

Bond investing

A Plain Talk™ guide for financial advisers

For professional investors only, not to be given to retail investors. The value of investments, and the income from them, may fall or rise and investors may get back less than they invested.



Contents

2	Thinking about bonds... or not?
4	Your bond is your word: bond basics
8	The ups and downs of bond markets
14	The long and short of bond maturity and duration
20	The highs and lows of yield curves
24	Perspective on bond types
28	The good and bad of credit quality
32	Risks, rates and markets
38	Bonds home and away
42	Correlations and combinations
50	Funds of bonds: Using bonds in portfolios
56	Busting bond myths: persistent misconceptions
60	Glossary
64	What next?

Thinking about bonds... or not?

Dependable? Boring? Safe-haven? Complicated? Irrelevant?

Many advisers still ask us for insights and support on the role that bonds and bond funds can play in client portfolios. Specifically, they ask us for guidance on how to ensure that any bond-related investments they recommend are appropriate both now and in the future. This guide aims to answer those queries.

The timeless uses of bonds

Advisers regularly ask for our opinion on bonds and bond investing and we're happy to give it, based on our investment philosophy and in-depth research.

Regardless of the state of bond markets at any given time, the timeless utility of bonds or bond funds in client portfolios remains the same:

- volatility dampening
- diversification
- downside risk protection
- income

The roles bonds can play

Dampen volatility	Bonds can help dampen volatility in client portfolios, helping advisers to tailor expected volatility levels to clients' risk profile
Diversification	Bonds offer the opportunity to diversify away from other asset classes. They have tended to offer compensating returns during periods when equities retreat.
Downside risk protection	Even when bond markets experience falls, they tend to be of smaller magnitude than other, more risky, assets such as equities. This means they can provide an anchor in a portfolio, helping to protect it from steep falls in other assets.
Income	Bonds pay regular income, which, of course, is a key reason to hold them, especially for those clients who require an income from their portfolio.

This guide explores these themes in detail, starting with a refresher on some bond basics, written specifically to be useful for advisers like you.

It then goes on to explore some relevant technical features of bonds and bond funds that can meaningfully inform how you build client portfolios.

Your bond is your word: bond basics

You'll often hear bonds referred to as 'fixed interest' or 'fixed income', but it's fairly easy to lose sight of the fact that they are just a type of IOU. When someone buys a bond, they are actually just lending money to the institution that issued the bond. The issuer offers a binding (hence the word 'bond') legal obligation, to pay interest on the bond throughout a set period, then to return the loan amount at the end of a set period.

Investors can then actively trade these bonds among themselves, which is how they can end up in client portfolios, either as a directly held security or as part of a bond fund.

A bond's 'face' value

Let's start with a bond's 'face value', sometimes called its 'par value', which indicates how much the bond issuer has borrowed. For simplicity's sake, let's say a bond has a face value of £100. So when the bond reaches the end of its life, whoever is left holding the bond gets back £100.

Over the course of a bond's life it may change hands many times and rarely will it trade at exactly its face value. Instead it will fluctuate for a variety of reasons that we explore later in this guide. Swings in a bond's price, which are usually much less than those of equities, form part of its return, be that positive or negative.

Clipping coupons

The other part of the return a bond delivers comes in the form of regular interest payments, called the 'coupon'. Just as with a loan, the coupon is expressed as a percentage of the bond's face value. So if the bond's face value is £100 and its coupon is 4.5%, the holder of the bond receives £4.50 per year.

But we mentioned earlier that bond prices fluctuate, so what happens if you buy a bond with a face value of £100, but you only paid £95 for it? Then, in effect, you will get a higher return. Read on to find out more about how and why that can happen.

Lifespan

Most bonds have an official cut-off date called 'maturity'.¹ That's the date on which a bond's issuer has promised to pay back, or 'redeem', the bond's face value.

¹ A few very rare bonds issued by the UK government don't have an end date attached. The UK version is called a 'Consol', but as a class of bond they're referred to as 'perpetual bonds'. The first ones were issued in 1751, while the most notable ones were issued to finance the Napoleonic Wars in the early 1800s. The UK government has been paying interest on them ever since, through a number of consolidations and conversions.

Putting it all together

The basic outline of a bond, issued by the UK government for example (more on this later), might look something like this:

Issuer	Maturity	Face (par) value	Coupon
UK Treasury	2018*	£100	4.5%

So, if an investor bought this bond on 1 January 2014 at face value and holds it until it matured on 31 December 2018 they would get £22.50 over the five years (£4.50 per year x 5 years), then get their £100 back. In reality, of course, it's a bit more complicated than that.

