

What is Quant
Trading?

Quantitative Trading
involves trading in
Financial Markets
with the help of
Trading Strategies
developed using
Mathematical Models

Quantitative Trading

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Financial Markets
Trading Strategies
Mathematical Models

There are 3 major components
we need to understand here

Quantitative Trading

involves trading in
with the help of
developed using

Financial Markets
Trading Strategies
Mathematical Models

Let's go through each of
them one by one

Quantitative Trading

involves **trading in Financial Markets**

with the help of **Trading Strategies**

developed using **Mathematical Models**

**What is a Financial
Market?**

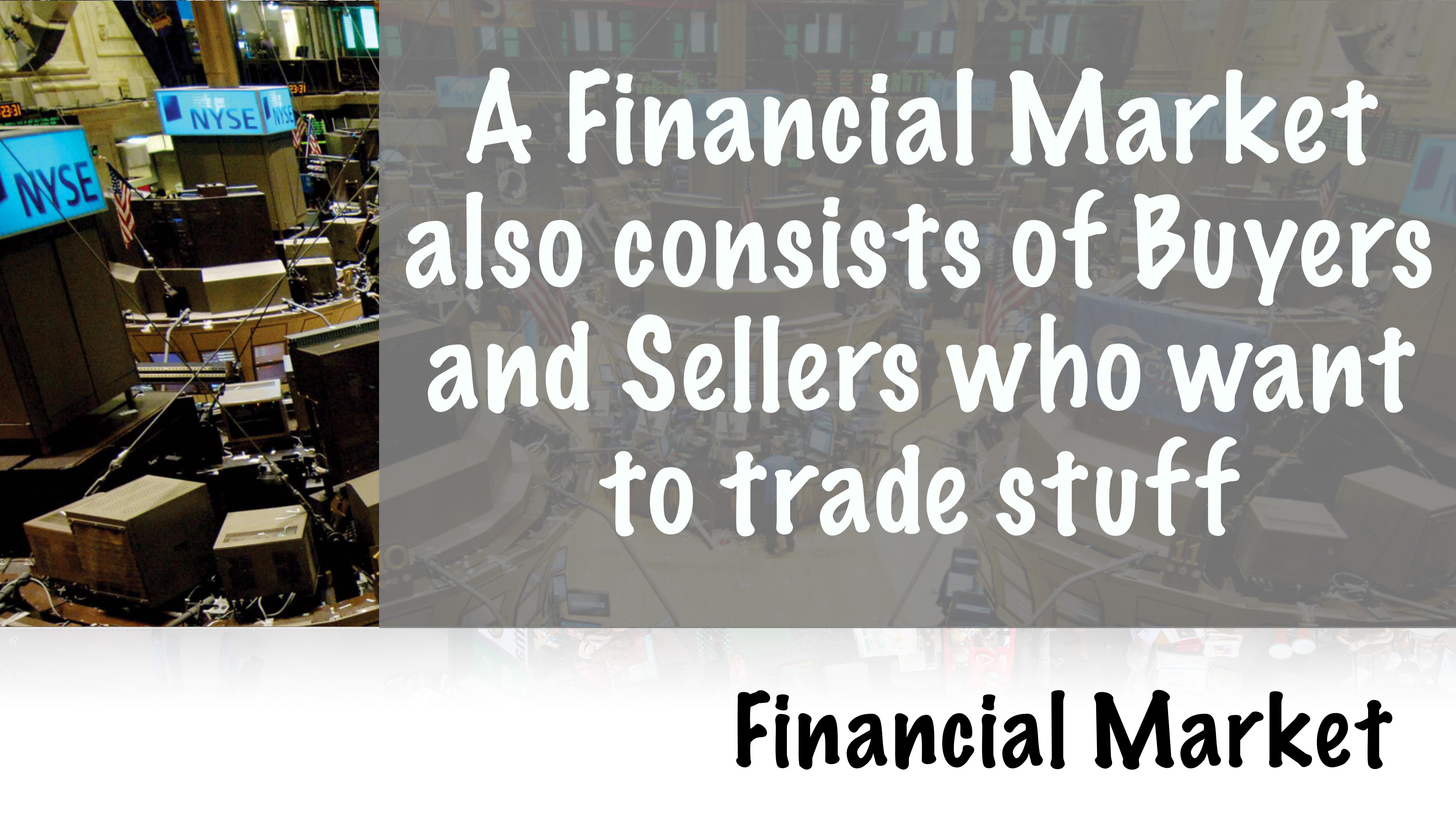
A Financial Market is
like any other market

Financial Market

A large, modern indoor market with a high ceiling featuring a complex steel truss structure and several pendant lights. The floor is filled with numerous small stalls and kiosks, mostly selling clothing. Many people are walking around, browsing the items. In the foreground, a black banner with white text reads "gbk".

