R02: The main asset classes 2020/2021
Part 2 Bonds

The international Bond markets are a vital part of the world's financial system.

Most people know what the stock market is. Every night news bulletins announce the closing price of the FTSE 100. If there is a large fall in the market, it's headline news. By contrast the Bond market stays in the background yet it's arguable that movements in that market have a far bigger influence on the economy than equity markets.

The Bond markets:

- Determine the rate of interest that nations and companies must pay to borrow.
- Can punish nations who are seen to be mismanaging their economies.
- Influence annuity rates.
- Affect the liabilities of pension funds
- Can affect mortgage rates
- Affects rates offered to savers
- Can give a guide to future economic trends
- Can influence the performance of equity markets

Perhaps because the Bond market has a lower visibility and is seen as less exciting than equity markets it is often ignored by investors. This is a grave error!

The characteristics of a bond

"Bond" is the most misused term in the financial services dictionary. When a bank offers a fixed rate "Two Year Bond" it is still a deposit account as the saver can normally get the money back before the end of the term although there will be a loss of interest. A Bond in its true sense is a **tradeable debt** or IOU.

Tom borrows £10,000 at 5% interest from Dick. Tom agrees to pay back the loan in full in seven years' time. Three years later Dick needs cash so he sells the loan to Harry.

Tom now pays the interest to Harry and will pay him £10,000 at the end of the loan.

This illustrates the key characteristics of a bond.

- It is a loan for a fixed period
- The borrower agrees to pay a fixed rate of interest
- The loan will only be repaid by the borrower at the end of the term
- The loan can be traded on the secondary market.

Bonds can be issued by companies or Governments. The former are referred to as **Corporate Bonds** and the latter as **"Sovereign Debt"** Bonds issued by the UK Government are known as **Gilts.**

The way that Bonds operate is basically the same regardless of who the borrower is, but we will focus on Gilts to get the basic principles.

The basic operation of a Gilt

This is a fictitious example but it illustrates the key points.

On March 1 2010 the Government issued a 20 year Gilt carrying an interest rate or coupon of 4%. For every £100 of nominal at issue, an investor will get the following:

- Every 6 months a gross payment of £2 starting on September 1 2010.
- Repayment of £100 together with the last payment of £2 will be made on March 1 2030
- In total, they would have received £80 in interest payments plus a full return of their capital.

The Government will not repay the holder before March 1 2030 but the gilt can be traded on the secondary market. The buyer is purchasing the right to receive a fixed income and the right to receive the loan repayment at maturity.

Individual and corporate investors will have lent different amounts so in practice all measures of bond performance use £100 as the par value. Put another way the market price tells you how much it costs to buy £100 of debt.

As with any market the price will be set by supply and demand and in turn this will be influenced by:

- The relationship between the coupon and current interest rates. In the previous example a rate of 4% rate is higher than market rates so the market price will be higher than £100. Effectively the owner of this Gilt is getting an income of £4 a year so a buyer is likely to pay more than the £100 that will be repaid in 2030. Conversely if rates were to rise above 4% the price would tend to fall below £100.
- The time to redemption date. Since £100 will be repaid in March 2030, the market price will gravitate towards this as March 2030 approaches.
- The credit worthiness of the borrower. The UK government has a high credit rating and is unlikely to default. In extremis it could print money. Countries in the Eurozone cannot do that so those with weak economies are seen as a higher risk. Other countries with less stable governments and economic systems are more likely to default particularly if the bonds are denominated in another currency such as the dollar.
- The investor's view of future inflation. With most bonds, the monetary amount of the interest and capital repayments are fixed so inflation will reduce the real returns on the bond.

Key Performance Measures

With a Gilt/Bond the coupon and redemption date are fixed but the market price will vary. This means that if coupon is 4% but an investor has paid £120 for a £100 unit, they won't be getting a 4% return on their investment of £120. The fact that only £100 will be repaid at redemption also needs to be factored in.

The total return from a gilt will be:

The interest payments that will be received plus or minus the gain or loss resulting from the difference between purchase and redemption price.

These are the prices of two gilts in November 2020

Redemption date	Coupon	Market Price
7 September 2034	4.5%	£152.07
7 December 2055	4.25%	£200.85

In this table two things are obvious. The market price of all of them is higher than the £100 nominal redemption value. That means that anyone buying them today will make a capital loss if they are held to redemption. This reflects current low interest rates.

From this information it's possible to calculate two key returns:

- Daily or running yield
- Gross Yield to Redemption. This is also referred to as Yield to Redemption. (YTR)

Before going on you need to be aware of the distinction between **clean price** and **dirty price**.