Discounts and premia

Bond prices are almost always quoted as a percentage of their par value, which is normally expressed as 100. So a bond quote of 99¼ is trading ¾ of a percentage point below its par value. If a bond is trading above its par value, for example, it's trading at a premium, but if the opposite is true, it's at a 'discount'.

If an investor buys the example bond for £95 – a discount of £5 on its par value – and holds it until maturity, they would still get the £22.50 in coupon payments, plus they would get £100 par value back for a profit of £5. Of course they would lose £5 if they bought the bond for a premium of £5 over par, e.g. £105.

Understanding bond returns

This combination of the coupon payments (interest) and any difference in the price between buying and selling (or redeeming) the bond is a bond's total return to the investor. The fluctuating nature of bond prices against their par value is also what can cause bond markets to appear complex and daunting to the uninitiated. As we walk through this apparent complexity and add new terms and bond jargon, keep this basic framework in mind and it all makes a lot more sense.

	Total interest received
+	Par value received at redemption
-	Price paid for bond
=	Total return

This value is also called the 'gross redemption yield'. It's a useful measure of exactly what return you can expect from a bond if you buy it at given price and hold it all the way to redemption. Remember, it's just one rough-and-ready measure of a bond's value. It doesn't take account of any taxes or compounding if you reinvest the interest payments, nor does it reflect changes in the bond's price over its term.

Income yield, or 'current yield'

Income yield offers another rough-and-ready way that bond investors look at bonds. It tells you what a bond would pay you over one year at its current market price. To get the current yield you divide the current market price by the bond's coupon.

The example below compares two hypothetical bonds trading at different market prices to show how this measure works.

	Bond 'A'	Bond 'B'
Par (Face) Value	£100	£100
Market price	£94	£99
Coupon	4.0%	4.5%
Current (Income) yield	4.26%	4.55%

This too, is a very rough measure of a bond's value and is used as a basic comparison tool. It doesn't take account of the bond's maturity, any taxes an investor may owe, or compounding if you reinvest the interest payments.

In the next section we'll look more closely at the relationship between bonds and yields.

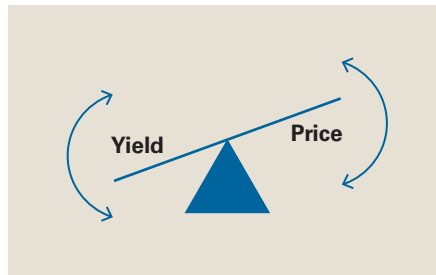
The ups and downs of bond markets

Whereas equity markets are sensitive to a mixture of company and economic data, bond markets generally respond to factors such as interest rates and inflation. This section covers the basics of bond market price and yield behaviour, topics which we'll delve into in more detail when we look at individual bond types in a later chapter.

The price/yield relationship

The last chapter hinted at one of the key relationships in understanding bond behaviour: that of price to yield and vice versa.

It showed how if the price of a bond goes up, its yield goes down and vice versa. But what causes changes in prices and yields?

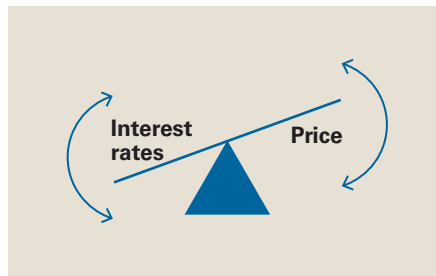


Suppose an investor buys a bond at exactly face value of £100, with a coupon of 5%, which exactly reflects the prevailing market interest rate of 5% at the time of purchase.

Later they want to sell the bond, but the market interest rate has gone up to 6%. No one will buy a bond that only pays 5% when the market rate is 6%. To find a buyer for the bond, the investor will have to lower the price until the yield the buyer gets equals the market rate of 6%, which is why bond prices fall when rates rise.

Waxing and waning interest rates

Let's start with interest rates, one of the key contributors to bond price movements.



In fact, they would have to sell the £100 bond for £83.33. Remembering that bond will pay out 5% of £100 whatever price the new investor pays, they will do a simple calculation that tells them the price they would need to pay to get an effective yield of 6% per year. In this case, rounded to the nearest pence:

$$\frac{\text{Coupon: } \pounds 5}{\text{Market price: } \pounds 83.33} = \text{Current yield: } 6\%$$

But what happens if interest rates in the market drop to 4% (e.g. bond prices rise)? In that case, the investor wouldn't want to sell the bond for anything less than a price that would result in an effective current yield of 4%. In other words, they would want more than the £100 face value of the bond. The calculation would be:

$$\frac{\text{Coupon: } \pounds 5}{\text{Market price: } \pounds 125.00} = \text{Current yield: } 4\%$$

Of course, these are just hypothetical numbers and it's a lot more complicated than that to value a bond. This measure just gives bond investors and traders another rough-and-ready way to compare bonds based purely on changes to interest rates. It only really works when comparing two bonds of identical maturity because annual interest payments over time affect the value of a bond and thus its price. The chapters on yield and duration delve into this topic in more detail.

