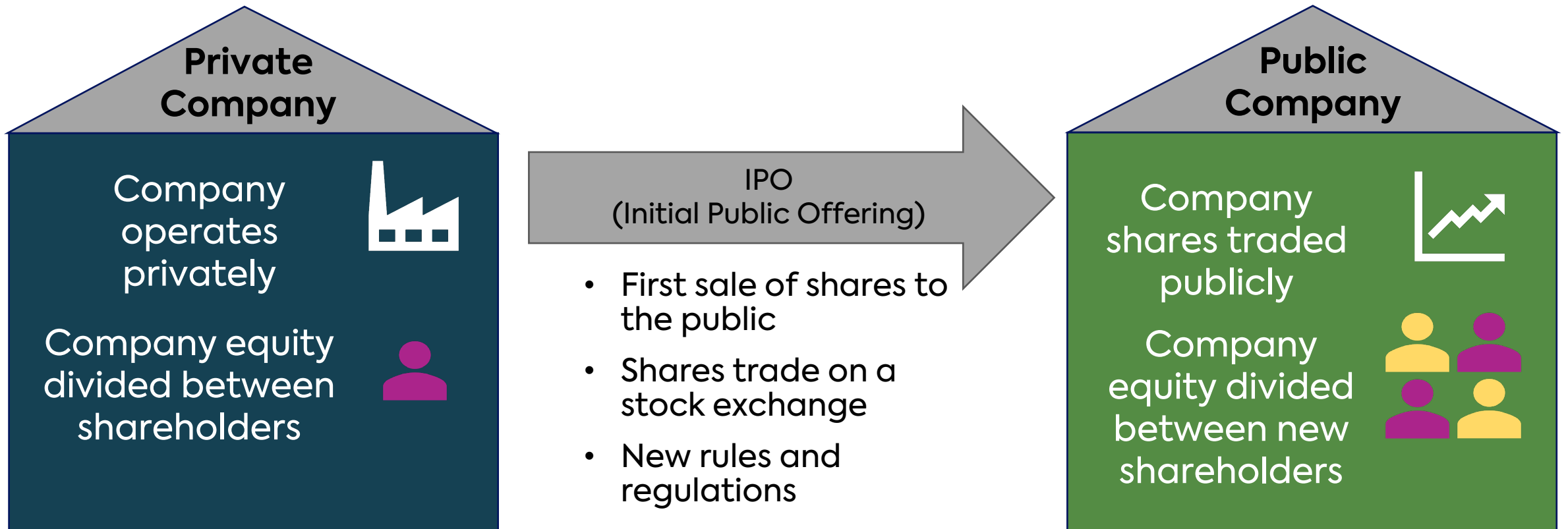
Objectives

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

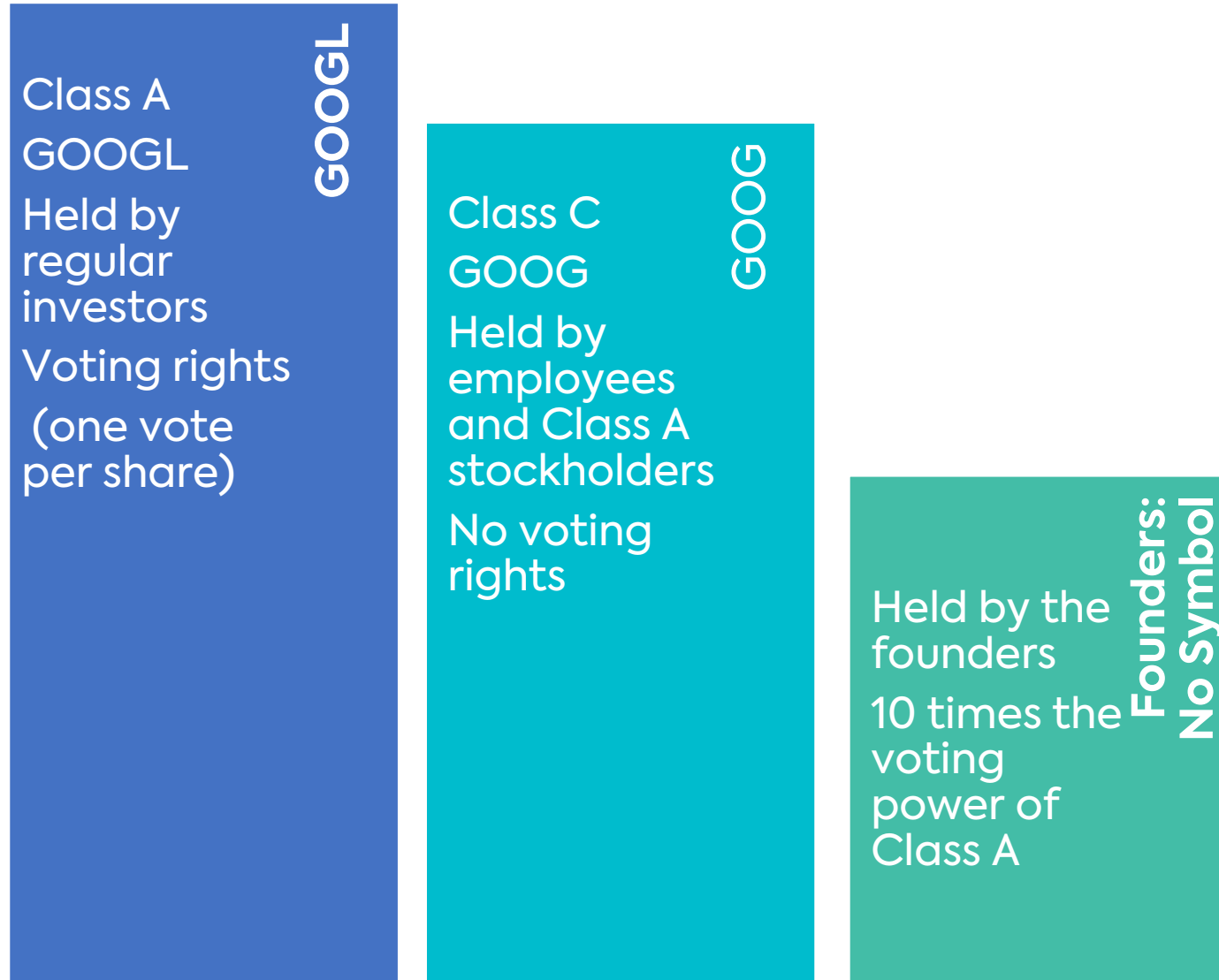
Redeemable Shares

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



1st March 2017
Day before the IPO

- Stock priced at \$17 a share
- Values Snap at \$24bn
- Controversially shares have no voting rights
- Snap has great revenue growth but not yet profitable

2nd March 2017
Day of the IPO

- Price soars to \$26.05
- Stock closes at \$24.48 – 44% up
- Values Snap at \$34.56bn

3rd March 2017
Day after the IPO

- FT: 'Snap IPO is the foolish leading the blind'
- Fortune: 'Here's how Snap's IPO just proved we're in a tech bubble'
- CityAm: 'Hold off on criticizing...it may be a Facebook, rather than a Twitter'

Exercise

What is the current share price of:

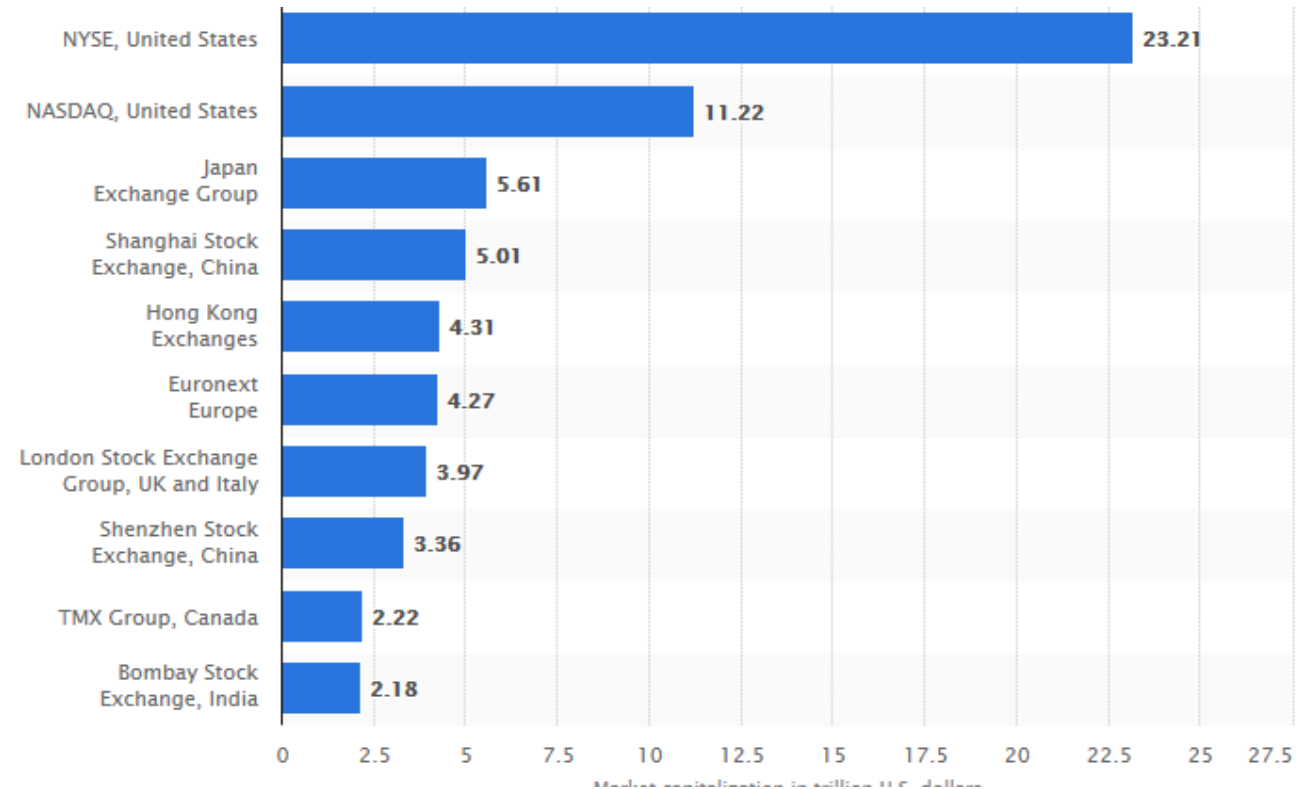
1. Snapchat
2. Facebook
3. Twitter

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?



Why would you invest in equity?

