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INVESTING FOR INCOME

GROW YOUR INCOME THROUGH SMARTER INVESTING

DAVID STEVENSON

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The Financial Times Guide to Investing for Income

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Grow your income through smarter investing

David Stevenson

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To Vanessa, Rebecca, Zac and Jake!

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3

Bonds – government and corporate

The basics

The wide and wonderful world of bonds represents a kind of *terra incognita* for most private investors. In popular lore bond investing is the preserve of the rich and wealthy investment banker, sitting in his gilt-edged tower lording it over the rest of the planet. When bond investors start asking awkward questions of governments and their credit worthiness, the term 'bond vigilante' is usually invoked and it's instructive that nearly every 'bond vigilante' this author has ever interviewed is a professional, institutional fund manager or banker.

By contrast over in the world of shares – otherwise known as equities, and explored in the next chapter – it's automatically assumed that private investors have a big role to play. Yet this perception of equities as being easy for the layperson to understand in contrast to bonds is almost certainly false. In many respects bonds are a simpler idea to grasp than equities or other complex financial instruments and can provide a steady, long-term secure income.

In fact building a portfolio of diversified bonds – be they issued by governments or corporations – as well as equities is an eminently sensible and practical idea for both cautious and adventurous investors. In this chapter we'll look at how a bond is structured and also analyse the various types of bonds issued, with issuers as diverse as global superpowers and small companies. Later on in this chapter we'll also look at how to trade bonds, before concluding with some simple trading strategies.

Let's start this adventure into the world of bonds with a simple definition of what constitutes a bond. In essence a bond is a very simple creation. A bond is nothing more than a loan structured as an IOU and issued by a borrower.

Imagine if you lent say £10,000 to the government or a company and they make a payment comprised of interest which works out at 5% per annum. That means as the investor who makes the loan you receive a yield (or coupon) that's equivalent to £500 per annum. The crucial twist is the structure of the loan – that IOU. That IOU is structured as a note or bond, with various terms written on the piece of paper or via the electronic record, i.e. the name of the borrower, the interest rate expressed as a coupon, the face value of the note or bond and, crucially, the duration of the loan (this represents the bond's maturity).

Later on in this chapter we'll explore these simple concepts in much greater depth but in summary a bond is just a piece of paper that constitutes an IOU issued to the investor who made the loan to the borrower. Crucially that piece of paper, electronic record or note – the bond itself – can be held until the end of its 'life' (called redemption) or traded to another party on a market of some form, at a given price well before the bond is due to redeem or mature.

This simplicity of construction – easily tradeable paper with clear features, understood by all as part of a contract between a lender and borrower – has allowed a massive global market to emerge incorporating a diverse range of buyers ranging from pension fund managers through to a much smaller number of private investors. This market has also enabled investors to construct diversified portfolios of different types of bonds, issued by different borrowers, over different time frames and with different interest rates or yields.

Before we go any further, it's worth noting a couple of key features from our simplistic IOU-based description. The most immediately obvious one is the price attached to that piece of paper which constitutes the bond. The principal – let us say you lent out £10,000 – might be split up into lots of smaller units each with their own initial, par value: for example, if you lent £10,000 and that's been broken down into 10,000 £1 notes or bonds, each bond will be issued at par or valued at £1 per bond.

Crucially you should receive back the principal per unit – that par of £1 – when the bond matures at the end of the period agreed between the lender and the borrower. There is of course an obvious risk that your borrower

defaults, in which case you might get back nothing. This potential for default is crucial – many investors assume that all bonds are somehow risk free, unlike supposedly riskier equities, and there are indeed some bonds issued by the likes of the UK and the US governments that are (almost) risk free. But note the use of that weasel word 'almost' because there is a tiny chance that in the future a government might have to default on that payment. That risk of potential default is tiny with the UK or US governments but many bonds issued by corporations can and do default – bonds can be a risky investment.

many bonds issued by corporations can and do default

To summarise, in this simple example we've already encountered some key terms:

- **Bonds** are in effect IOUs – loans – structured as a form of note.
- The **issuers** of these bonds can vary enormously. If you buy a corporate bond, you're lending a private business or even a large corporation your money. If you buy a government bond (also known as a **gilt**), you're lending to the government.
- A bond pays interest periodically (usually either annually or every six months) and repays the principal in the future (the **redemption date**).
- There's an issue price, called the **par** (or the **face value**).
- Each bond also has an annual interest rate expressed as a percentage, and known as the **coupon**.
- The bond's issuer will also announce a timeframe or **duration** for the loan – this will include an end date when they will repay (hopefully) the principal at **par value**.

One last point – as we've already noted there's always some element of risk. The biggest risk is that our borrower defaults, i.e. doesn't pay back the principal. And all things being equal, it's obvious that that risk (chance of default) grows over time, i.e. a loan over five years is likely to be less risky than a loan over 50 years, unless of course it's the UK or US government, neither of which have ever defaulted on any payments! This concept of risk increasing over time needs to be reflected somehow in the interest rate charged or income: in the vast majority of cases an issuer will pay a higher interest rate for a long-term bond. An investor therefore will potentially earn greater returns on longer-term bonds, but in exchange for that return, the investor incurs additional risk.

In detail: price and duration

Now that we've surmised some basics about bonds it's time to dig a little deeper and try to establish some of the internal mechanics of the bond industry. We'll start with perhaps the most important feature of a bond for a purchaser, namely how we arrive at the **price** of a bond. This involves understanding how the forces of supply and demand work together to help establish a price for a bond in the wider marketplace. Three factors stand out:

- the interest or the coupon rate
- the date in the future when the bond matures, also known as the term to maturity
- the interest rate or yield to maturity.

The first two factors have already been explained in some detail but the last – the interest rate or yield to maturity – needs some explaining. Lurking behind this term is a simple idea – that the price of a bond may change as it reacts to different external influences, such as the prevailing interest rate set by the government.

Imagine that a company issues a bond valued at £100 paying the prevailing interest rate at the time (5%) plus an additional 2% for the extra risk of investing in this private enterprise. Thus our interest rate or yield at issue is 7% (£7 per annum per £100 bond issued), in this case paid as an annual coupon until the bond matures in ten years' time. Let's imagine that one year later interest rates suddenly collapse to just 1%. The attractions of our bond paying 7% are now obvious to all and sundry – a 6% spread between the prevailing interest rate and our bond. That massive spread lures many usually risk averse investors to take a punt on our riskier private company, which in turn helps push the price per bond up beyond its initial £100.

Given the higher level of risk – already reflected by the higher initial yield – investors decide that they'd be willing to buy the bonds for as much as £200 per bond. At this £200 purchase price level our £7 annual coupon translates to an annual yield of 3.5% if the investor bought the bond for £200 . But there's a problem: investors aren't stupid and they know perfectly well that in nine years they'll only get back £100 for each bond which actually cost them £200 to buy on the secondary market. Suddenly there's a discrepancy between the yield at issuance (7%), the yield at the current market price (3.5%), and yield based on what they'll get back when the bond is redeemed in nine years' time, called the yield to maturity. Each yield will be different.

From this very simple example one can begin to see that there are in fact a great many variables that combine together to affect both the pricing of a bond and the various different yields, with prevailing interest rates being one, alongside both the risk of the issuer and the duration of the bond. Crucially we can see that a bond's yield *declines* as the price paid to buy the bond *increases*.

But how do we know how much a bond's price will change as wider interest rates change? To work out how much a bond's price will move when interest rates change, bond investors uses a measure called **duration**. This widely used measure is actually defined as the weighted average of the present value of a bond's cash flows, a rather technical term to describe a series of regular coupon/interest payments followed by the final redemption payment at maturity when the bond matures and the nominal or par value is repaid. Crucially this duration measure will also be affected by the size of the regular coupon payments and the bond's face value.

The actual equation used to work out this duration value is:

$$D = \sum_{i=1}^{n} \frac{P(i)t(i)}{V}$$

where:

- i indexes the cash flows
- $P(i)$ is the present value of the ith cash payment from an asset
- $t(i)$ is the time in years until the ith payment will be received
- V is the present value of all cash payments from the asset until maturity.

Each 'duration' measure – one number, expressed in years – is unique to that bond and it is, in effect, a risk measure that lets us compare bonds with different terms, coupons and par values. In effect this duration measure tells us the approximate change in price that any given bond will experience in the event of a 1% change in interest rates by the central bank or government. To understand how this works imagine that interest rates fall by 1%, causing yields on every bond in the market to fall by the same amount. In that event, the price of a bond with duration of two years will rise 2% and the price of a five-year duration bond will rise 5%. Because interest rates directly affect bond yields, the longer a bond's duration, the more sensitive its price is to changes in interest rates.

In detail: the yield

In our previous example of a simple £100 corporate bond we can see how the price paid on the open market after issue has varied enormously (influenced in our example by prevailing interest rates) as did the different yields on offer (the initial yield of 7% versus the current or running yield of 3.5% as the bond hits £200 in value). Many investors will buy a bond when it's issued and hold it through to maturity. Hopefully if the bond pays off in full, their issue price and redemption price will not differ, nor will the net effective yield (the income stream) over the term of the investment. In this case they paid £100 for each bond and received £100 per bond at maturity and all the way through the investment term they received their £7 per annum coupon, or £70 in total.

