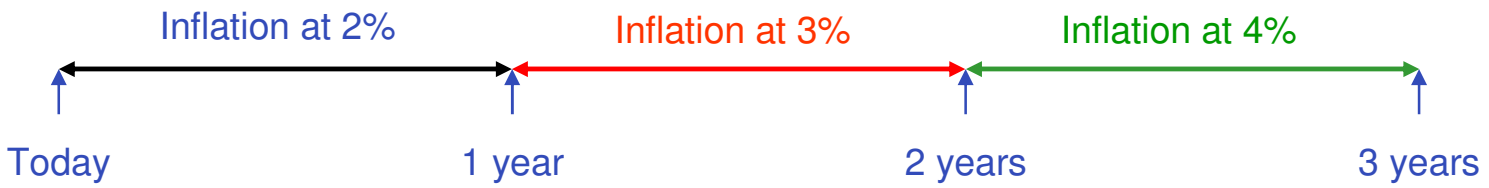
Coverage

- Interest Rates
- Time Value of Money
- Money Market Securities
- Interest Rate Swaps
- Currency Markets
- Equities
- Bonds
- Commodities
- Futures and Futures Pricing
- Options and Option Pricing

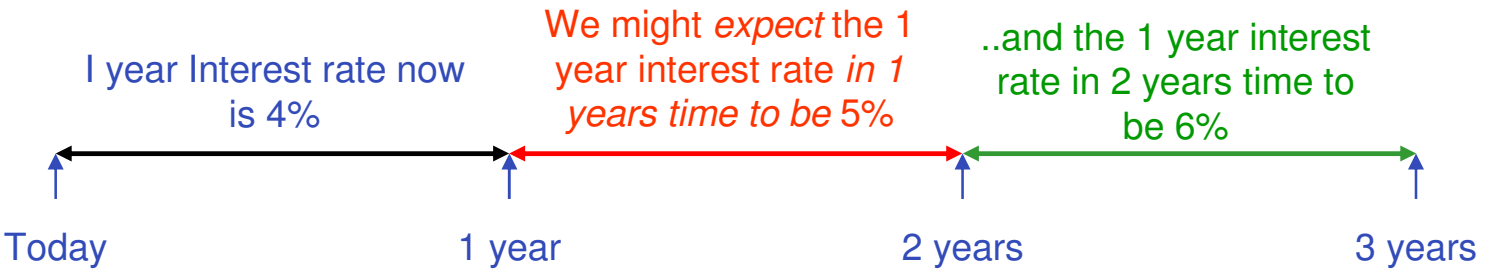
Interest Rates

The market has expectations about future inflation which, in turn, lead to expectations about future interest rates. This principle is known as expectations theory.

- Market expectations about inflation…..

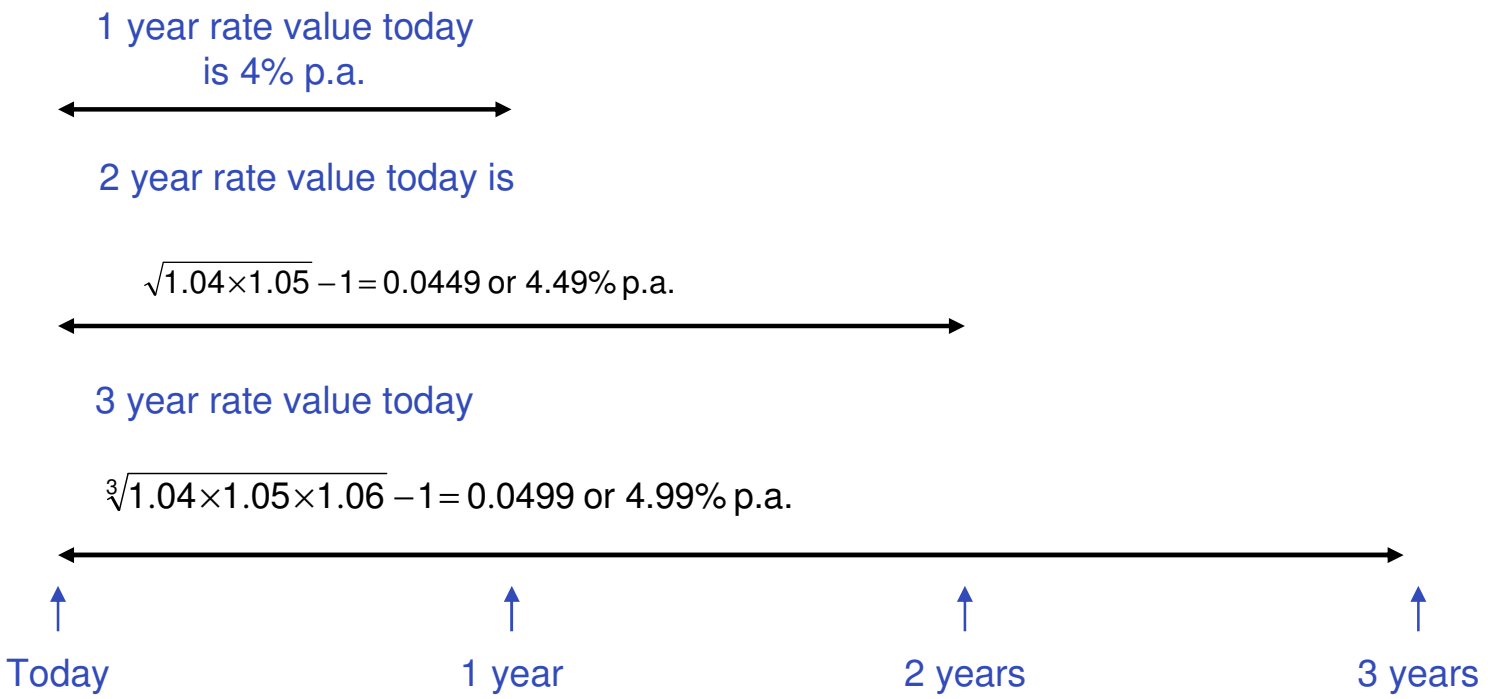


- …give us interest rates for different future periods – these are called forward rates:



Zero Interest Rates

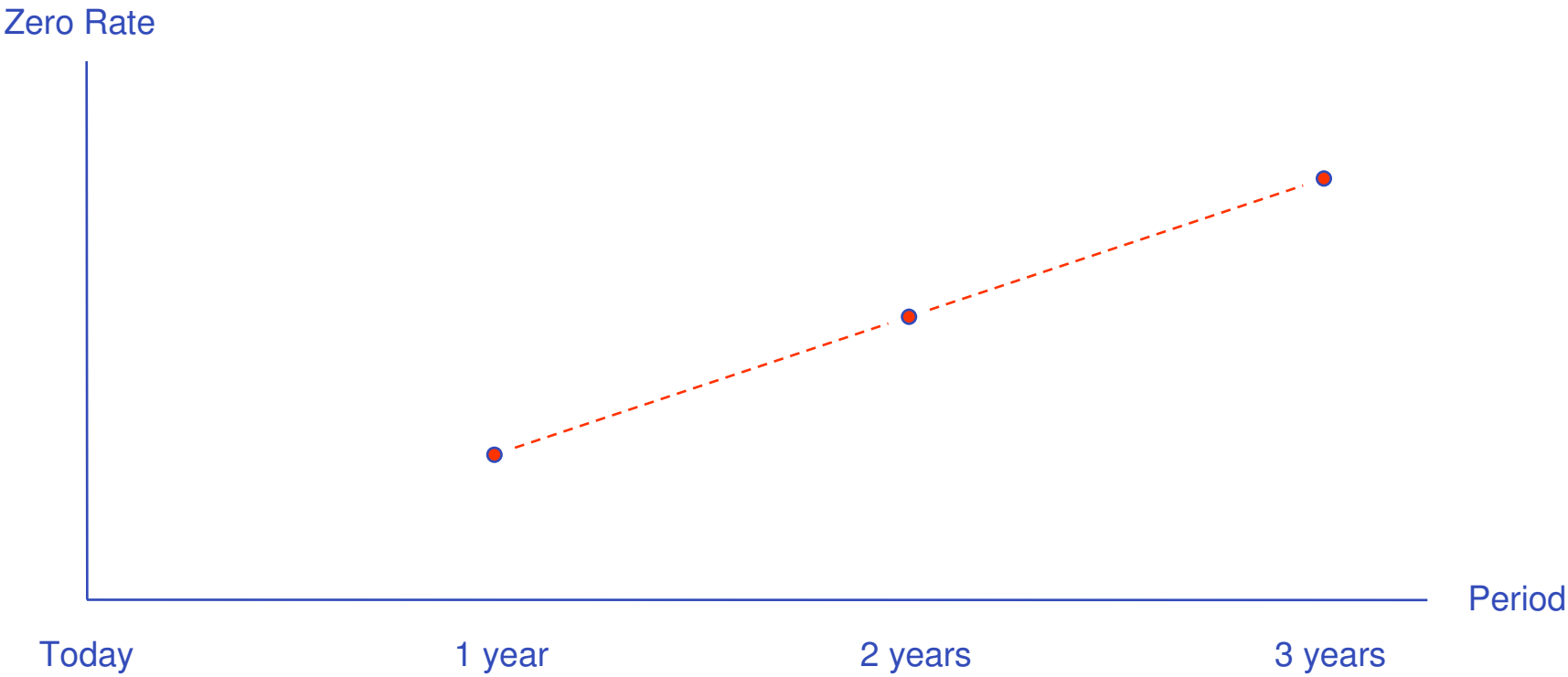
From these forward rates we can determine what interest rates for years 2 and 3 would be:



The Zero Curve

These regular annual interest rates are known as zero coupon rates or spot rates.

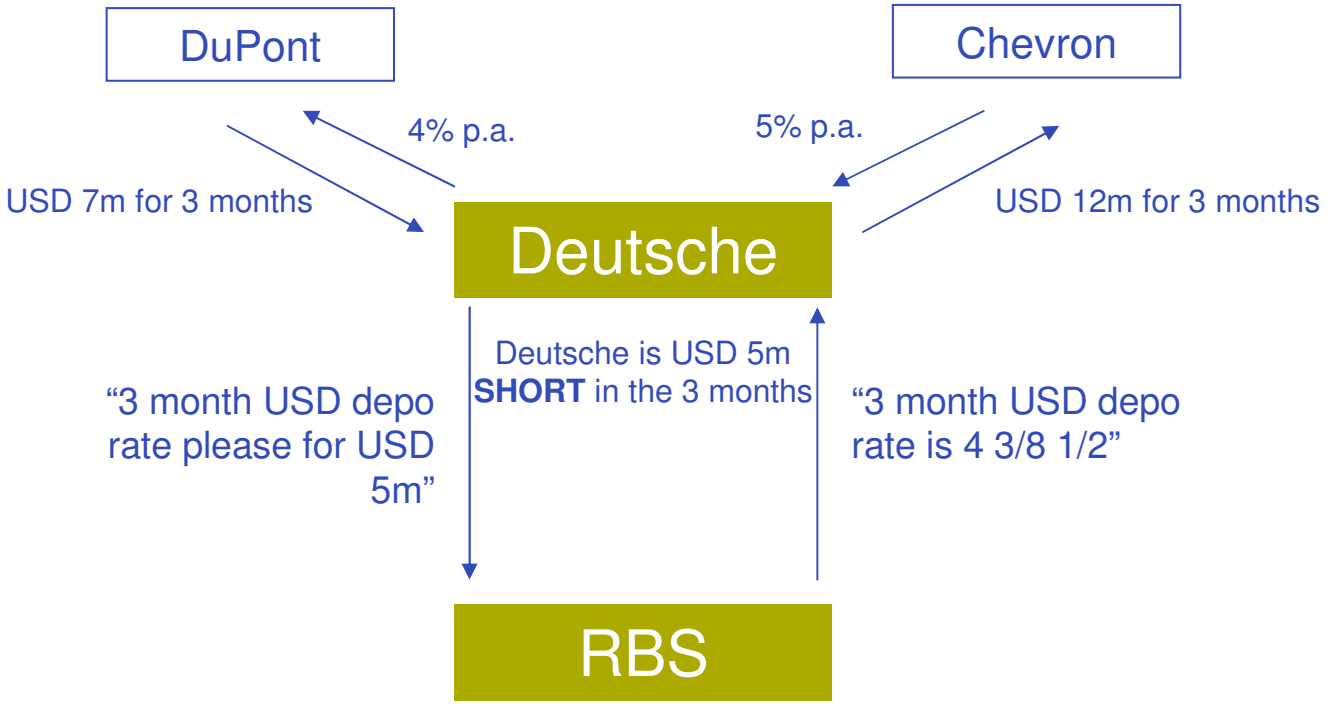
If we plot them on a graph we have a **zero, or spot, curve**:



Money Markets: Term Deposits and Loans

Corporate Short Term Borrowing and Lending

Corporations use investment banks to fund / lay off short term deficits and surpluses. The investment banks that make up the money markets warehouse the risk and offset their mis-matched positions with each other:



LIBOR EURIBOR Fixing

Inter-bank money market rates change throughout the day. A sample is taken each business day by the British Banking Association (BBA) of the various inter-bank offered rates at 11.00am. This is referred to as the BBA 11.00am Libor Fixing.