Regular Income

Capital Growth

Long Term
Investment

High Liquidity

Transparent
Marketplace

Ownership Voting
Rights

Market Participants



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

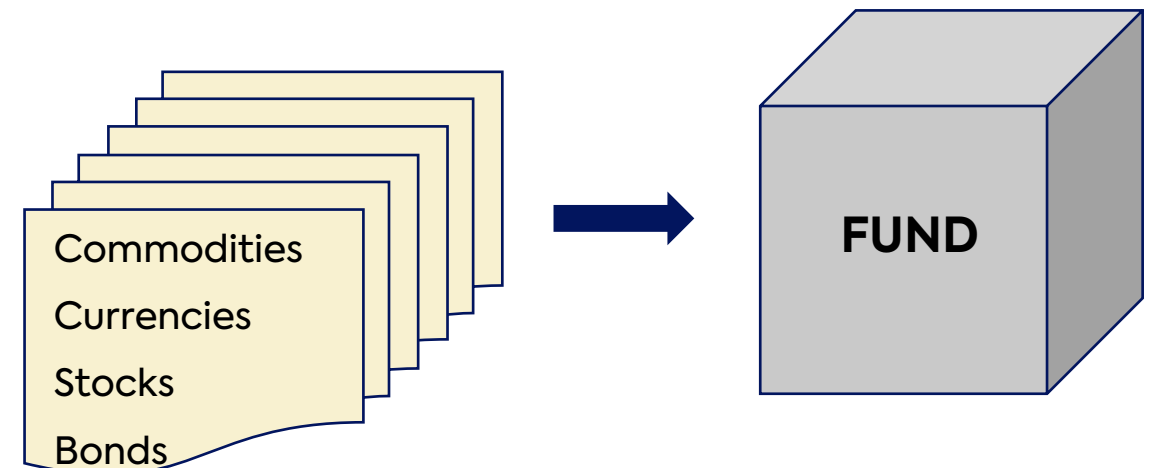
FTSE 100 Index

FTSE:FSI

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

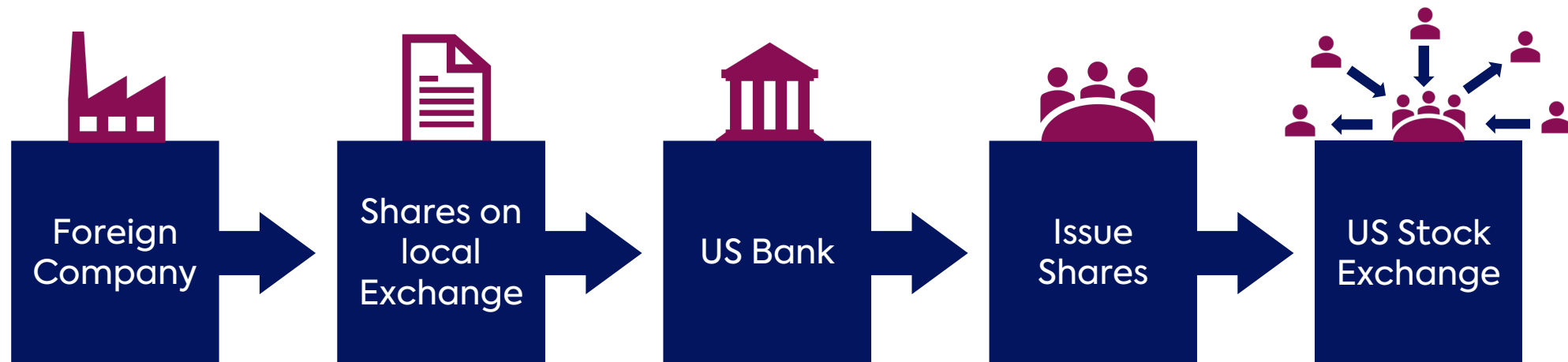
Example Indexes



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

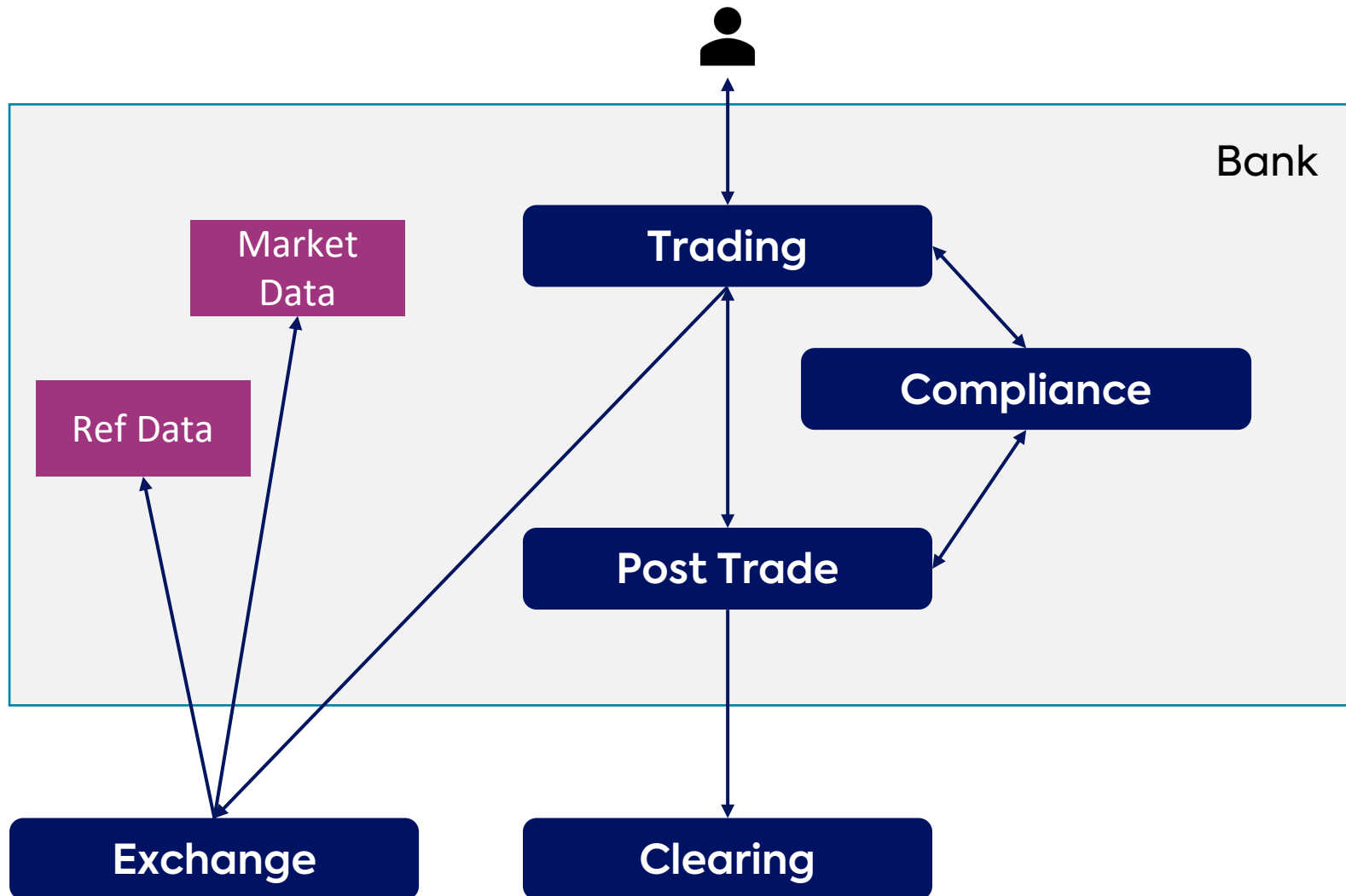


First put in place after Black Monday in 1987, circuit breakers are measures used to curb panic selling on US Stock exchanges.

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



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	576.36	576.74	100	NSDQ	10:58:01.369
10:58:00.225	NSDQ	8	576.26	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
10:56:34.266	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

<i>Cancel</i>				<u>Type</u>	<u>Size</u>	<u>Price</u>	
Ask	1150	93.05	➡	Ask	1150	93.05	
<i>New Order</i>				Ask	2205	93.04	<i>Best Ask</i>
Ask	100	93.03	➡	Ask	300	93.03	<i>Best Ask</i>
Ask	20000	92.99	➡	Ask	7658	92.99	
			<i>Spread=0.0 One sided</i>				
Bid	500	93.03	➡	Bid	¹ 100	93.03	<i>Best Bid</i>
				Bid	349	93.02	<i>Best Bid</i>
Bid	7	93.01	➡	Bid	857	93.01	
				Bid	5136	93.00	
				Bid	5900	92.99	
			➡	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