But some investors buy bonds on the open market – the secondary market – *after* issue and that price may vary enormously (in our example hitting £200 per bond). The cause of these price movements – and yield variations – is dictated by a bundle of factors (prevailing interest rates, duration, risk) summed up in the concept of supply and demand.

To understand these myriad interactions let's assume a decline in interest rates – in this situation a bond paying a high and safe fixed rate of interest every year will become increasingly in demand from investors which will in turn have the effect of pushing up the share price.

Equally, as interest rates rise, investors – all other things being equal – will find this fixed income stream less attractive and as a consequence the market price of that bond will fall. This relationship between price and yield is key to understanding what powers the market for fixed income securities or bonds.

this relationship between price and yield is key

The other key insight is to look on a bond as a promise which is in turn based around cash payments – you pay out cash up front to buy this bond and then over the course of the bond's life the investor will receive several cash payments plus a final cash payment at maturity. Those payments are all fixed and known in advance unlike the dividends received from holding shares, which are unpredictable and liable to termination in a sudden economic downturn. In this respect, bonds differ fundamentally from equities, in that the future cashflows are known. Combine this knowledge of those future cashflows alongside the duration and the current market price and we can identify a number of different yields on offer:

- **The simple yield**. This is probably the best 'back of an envelope' guide to the returns available on a single bond and is calculated using the following formula:

  Annual coupon/market price + (par-market price)/Market price/life × 100

- In our example, if we move through time and find ourselves in the ninth year, we might find that the bond has fallen in price to £80 per bond yet is still paying out the £7 per annum coupon. If an investor bought this bond for £80 and held it until maturity (now in just a year's time) they'd receive the final £7 annual coupon but in addition they'd also benefit from an extra £20 in profit as the bond matures at par value at the end of the ten-year term, i.e. a total profit of £27 against a purchase price of £80 or a simple yield of 33% in total for the final year.
- **The income or running yield**. In our example from above, remember how the £100 bond that pays out £7 per year shot up to £200 in value at the end of year one as interest rates fell to 1%. What's the yield at the end of the first year for the investor who paid £200 to buy the bond? The equation for working out what's called the income or running yield is:

$$\frac{\text{issue price or par}}{\text{purchase price}} \times \text{coupon} = \text{running yield}$$

- So in our example this looks like 100/200 × 7 = 3.5%. This running yield doesn't take into account any profit (or loss) through holding the bond to redemption, and simply assumes that the investor will be able to sell the bond at the same price that they purchased it for on the open market.
- Finally we come to perhaps the most important and widely used measure of yield namely the **Yield to Maturity (YTM).** This is effectively the internal 'rate of return' on the investment, allowing for each and every cash flow paid and reflects all of the interest payments from the time of purchase until maturity, including interest on interest. Equally important, it also includes any appreciation or depreciation in the capital price of the bond. This yield will change as the purchase price changes although the cash flows from the gilt are fixed: i.e. as prices rise you are effectively paying more for a series of fixed cash flows so the yield falls, and if prices fall the yield rises. In summary the redemption yield reflects the net present value of the future flow of interest and includes the effect of the capital gain or loss from holding the gilt until maturity, at a given price. The formula here is:

$$c(1 + r)^{-1} + c(1 + r)^{-2} + \ldots + c(1 + r)^{-Y} + B(1 + r)^{-Y} = P$$

where c = annual coupon payment (in pounds, not a per cent); Y = number of years to maturity; B = par value; P = purchase price. (It's worth noting that YTMs can be worked out using the YIELDMAT function on Microsoft Excel.) By examining yields to maturity, investors can compare bonds with varying characteristics, such as different maturities, coupon rates or credit quality.

Trade that bond!

The global market for bonds is enormous and growing all the time, with every permutation and variable closely analysed by an army of bonds analysts. When listed on the open, secondary market, a bond's **price** and **yield** determine its value. The most obvious relationship here is that a bond's price always moves in the opposite direction to its yield. Also the previously remarked upon relationship with wider interest rates is crucial, i.e. when central bank determined interest rates fall, 'older' bonds of all types become more valuable because they are sold in a higher interest rate environment and therefore have higher income coupons. In effect investors who own these older coupons can charge a 'premium' to sell them in the open market.

These relationships are easily expressed in the price and yield – both of which are reported in all coverage of the bond markets. Take a newspaper and look at its bonds section and you'll see a range of numbers quoted including the price to buy the bond, its yield and probably some mention of its duration. But these market quotes might also contain some slightly more curious items of information – you may notice for instance that prices include fractions like $\frac{1}{32}$ as the last digits, not decimals.

To understand how these bonds are 'quoted' let's assume you see a government bond or gilt quoted at '97' in the market – this means the price is £970 for every £1,000 (or £100 or £1 depending on the par) of face value and the bond is said to be trading at a 'discount'. If the bond is trading at '110', it costs £1,100 for every £1,000 of face value and the bond is said to be trading at a 'premium'. If the bond is trading at 100, it costs £1,000 for every £1,000 of face value and is said to be trading at 'par'. You'll also see columns in a newspaper and on the internet featuring YTM which, as we have seen, means the yield to maturity, plus there'll be a bunch of abbreviations including 'm' which means matured bonds or 'cld' means called (i.e. redeemed and bought back by the issuer). There's also some specific data which relates to government bonds or gilts as they are also called

– remember that interest on gilts accrues on a daily basis between one coupon (or dividend) date and the next. You'll also see something mentioned called ex-dividend dates – interest payments are usually made to the person who is the registered holder of a gilt seven business days before the coupon payment date (ten business days for 31/2% War Loan) unless alternative instructions have been given to the Registrar. These periods are known as the ex-dividend periods.

Probably the best source for information on bonds is online, on the internet at a British-based website called www.bondscape.net. This is actually the public facing part of a bonds trading network run by investment bank Barclays Capital and Winterflood Securities, a market making firm. Underneath this platform sits a trading engine that's used by many of the UK's leading stockbrokers to buy bonds on the open markets but this website isn't only a trading site – it also features excellent information on the structure of bonds by an analyst called Mark Glowrey, as well as a button that calls up all the closing market prices for major bond issues on the platform (see Figure 3.1).

Figure 3.1 The Bondscape homepage

Source: www.bondscape.net

In Figure 3.2 we've shown this closing prices page – on the Bondscape platform there are literally hundreds of different bonds and government gilts. You'll also see from the graphic that a range of information is featured, including:

- epic – this is the ticker or identification initials given to the bond by market makes
- description – the name of the bond generally including the issuer
- coupon – this tells you the initial interest rate or coupon paid at issue
- maturity – how many years the bond has left, based on the maturity date
- bid/ask – the purchase/sale price
- change – change on the previous day
- income yield – the running yield
- gross redemption yield – the yield to maturity.

Bondscape.net - Daily Pricing - Mozilla Firefox

http://www.bondscape.net/feed.html

bondscape.net close X

Please scroll down to view Euro Sterling closing prices

Gilt closing prices for 11-Aug-2010

epic	description	coupon	maturity	bid	ask	change	income yield	gross redemption yield
CN4	Uk Gilt Consols	4.0	Perpetual	80.95	83.75	-0.10	4.86	4.86 *
WAR	Uk Gilt War Loan Stk	3.5	Perpetual	74.69	77.64	-0.07	4.60	4.60 *
CV3H	Uk Gilt Conversion Stk	3.5	Perpetual	74.40	77.38	-0.09	4.61	4.61 *
T3UD	Uk Gilt Treasury Stk	3.0	Perpetual	62.50	65.24	-0.05	4.70	4.70 *
CN2H	Uk Gilt Consols	2.5	Perpetual	53.40	55.24	0.01	4.60	4.63 *
T2H	Uk Gilt Treasury Stk	2.5	Perpetual	54.20	56.30	-0.01	4.52	4.52 *
T6Q	Uk Gilt Treasury Stk	6.25	25-Nov-2010	101.55	101.71	-0.02	6.15	0.52
TR11	Uk Gilt Treasury Stk	4.25	07-Mar-2011	102.06	102.15	-0.01	4.16	0.55
CV11	Uk Gilt Conversion Stk	9.0	12-Jul-2011	107.56	107.66	-0.00	8.36	0.65
T11	Uk Gilt Treasury Stk	3.25	07-Dec-2011	103.35	103.45	0.02	3.14	0.66
T512	Uk Gilt Treasury Stk	5.0	07-Mar-2012	106.62	106.71	0.03	4.69	0.72
TR12	Uk Gilt Treasury Stk	5.25	07-Jun-2012	107.92	108.01	0.04	4.86	0.83
TY12	Uk Gilt Treasury Stk	9.0	06-Aug-2012	114.50	116.90	-0.33	7.78	0.99
TR13	Uk Gilt Treasury Stk	4.5	07-Mar-2013	108.63	108.70	0.18	4.14	1.07
T813	Uk Gilt Treasury Stk	8.0	27-Sep-2013	120.64	120.77	0.27	6.63	1.23
TR14	Uk Gilt Treasury Stk	2.25	07-Mar-2014	102.74	102.84	0.38	2.19	1.45
T514	Uk Gilt Treasury Stk	5.0	07-Sep-2014	112.87	113.15	0.46	4.42	1.68
T15	Uk Gilt Treasury Stk	7.75	26-Jan-2015	109.35	110.65	0.02	7.05	0.82
T4T	Uk Gilt Treasury Stk	4.75	07-Sep-2015	113.28	113.37	0.62	4.19	1.98
TY8	Uk Gilt Treasury Stk	8.0	07-Dec-2015	129.91	130.00	0.70	6.16	2.03
T16	Uk Gilt Treasury Stk	4.0	07-Sep-2016	109.34	109.45	0.71	3.66	2.33
TR17	Uk Gilt Treasury Stk	8.75	25-Aug-2017	139.99	140.12	0.88	6.25	2.50
T18	Uk Gilt Treasury Stk	5.0	07-Mar-2018	115.33	115.40	0.78	4.33	2.74
T19	Uk Gilt Treasury Stk	4.5	07-Mar-2019	111.28	111.35	0.82	4.04	2.99
TR19	Uk Gilt Treasury Stk	3.75	07-Sep-2019	105.11	105.21	0.83	3.57	3.09
TS20	Uk Gilt Treasury Stk	4.75	07-Mar-2020	113.13	113.21	0.94	4.20	3.15
TR21	Uk Gilt Treasury Stk	8.0	07-Jun-2021	143.76	143.81	1.15	5.56	3.18
TR22	Uk Gilt Treasury Stk	4.0	07-Mar-2022	104.99	105.05	0.77	3.81	3.47
TR25	Uk Gilt Treasury Stk	5.0	07-Mar-2025	113.75	113.87	0.71	4.39	3.76

Figure 3.2 The Bondscape closing prices page

Sources: www.bondscape.net

HOW DO BONDS REACT TO CHANGES IN INTEREST RATES?