Calculation of BBA 11.00am LIBOR:

- British Banking Association
- 16 member banks
- 11.00am each day submit their inter-bank offer rates for various periods
- BBA removes top 4 and bottom 4 values for each rate and takes an average of the middle eight

There is also a European fixing of the Euro's offered rates in Europe. This is known as EURIBOR. The calculation of EURIBOR is as follows:

- Euro Inter-bank Offered Rate: rate at which Euro inter-bank term deposits within the Euro zone are offered by one Prime Bank.
- It is computed as an average of daily quotes provided for thirteen maturities by a panel of 57 of the most active Banks in the Euro zone.
- Fixed at 11:00am (CET) The top and bottom 15% are eliminated and an average taken of the remaining quotes

Other Reference Rates

SONIA

- Sonia is the weighted average rate to four decimal places of all unsecured sterling overnight cash transactions brokered in London by WMBA member firms between midnight and 4.15pm with all counterparties in a minimum deal size of £25 million

EONIA

- Eonia is computed as a weighted average of all overnight unsecured lending transactions in the inter-bank market, initiated within the euro area by the Panel Banks. It is reported on an act/360 day count convention and is displayed to two decimal places.

The Time Value of Money

Simple Versus Compounded Interest

Example: $1,000 is deposited for 3 years at 6% p.a. Calculate the final amount after the three years (TERMINAL VALUE)

- SIMPLE (Take interest out):
  - 1,000 x 0.06 = 60
  - 60 x 3 = 180
  - 1,000 + 180 = 1,180

- COMPOUND (Leave interest in):
  - 1,000 x 1.06 = 1,060
  - 1,060 x 1.06 = 1,123.60
  - 1,123.60 x 1.06 = 1,191.016

Compounding Formula

Officially we would write the compounding formula as follows:

- $TV = PV\ (1+r)^n$

Where TV is the terminal value of an amount PV invested today for n periods at an interest rate of r per period.

Example: Calculate the terminal value of $20,000 invested for 14 years at 5.16% p.a.

$$\$20{,}000 \times 1.0516^{14} = \$40{,}451.82$$

Non-annual Compounding

In the formula, n is the number of periods and r is the periodic rate. The relationship between n and r must always be kept constant. Also, interest rates are generally quoted as nominal annual rates. This means we divide the annual rate by the frequency of the payments:

- $$\mathrm{FV} = \mathrm{PV} \times \left(1 + \frac{r}{f}\right)^{n \times f}$$

Where TV is the terminal value of an amount PV invested today for n periods at an interest rate of r per period paid at a frequency of f times per period.

If we increase the frequency with which the interest is paid more interest is earned. Notice how, with increasing frequency, the *extra* interest earned diminishes:

Example: Calculate the terminal value of $100 for 1 year at 5% p.a

- Paid semi-annually $100\left(1+\frac{0.05}{2}\right)^{2}=105.0625$
- Paid monthly $100\left(1+\frac{0.05}{12}\right)^{12}=105.1162$
- Paid daily $100\left(1+\frac{0.05}{365}\right)^{365}=105.1267$
- Paid once per hour (8,760 times) $100\left(1+\frac{0.05}{8,760}\right)^{8,760}=105.1271$

CONTINUOUS COMPOUNDING

As the interest payments per period are increased the final amount approaches a constant value of 105.1271…

A direct method for calculating the final amount after continuous compounding is to use the e function, or exp() in Excel.

To calculate the terminal value (TV) with continuous compounding we use the formula:

$$TV = PVe^{rn}$$

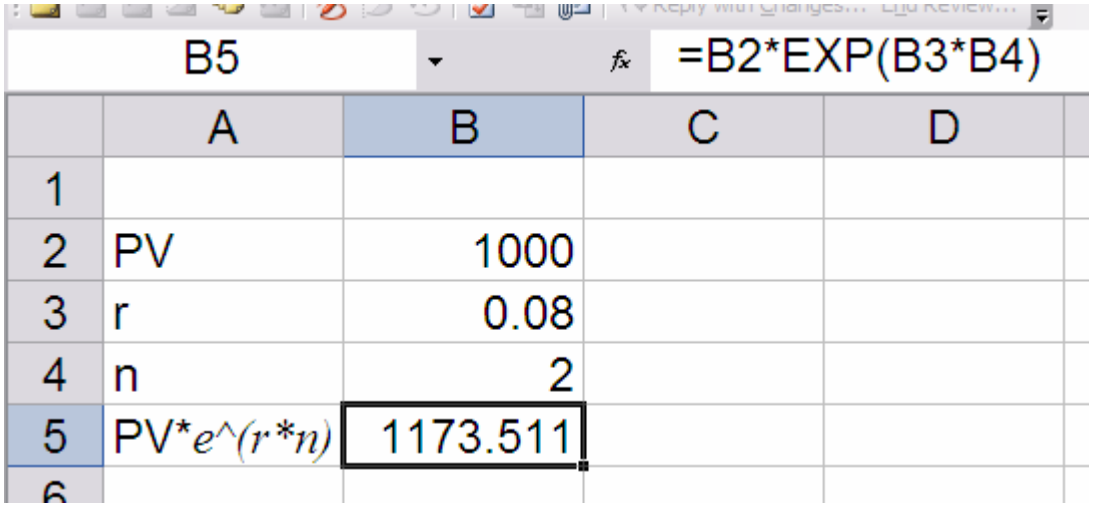
- PV is the present value of an amount of money invested now
- e is a constant with a value of 2.71828
- r is the nomial interest rate for one period
- n is the number of periods

Example

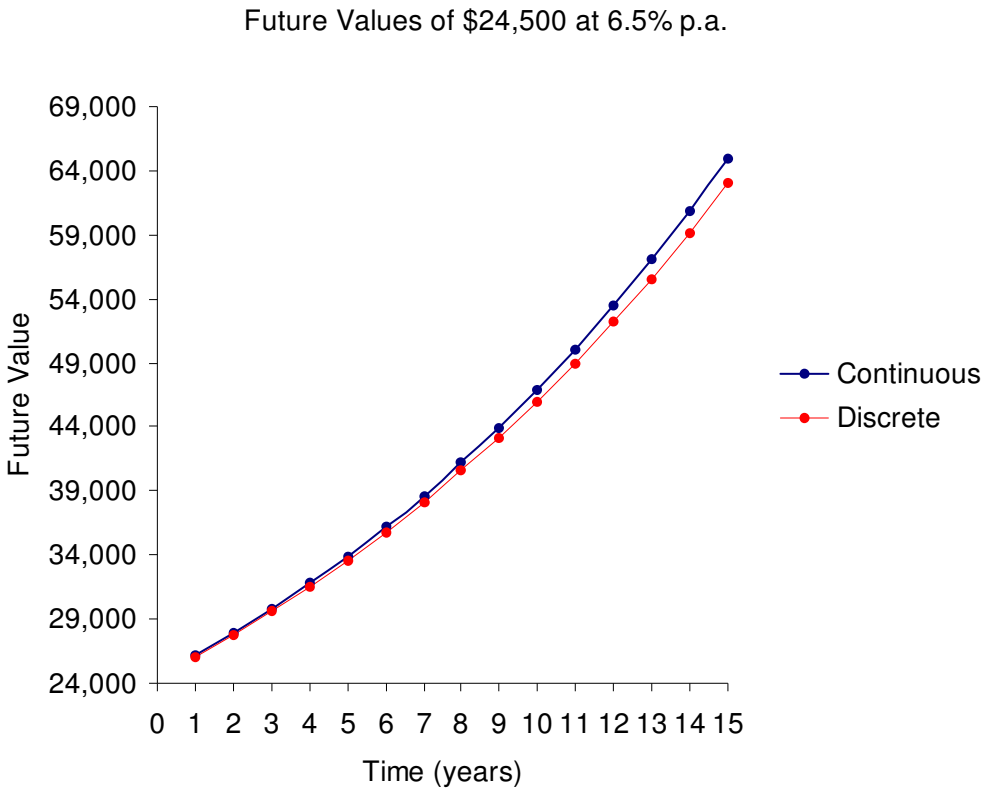
What is the final value of $1,000 paid for two years at a rate of 8% using continuously compounding?

$$\$1000\, e^{0.08\times 2} = \$1{,}173.51$$

In Excel:



The effect of continuous compounding mat be see by comparing it with discrete compounding (6.5% paid annually) on a graph



Discounting and Discount Factors

To discount future cash flows for analysis or valuation purposes we simply need to work backwards through the time value of money formula:

- $$PV = \frac{TV}{(1+r)^n}$$

This would give us the value today of a cash flow due in the future:

It is often useful to quickly be able to multiply a cash flow by a number to generate PV. For this we need a discount factor (df) which is related to the above equation as follows:

$$df = \frac{1}{(1+r)^n}$$

Discount factors are also powerful for quickly calculating forward rates

Continuous Discounting Formula

If we want to discount using a continuous interest rate we use:

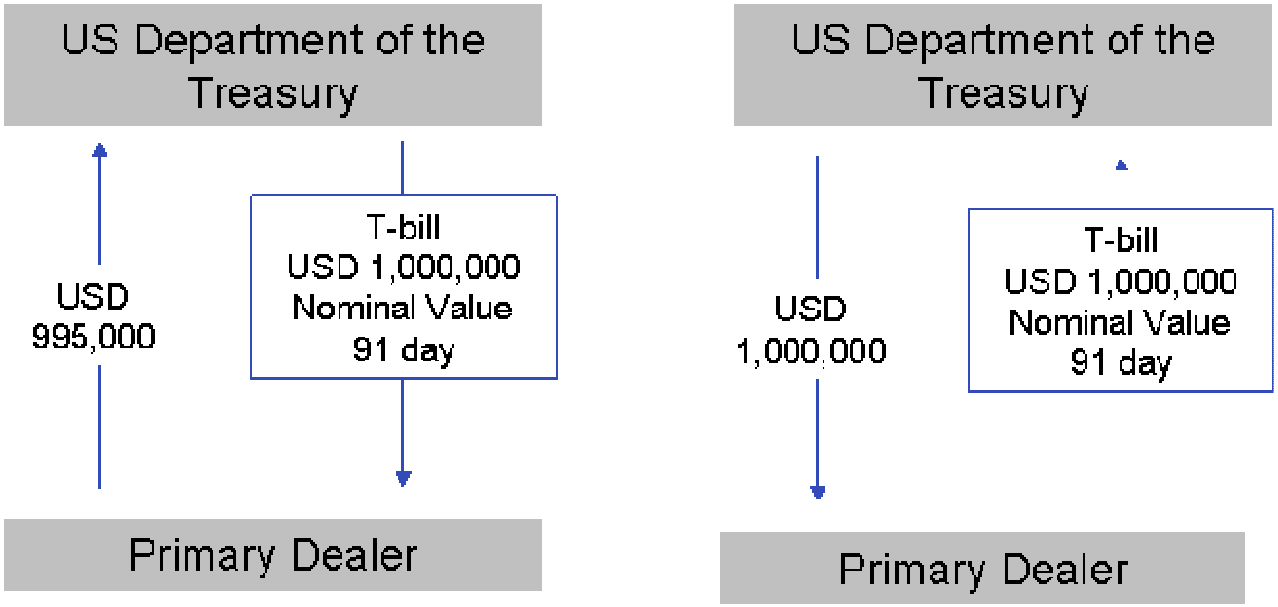
$$PV = TVe^{-rn}$$

Money Market Securities

US Treasury Bills

Treasury Bills are issued buy the US Department of the Treasury to fund the government's short term cash flows.