The September 2034 issue will pay interest on September 7 and March 7. If it is sold on 7 July four months interest will have accumulated, about £1.50 for each £100. The buyer must pay this to the seller in addition to the market price. The price without the accumulated interest is the clean price. The price with the interest is the dirty price. In the table market price refers to the clean price.
This can be expressed in percentage terms by calculating the **Gross Yield to Redemption (GYR)**. It is sometimes referred to as **Yield to Redemption or YTR**. It is the key measure in assessing whether a Gilt on the secondary market offers reasonable value.

The formula for **running yield** is:

Coupon/Clean Price x 100

<u>September 2034</u>

4.5/£152.07 x 100 = 2.96%

<u>December 2055</u>

4.25/£200.85 x 100 =2.12%

If the clean price is greater than £100 the running yield will always be lower than the coupon.

Running yield is not that useful a measure as it doesn't take into account the gain or loss that will be made if it is held to redemption. Yield to redemption does that. There are different ways to calculate this but for the exam the simplified or Japanese method will be used.

Taking the 2034 gilt the running yield has been calculated as 2.96% and this is the starting point in the calculation

If held to redemption there will be a capital loss of £52.07. Assuming there are exactly 14 years to redemption this is an average loss of £3.72 a year.

This is then divided by the clean price and multiplied by 100. Therefore:

£3.72/£152.07 x 100 = 2.45%

This is then subtracted from the running yield so 2.96% less 2.45% = 0.51%.

The full formula for YTR when the clean price is higher than £100 is:

$$\text{Running yield LESS } \frac{\text{Capital loss/number of years to redemption}}{\text{Clean Price}} \times 100$$

In practice you should tackle the calculation in this order:

1. Calculate running yield
2. Calculate capital loss if held to redemption
3. Divide this by number of complete years to redemption.
4. Divide this by the clean price and multiply by 100 to get a percentage.
5. Subtract this from the running yield.

TIP This will always be tested in R02.

The relationship between market price and yield to redemption.

The following table shows the historic price and yield for the Treasury 2038 4.75%.

December 2008	£112.53	4.02%
June 2017	£151.76	1.81%
November 2019	£162.44	1.11%
June 2020	£172.10	0.70%

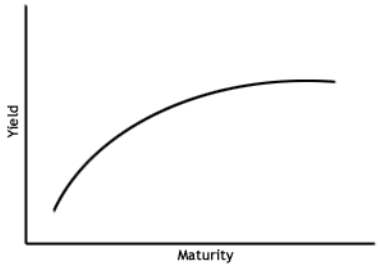
The most obvious point is that prices have increased and yields have fallen. This is simply mathematics. If the price rises the yield falls and the yield falls. If the price falls the yield increases.

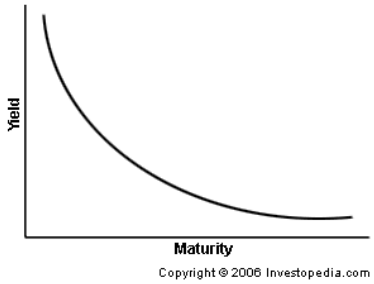
Both the price and yield are set by the market. Increased demand for a gilt pushes up the price and lowers the yield. A low demand (more investors wanting to sell) will have the opposite effect.

Yield Curves.

Under most circumstances the longer the term of a loan the higher the rate the market will demand. Bonds have different remaining terms and the relationship between YTR and term to redemption can be plotted on graphs as follows.

In the first, the YTR increases as the term increases. This is called a **normal distribution curve** as we would expect investors to demand a higher return the longer the money is invested. In the second one the yield falls as the term increases. This is called a **reverse curve**.





The standard explanation for the yield curve inverting is that investors are more concerned about short term rather long term inflation. The full explanation is a little more complicated!

For the curve to level or invert, yields on the short term (the left hand side) must rise and long term yields (the right hand side) must fall.

If short term yields rise then prices must have fallen which in turn must have been caused by a reduced demand. This is likely to be because interest rates have risen (or investors believe they are about to rise) and the coupon becomes less attractive.

If long term yields fall then the price must have risen. Buying gilts enables investors to lock into future returns. This makes them attractive if investors believe that returns on equities are going to fall. This will push up demand which in turn increases prices and pushes down the yield.

An inverse yield curve has been cited as an early warning indicator of a future recession. It can also show that the market does not believe that inflation is unlikely to rise in the future.