In our earlier example of a £100 bond shooting up in value to £200 as interest rates fall, we established that the price of a bond is hugely affected by the change in interest rates. This impact is based around three key variables:

- the maturity of the bond
- the coupon rate
- the prevailing interest rates at the time of an interest rate change.

Unsurprisingly economists have got to work on the analysis of these variables and five principles have emerged:

1. Bond prices move in the opposite direction to interest rates.
2. Bonds with longer dates to maturity suffer greater percentage price changes for a given change in interest rates.
3. The price sensitivity of bonds increases with maturity, but it increases at a decreasing rate.
4. Bonds with lower coupon rates experience greater percentage price changes for a given change in interest rates.
5. For a given bond, the absolute price increase caused by a fall in bond yields will exceed the price decrease caused by an increase in bond yields of the same magnitude.

The yield curve

In the next section we'll look in detail at the huge variety of issuers and bond structures available to the private investor, but before we move away from the basics of bonds let's explore one last, crucial, concept namely the **yield curve**. Later in this chapter we'll look closely at government bonds or securities (also known as gilts) and discover that there's a massive range of 'maturities' on offer, ranging from short-dated three-month government bills, through to 30–50 year bonds, plus a rare breed of bonds called undated or 'perpetual' bonds with no final maturity.

It's important to understand that bonds of different maturities will boast different yields, produced in part by the markets take on current and future interest rates. Generally speaking investors will want higher yields – greater income payments or coupons expressed as an interest yield – for longer-dated debts. If we show this relationship in a graph it'll probably look a little like Figure 3.3 which shows the 'curve' for gilts in the middle of 2010 – the line in this graph from www.bloomberg.com begins with the *spot interest rate*, which is the rate for the shortest maturity,

bonds of different maturities will boast different yields

and extends out in time, typically to 30 years or even more. A yield curve can be plotted for any bond – be it government or corporate – and simply demonstrates the link between bond interest rates and bond maturities.

Figure 3.3 shows that as the term or maturity of the loan increases, the yield paid increases, although this starts to flatten out as we approach bonds with maturities of more than 20 years. Very long-dated bonds, and especially government bonds, are hugely popular with big pension funds who snap them up to match against their long-term liabilities to pensioners. Crucially if investors expect interest rates to rise in the future, the price of longer-dated bonds will fall, pushing up yields at the long end of the curve. This is known as a 'steepening' of the yield curve.

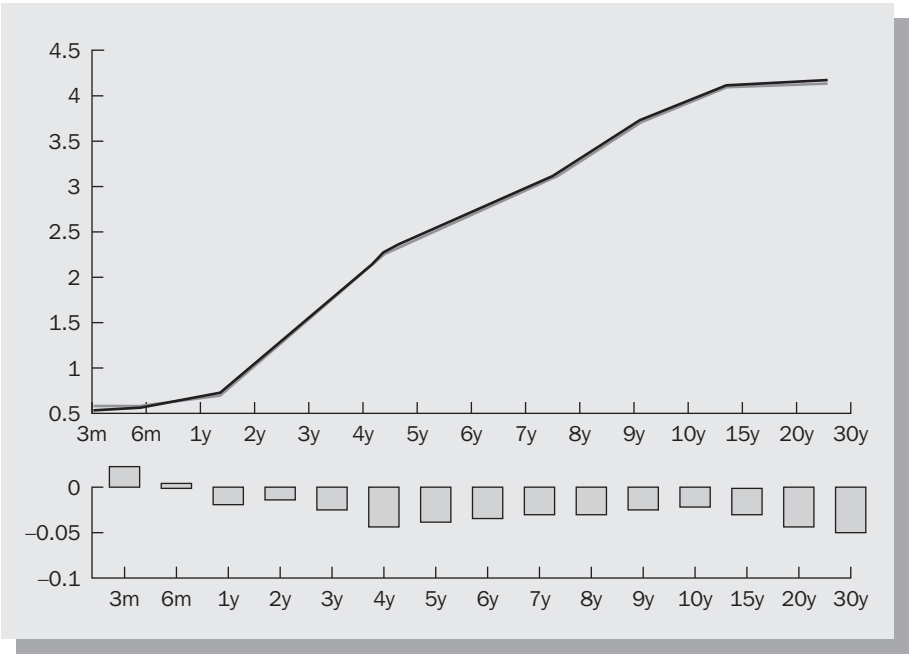

Figure 3.3 UK yield curve Summer 2010

Source: Bloomberg Finance LP

Sometimes though the belief that interest rates are going to fall, sharply, can produce another less common phenomena expressed in Figure 3.4 which is called an 'inverse' yield curve – in this situation bond investors race to buy fixed rates at the long end of the curve pushing yields down below current money market rates.

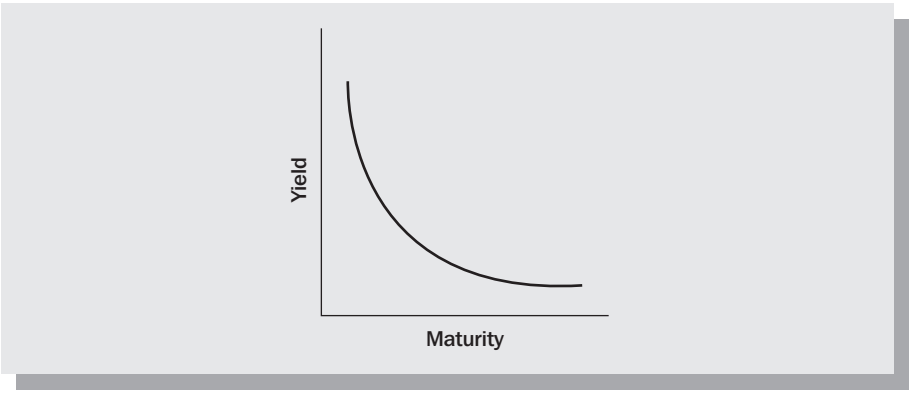

Figure 3.4 Yield curve inversion

In most markets the yield curve for government securities is normal – as in Figure 3.3 – but an inverse yield curve is eagerly seized upon by bears and macro-economists as a sign of impending recession. According to a report on the curve by the massive US bond investor PIMCO:

> *Historically, the slope of the yield curve has been a good leading indicator of economic activity. Because the curve can summarize where investors think interest rates are headed in the future, it can indicate their expectations for the economy. A sharply upward sloping, or steep yield curve, has often preceded an economic upturn. The assumption behind a steep yield curve is interest rates will begin to rise significantly in the future. Investors demand more yield as maturity extends if they expect rapid economic growth because of the associated risks of higher inflation and higher interest rates, which can both hurt bond returns.*
>
> (http://canada.pimco.com/LeftNav/Bond+Basics/2007/Yield+Curve+Basics.htm)

Unsurprisingly the yield curve has become an important tool of analysis for bond market analysts. Again according to PIMCO, the yield curve is useful as an:

> *impressive record as a leading indicator of economic conditions, alerting investors to an imminent recession or signaling an economic upturn, as noted above. Second, the yield curve can be used as a benchmark for pricing many other fixed income securities. Because U.S. Treasury bonds have no perceived credit risk, most fixed-income securities, which do entail credit risk, are priced to yield more than Treasury bonds. For example, a three-year, high-quality corporate bond could be priced to yield 0.50%, or 50 basis points, more than the three-year Treasury bond. A three-year, high-yield bond could be valued 3% more than the comparable Treasury bond, or 300 basis points 'over the curve'.*
>
> (http://canada.pimco.com/LeftNav/Bond+Basics/2007/Yield+Curve+Basics.htm)

Different types of bonds

As we've already noted above, one of the great peculiarities of investing is that so many investors regard bonds as inherently more complex than equities – hopefully our explanation of some of the basic terms and structures used should help to dispel this myth. Bonds are almost always uniform in construction – and the measures used to analyse them are also standardised across all the different types of bonds.

Where confusion can creep in is with regards to the different organisations that issue bonds. An enormous variety of institutions issue bonds (plus a tiny number of famous individuals such as rock star David Bowie who boasts his own Bowie bonds, with interest paid from the royalties earned from his songs!). Most investors in bonds will probably end up investing in one or all of the following issuers.