- They are issued at a discount and redeemed at par;
- They are a proxy for a risk-free return for their currency



Calculating T-Bill Returns

T-bills are quoted on a discount yield rather than a money market yield basis:

Example

$100,000 nominal 12m T Bill quoted at a discount yield of 10% has a market value of $90,000. Buying this bill and holding it for a year would result in a money market yield of 11.11%:

$$\frac{\$10{,}000}{\$90{,}000} = 0.111, \text{or } 11.11\%$$

Question: $100,000 nominal 91 day T-bill quoted at a discount yield of 5% p.a. What is its money market yield?

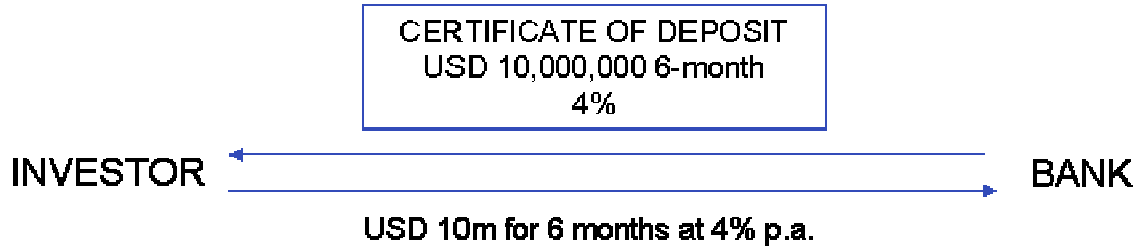
Commercial Paper

US Commercial Paper (USCP) is an unsecured form of borrowing issued by major financial and non-financial corporations. Maturities average about 30 days; max 270.

Euro Commercial Paper (ECP) may have maturities up to 365 days ("Euro" refers to non-domestic currency issue)

Certificates of Deposit

A CD is a certificate representing funds deposited at a bank for a named period at a FIXED INTEREST RATE. Note that CDs pay interest.



Interest Rate Swaps

Features of Interest Rate Swaps

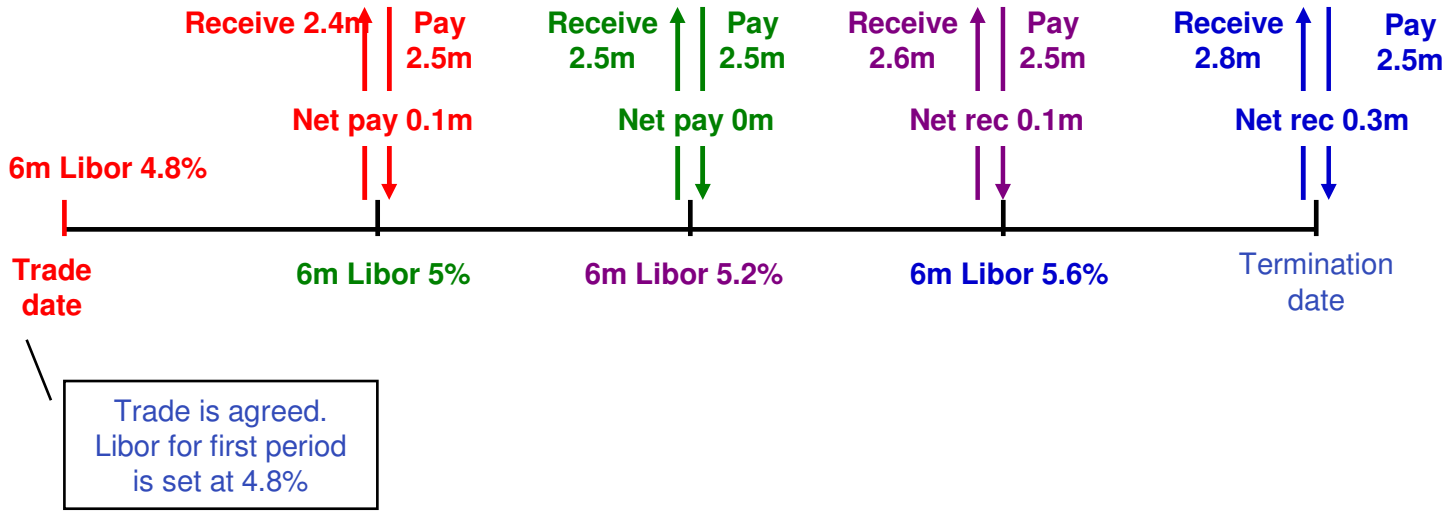
An interest rate swap is an agreement in which floating interest payments are swapped for fixed interest payments. An IRS will have 3 basic features:

- The term – this is the length of time the swap lasts for;
- The notional amount – this is the size of the swap. The notional is a reference amount and not paid by anyone to anyone else.
- The frequency – this is how often each year the payments are swapped.

Example

A bank is quoting the 2 year 6 month swap rate as 5% p.a. This means that we may either pay 5% on a notional amount and receive a floating rate, or receive 5% and pay the floating rate.

- Supposing we choose to pay fixed and receive floating.
- Lets also say that the notional amount is $100m and the 6 month floating rate is to be 6 month US dollar Libor.



Foreign Exchange (Currency) Markets

Background

Foreign Exchange markets come under Global Markets Division within Deutsche Bank. It features are as follows:

- OTC market
- Major international banks
- Spot market and forward market
- London is the largest centre

All currencies are primarily valued against the USD dollar:

- USD 1 = JPY 112.26 (in this quote, the most common type, the USD is the **base currency**)
- EUR 1 = USD 1.2594 (in this quote the USD is the **variable** currency)

Spot Rates

Spot is the term used for standard settlement in the FX markets. The spot date is two business days after the trade date: T+2.

- Spot rates are quoted as two way prices between the banks that populate the FX markets:

<HELP> for explanation, <MENU> for similar functions. 2 RBSL Curncy FXGN
98<GO> for local pricing hours

Bloomberg FX Generic Page 1/20

G10

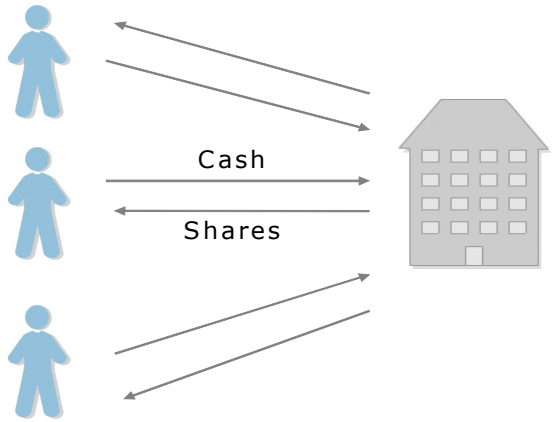
Ticker	Time	Bid	Ask	Spread	Open	High	Low	Close
1) EUR BGN	14:42	1.4177	1.4178	+0.0001	1.4196	1.4213	1.4162	1.4197
2) JPY BGN	14:42	117.53	117.55	+0.02	117.27	117.69	117.14	117.28
3) GBP BGN	14:42	2.0331	2.0333	+0.0001	2.0315	2.0359	2.0246	2.0317
4) CAD BGN	14:42	0.9731	0.9734	+0.0003	0.9766	0.9798	0.9723	0.9768
5) AUD BGN	14:42	0.9036	0.9038	+0.0002	0.9005	0.9053	0.8953	0.9006
6) NZD BGN	14:42	0.7734	0.7737	+0.0003	0.7691	0.7754	0.7675	0.7692
7) CHF BGN	14:42	1.1855	1.1857	+0.0002	1.1819	1.1876	1.1805	1.1821
8) DKK BGN	14:42	5.2548	5.2557	+0.0009	5.2477	5.2613	5.2419	5.2480
9) NOK BGN	14:42	5.4042	5.4069	+0.0027	5.3941	5.4102	5.3797	5.3960
10) SEK BGN	14:42	6.4258	6.4283	+0.0025	6.4248	6.4375	6.4115	6.4269

Source: Bloomberg

Equities

Companies and Their Shareholders

A company issues shares in order to raise capital. The investors buy a share in the company's success.



Points to note:

- The board of directors manage the company
- Authorised share capital versus issued share capital

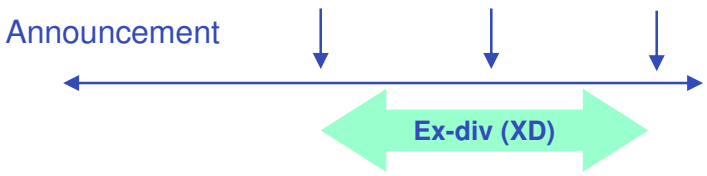
Cum and Ex-div Dates

Shareholders are entitled to certain rights, amongst them are:

- **Voting** (common stock generally) on resolutions at annual and extra-ordinary general meetings (AGMs and EGMs)
- **Dividends**; these may be paid in cash or shares. With each dividend payment an ex-div, record and payment date will be declared. Below are past dividend schedules for AIG.

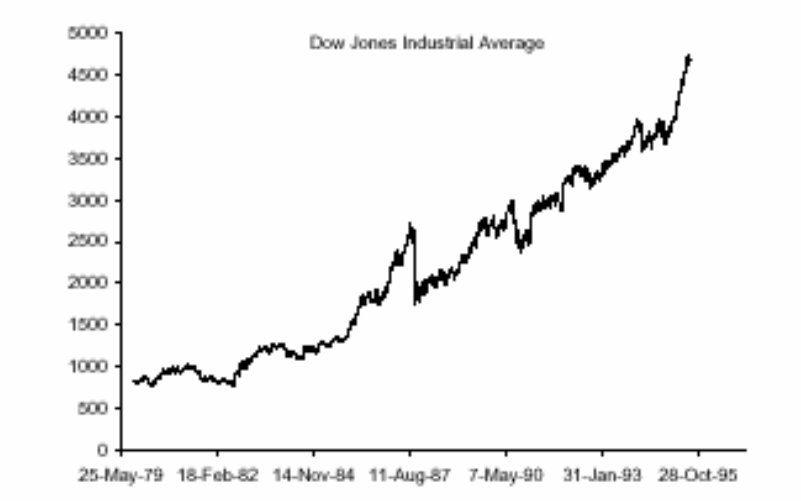
Range 1998 to 2008 Type 1 All Frequency Quarterly

	Declared	Ex-Date	Record	Payable		Amount	Type
1	5/ 8/08	9/ 3/08	9/ 5/08	9/19/08	USD	.22	Regular Cash
2	3/12/08	6/ 4/08	6/ 6/08	6/20/08	USD	.20	Regular Cash
3	11/14/07	3/ 5/08	3/ 7/08	3/21/08	USD	.20	Regular Cash
4	9/ 4/07	12/ 5/07	12/ 7/07	12/21/07	USD	.20	Regular Cash
5	5/16/07	9/ 5/07	9/ 7/07	9/21/07	USD	.20	Regular Cash
6	3/14/07	5/30/07	6/ 1/07	6/15/07	USD	.165	Regular Cash



Equity Prices

When we observe equity prices over time we can see there is an element of **randomness** present



This means that when we model equity prices we must do so in a **probabilistic** sense.