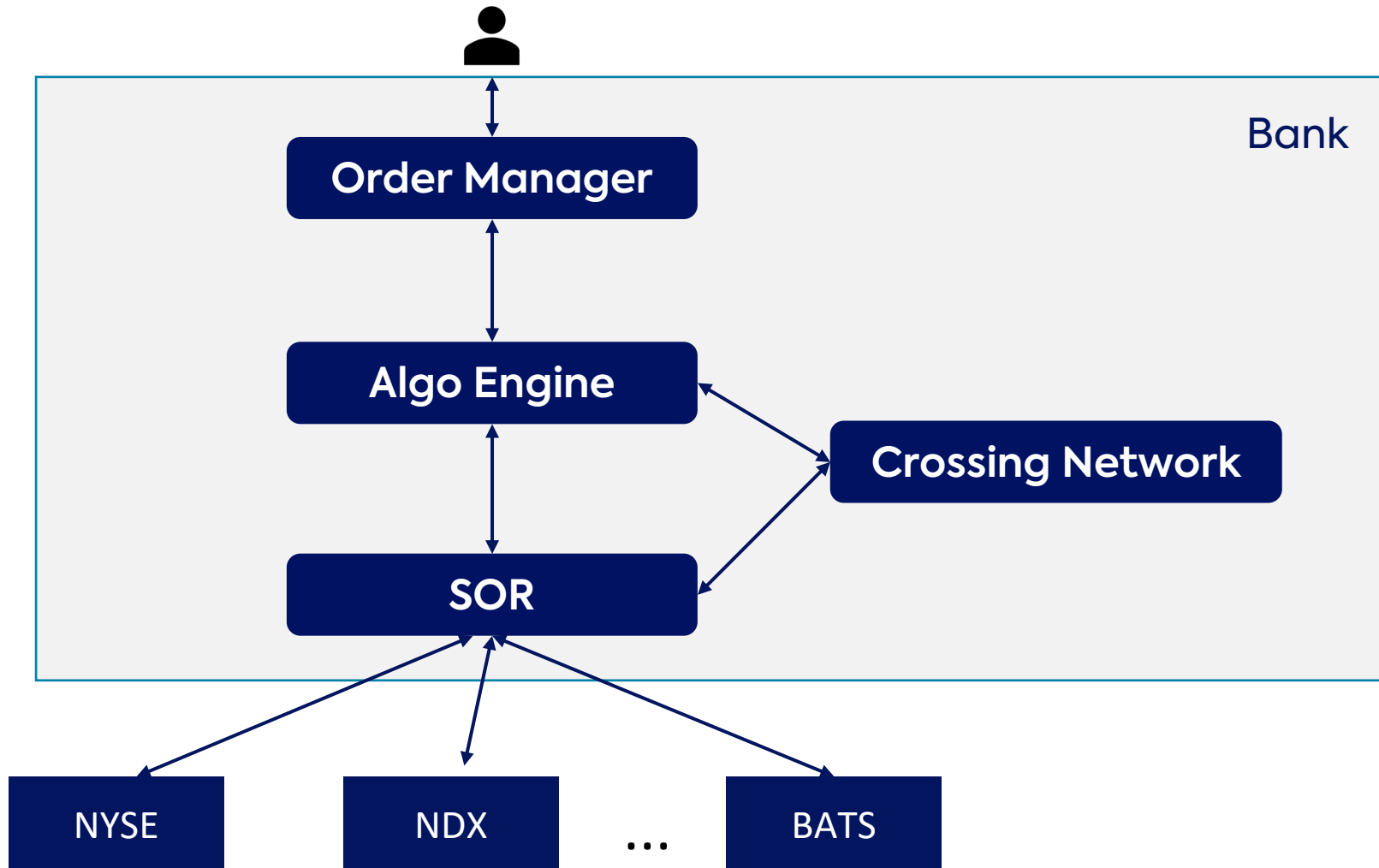
- A venue to match buy and sell orders but not regulated as an exchange
- Also known as multilateral trading facilities (Europe), electronic communication networks (ECNS) and cross networks
- Most are registered and regulated as broker dealers.
- Some ATS are LIT venues – the orderbook is visible to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