Gilts or government bonds

These are issued by HM Treasury and are rated as AAA in risk terms (more on these ratings below) by all the major credit ratings agencies and can be viewed as effectively risk-free from the point of view of default – as noted above neither the UK nor US government has ever defaulted or missed a payment on their bonds.

Crucially the notes or bonds issued by the government to fund its public services will fluctuate from day to day in the market, depending on the outlook for interest rates. And it's not just the UK government that issues bonds – nearly every major government in the developed world currently runs a deficit and needs to borrow via bonds on the global markets although it's worth noting that the US, Japan and Europe (primarily the UK, Germany, France, Italy and Spain) dominate the government bond market, accounting for more than 84% of all government bonds outstanding!

Within this broad category of government bonds you may also encounter two different types of bond. The most popular bonds consist of **conventional gilts** – these represent the largest part of the gilt portfolio (78% by 2010) and are in effect a guarantee by the government to pay the holder a fixed cash interest payment (half of the coupon) every six months until the bond matures. On maturity the holder receives the final coupon payment and the nominal capital amount invested. The prices of conventional gilts are quoted in terms of £100 nominal or par. A 'conventional' gilt is denoted by its annual coupon rate and maturity (e.g. 5% Treasury Stock 2014) – with that duration varying between a few months and as much as 50 years! The range of maturities is usually broken down into three main groups:

- shorts: 1–7 years
- mediums: 7–15 years
- longs: over 15 years.

The most popular gilts for private investors are maturities between two and ten years although in recent years the government has concentrated its issuance programme around the 5-, 10-, 30-, 40- and 50-year maturity areas. Investors in gilts may also run into a variety of names including Treasury Stock, Exchequer Stock, Conversion Stock, War Loan and Consolidated Stock. According to the organisation that manages these gilts, the Debt Management Office: 'The names have no significance as far as the underlying obligation to repay is concerned. All new gilts issues in recent years have been named "Treasury Stock"' (www.dmo.gov.uk/docs/publications/investorsguides/mb070605.pdf). You may also run into some oddities called *double-dated conventional gilts* – these are gilts which have two repayment dates, e.g. '73/4% Treasury Stock 2012–2015'. This complex sounding structure actually means that the government can choose to repay the gilt at any time from 2012 onwards with three months' notice, but must repay the gilt by 2015.

FACTS ABOUT GILTS

- 2009–10 saw a record volume of gilt issuance. Planned gilt sales increased from £220.0 billion at Budget 2009 to £225.1 billion at the Pre-Budget Report (PBR) in December 2009. The gilt sales outturn was £227.6 billion.
- Gilt sales at auctions (£187.0 billion) accounted for the bulk (82%) of the issuance.
- At the end of March 2010 there were 28 conventional gilts with over £15.0 billion in issue and 9 with £25.0 billion or more in issue. The average size of the largest 20 conventional gilts was £24.7 billion.
- The value of gilts held by overseas investors continued to rise in 2009–10, by £27.7 billion to £243.6 billion, or 29% of the overall portfolio at end-March 2010. According to the DMO, 'In absolute terms, overseas holdings have more than doubled in four years.'
- At the end of March 2010 nominal value of all gilts in issue was £913.5 billion with a market value of £986.9 billion.
- This massive bulk of gilt issuance is also tracked by a number of key indices including one managed by Barclays Capital. Figures 3.5–3.7 show the composition of their index of conventional gilts over time, as well as by total market cap (bonds issued).

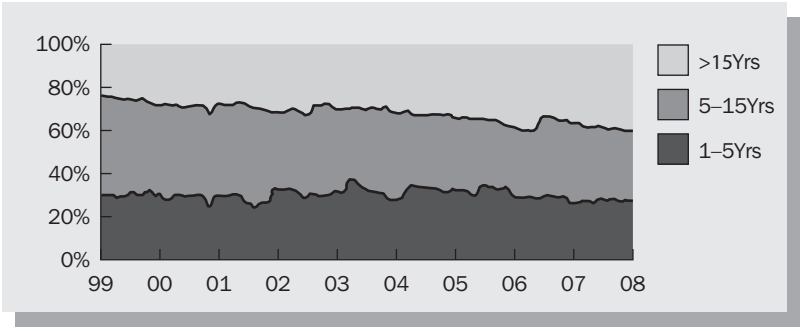

Figure 3.5 Barclays UK Gilt Index historical weights

Source: Barclays Capital

Figure 3.6 Market size growth since 1999 to end August 2008

Source: Barclays Capital

31 August 2008	Market cap £bn	Weight % of overall	No of issues	Average yield (semi)	Average life	Average mod duration
Barclays UK Gilt Index	371.8	100.0	27	4.48	15.37	9.20
1–5 yrs	93.5	25.1	8	4.46	2.69	2.46
5–15 yrs	125.0	33.6	9	4.54	8.82	6.84
>15 yrs	153.3	41.2	10	4.45	27.93	15.24
>5 yrs	278.3	74.9	19	4.48	19.97	11.46

Figure 3.7 Barclays UK Gilt Index characteristics

Source: Barclays Capital

Source: From the government's Debt Management Office report in 2010 (www.dmo.gov.uk/docs/publications/investorsguides/mb070605.pdf)

You may also encounter another form of government bond namely **index-linked gilts**. In the UK, these bonds were first issued back in 1981 and these 'linkers', as they're popularly called now, account for 20.9% of the government's gilt portfolio (based on figures from the DMO at the end of March 2010). In total the government has issued 29 different index-linked gilts of which 12 have since matured.

Index-linked gilts are still bonds issued by the government to pay for spending but their structure of payouts is very different from that of conventional gilts – with linkers the semi-annual coupon payments and the principal (the final payout) are adjusted in line with a measure of inflation called the General Index of Retail Prices (also known as the RPI). This means that both the coupons (the cash flows paid out) and the principal paid on redemption are adjusted to take account of *accrued* inflation since the gilt was first issued. (Note though that the redemption price may be many years away, so prices may fluctuate on a day-to-day basis, reflecting investor's changing yield expectations.)

The idea behind these innovative instruments is to protect the real value of investors' savings against the menace of inflation which is especially dangerous for investor in securities with a fixed income. Many investors buy conventional bonds for the stable and predictable income stream, which comes in the form of interest, or coupon, payments. However, because the rate of interest, or coupon, on the vast majority of fixed income securities remains the same until maturity, the purchasing power of those interest payments falls as inflation rises. Economists even have a measure for this called the *real interest rate* which is the normal or nominal rate minus that of inflation. So, if a bond has a nominal interest rate of 5% and inflation is 2%, the real interest rate is 3%.

the purchasing power of those interest payments falls as inflation rises

Index-linked bonds or gilts – linkers – help to address this (largely hidden) inflation menace. Rather than pay a fixed interest rate (or coupon) and principal/par on redemption, index-linked gilts set the coupon and the principal repayment based around an index which measures inflation (either the CPI or the RPI, depending on the government). In essence with an inflation-linked bond, the interest and/or principal is adjusted on a regular basis to reflect changes in the rate of inflation, thus providing a 'real', or inflation adjusted, return. But that inflation adjusted return needs to be put into some perspective – in reality there's always a lag between the relevant time period for which an index value is worked out and the date on which that number is published. Here in the UK all new index-linked gilts are issued with a three-month indexation lag (as opposed to the eight-month lag used for earlier issues).

Over the past decade the UK government has started issuing more and more index-linked gilts, especially as inflation rates have hit ever lower levels. But by far the most enthusiastic issuer of index-linked government bonds is the US Treasury. Between 1997 and 2004, the issuance of Treasury Inflation Protected Securities (TIPS) soared almost tenfold from $25 billion to $200 billion – in fact by the end of this decade, the US Treasury expects it will be issuing almost as much in TIPS as in conventional bonds.

HOW TO WORK OUT WHETHER AN INDEX-LINKED GILT IS A GOOD INVESTMENT

Index-linked gilts are a complex and relatively difficult to understand beast. These are all issued at a nominal par price of 100p and then pay a coupon that is determined in part by the RPI level three or eight months prior. Crucially they pay out a coupon which is taxable and is likely to vary with inflation, plus the redemption at maturity is also dependent on inflation levels, i.e. if the duration is many years, they're highly unlikely to pay out at par of 100p. The final redemption amount will vary based on inflation – this is calculated by looking at what's called an RPI index level.

To understand how this might all work let's take two simple examples – one index linker due to mature in 2017 and another due to mature far in the future, in 2055.

- 1¼% Index-linked Treasury Gilt 2017 is trading – as of writing – at 124.83p based on the dirty price. This dirty price is calculated as the product of the real clean price (no interest accumulated at all) and the relevant index ratio (more on that later), plus the accrued interest. Like all index-linked gilts this pays out twice yearly with the coupon subject to further income tax and any capital gains free of tax. Crucially the RPI index levels used for working out final values are based on a three-month lag.
- 1¼% Index-linked Treasury Gilt 2055 is trading at a dirty price – including accumulated interest – at 144.06p.

The next step is work out what these two linkers might be worth under different inflation scenarios. Luckily the government's debt office – the Debt Management Office – has an excellent website with a range of invaluable tools, all at www.dmo.gov.uk. To access most of the gilts-based tools find the tab titled Gilt Market and then search for the side link to Index-linked Gilts. This page contains a number of tools including one called 'calculating estimates of redemption payments' which allows you to input various inflation scenarios and then estimate the final payout amounts.