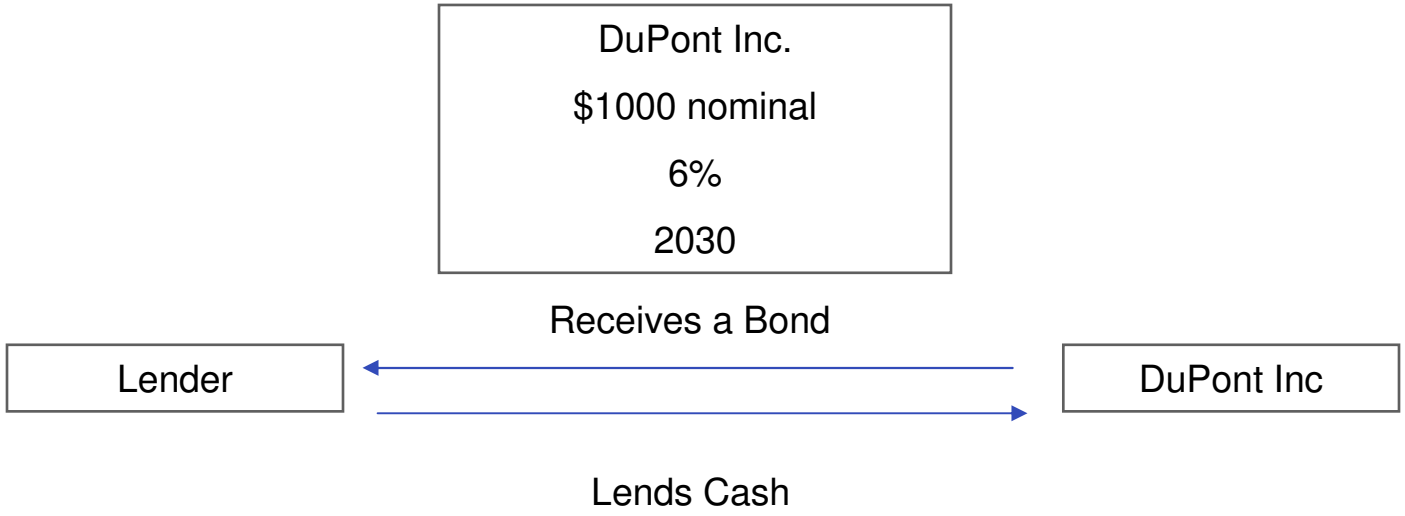
Fixed Income Securities

What is a Bond?

A bond represents a loan to a company or government.

If an investor lends money to a company the company gives the investor a promise, or bond, to repay the debt.

At the beginning of a bond's life:



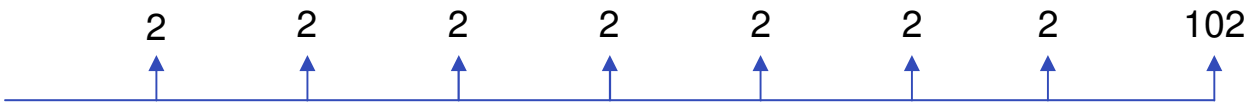
The Basic Features of a Bond

A bond will have three fundamental features. These are:

- the **maturity** or **redemption date** of the bond is the date when the loan is repaid. The term bullet maturity means the principal is paid off in one lump at the end of the bond's life;

- the **par** or **nominal** (a.k.a. **principal** or **capital**) value is the amount repaid at redemption. It is not necessarily the price of the bond; and

- the **coupon** is the income from the bond:
  - Quoted as an annual % of par
  - Usually paid semi-annually, for example 100 nominal of a 4-year 4% coupon bond:



  - Sometimes bonds issue floating coupon bonds. These pay coupons linked to a reference rate such as LIBOR

    - Coupon = Libor + 240bps

Types of Bond

Governments, local authorities and corporates all issue bonds. This leads to a great deal of variation in bond features. An ordinary bond is known as a vanilla bond:

Government Bonds

Government bonds are generally bonds issued by G20 governments. They are considered default risk-free and the least risky investment in their own currency. Some examples of government bonds are:

- UK Gilts
- French OATs
- German Bunds
- US T-bonds

Many of these governments issue bonds that are inflation protected. These are known as index-linked bonds.

Corporate Bonds - Credit

Bonds issued by companies are not free from the risk of default; their ability to pay may be doubtful. One way to assess an issuer's ability to repay their debt is their **credit rating**. Credit ratings are published by three credit rating agencies:

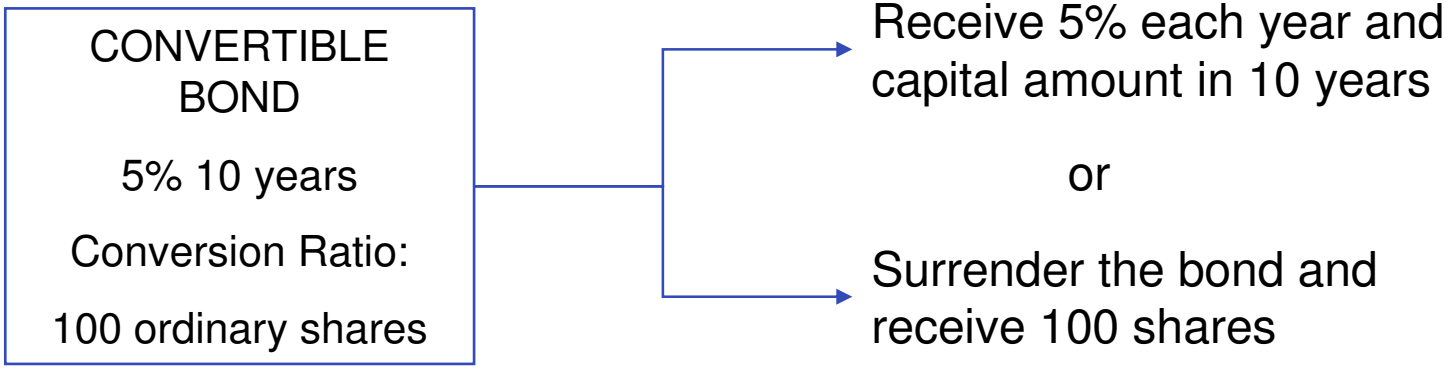
- Standard and Poors
  - AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-, | BB+ ……
- Moody's
  - Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, | Ba1 ……
- Fitch
  - AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-, | BB+ ……

Each notch represents the same marginal difference in creditworthiness

Convertible Bonds

Another feature is convertibility. Convertible bonds offer:

- Bond returns of a fixed coupon and capital redemption; and
- A chance to surrender the bond and receive shares in the company.
- Example: A company issues a 10-year 5% convertible. The holder of the bond has two choices:

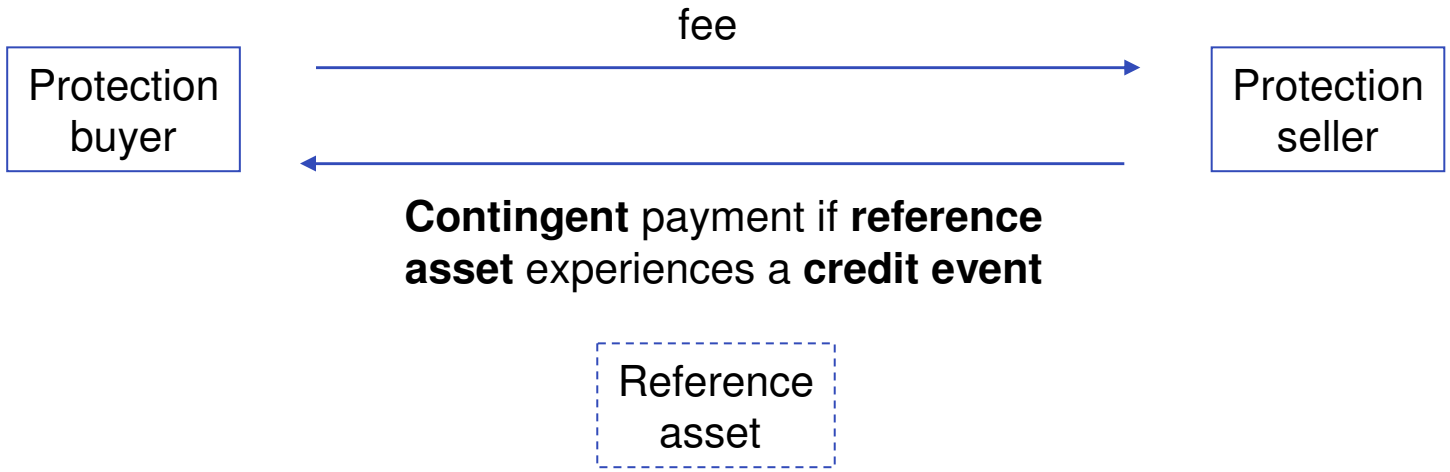


Credit Default Swaps

Credit default swaps (CDSs) are the main building block of more complex credit derivatives structures.

A CDS is an agreement between two parties. In this agreement the protection seller receives a fee. In return for this fee the seller is obliged to compensate the protection buyer if a credit event occurs with respect to a notional amount of debt of the reference entity.

In short it is credit risk insurance:



Simple Yield to Maturity

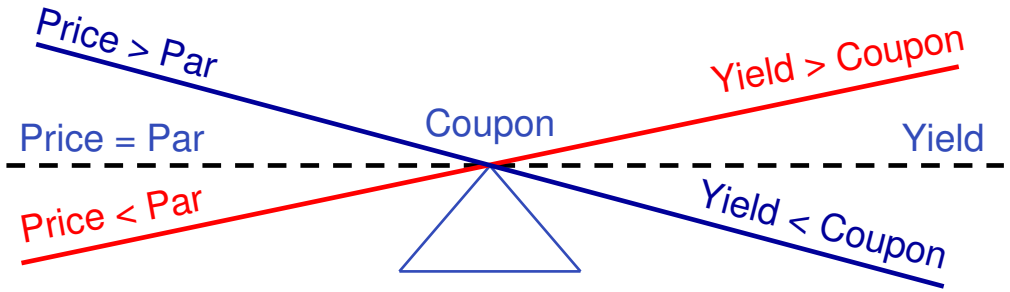
What is the return (yield) we would receive on a $100 nominal of a two-year bond with an annual 4% coupon if it is trading at 98?

This would equate to an extra $1 per year return meaning that overall the investor make an average annual return of 5.1%. This is known as the redemption yield or the yield to maturity (YTM):

$$\frac{\$4+\$1}{\$98}=\frac{\$5}{\$98}=0.051=5.1\%$$

Summary

If the required yield from a bond rises its price will fall. If the required yield from a bond falls its price will rise. Bond prices have an inverse relationship with their yields



The Simple Yield to Maturity

The bond return which takes into account the coupon and the capital gain or loss at redemption is known as the SIMPLE YIELD TO MATURITY. The simple yield does not take into account the time-value of money; receiving a profit of $4 in four year's time is NOT the same as receiving $1 at the end of each of the four years

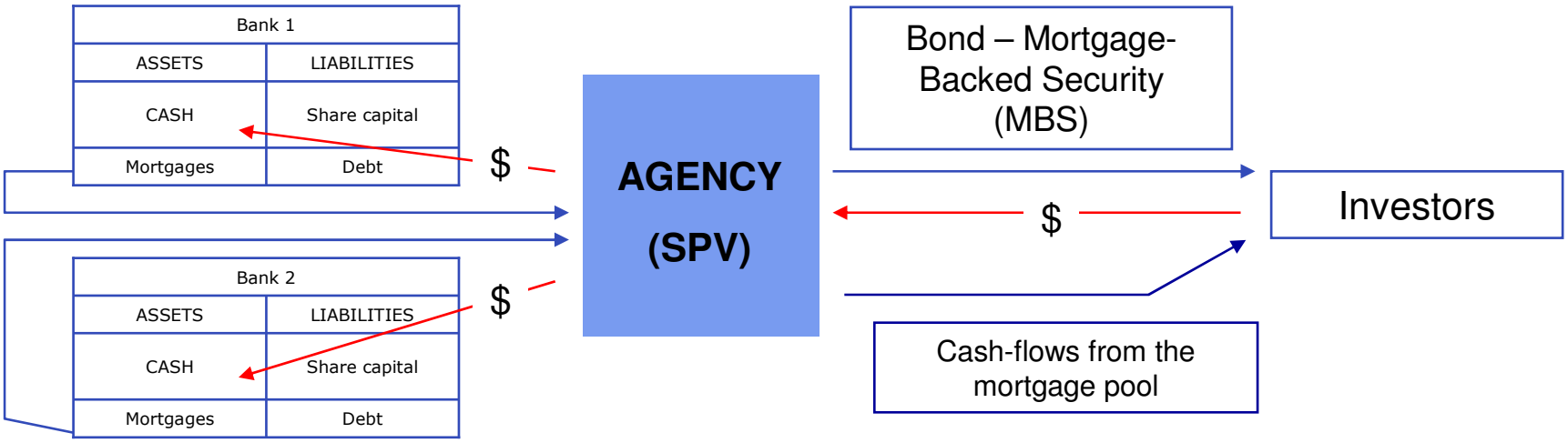
Mortgage Backed Securities

These are bonds where the cash flows from mortgages are turned into bonds. There are three organisations associated with MBSs in the US:

- Government National Mortgage Association (GNMA) - Ginnie Mae. Ginnie Mae is government backed
- Federal Home Loan Mortgage Corporation (FHLMC), Freddie Mac
- Federal National Mortgage Association (FNMA), Fannie Mae

The MBSs issued by these organisations are referred to as agency securities.