Multilateral Trading Facilities

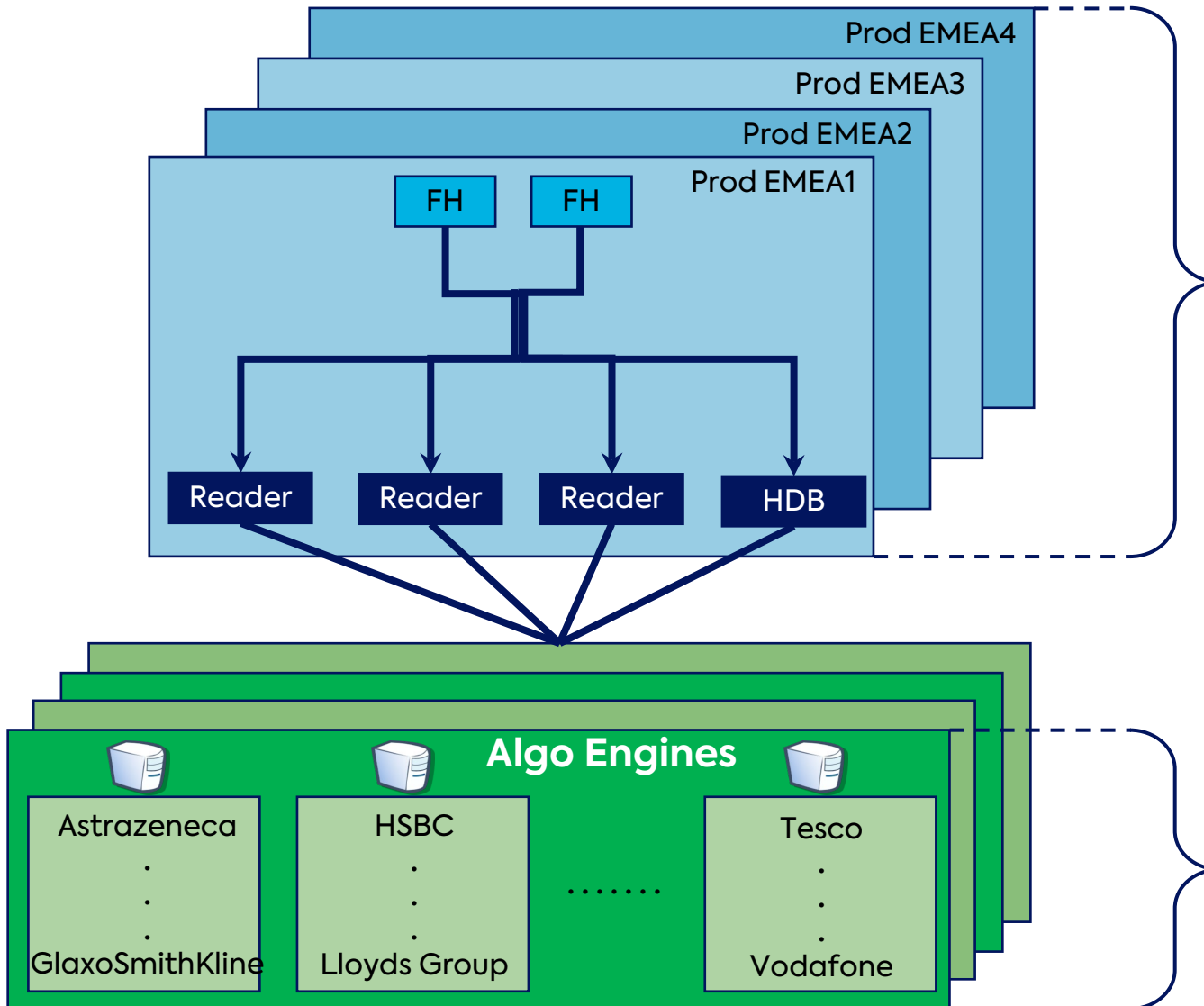


- MTFs – Multilateral Trading Facility is a term originating in Europe for a trading system that facilitates the exchange of financial instruments between multiple parties.
- This includes instruments that may not have an official market (and across a variety of securities)
- Usually controlled by approved 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