You may also encounter a peculiar form of government bond known as a **perpetuity**, i.e. a bond issued by the government many hundreds of years ago, that has never been redeemed and continues to pay out an interest rate into perpetuity. One of the most common perpetuity-based securities in the UK is called the 3.5% War Loan which is a gilt first issued by the government in 1917 when it sought to raise finance for World War 1. In its

the War Loan no longer has a maturity date

early life the War Loan paid an income of 5% but this was reduced to 3.5% during the 1930s as a consequence of the economic depression. The War Loan was supposed to reach maturity in 1952 but as yields were above 3.5% at the time the government decided against redeeming the debt. The War Loan no longer has a maturity date.

As we move away from the world of government bonds we also encounter quasi governmental organisations which issue bonds. These bonds might be issued by a variety of 'arm's-length' agencies – on the continent some agencies fund local small businesses through bonds. Alternatively they might be issued by organisations that are not accountable to any one government, such as the European Investment Bank (EIB) or even the IMF. But all these organisations share one common feature – a government or a collection of governments has explicitly stated that they will back these debts, i.e. if all else fails, a government will honour the debt. That 'guarantee' means these are viewed as almost risk free by the market, which allows the issuers to borrow at rates close to gilts.

Last but by no means least investors may also encounter emerging market debt bonds issued by governments in places such as China, Russia and India. These are perceived as being riskier than the equivalent UK or US debt and thus more expensive in terms of the interest rate paid – see the following box.

ALTERNATIVE BOND IDEAS: PART 1

WEALTHY NATION EMERGING MARKET BONDS

Emerging market bonds have been growing in popularity over the past decade – many investors seem to have overcome their worries about third world countries defaulting on their debts and now view the emerging markets as potentially stronger. But that new-found confidence – and enthusiasm for the higher yield on offer - can't hide the fact that many emerging markets do still have weak national balance sheets in that the governments may not owe much but the corporate sector is heavily in debt.

One novel take on this challenge comes from a London-based hedge fund called Stratton Street which has set a Wealthy Nations Bond fund with private bank EFG. This new fund is trying to capitalise on a specific opportunity based on value considerations – it focuses its investment selection criteria solely on bonds from countries where overall levels of indebtedness are low and yields relatively high.

The scoring system that ranks nations is especially interesting and boasts a number of overlays – the fund's managers use a range of debt measures that produce a bias towards oil-rich states for instance. Oil-rich countries such as Qatar and the United Arab Emirates are clearly not going to have problems paying down their debt – their net foreign asset position is incredibly low. Russia is another example of this relative value-based overlay built on macro-economic analysis. Mention

Russian top-tier debt and most investors would reckon you were crazy, but according to Stratton Street, Russia has low overall total levels of debt and the government has explicitly said it will back the debt of its largest state-owned companies. That doesn't necessarily apply all the way down the pecking order to smaller entities but Stratton Street Capital reckon that elevated yields on offer more than compensate for the extra (low in their opinion) risk with investment grade debt.

Add this all up and you end up with an emerging markets debt fund that's paying close to 6% per annum or at least 200 basis points above most UK gilt stock, all achieved with very high credit quality, according to the managers. One of the nearest equivalent funds is an exchange traded fund from iShares which invests in a global index of emerging market government debt – this too has some big Russian debts within its portfolio but there's also plenty of stuff from much riskier (and very indebted) Turkey and Venezuela, and it's paying 200 basis points less in yield for extra risk. The Stratton Street fund managers reckon that this value-based anomaly based on what they regard as investment grade debt will be whittled away over the next few years, generating a handy 20–25% capital uplift.

Corporate bonds

These are issued by companies and corporations, large and small, from almost every sector in the global economy although some of the most popular have been issued by the large private sector banks. In many respects these bonds are almost identical in form and structure to gilts or bonds issued by governments – they feature the full range of structures, with all the same characteristics (coupons, maturities) but with one key difference, namely **risk**. Corporations and companies, banks and industrial companies – all can, and do, go bust from time to time (and especially during recessions), so that extra risk is reflected in the interest rate charged to the borrower.

The issuance of corporate bonds has expanded massively in the last decade as Figure 3.8 from Barclays Capital shows – that growth in the total stock of bonds isn't surprising given the obvious advantages of bonds.

Investors have flooded into funds comprised of corporate bonds for a wide range of reasons including:

- They're another form of bond with different risk characteristics compared to gilts, thus allowing the investor to build a diversified portfolio of bonds from different issuers.
- Most corporate bonds provide an income that is both steady and greater than that provided by government bonds.
- Corporate bonds are also increasingly easy to trade in and out of. In fact corporate bonds are often more liquid than other securities and stocks. In the USA, for example, corporate bond trading averaged about

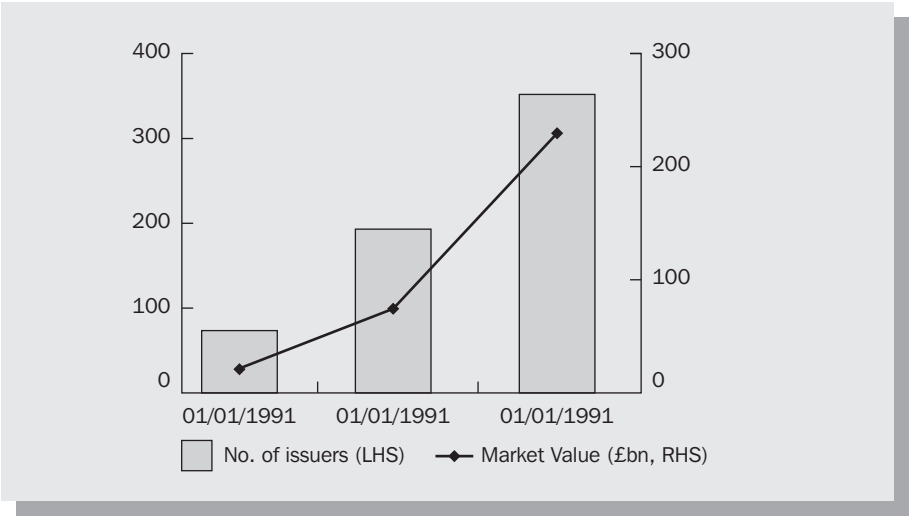

Figure 3.8 **Sterling corporate bond market**

Source: Barclays Capital

$15 billion per day in 2006, according to the Securities Industry and Financial Markets Association, although it is worth noting that dealing spreads for these bonds are wider than those for gilts with spreads on lower quality bonds typically 0.2% to 0.3%, compared to 0.1% for gilts. Astonishingly the highest quality segment of the corporate market (investment grade – for a description of this market see below) now exceeds the gilt market in size.

- Risk can be easily measured. In a later section we'll look at the credit scoring system used by the likes of S&P to assess the risk of investing in a particular bond. These measures are now widely used and understood, and investors can sensibly assess the basic risk of a corporate bond within just a few seconds. Other factors being equal, the better a bond's credit quality, the lower the credit spread. Broadly speaking, lower-rated corporate bonds (BBB rated) do, on average, trade on lower prices and higher yields compared to highly-rated, low-risk bonds with a rating of AAA.

Within this vast global universe of corporate bonds you'll encounter two basic distinctions – that between investment grade and speculative grade (also known as high-yield or 'junk') bonds. The first category of bonds (investment grade bonds) itself encompasses a vast range of 'risk levels' (see our discussion of credit ratings later in the chapter) whilst speculative bonds

or junk bonds are clearly regarded as riskier, and must pay a higher interest rate to compensate the investor for the possibility of future default.

In reality though the very term junk is itself misleading, implying that the issuers are close to rubbish and thus are likely to go bust. In fact the majority of these bonds will never default, and all interest coupons end up paid – investors might even make some money by buying them cheaply second hand on the market and then waiting around (collecting those regular coupons or interest rate payments) until they redeem at par, paying back the entire principal.

Many large fund management firms are already aggressive operators in the junk bond space. We've already mentioned PIMCO a number of times in this chapter – it's the largest bond fund manager in the world – and although this American firm is best known as an investor in high-grade government bonds, it's also a big fan of investing a small amount of your portfolio in relatively high yielding junk bonds.

The case for investing in junk bonds

The biggest attraction of junk bonds is the relatively chunky yield. According to PIMCO:

> *For much of the 1980s and 1990s, high yield bonds typically offered about 300 to 400 basis points of additional yield relative to Treasury securities of comparable maturity... according to [investment bank] Merrill Lynch, high yield bonds offered about 306 basis points of additional yield relative to Treasuries as of Sept. 30, 2005.*
>
> (http://canada.pimco.com)

But the attractions of junk bonds don't stop with the yield on offer – investors can also make some big capital gains as these bonds increase in price. This capital uplift can happen after the bonds are upgraded by ratings agencies or because an economic upturn boosts the confidence and underlying profitability of the companies that issue the bonds. According to PIMCO 'high yield bond prices are much more sensitive to the economic outlook and corporate earnings than to day-to-day fluctuations in interest rates. In a rising-rate environment, as would be expected in the recovery phase of the economic cycle, high yield bonds would be expected to outperform many other fixed income classes' (Ibid.). Last but no means least, junk bonds also offer some diversification benefits to investors – the high-yield sector generally has a low correlation to other sectors of the fixed income market.