An agency acquires mortgages from banks. The banks have cash to re-lend. In order to pay for the mortgages the agency raises finance through issuing Mortgage-Backed Securities (MBSs)



Agency MBSs are pass-through securities. This means the cash flows from the mortgages are paid on a pro-rata basis:

Repo Agreements

FEATURES OF REPOS

Definition

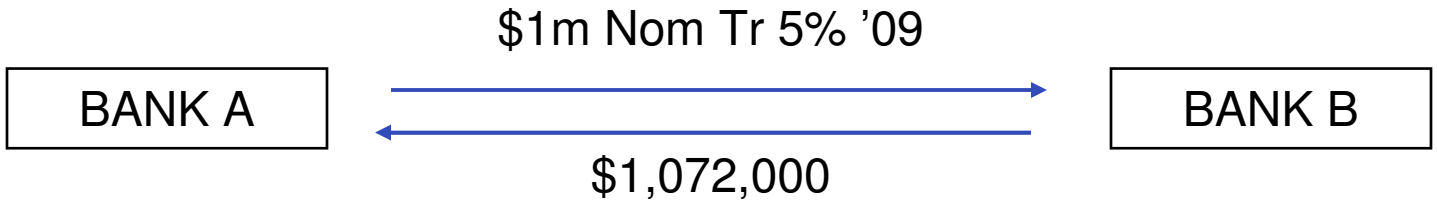
A transaction in which one party sells another a security. At the same time, as part of the same agreement the party agrees to repurchase identical securities on a specified date at a specified price.

- There are two legs to a repo
- The seller delivers securities and receives cash from the buyer
- The difference between the cash received by the seller in leg 1 and returned in leg 2 is known as the repo rate

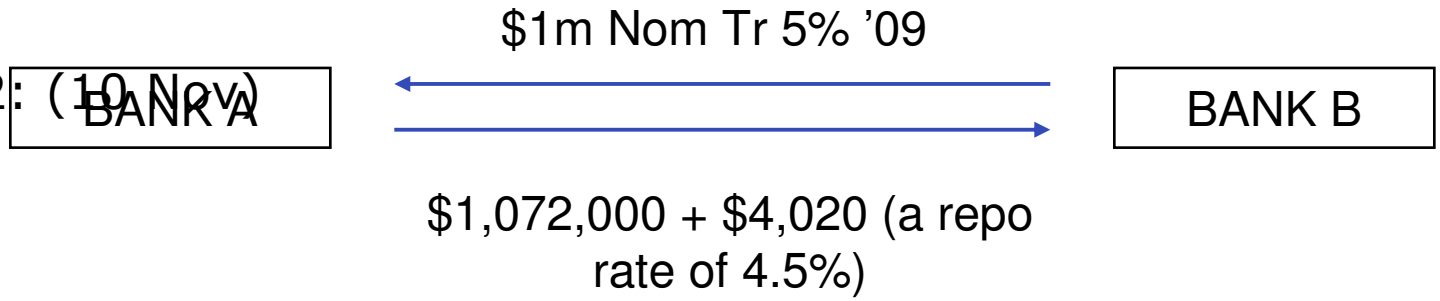
Example: A specific repo (the collateral is a specific type of security)

Today is 9 October, start date of repo 10 October.

Leg 1: (10 Oct)



Leg 2: (10 Nov)



Commodities

Commodities are real things. They are mainly traded on derivatives (futures and options) exchanges. Two things to remember about commodities: firstly they have **utility value** – this has an important bearing on their derivatives' pricing; secondly electricity cannot be stored.

- Metals
  - Precious (Gold)
  - Base (Copper)
- Agricultural
  - Grains (Wheat)
  - Softs (Sugar)
- Energy
  - Oil
  - Gas
  - Uranium
  - Electrcity

Derivatives

The Futures Contract

A futures contract is an agreement between two people to do a transaction on a date in the future, but at terms agreed now. A futures contract is an obligation.

Contract (no.1)
A **will** buy from B 100 Boeing at 72 per share on the third Wednesday in September

Terms

- Buyer / Long – Takes delivery
- Seller / Short – Makes delivery
- Underlying
- Delivery date
- Futures price (cf. cash or spot)
- Contract size
- Margin

Futures and Forwards

Forward contract (OTC)

An agreement between two people to do a transaction later, at terms agreed now.

Over-the-Counter (OTC).

- OTC derivatives are privately negotiated;
- The terms are therefore fully flexible (trade size, expiry, underlying etc..);
- OTC derivatives can suffer from low liquidity;
- They need legal agreements (ISDA Master Agreement)
- Swaps (Equity, currency and interest rate), FX Forwards and credit derivatives are examples of OTC derivatives

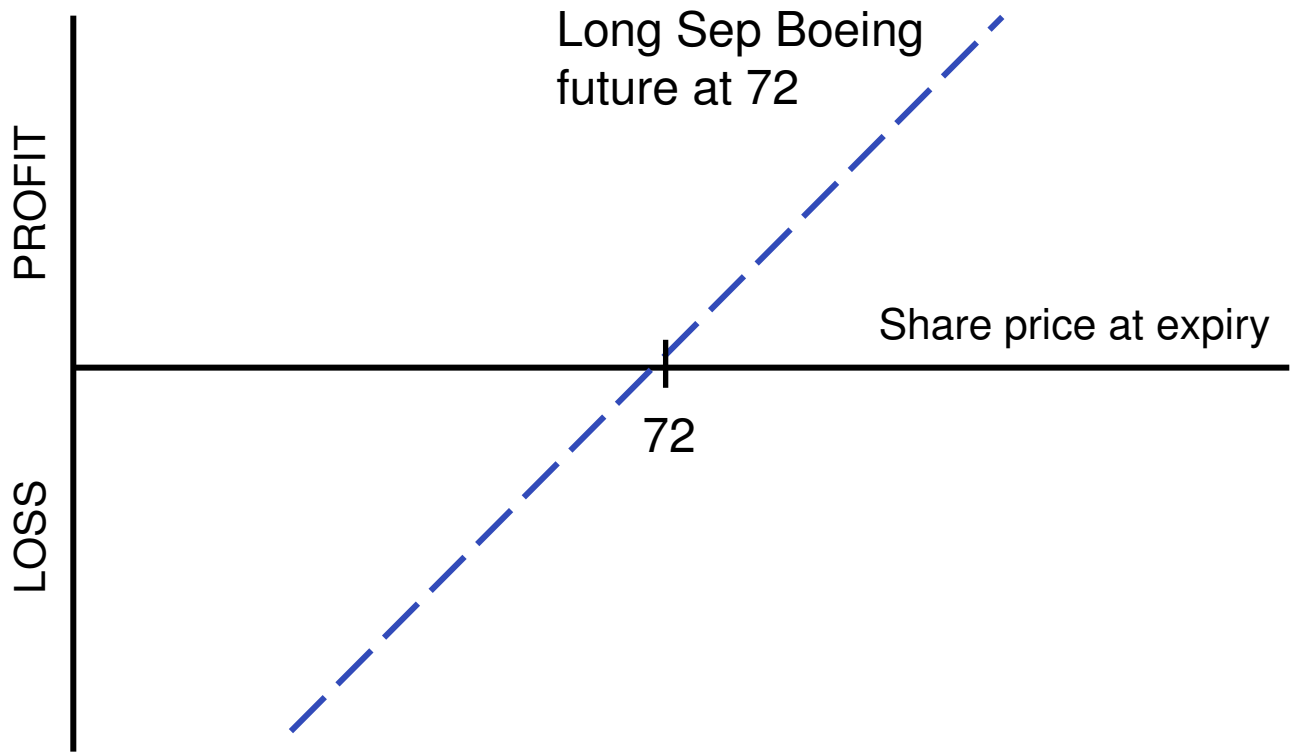
Futures contract (ETD)

A standardised agreement between two people to do a transaction later, at terms agreed now.

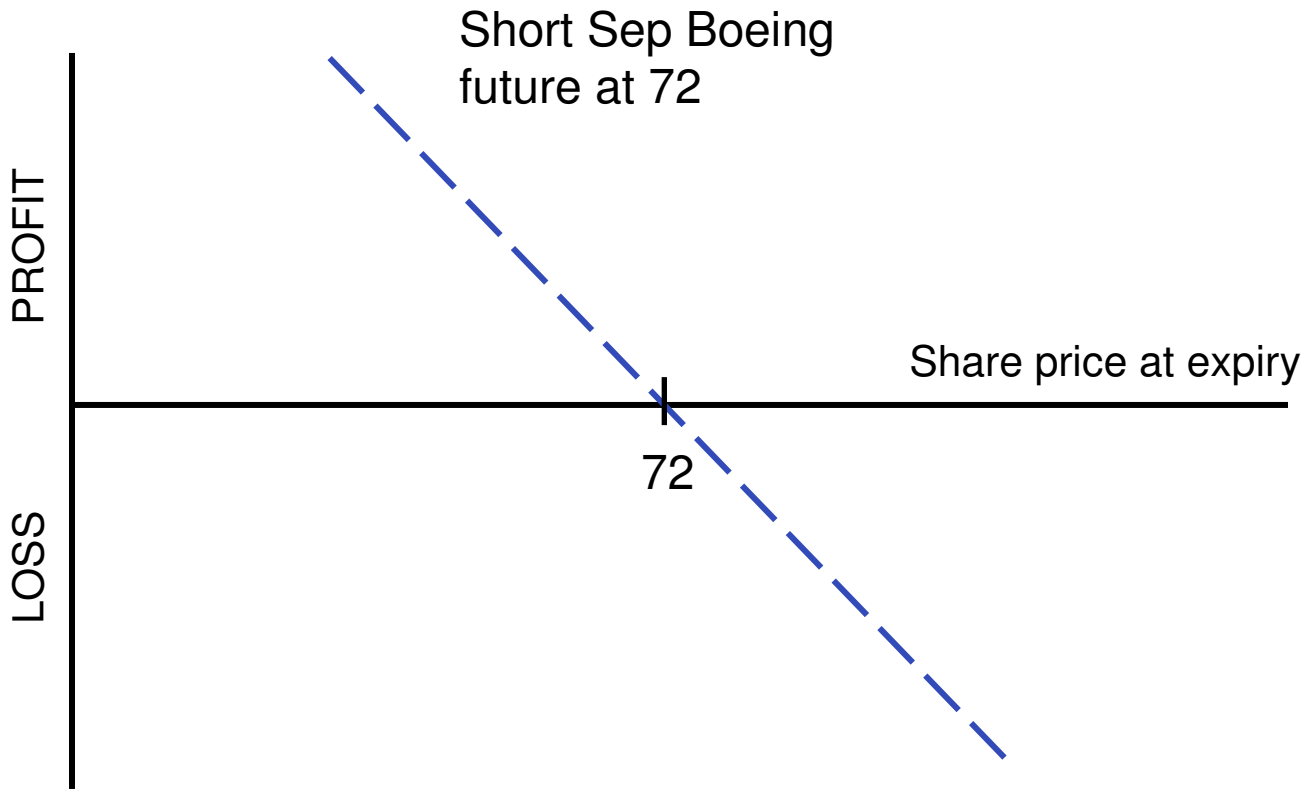
e.g. Euronext.liffe's Universal Stock Future:

- 1 contract is for 1000 shares
- Delivery dates are fixed (March June Sep Dec)
- The QUOTATION method is pence per share
- 1 tick is 0.5 pence, tick value is therefore £5
- Trading 08:00 – 17:00

The Long Futures Position:



The short position:



Trading Futures Contracts - Closing Out

A and B have entered in to the following futures contract:

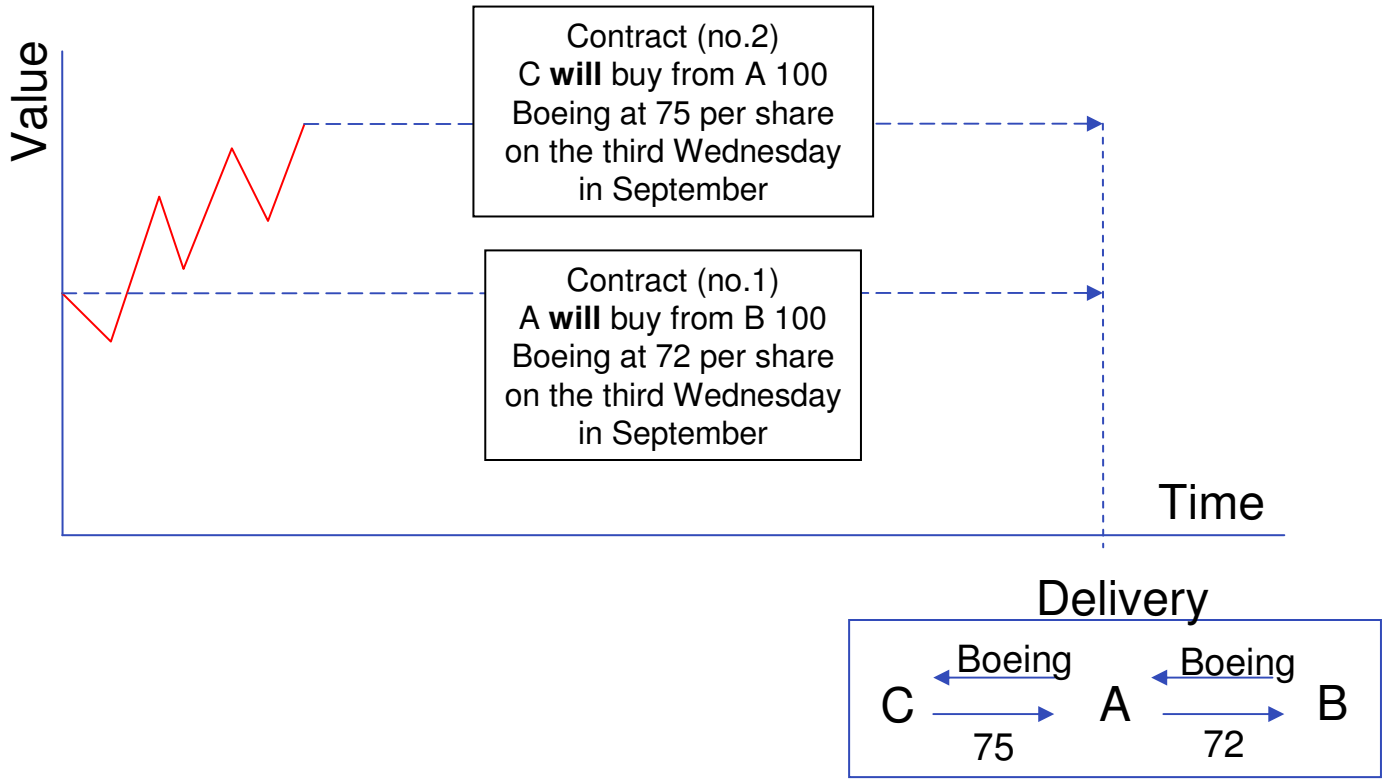
Contract (no.1)
A will buy from B 100 Boeing at 72 per share on the third Wednesday in September

Suppose that after Contract no.1 is agreed the price of Boeing rises to 75. Who would benefit from this development?

This profit may be 'locked-in' by entering another futures contract for the same delivery date with another counterparty, say C:

Contract (no.2)
C **will** buy from **A** 100 Boeing at 75 per share on the third Wednesday in September

Notice that there is no ownership of a futures contract. Even though we say we have 'bought' and 'sold' in reality we have entered two agreements both of which come to fruition on the same delivery date:



Pricing Futures & Forwards

Imagine you are asked to quote someone a price for delivering Boeing shares in a year's time. How would you determine the 12-month delivery price? You could:

- Make an educated guess
- Buy the asset now and hold it until the delivery date (the less risky choice)

In the second instance you would need to know:

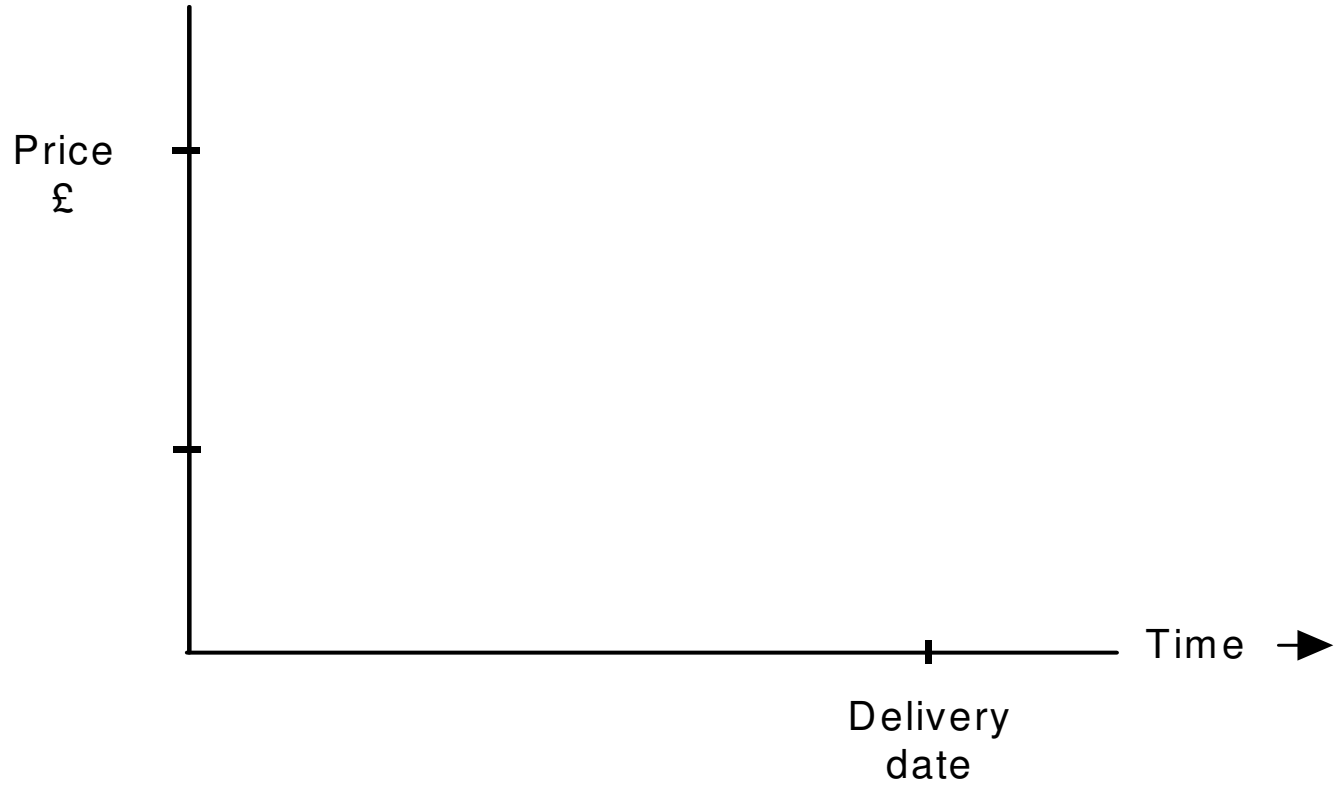
- The price of the asset now (cash price)
- Your costs of holding the asset until delivery
- Any benefits obtained from holding the asset until delivery

- FAIR VALUE = CASH PRICE + COST OF CARRY – BENEFITS OF CARRY

Put more formerly the fair value of a future, F with a delivery date at time T, on an underlying asset trading today, t, at $S(t)$ when interest rates are r:

$$F = S(t)e^{r(T-t)}.$$

Convergence



A First Example of No Arbitrage

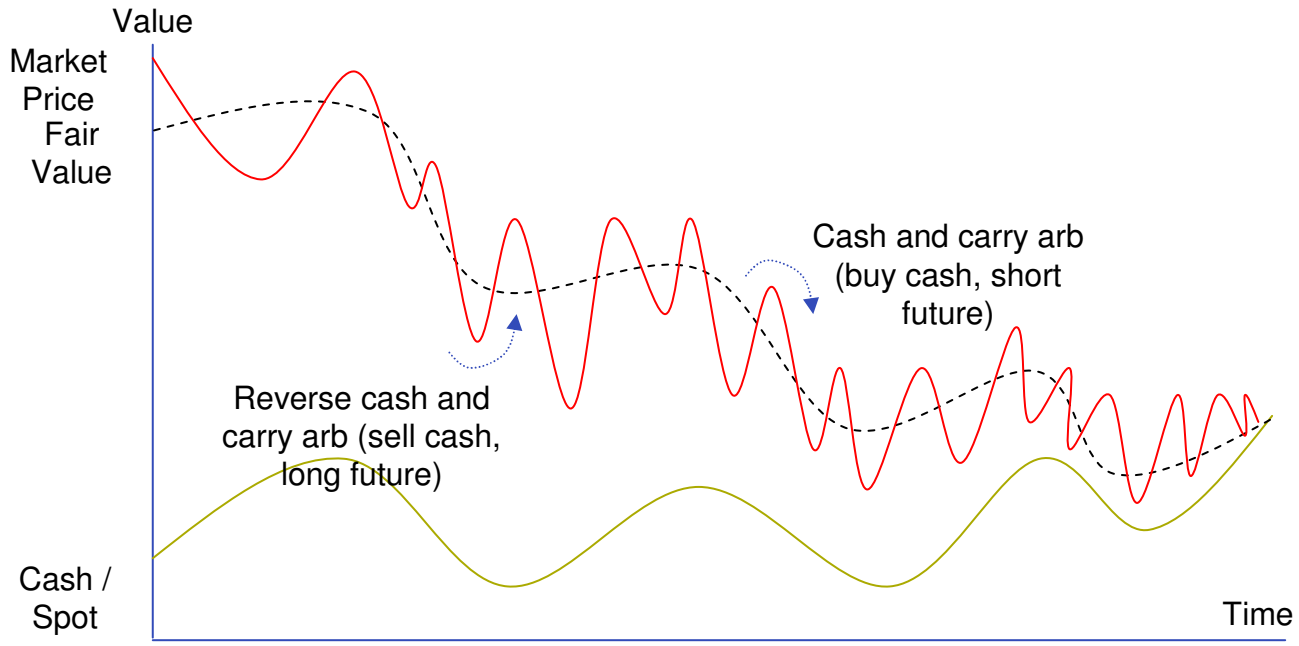
It may be possible to generate a profit if the future is not trading at its fair value. This is known as cash and carry arbitrage.

- If the future is above fair value:
  - Buy cash and sell future today

- If the future is below fair value:
  - Sell cash and buy future today

This also illustrates the term 'pricing using the no arbitrage principle'.

In financial asset markets the future is kept in the vicinity of its fair value by arbitrage:



The market price of the futures contract is constantly being buffeted by the actions of speculators and arbitrageurs.

Convenience Yield in Commodity Futures

Holders of cash commodities receive benefits not available to holders of futures contracts. This causes backwardation which results in an inequality:

$$F \leq S \times (1 + (h + r))^n$$

These benefits are described as the convenience yield. If we include the convenience yield (c) in the equation we get an equality:

$$F = S \times (1 + (h + r - c))^n$$

For a commodity market in backwardation c is greater than $h + r$.