A Market consists of
Buyers and Sellers who
want to trade stuff

Financial Market



A Financial Market
also consists of Buyers
and Sellers who want
to trade stuff

Financial Market

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

Financial Market

consists of **Buyers and Sellers**
who want to trade stuff

Who are
the
Buyers?

Who are
the
Sellers?

Financial Market

consists of Buyers and Sellers
who want **to trade stuff**

Who are
the
Buyers?

Who are
the
Sellers?

What are
they buying/
selling?

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

Who are
the
Buyers?

Who are
the
Sellers?

What are
they buying/
selling?

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

**Who are
the
Buyers?**

**Who are
the
Sellers?**

**What are
they buying/
selling?**

Financial Market

Who are the Buyers?

**Folks who have
money to invest**

Financial Market

Who are the Buyers?

Folks who have money to invest

Individuals

Companies

Mutual Funds

Hedge Funds

..are a few
examples

Financial Market

Who are the Buyers?

Folks who have money to invest

Individuals

Companies

Mutual Funds

Hedge Funds

Folks like you and me
who have some savings
we want to invest

Financial Market Who are the Buyers?

Folks who have money to invest

Individuals

Companies

Mutual Funds

Hedge Funds

Companies that have
some excess cash and
want to make more
money with it

Financial Market

Who are the Buyers?

Folks who have money to invest

Individuals

Companies

Mutual Funds

Hedge Funds

Pooled-together funds
from lots of investors
that are professionally
managed

Financial Market

Who are the Buyers?

Folks who have
money to invest

Individuals
Companies
Mutual Funds
Hedge Funds

All of these folks want
an opportunity to
increase their capital

Financial Market

Who are the Buyers?

Folks who have
money to invest

Individuals
Companies
Mutual Funds
Hedge Funds

They are ready to lend
the capital to someone
who will **return it later**
with some profit

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

**Who are
the
Buyers?**

**Who are
the
Sellers?**

**What are
they buying/
selling?**

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

Who are
the
Buyers?

Who are
the
Sellers?

What are
they buying/
selling?

Financial Market

Who are the Sellers?

Folks who want to
raise money

Financial Market

Who are the Sellers?

Folks who want to raise money

Companies

Governments

..are a few
examples

Financial Market

Who are the Sellers?

Folks who want to raise money

Companies
Governments

Companies need to
raise money to
expand their business

Financial Market Who are the Sellers?

Folks who want to raise money

Companies
Governments

**Governments raise
money, often when
their spends exceed tax
revenues**

Financial Market

Who are the Sellers?

Folks who want to raise money

Companies

Governments

In addition to these
folks, all of our buyers
could be sellers too..

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

Who are
the
Buyers?

Who are
the
Sellers?

What are
they buying/
selling?

Financial Market

consists of **Buyers** and **Sellers**
who want to trade stuff

Who are
the
Buyers?

Who are
the
Sellers?

What are
they buying/
selling?

Financial Market

What are they buying/selling?

All of these are
Financial Assets
which can be traded
Such assets are
also known as
Securities

Stocks
Bonds
Derivatives

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Stocks/Shares

represent a unit of
ownership in a company

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Companies sell shares
to other investors in
order to raise money

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Owners of the
shares are called
shareholders

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Shareholders money when
the company pays out
dividends, or when its
share prices rise

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Initial Public Offering (IPO)

When a company
first sells shares on
a financial market

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Initial Public Offering (IPO)

In an IPO, the shares
are sold by the company
to buyers in the market

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Initial Public Offering (IPO)

After that, the shares
can be bought and sold by
anybody in the market

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

When companies/
governments need to
raise debt, they issue
bonds

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Bonds represent **borrowings**
- similar to loans. The issuer
(debtor) is obliged to repay
the buyer (creditor)

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Bonds have

A rate of interest

A maturity date
when the principal will be paid
back with interest

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Derivatives are contracts
whose value depends on the
value of some other entity

A stock, bond, currency,
commodity etc

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

Derivatives are
very special kind
of financial asset

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

They allow people to
bet on the value of
some underlying asset
without actually
owning it

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

A Financial Market is
usually distinguished by
the types of securities
traded on that market

Financial Market

What are they buying/selling?