The risks are also equally obvious. Clearly the chance of default by the issuer is greater compared to investment grade bonds, and very likely to grow as an economy slips into recession. It's also important to realise that if a company's financial health deteriorates credit rating agencies may downgrade the bonds, which can knock prices. Perhaps most importantly PIMCO itself notes that 'companies rated below investment-grade may be more negatively affected by economic downturns and adverse market conditions than those with higher credit ratings' (Ibid.).

credit rating agencies may downgrade the bonds

A huge global market for all types of bonds vs equities

Add up all these different structures and issuers and the reader can begin to understand the vast scale of the aggregate bonds space – corporate and government. There are quite literally hundreds of governments and thousands of quasi-governmental organisations (including municipalities in the USA) and tens of thousands of corporations around the world that issue bonds of one form or another. Getting a handle on just how huge this potential market is really isn't actually that easy. For example hundreds of different towns and municipalities in the USA issue their own debts, and some of them are rarely if ever traded on any public exchange, while the European Investment Bank may have several hundred bond issues trading at any one time. One recent stab at putting a total figure on the bond markets was made in a report from Merrill Lynch called 'Size and Structure of the World Bond Market: 2004' which estimated that there was about $45 trillion in global bonds outstanding at the end of 2003 – a year earlier a report by the International Monetary Authority in 2002 estimated the total amount of debt securities as around $43 trillion.

More recently a study by the McKinsey Global Institute, '$118 Trillion and Counting: Taking Stock of the World's Capital Markets', put the size of the global bond market at about $51 trillion in 2003. By comparison the global equity markets – those that trade in stocks and shares – was estimated by this same study to be worth just $32 trillion, around two-thirds the size of the global bond market. There's more detailed analysis available on who issues bonds in Figure 3.9 which is from UK investment bank Barclays Capital and shows the composition of one of their most widely followed bond indices (an index tracks the major issues of a stock or bond), namely the BarCap Global Aggregate Bond index.

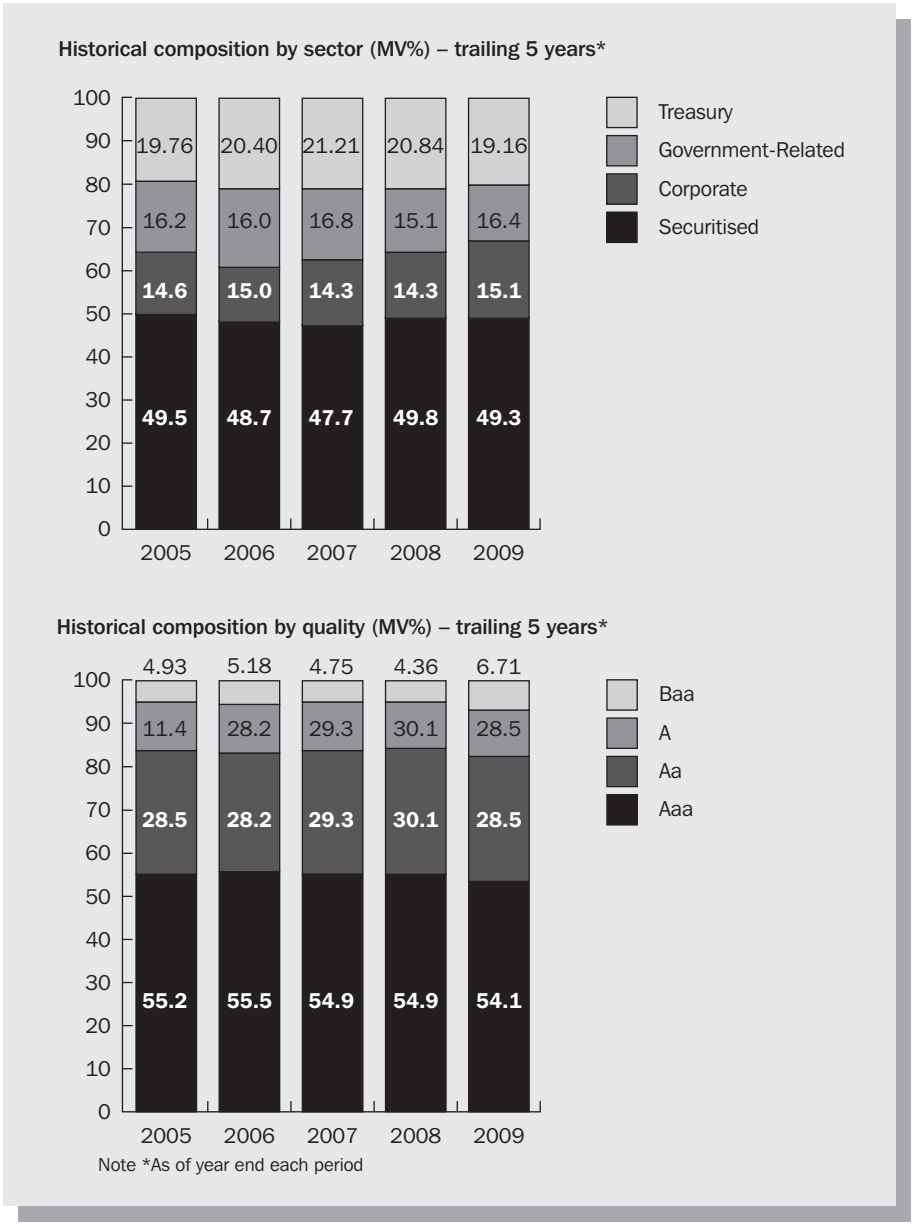

Figure 3.9 The size of the global bond market – the BarCap Global Aggregate Index

Source: Barclays Capital Indices

Measuring risk: credit ratings explained

Bond investors obsess about risk and in particular the chance that an issuer will default on their bonds. The reason for this obsession is obvious – bond investors are reluctant to take on extra risks, unlike most equity investors! Shares go up and down and companies stop paying dividends and then restart them but that large element of risk is compensated for by the potential for extra returns. Bonds by contrast are supposed to be safer and less volatile in terms of price – which also helps explain why returns on bonds have been more modest over the past few decades.

Table 3.1 is from Barclays Capital 'Annual Equity Gilt study' which looks at long-term returns from both shares and equities. Over the 82 years to 2008 equities returned an average of 7.1% per annum while bonds returned 2.3% per annum.

Table 3.1 Real investment returns to 2008

Last	*10 years*	*20 years*	*50 years*	*82 years*
Equities	4.1	8.9	7	7.1
Bonds	4.4	5.9	2.6	2.3

Source: Barclays Capital

And many analysts expect this underperformance to continue. In the USA the large stockbroker Charles Schwab recently commissioned their researchers to look into likely future returns and they suggested that bonds would continue to underperform (http://www.schwab.com/public/schwab/research_strategies/market_insight/investing_strategies/portfolio_planning/what_are_the_long_term_market_prospects_for_stocks_and_bonds.html).

- The Schwab study suggested that 'the average return on large-cap stocks are estimated to be about 7.3% per year in the long term (which we define to be 20 years).
- Mid/small-cap and international stocks are estimated to return about 8.6% and 7.4%, respectively.
- Bonds are estimated to earn about 3.8% per year in the long term.

Those lower returns are a simple function of risk – the riskier an asset, the greater the chance for potential returns and losses. Chart the annual gains and losses of equities over the past hundred years and an investor in equities would have put up with many, many years where annual losses

totalled more than 20% (and a few where they totalled more than 40%). With bonds, by contrast, any charting of annualised returns would show a massive cluster around -15% and +20%. There are *no* years where returns from the Barclays Capital indices show bonds lost more than 20% yet there are a few years where returns exceeded 20%. Even in the last 20 years of returns shown in Figure 3.10, bonds have not lost more than 10% in one year. In essence bonds are less risky and thus less rewarding.

So, risk really matters to investors in bonds and that means they need a reliable way of measuring risk. Luckily this is available through the research of a number of different credit rating agencies – namely S&P, Moody's and Fitch. Each of the agencies has their own specific measures and methodology but they all produce ratings that tend to cluster together and roughly mean the same thing. In Table 3.2 we've compared each of the ratings as they move from the highest grade (safest) which is usually AAA through to lowest grade which is a company in default (usually marked C or D). Investors need to understand that these ratings can change over time. As an example the government of South Korea found itself downgraded from AA- to BBB- in a matter of a few years. The key to this very dynamic process is a regular programme of research.