Options

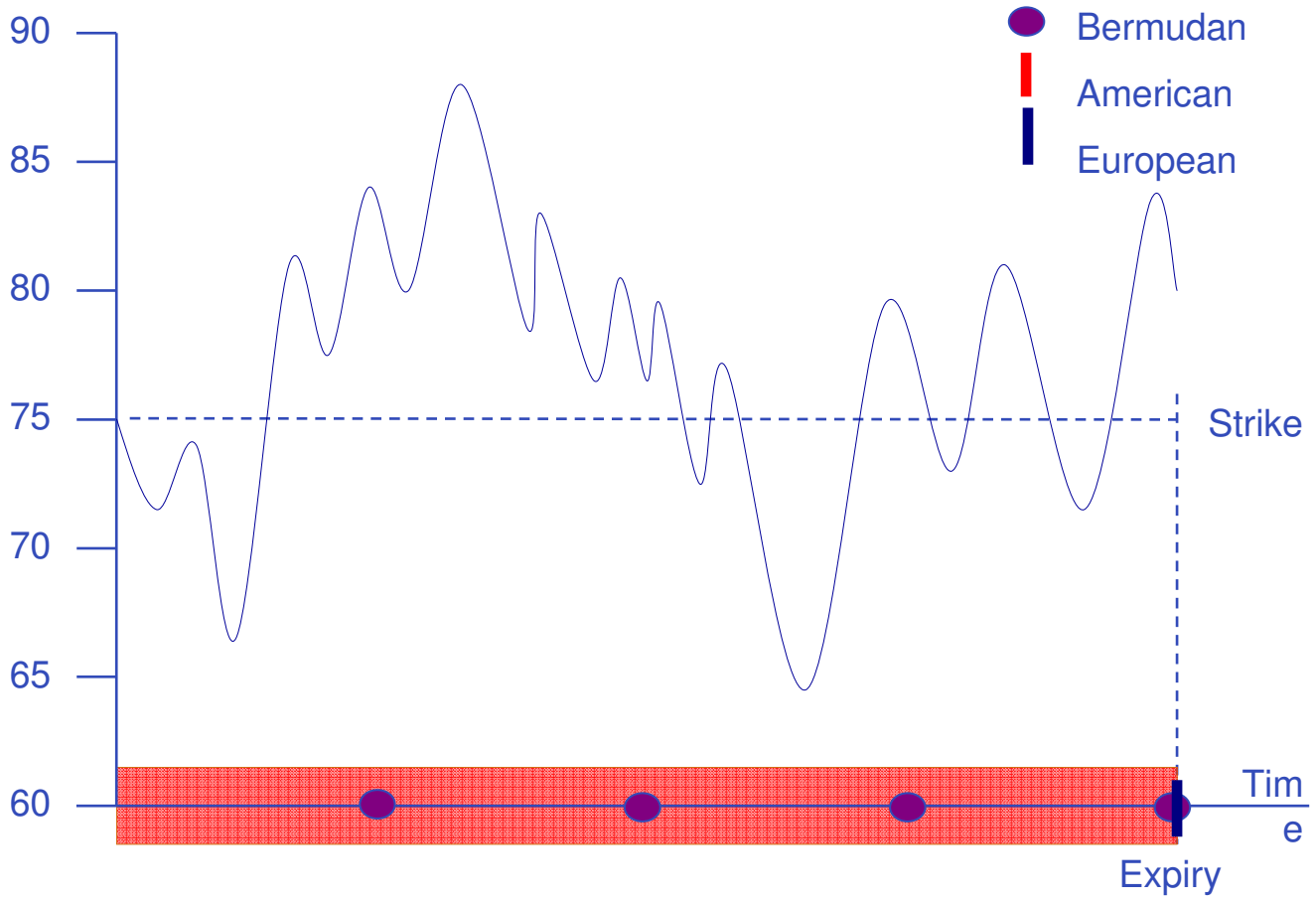
Call Options – The Right to Buy

Option

A may **buy from** B 1,000 Chevron shares at 55 on or before 3rd Wednesday in April

- Holder / buyer / long
- Writer / seller / short
- Underlying
- Expiry
- Exercise price, or strike price
- Exercise styles
  - American
  - European
- Premium

Exercise Styles



Option Profit and Loss Profiles

CALL: Strike 55 Premium 5

Put Options – The Right to Sell

Option

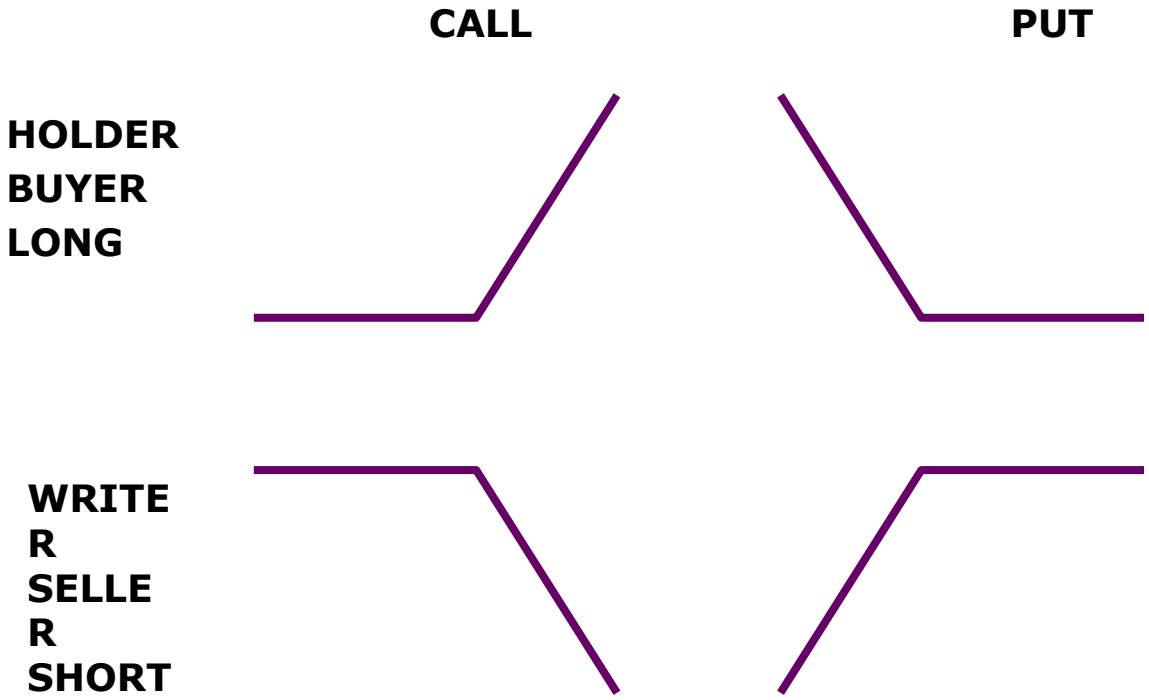
A may **sell to** B 100 Chevron shares at 55
on or before 3rd Wednesday in April

- Holder / buyer / long
- Writer / seller / short
- Underlying
- Expiry
- Exercise price, or strike price
- Exercise styles
  - American
  - European
- Premium

PUT: Strike 55 Premium 3

Option Summary

Here is an aide memoire to help you remember the basic option strategies:

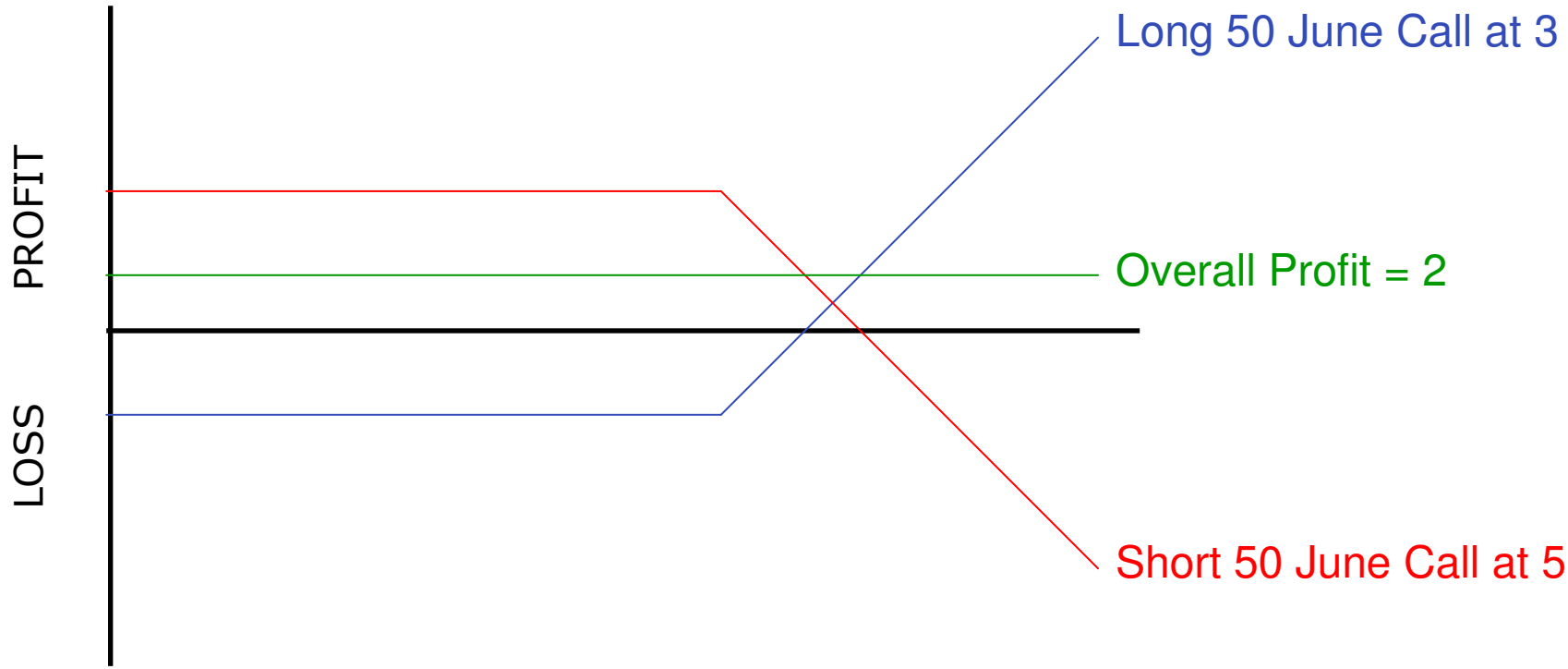


Closing Out an Option Position

A speculator is bullish about a particular share which is currently trading at 50. Instead of buying the share she purchases a 50 call option with an expiry date of the third Wednesday in June, paying a premium of 3.

Share Price	50 June Call Premium
47	**1.5**
50	**3.0**
53	**5.0**
55	**6.5**

Later, when the underlying has risen in value, 50 June calls are trading at 5. How might the investor take a profit?


PROFIT
LOSS
Long 50 June Call at 3
Overall Profit = 2
Short 50 June Call at 5

Option Pricing

The Premium

The premium is paid by the holder of an option to the writer. It represents the value of the right to buy (call) or sell (put) at the strike.

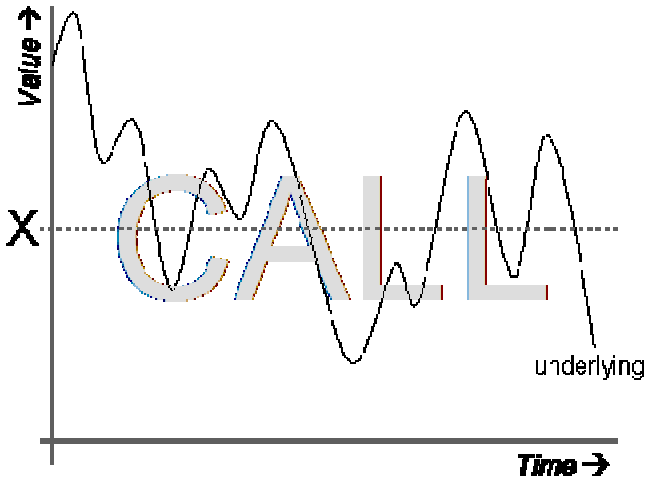
The premium may be spit into two components; intrinsic value and time value:

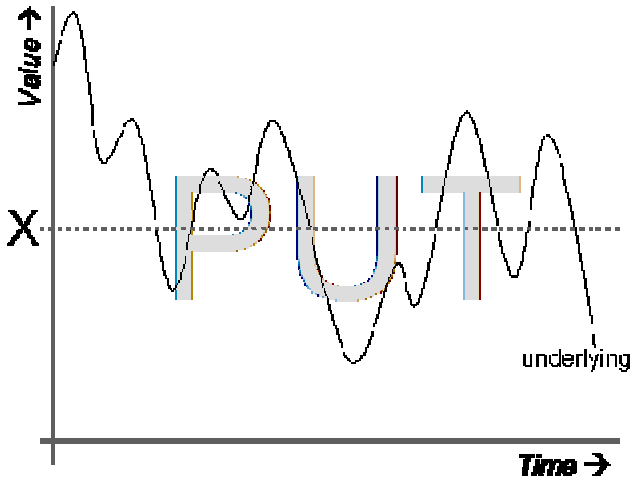
- Intrinsic value is the built in profit the option has by virtue of the underlying's price and its strike price. For example a 100 call when the underlying is trading at 110 will have intrinsic value of 10. NOTE: intrinsic value will be positive or zero.
- Time value represents the remaining life the option has regardless of any intrinsic value.