Stocks

Bonds

Derivatives

A Financial Market is
usually distinguished by
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traded on that market

Financial Market

What are they buying/selling?

Stocks
Bonds
Derivatives

How is the price of
these securities
determined?

Financial Market

Price of Securities

Like any other market, a financial market is subject to the forces of



Financial Market

Price of Securities

Supply

Demand

Let's consider a
company's stock

Price of a stock

Supply

Folks who want
to sell the stock



Demand

Folks who want
to buy the stock



Price of a stock

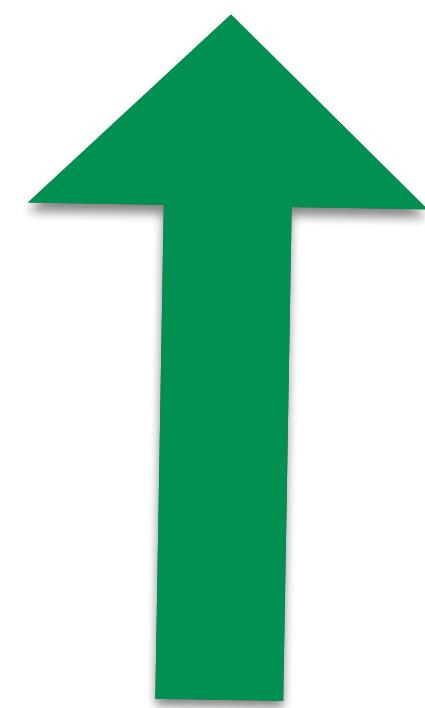
When the company does well, more people want to own it's stock