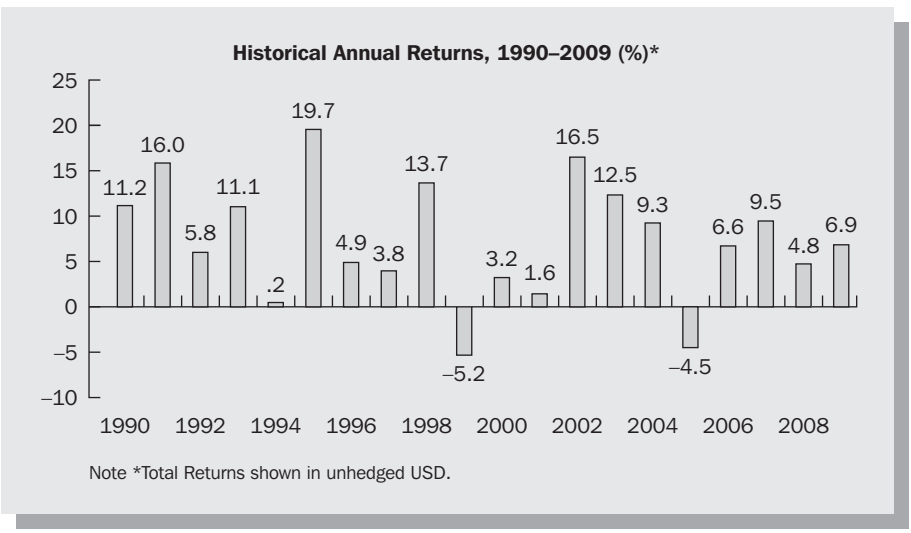

Figure 3.10 Returns from the BarCap Bonds Index between 1990 and 2009

Source: Barclays Capital Indices

Here's S&P's research (www.standardandpoors.com):

- Issuer requests a rating prior to sale or registration of a debt issue.
- S&P analysts conduct basic research including meeting issuer to review in detail the key operating and financial plans, management policies, and other credit factors that have an impact on the rating.
- Analysts present findings to S&P rating committee of five to seven expert voting members.
- Rating decided by rating committee.
- Issuer notified and has the opportunity to appeal prior to the rating publication.
- Rating is published.
- Issues are monitored by S&P for at least one year from date of publication. The issuer can elect to pay S&P to continue surveillance thereafter. It is worth noting the relevance of credit ratings in accounting. FRS17 requires the yield on AA rated corporate bonds to be used as the benchmark reference point for assessing liabilities. It is also worth noting that it is the market and not the credit rating that will determine the yield on individual issues. But the credit rating will influence the market yield. A change in rating for an outstanding issue is a discrete event whereas the yield will generally discount such a change over a period.

Table 3.2 Bond credit quality ratings compared: ratings agencies

Investment grade	Moody's[1]	S&P[2]	Fitch IBCA[2]
Highest grade	Aaa	AAA	AAA
High quality (very strong)	Aa	AA	AA
Upper medium grade (strong)	A	A	A
Not investment grade			
Lower medium grade	Ba	BB	BB
Low grade (speculative)	B	B	B
Poor quality and may default	Caa	CCC	CCC
Very speculative	Ca	CC	CC
No interets being paid or bankruptcy	C	D	C
In default	C	D	D

[1] The ratings from Aa to Ca by Moody's can be modified by adding 1,2 or 3 to show relative stature of the company.

[2] The ratings from AA to CC by S&P and Fitch may be modified by adding a plus or minus sign to show the relative strength within the band.

These credit ratings aren't the only measures used to assess the risk of default. Many investors, especially in the institutional space, also use credit risk measures based on swaps which price in the likelihood of default. These financial instruments are known as credit default swap spreads or CDSs. These credit derivatives were first introduced back in 1997 – these swaps are 'essentially an ... agreement/transaction between two parties, in relation to loans, bonds or other debt instruments issued by a company (often called the reference obligation)' (www.incapitaleurope.com/docs/counterparties.pdf).

On a very simplified level swaps are a form of insurance in which one organisation – the seller – offers protection against default to a buyer who wants to insure against the risk of a debtor going bust. That insurance or protection comes with a fee attached to it. When the buyer pays that fee the CDS will then compensate the seller if a credit event (a default for instance) hits the borrower.

Credit default swaps are quoted in the market as an annualised percentage spread, over LIBOR, known as the CDS spread. For example, the CDS spread quoted for a bond issued by XYZ company may be 100bps. If the CDS buyer wants to protect US$10 million investment in an XYZ bond, then the buyer has to pay the CDS seller an annual fee of US$100,000 (typically paid quarterly).

OTHER TERMS YOU MIGHT SEE USED IN THE WORLD OF BONDS

Bond discount: the bond discount is the difference between the par value and the selling price.

The credit spread: the difference between the yield on a lower-rated bond and the LIBOR rate is known as the **credit spread**.

The spread to government: this is the difference between the yield of a fixed-rate corporate bond and a government bond with a similar maturity (in the same currency).

Accrued income: accrued interest is the portion of the next coupon payment that has been earned at the time of purchase.

Accrued interest = current (principal balance) × (interest rate per year) × (amount of time)

$$I_A = F \times P \times I$$

Where:

I_A = accrued interest

F = fraction of year

P = principal

I = annual interest rate.

Treasury bills (T-bills): T-bills are obligations of the US Treasury and are equivalent to UK gilts.

Investing in bonds: challenges, opportunities and strategies

Corporate bonds – are they almost as safe as gilts?

Corporate bonds have become hugely popular over the past decade not least because of the sheer choice and range of risk profiles, maturities and, crucially, yields. Corporate bonds tend to offer a higher expected return than gilts. But that risk profile is asymmetric, with the upside limited by the gilt market, i.e. with very few exceptions most corporate bonds will never trade at a lower risk profile than the US and UK government while the downside is potentially a total loss! There are though some very high-grade investment grade corporate bonds that are closely correlated with gilts and may therefore be treated as almost the same asset class as gilts – the average correlation between investment grade corporate bonds and gilts is 90%, with 100% being perfectly correlated.

Table 3.3 Correlation between gilts and corporate bonds

Bond rating category	*Average monthly correlation with gilts*
AAA	93%
AA	90%
A	83%
BBB	79%
Total investment grade	90%

What about trading in international bonds?

Diversification is always a good idea in any investment portfolio but especially in bonds where the choice is so enormous. That means looking at different risk levels, different issuers and different maturities, but what about international bonds, and especially international government bonds? As we've already discussed earlier, some investors are brimming with enthusiasm for emerging markets bonds but investors don't have to travel quite that far to achieve some international diversification. Table 3.4 is from Standard and Poor's research and it shows the returns – and risks – from investing in international bonds compared to orthodox US Treasury stock. Between 2001 and 2009, for example,

investors don't have to travel far to achieve some international diversification

International Treasuries as an 'asset class' produced an annualised return of 9.1% compared to US Treasuries at 6.41% (UK returns have been close to these US returns). But those higher returns also came with the potential for greater risk– the largest loss in any one year for international treasuries was over 13% compared to just under 5% for US Treasury stock. Perhaps the most obvious portfolio risk is that of **currency risk** – if sterling strengthens against the local currency the return on that bond for a UK-based product will fall! But international bonds, especially those from outside Europe and North America present other challenges including liquidity risk – when markets are deeply uncertain it may become difficult or costly for investors to exit a position – as well as rating and credit risk. Countries can also find their debt downgraded by credit ratings agencies – as has Greece in 2010 – and that can result in falling prices and rising yields.

Table 3.4 Risk and return profile of international and US stocks and Treasury bonds

	International Treasuries	*US Treasuries*	*International stocks*	*US stocks*
Annualised return	9.10%	6.41%	–0.28%	–5.05%
Standard deviation	9.26%	5.28%	17.94%	15.13%
Sharpe ratio	0.664	0.661	–0.064	–0.416
Maximum drawdown	–13.63%	–4.98%	–56.43%	–50.95%

Sources: Standard & Poor's, Citigroup Index LLC and Lehman Brothers. International Treasuries are represented by the S&P Citigroup International Treasury Bond Index Ex–US, US Treasuries are represented by the Lehman US Treasury Index, US Stocks are represented by the S&P 500 and International Stocks are represented by the S&P International 700. Correlations are calculated based on monthly returns from April 2001 to February 2009.

Active or passive?

Most investors choose to invest in bonds through a diversified fund, usually actively run by a fund manager. But in recent years a new form of fund structure has emerged which involves building a diversified range of bonds by tracking a key index that comprises the most popularly traded bonds. These index tracking bond funds span every part of the spectrum of fixed income securities ranging from international index-linked government bonds through to UK corporate bonds.

These index tracking funds are called exchange traded funds or ETFs and this fast growing investment product space is dominated by one key player, iShares, which is in turn owned by Blackrock, a large American fund company that boasts its own actively managed funds. iShares' range of 40 fixed income bond funds now accounts for nearly 50% of total assets in European fixed ETFs, and assets under management have grown at a rate of 44% per year over the past two years. The largest fixed income ETF in Europe is now something called the iShares Markit iBoxx Euro Corporate Bond, which offers exposure to the largest and most liquid Euro denominated corporate bonds and has $4.5 billion in assets.

But investors have also been warming to emerging market bonds according to iShares: 'Corporate and emerging market bonds have offered relatively high yields in a generally low yield environment, and investors have used these sector ETFs to participate from the risk premium over government bonds' (www.ishares.co.uk). Table 3.5 shows the full range of iShares Bond ETFs – all feature low charges, measured as total expense ratios and are easy to trade in through a stockbroker.