The yields on a selection of Gilts (June 2020) are as follows

September 2024	0.037%
September 2034	0.058%
December 2042	0.761%
December 2049	0.78%
July 2065	0.693%

There is a slight increase as the term gets longer although it dips for the 2065 maturity. Ultra long gilts are popular with final salary pension funds and demand for it may have increased the price

The workings of the Bond Markets

Bond markets have a primary and secondary market function:

- To enable governments and companies to borrow money for a fixed period at a fixed rate. (Primary market)
- To enable investors to buy and sell these debts (Secondary market)

Issuing new Gilts

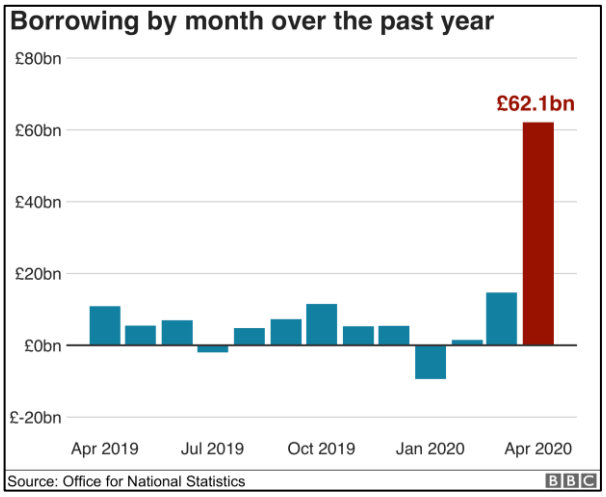
The issue of gilts is managed by the **Debt Management Office. (DMO)** Most new issues are carried out by auction.

The DMO on the instructions from the Treasury will issue a new Gilt and invite institutions called **Gilt Edged Market Makers (GEMM)** to bid. They can offer more or less than £100 for each £100 of debt being offered.

Note that if each pays more than £100 their return would be less than 2%. This illustrates that it is the market that sets the rate of interest the Government must pay. Individuals can buy new issues but this must be done through a GEMM.

The impact of the Coronavirus pandemic

The UK government had to increase its issues of Gilts substantially in April 2020 to fund additional borrowing in the wake of the coronavirus pandemic as can be seen in this chart.



If an individual wanted to increase their borrowings by this amount it would a reasonable assumption that lenders would be reluctant to offer more credit and if they did they would want a higher rate. The government managed to sell all this debt at a record low rate.

Indeed, in May 2020 the DMO sold £3.8 bn of a three year gilt at a negative yield of 0.003% which means if held to maturity you would get back less than the purchase price

What's happening in the secondary market?

Here is a selection of YTR of two gilts as at May 1 2019 compared with the similar figures for June 2020

		May 1 2019		June 9 2020	
Redemption date	Coupon	Price	YTR	Price	YTR
7 December 2038	4.75%	£153.46	1.57%	£172.10	0.618%
7 December 2042	4.5%	£155.84	1.63%	£179.14	0.70%

Do not try to confirm the YTR from the above data as they take account of the actual time rather than actual years.

So why are investors willing to accept such low yields?

- In uncertain times (which we are currently in) there is a "flight to safety" and UK gilts carry a virtually nil default risk
- Holders of the 2038 gilt would still receive £4,750 for every nominal £10,000 held so it does give investors a secure income.
- Since the 2008 banking crisis, banks, pension funds and insurance companies have increased their holdings of UK gilts as they are seen as secure assets so again demand has increased pushing up prices and reducing yields.
- The other main factor has been the Government's policy of quantitative easing.

Quantitative Easing

The Bank of England is prohibited from bidding in a primary gilt auction but can buy them in the secondary market using **Quantitative Easing** which works as follows:

- The Government sanctions the Bank of England to create money.
- It uses this to buy up existing gilts and corporate bonds from banks and other financial institutions.
- This extra demand increases prices and lowers yields.
- The aim is to increase liquidity of institutions enabling to lend more money to business or to invest money in further assets.

The Bank buys £1 million of bonds from a pension fund. The fund now has £1 million in money and rather than hold on to it might invest in shares to get a higher return.

In March 2020 the Bank created £200 billion of new QE with further measures planned. A consequence of QE is that the Bank of England is becoming the largest holder of UK gilts.