Supply



Demand





Price of a stock

Demand

As demand increases,
the price of the stock
goes up

Supply



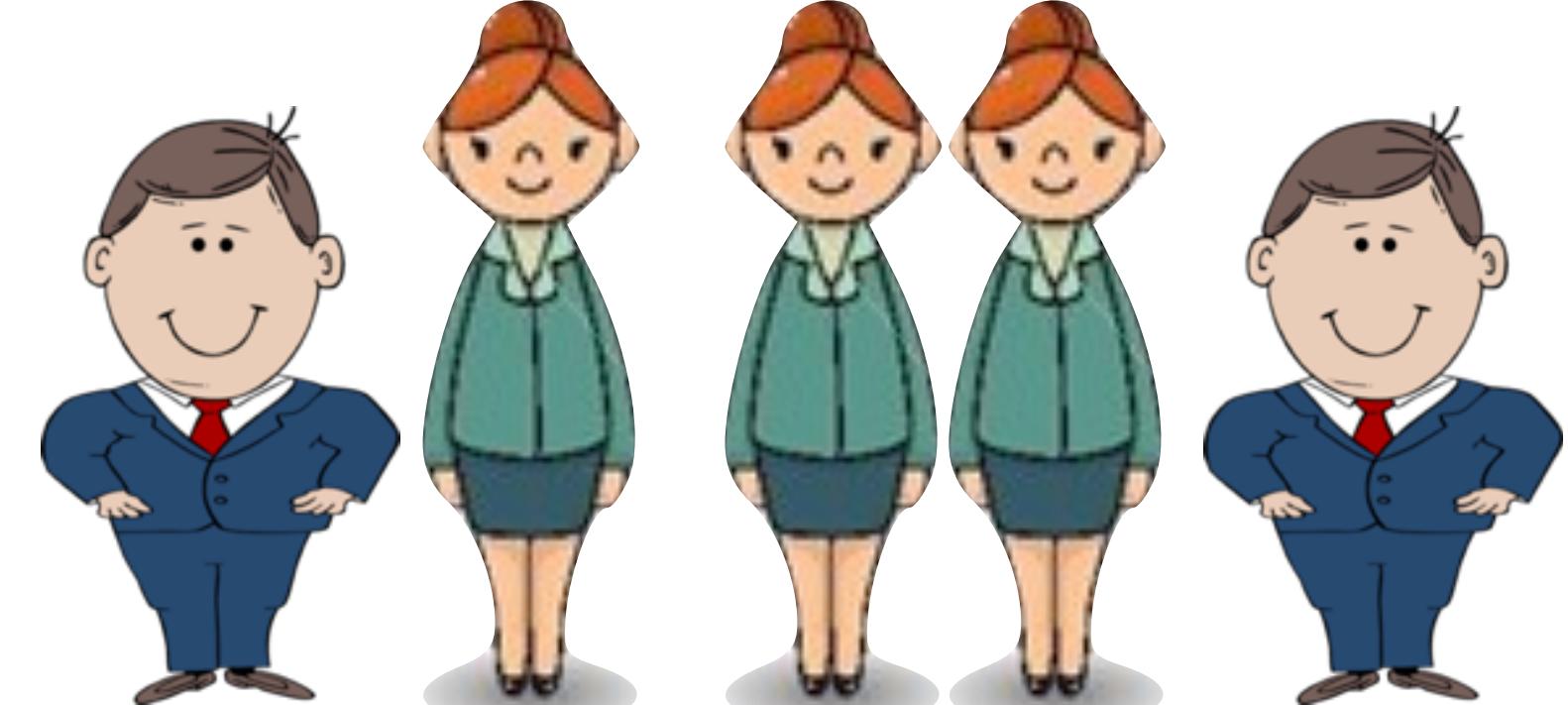
Price of a stock

When the company does badly,
people want to cut their losses
and sell off the company's stock