- PREMIUM = INTRINSIC VALUE + TIME VALUE

The Money-ness Of An Option

Options will be either in-the-money (ITM), at-the-money (ATM) or out-of-the-money (OTM):



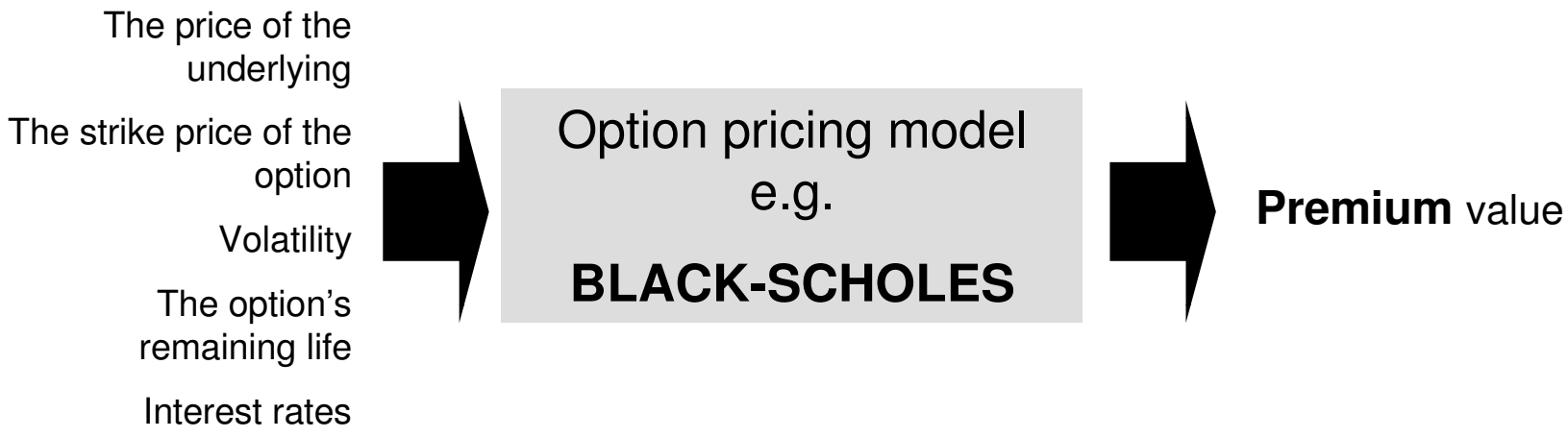


Factors that influence the Option Premium

There are five factors that drive option premiums:

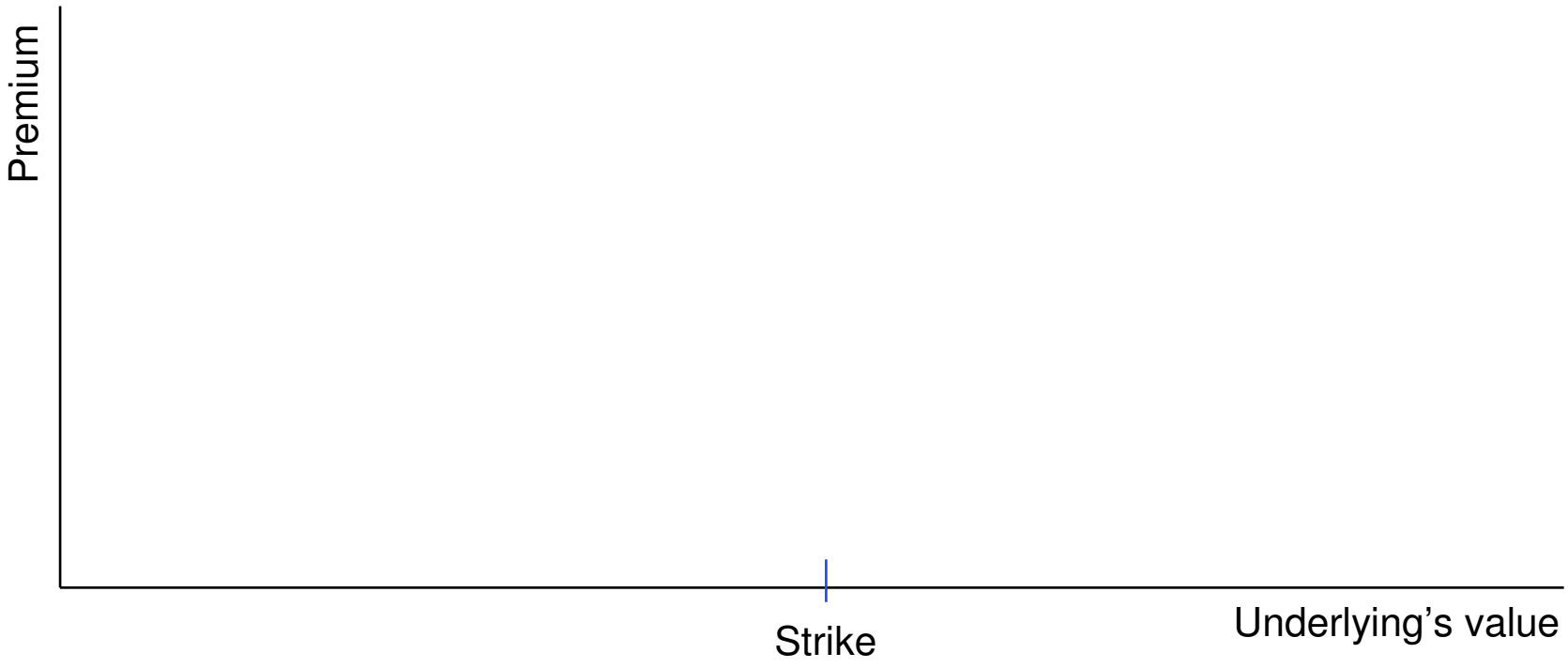
- The price of the underlying
- The strike price of the option
- The option's remaining life
- The volatility of the underlying asset
- Interest rates

These are usually input into a pricing model to calculate a return:

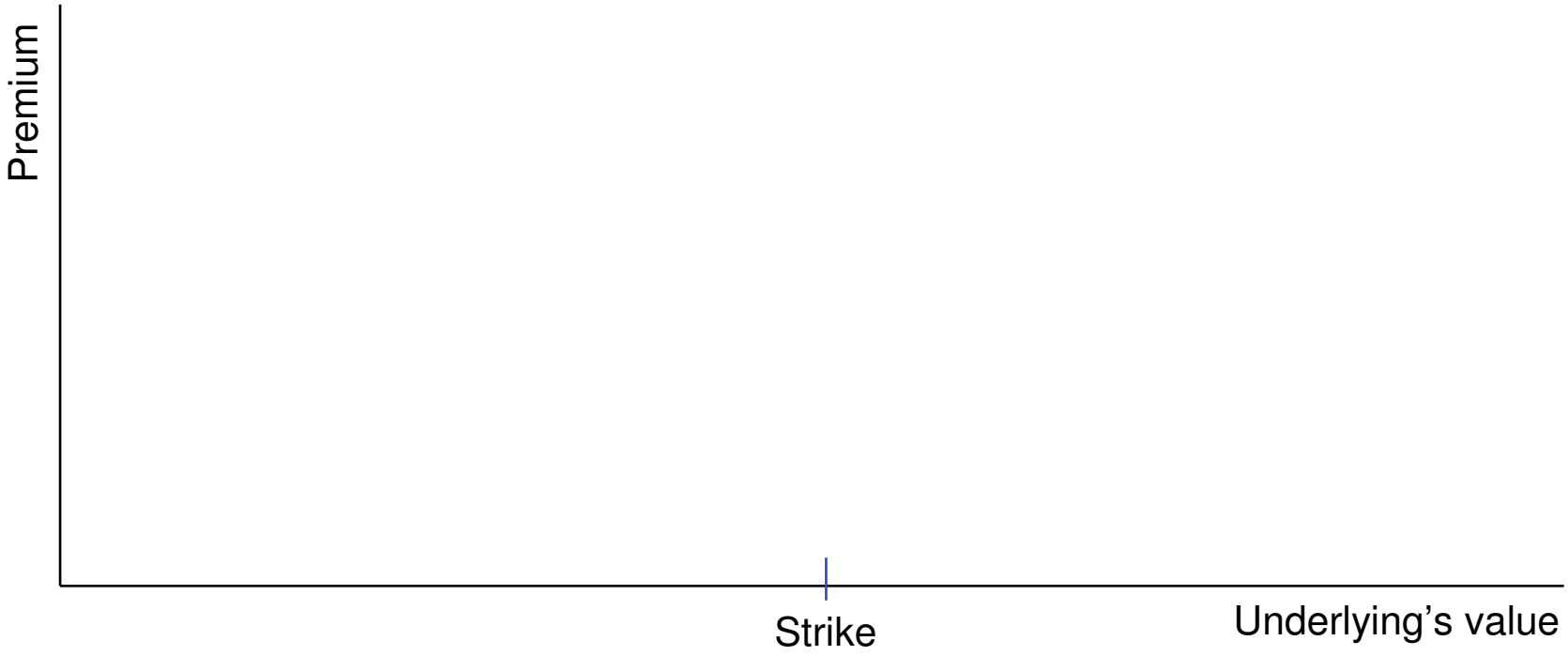


Option Payoff Diagrams

How does the **call** option's premium change against the underlying price?



How does the **put** option's premium change against the underlying price?



Put-Call Parity (PCP)

What is PCP?

Put-call parity is the relationship between the premiums of a call and a put option with the same

- Underlying
- Strike
- Expiry

PCP Illustration

A non-dividend paying stock is currently trading at 42 (). A I-year European 40 call on the stock is trading at 10. So

- S_0 = 42
- T = 1
- C = 10
- X = 40

All we need is the interest rate for the period to the expiry of the option and put-call parity allows us to calculate the premium for a 1-year 40 European Put. Lets say

- r_{1year} = 5%

Rationale (Discrete Compounding)

Consider two ways that guarantee owning the stock above in one year's time

- Buy the stock now and hold it for a year. We do this by borrowing S_0 at r now, buying the stock and holding it. Our costs would be:

$$S_0(1 + r)$$

- Alternatively, we could buy a call and sell a put, both with the same strike, X, and with an expiry of 1-year. We borrow the net cost of the options, so our costs here would be:

$$(C - P)(1 + r) + X$$

Put call parity assumes these two journeys to the same point cost the same amount (we'll see if this is reasonable)

Which would mean:

$$(C - P)(1 + r) + X = S_0(1 + r)$$

If we divide by $(1 + r)$ and re-arrange we get:

$$C - P = S_0 - \frac{X}{(1+r)}$$

This equation fits our 1-year example, but if we say that t is the fraction of a year until expiry we could re-write the formula for any European option on a non-dividend stock using any expiry:

$$C - P = S_0 - \frac{X}{(1+rt)}$$

If we put the data from our example above we can see what a put should be trading at:

$$P = C - S_0 + \frac{X}{(1+r)}$$

$$= 10 - 42 + \frac{40}{1.05}$$

$$= 6.09$$

Suppose the put was trading in the market at 5. What would you do?

…if the put was trading at 5 it is under-priced:

Action	Cash flow (in:+, out -)	Result if S>X	Result if S<X
Sell call	+10	Call exercised against us – hand over stock and receive 40	Call abandoned
Borrow X/(1+rt)	+38.09	Use 40 to repay loan	Proceeds of exercised put
Buy put	-5	Abandon put	Exercise put – deliver stock at 40
Buy the underlying	-42	Delivered through Short call	Delivered through long put
Total	+1.09		