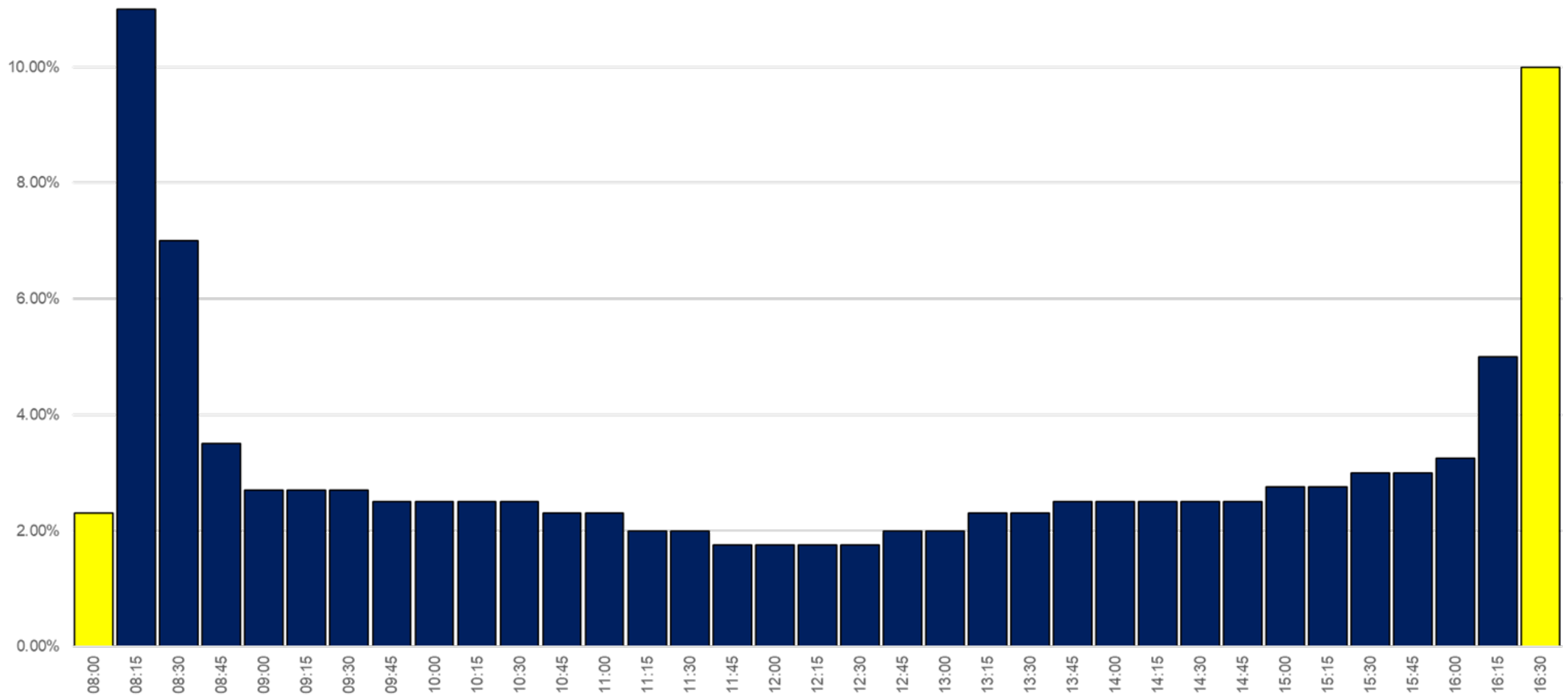
Percentage of Volume – take % of volume until done

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



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.

Once an algo has decided it wants to trade a certain amount 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.

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.