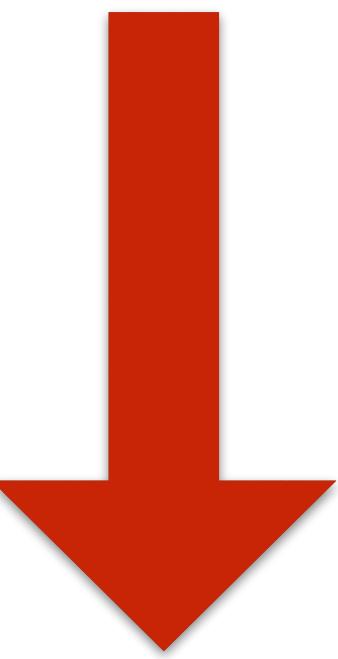
Supply



Demand



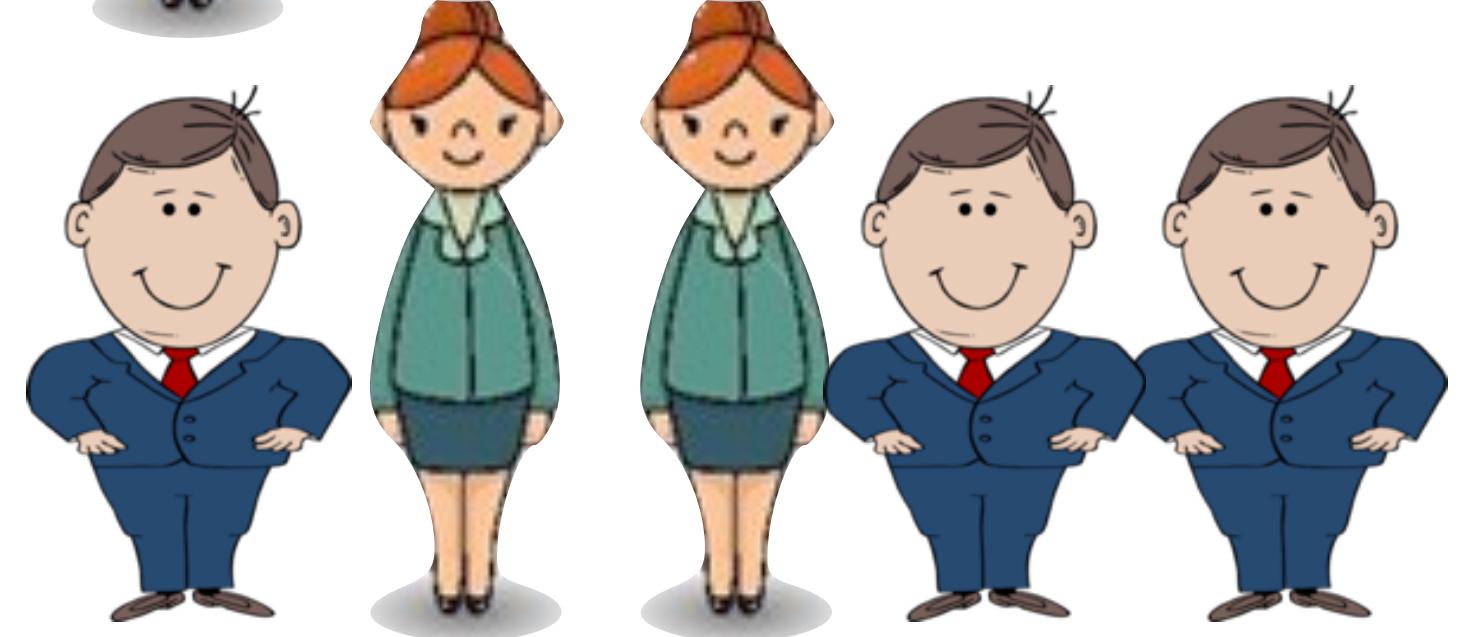
Price of a stock



Supply



As supply increases,
the price of the stock
goes down



Demand



Price of a stock

The price of any security is
fundamentally determined
by these 2 forces

Supply



Demand



Price of a stock

Supply

Demand

There are many, many factors
that impact Supply and Demand
and in turn the Price of a Stock

The performance
of a company

Price of a stock

Supply

Demand

There are many, many factors
that impact Supply and Demand
and in turn the Price of a Stock

Price of a stock

There are many, many factors that impact the price of a stock

The performance of its suppliers and consumers

Price of a stock

There are many, many factors that impact the price of a stock

Macroeconomic factors

Unemployment,
Inflation,
GDP

Price of a stock

There are many, many factors that impact the price of a stock

Regulatory factors

What kind of regulations and policies are being written for an industry?

**What is a stock
market index?**

What is a stock market index?

A stock market index
measures the performance
of a stock market as a whole

What is a stock market index?

The index value is normally
the weighted average of a
selected set of stocks

These stocks are thought to be
representative, in some sense, of the market

What is a stock market index?

S&P 500

Standard and Poor's

is one of the world's oldest
stock market indices

What is a stock market index?

S&P 500

Standard and Poor's

It consists of stocks of 500
large public companies that
trade on NYSE and NASDAQ

What is a stock market index?

NIFTY

is an index of 50 stocks that
trade on the National Stock
Exchange of India

What is a stock market index?

Stock market indices may also represent one sector of an industry

BANKNIFTY

CNXIT

What is a stock market index?

You cannot directly
invest in an index, like
you would stocks

What is a stock market index?

Traders can bet on an
index using **Derivatives**,
or **Index ETFs**

More on this later

What is trading?

What is trading?

Trading is the process of
buying and selling securities
on a financial market

What is trading?

Let's say you bought a security at a price P_{buy}

What is trading?

Bought at P_{buy}

You sell the security at a
price P_{sell}

What is trading?

Bought at P_{buy}

Sell at P_{sell}

If $P_{sell} > P_{buy}$

You've made a profit

What is trading?

Bought at P_{buy}

Sell at P_{sell}

If $P_{buy} > P_{sell}$

You've made a loss

What is trading?

As a trader, you might
buy and sell many
securities over a period
of time

What is trading?

At any given point in time, a
trader needs to have

A Point of View
about a security

What is trading?

Point of View

If the trader believes the security's price will

Go up

Bullish

Go Down

Bearish

What is trading?

Bullish

A bullish investor
is optimistic
about the
performance of
the security

Bearish

A bearish investor
is pessimistic
about the
performance of
the security

What is trading?

Bullish

In a bull market,
prices rise and
investors are
optimistic that this
trend will continue



BULL MARKET: PRICES RISE AND
INVESTORS CAN'T
KEEP UP.