Table 3.5 iShares corporate bond fund range

Fund name	*Domicile*	*TICKER/ EPIC*	*Currency*	*Total expense*	*Assets (m in relevant currency)*
iShares Barclays Capital $ TIPS	Irish	ITPS	USD	0.25	538
iShares Barclays Capital $ Treasury Bond 1-3	Irish	IBTS	USD	0.20	538
iShares Barclays Capital $ Treasury Bond 7-10	Irish	IBTM	USD	0.20	461
iShares Barclays Capital £ Index-Linked Gilts	Irish	INXG	GBP	0.25	487
iShares Barclays Capital Euro Aggregate Bond	Irish	IEAG	EUR	0.25	202
iShares Barclays Capital Euro Corporate Bond	Irish	IEAC	EUR	0.20	972
iShares Barclays Capital Euro Corporate Bond 1-5	Irish	SE15	EUR	0.20	43

►

Table 3.5 continued

Fund name	*Domicile*	*TICKER/ EPIC*	*Currency*	*Total expense*	*Assets (m in relevant currency)*
iShares Barclays Capital Euro Corporate Bond ex-Financials	Irish	EEXF	EUR	0.20	82
iShares Barclays Capital Euro Corporate Bond ex-Financials 1-5	Irish	EEX5	EUR	0.20	57
iShares Barclays Capital Euro Government Bond 1-3	Irish	IBGS	EUR	0.20	541
iShares Barclays Capital Euro Government Bond 10-15	Irish	IEGZ	EUR	0.20	24
iShares Barclays Capital Euro Government Bond 15-30	Irish	IBGL	EUR	0.20	154
iShares Barclays Capital Euro Government Bond 3-5	Irish	IBGX	EUR	0.20	427
iShares Barclays Capital Euro Government Bond 5-7	Irish	IEGY	EUR	0.20	40
iShares Barclays Capital Euro Government Bond 7-10	Irish	IBGM	EUR	0.20	381
iShares Barclays Capital Euro Inflation-linked Bond	Irish	IBCI	EUR	0.25	685
iShares Barclays Capital Euro Treasury Bond	Irish	SEGA	EUR	0.20	10
iShares Barclays Capital Euro Treasury Bond 0-1	Irish	IEGE	EUR	0.20	21
iShares Barclays Capital Global Inflation-Linked Bond	Irish	IGIL	USD	0.25	140
iShares Citigroup Global Government Bond	Irish	IGLO	USD	0.20	336
iShares FTSE Gilts UK 0-5	Irish	IGLS	GBP	0.20	261

Table 3.5 continued

Fund name	*Domicile*	*TICKER/ EPIC*	*Currency*	*Total expense*	*Assets (m in relevant currency)*
iShares FTSE UK All Stocks Gilt	Irish	IGLT	GBP	0.20	377
iShares JPMorgan $ Emerging Markets Bond Fund	Irish	IEMB	USD	0.45	880
iShares Markit iBoxx $ Corporate Bond	Irish	LQDE	USD	0.20	902
iShares Markit iBoxx £ Corporate Bond	Irish	SLXX	GBP	0.20	1244
iShares Markit iBoxx £ Corporate Bond ex-Financials	Irish	ISXF	GBP	0.20	122
iShares Markit iBoxx Euro Corporate Bond	Irish	IBCX	EUR	0.20	3678
iShares Markit iBoxx Euro Covered Bond	Irish	ICOV	EUR	0.20	61

Source: iShare (www.ishares.co.uk)

The idea behind all these ETFs is to simply buy what the market is buying, by tracking the market through a major index. The advantage of this approach is that it cuts out the risks associated with an active fund manager making mistakes. This lack of 'active' management removes a key component of total costs and thus nearly all index-tracking funds are much cheaper in terms of fund management fees. But many big fund groups utilising an active approach such as PIMCO naturally see this index-tracking trend as a threat – PIMCO does issue its own ETFs but in general its suspicious of index tracking with bonds as 'the issuers or sectors with the largest debt are often the least creditworthy and the credit risk tends to increase when their market weighting is rising'. It also notes that 'active managers are free to anticipate rating upgrades and downgrades. By definition the index must follow a downgrade down, and cannot anticipate a new entrant arising from an upgrade. These are low risk opportunities to add value which are denied to the passive manager.' According to PIMCO these arguments are powerful enough to 'favour an active, as opposed to a

passive, management approach'. ETF providers would argue strongly against these criticisms, pointing out that cutting costs is absolutely essential in the lower return bonds investment space. Index providers also, rightly, point out that most active fund managers don't actually produce superior performance when compared to the cheaper, dumber, passive index fund. At the end of the day investors need to make up their own minds – bond ETFs are much, much cheaper and take the risk of trusting in an active fund manager whereas active bond managers can help make sensible decisions by limiting risk (investing for instance in the most creditworthy bonds as opposed to the most traded) and can run trading strategies that can make investors money in all markets.

Trading bonds – different strategies

Investors in bonds can run a number of strategies that might make them money if they judge the wider markets correctly. Many bond investors for instance adjust the maturity structure based on anticipated changes in the yield curve, especially as economies move into recession. A slower economic growth rate, all things being equal, tends to result in lower interest rates which makes higher yielding, longer-dated securities more attractive. Another popular idea is to adjust a bond portfolio's duration. If bond investors believe interest rates are about to decline, they might lengthen a portfolio's duration by selling short-term bonds and buying longer-term bonds – the longer the duration, the more price appreciation the portfolio will experience if rates decline. On the other hand, a bond manager expecting interest rates to rise would normally shorten the bond portfolio's duration through selling longer-term bonds. Changes in macro-economic growth might also prompt a strategy built around credit quality. As economic growth picks up, bond investors might start investing in lower-grade junk bonds in the hope that greater profits will boost company balance sheets and improve credit ratings.

another popular idea is to adjust a bond portfolio's duration

What about tax?

Corporate bonds and other non-government bonds are treated like all other investments. Income (normally paid gross) is taxed while any capital gains are also taxable on sale. Gilts by contrast have some obvious advantages. Although income (interest) on gilts (both conventional and index-linked) is taxable on the gross amount, UK individual investors are not liable to capital gains tax or income tax on the disposal of gilts. Also no stamp duty or stamp duty reserve tax is payable on purchases or sales of gilts.

ALTERNATIVE BOND IDEAS : PART 2

MORTGAGE-BACKED SECURITIES

Some institutional investors are beginning to champion a relatively contrarian bond investment namely investing in residential mortgage backed securities or RMBS. These may be familiar to students of the 2007–09 financial crises as the 'weapons of mass destruction' that nearly brought down the western capitalist system.

On paper these seemed like a good idea when they were first created back in the 1990s. They are securitised loans in which the cash flows from various types of mortgages loans are bundled together and resold to investors as securities. More particularly RMBS bonds are securities created from the monthly mortgage payments of many residential homeowners. Mortgage lenders sell individual mortgage loans to another entity that bundles those loans into a security which in turn pays an interest rate similar to the mortgage rate being paid by the homeowners. In Germany this idea has another name – they're called Pfandbriefe or covered bonds (iShares, the exchange traded fund provider runs a German covered bond index tracking fund).

This securitisation of these mortgage loans into RMBS has now become utterly mainstream and is a key long-term financing tool. Mortgages are initially financed by the lender's balance sheet, but once a sufficiently large pool of mortgages has been issued, the assets are ring fenced, removed from the lender's balance sheet and transferred into a trust which is financed by RMBS investors. The trust holds the mortgages and has first recourse to the properties; however, on a day-to-day basis, the mortgages are administered by the lender as if they had never left.

Crucially the loans are 'structured' into various layers of risk, with different investors taking on different risks. The most senior bonds are typically rated AAA and benefit from several layers of protection against losses – these losses typically only occur when a property is repossessed and then sold for less than the mortgage, thereby wiping out the homeowner's equity. As losses mount, different layers or tranches of investors in these RMBS are hit, with the lowest rated losing their money first. Only when massive losses have been made are the most senior AAA rated bonds wiped out.

On paper RMBS losses should have been minimal during the global financial crisis, especially at the very senior level. Sadly, as we're nearly all aware by now, the massive housing boom in the first decade of this century (in both the US and the UK) encouraged financial institutions to lend money to home owners who couldn't really afford their mortgages. As more and more 'sub-prime', i.e. less credit worthy and riskier mortgages were issued, house prices increased. But then an eminently predictable disaster struck – house prices peaked, and then started falling and many borrowers found themselves unable to pay their mortgages. Losses cascaded through these structured and securitised RMBS products, sinking supposedly safe AAA rated bonds.

Suddenly the massive Wall Street investment banks faced countless tens of billions in losses, and financial meltdown beckoned. The rest is, of course, history as the US and the UK governments stepped into the breach to rescue western capitalism. Understandably many investors now tend to fight shy of any RMBS bonds but a small UK fund management company called 24 reckons there could still be a valid bond investment idea lurking in the carnage of the sub-prime disaster. A few years back this bonds specialist launched something called the Monument Bond fund which invests in a wide range of European (mainly UK) mortgage-backed securities, with well over 60% rated as AAA, i.e. the lowest risk rating possible. Table 3.6 shows the holdings in this fund as of summer 2010.

Table 3.6 Top five RMBS holdings

Security	Issuer (Originator)	%
PERMM (various)	Permanent (Lloyds)	9.1
LAN (various)	Lanark (Clys & Yorks)	8.9
GRANM (various)	Granite (N Rock)	8.9
MFPLC (various)	Mount Fin (BoS)	7.9
KDRE 07-1	Kildare (ICS/BoI)	4.8

According to the fund's managers the financial crisis has exposed an interesting financial opportunity for bond investors – many of the surviving securitised mortgage structures are actually offering better credit quality than equivalent corporate bonds. The managers reckon that this specialist asset class still offers over 1100 different bonds with £1 trillion of issuance in existence. Crucially many of these securitised structures (sold as bonds) offer interest rates that are floating, i.e. they vary with interest rates and inflation. And that yield is anything between 50 and 300 basis points, i.e. 0.5% to nearly 3% higher than equivalent corporate bonds.

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