The 10 year Bond yield

Bond yield is important to all governments because it shows the rate at which it can borrow from the capital markets. The usual benchmark is a 10 year bond. In May 2019 and June 2020 the comparative rates were as follows (source Bloomberg):

	May 2019	June 2020
UK	1.18%	0.35%
Japan	-0.04%	0.4%
USA	2.48%	0.9%
Greece	3.34%	1.32%
Germany	-0.2%	-0.28%

Note that the yield for Germany is negative. Investors are effectively paying the government to lend them money!

Bonds for investors

- Gilts can be seen as low risk investments in that the Government cannot default. Someone who invests £10,000 in a new Gilt knows that they will get £10,000 back at maturity and a guaranteed income in the meantime.
- Buyers in the secondary market know the return they will get at the outset.
- They produce a fixed income.
- They are exposed to inflation risk. The income cannot increase so will fall in real terms. In addition you will only get back the original investment and will almost certainly be less in real terms than at the start.
- Gilts/CBs can be traded and this can result in a loss or gain on the original investment.
- Corporate Bonds are also exposed to the risk that the company can default.
- Gilts/CBs will be less volatile than shares because they have an underlying value. That is the capital repayment at maturity.

Indexed Link Gilts

- The previous section described conventional fixed interest. The Government also issues **Indexed Linked Gilts**
- These offer a coupon rate plus RPI. This means each six monthly payment will vary depending on the rate of inflation. This is a complicated calculation but for the exam you should be aware that for gilts issued before 2005 the RPI used is the figure 8 months before the payment date. For gilts issued since 2005 the RPI used is set 3 months before the income distribution is made. The maturity value is also linked to RPI between issue and redemption date.

Corporate Bonds

These are issued by companies as a way of raising capital. As with Gilts, bondholders have a right to receive coupon plus return of their capital at the end of the term. Unlike the UK Government companies can fail so there is default risk. As a consequence:

- Coupons are generally higher than Gilts and the greater the risk of default the higher the coupon has to be.
- Terms are generally shorter with the maximum being usually 10 years.

Historically in the UK issuers of CBS have tended to go to the institutional market such as banks and insurance companies. Recently there have been issues aimed primarily at the individual investor.

Bonds can be **secured** or **unsecured**. Secured bonds are a lower risk than unsecured since if the company defaults, the secured asset can be taken

Secured bonds are often referred to as **Debentures**. They can have a fixed charge, that is there is a specific asset, or a floating charge where it is held over any unsecured assets of the borrower

Convertible loan stock is a bond which offers the chance to convert to shares. This will probably mean that it trades at a higher price than an ordinary loan stock.

Permanent Interest Bearing shares (PIBS) are a form of corporate bond issued by a building society. If the BS converted to a PLC, they come **Perpetual Subordinated Bonds (PSBS)** Both are undated and the borrower is under no obligation to repay the debt which means they are most susceptible to changes in interest rates. They rank behind other depositors and creditors and do not qualify for compensation under FSCS if the bank goes into liquidation

Tax

- Interest is classed as **savings income**. Gilt income and corporate bond income is paid gross.
- No capital gains tax is payable on Gilts or qualifying Corporate Bonds
- Individual investors can use the Personal Savings Allowance and the 0% starting rate.

Mini Bonds

A recent development has been the introduction of mini bonds. The characteristics of these are:

- They tend to be issued by smaller companies.
- They are offered directly to the public
- They are not tradable on the stock market.

From the borrower's point of view they are easier to launch than a conventional corporate bond. Investors may be attracted by a high coupon but as they are not tradeable they are locked in until the bond matures.

A number of these bonds have defaulted and investors have lost their entire investment. They fall into something of a regulatory grey area as they are not regulated products although the financial institution that set up the bond for the borrower may have been FCA authorised. Like other CBs there is no compensation under the FSCS. If an FCA authorised firm recommended the bond to a client there may be a valid complaint if it can be shown that the product was unsuitable for the client's needs.

Non UK Sovereign Debt.

All Governments issue bonds. As we have seen these may offer higher yields than the UK but all are subject to greater risk.

If the currency is in anything other than UK £ then there is currency risk which may work for or against the investor.

There is also default risk. If a country issues bonds in its own currency it can, if all else fails, print or create more money to pay off the bond holders. This though would lead to inflation and devalue the real value of the bond.

If it borrows in another currency such as the US Dollar or doesn't have its own currency as in the Eurozone then default is possible.

Whilst countries can default they cannot go into liquidation. If a company defaults the bondholders may get something back when all the assets are liquidated. There is no such provision for sovereign debt holders as they cannot take over any of the country's assets. Nor can they take over the running of the country.

Investors and analysts tend to compare the YTR of different government bonds that are repayable in 10 years' time.