What is trading?



BEAR MARKET: PRICES FALL AND INVESTORS CAN'T GET OUT OF THE WAY.

Bearish

In a bear market, investors don't have confidence in the share prices and the prices continue to fall

What is trading?

Based on the point of view, a trader might want to **execute a trade**

What is trading?

Based on the point of view, a trader
might want to **execute a trade**

If the trader is
bullish about a
security

He/she would
go long

What is trading?

If bullish

Go long

To go long means
to buy a security

What is trading?

If bullish

Go long

When you go long, you are making a bet that the price of the security will go up

What is trading?

If bullish

Go long

If an investor owns a security,
they are said to hold

a long position
in that security

What is trading?

A long position

If you have a long position
in a security, you make
money as long as the
security's price increases

What is trading?

Based on the point of view, a trader
might want to **execute a trade**

If the trader is **bearish** about a security He/she would **go short**

What is trading?

If bearish

Go short

When you go short, you are
making a bet that the price
of the security will go down

What is trading?

If bearish

Go short

What are the
mechanics of going
short on a security?

What is trading?

If bearish

Go short

To go short on a stock,
trader would borrow
the shares and sell them

What is trading?

If bearish

Go short

The trader would then
buy back the shares and
return them to the lender

What is trading?

If bearish

Go short

During the time when trader has borrowed the shares , he/she holds

a short position
in that security

What is trading?

A short position

If you have a short position in a security, you make money as long as the security's price decreases

What is trading?

A short position

Let's take an example

What is trading? A short position

The current price
of Apple stock

\$110

April 10

Apple is set to
announce a new
iPhone on April 13

What is trading? A short position

Apple stock

\$110

April 10

You are pessimistic about
the new iPhone and
believe that share prices
will fall after the launch
event

What is trading? A short position

Apple stock

\$110

April 10

You borrow 100
shares of Apple stock
today and sell them

What is trading?

A short position

| | |
|-----------------|----------|
| | April 10 |
| Apple stock | \$110 |
| Your cash | \$11,000 |
| Borrowed Shares | 100 |

You plan to return the shares by buying them back on April 13 after the launch

What is trading?

A short position

| | April 10 |
|-----------------|----------|
| Apple stock | \$110 |
| Your cash | \$11,000 |
| Borrowed Shares | 100 |

Between April 10-13
you are holding a
short position on the
security

What is trading?

A short position

| | |
|-----------------|----------|
| | April 10 |
| Apple stock | \$110 |
| Your cash | \$11,000 |
| Borrowed Shares | 100 |

Case 1:
Price decreases
on April 13

What is trading?

A short position

| | April 10 | April 13 |
|-----------------|----------|----------|
| Apple stock | §110 | §108 |
| Your cash | §11,000 | §200 |
| Borrowed Shares | 100 | 0 |

You spend
§10,800 to buy
back the shares

You spend less than
you got by originally
selling the shares

What is trading?

A short position

| | April 10 | April 13 |
|-------------|----------|----------|
| Apple stock | ">\$110 | ">\$108 |

Since the stock price fell,

You made a profit of \$200

What is trading?

A short position

| | |
|-----------------|----------|
| | April 10 |
| Apple stock | \$110 |
| Your cash | \$11,000 |
| Borrowed Shares | 100 |

Case 2:
Price increases
on April 13

What is trading?

A short position

| | April 10 | April 13 |
|-----------------|----------|----------|
| Apple stock | ₺ 110 | ₺ 113 |
| Your cash | ₺ 11,000 | ₺ - 300 |
| Borrowed Shares | 100 | 0 |

You spend
₺ 11,300 to buy
back the shares

You spend more than
you got by originally
selling the shares

What is trading?

A short position

| | April 10 | April 13 |
|-------------|----------|----------|
| Apple stock | ">\$110 | ">\$113 |

Since the stock price rose,

You made a loss of \$ 300

What is trading?

A short position

If you have a short
position in a security, you
make money as long as the
security's price decreases

What is trading?

A short position

It may not always be
possible for a trader to go
short ie. borrow a stock

What is trading?

A short position

Short selling is
often done through
futures contracts

What is trading?

A short position

Futures contracts
are Derivatives