Inflation equals value erosion

So we've seen how changes in market interest rates can affect bond prices, and one of the key influences on interest rates is inflation.

If we take the creditworthiness of the bond issuer out of the equation for the moment (covered in a later chapter), the value of a bond rests on its recurring coupon payments. But if the value of those coupon payments is eroded by inflation, the bond itself is actually worth less. Or, to put it another way, if inflation rises, bond investors will demand a higher yield to compensate for rising inflation. Why, for example, would they invest in a bond that pays 5% if inflation is running at 6%? That would effectively throw away 1% per year.

So, if inflation goes up, interest rates normally go up too. If interest rates go up, bond prices fall until the yield on the bond takes account of an expected rise in inflation. We will look further at this concept later when we discuss duration and yield to maturity, but for now, remember that if inflation expectations rise across the board, so will bond yields, causing bond prices to fall.

Real yields

If you hear the term 'real yield' in the investment press, it's referring to this concept. A 'real yield', is a yield that has been adjusted to take account of inflation. It's a yield that has had the corrosive effects of inflation subtracted from the yield to reveal the true value of the bond's interest payments.

Price equals expectations

In practice, bond price and yield movements do not happen as mechanically as described in the previous section, because they are traded in the open market. Sellers must offer and buyers must bid and the two must reach a price acceptable to both parties before a given bond will change hands.

Both buyers and sellers continually evaluate what they 'think' will happen to inflation or interest rates in the future in order to decide the value of the bond they are trying to buy or sell. As a result, the movements of bond prices and indices reflect the average of what participants in the bond market expect will happen.

You might hear bond commentators talking about a rise in interest rates being 'priced in'. They mean that the market has decided that interest rates are going to go up at some point in the future and have set bond prices at that level, rather than at the current level of interest rates.

Of course if interest rates don't rise when expected or some economic news changes bond investors' views, they will change their pricing assumptions and thus the level they are willing to buy or sell. As a result, the bond market will go up or down.

In other words, just like equities and house prices, bond markets move according to what investors expect may happen in the future.

Like equities and house prices, bond markets move according to what investors expect may happen in the future.

The long and short of bond maturity and duration

A full understanding of 'maturity' and 'duration' will help you understand how a given bond, or bond fund, might respond to changes in interest rates.

A bond may begin life as a long-dated bond of 15 years or more and the term left to its redemption date is called its 'term to maturity'. The second that a bond is issued it begins its journey towards the date that the issuer has promised to pay back the face value of the bond – its redemption date.

Short, medium and long maturity

‘Maturity’ refers to the length of time that a given bond has to run before it reaches redemption. Bonds with different lengths to maturity will react very differently to news and economic events in the market due to the fact that a bond’s value, in part, results from how many coupon payments are left before maturity.

Let’s look at a simplified example. Let’s say you had two bonds from the same issuer with identical par value and coupon rates, but different terms to maturity:

Bond 1:

Face value	£100
Coupon	5%
Term to maturity	10 years

Bond 2:

Face value	£100
Coupon	5%
Term to maturity	2 years

If you hold these bonds all the way to maturity and interest rates stay level, here is what you would get:

- Bond 1: You’ll get £5 per year over the course of 10 years then get your capital back. Assuming you paid £100, the total return of this bond is £50 in income.
- Bond 2: You’ll get £5 per year over the course of 2 years then get your capital back. Assuming you paid £100, the total return of this bond is £10 in income.

But remember, if you pay more or less than the £100 face value of the bond, you will also make a loss or gain on that amount if you hold the bond to maturity.

Holding a bond to maturity

The two examples in the previous section hint at the idea of a 'yield to maturity' (YTM), but do not take account of the fact that you can reinvest the interest payments. The calculation for this can be a bit daunting. For now, just remember that the full YTM calculation gives you the yield on the bond if you held it all the way to its maturity, based on the assumption that all the interest payments are compounded.

For simplicity sake, the market uses the terms 'short', 'medium', and 'long' as a kind of short hand to clump bonds together. There are a number of different definitions of these categories in different regions and markets, but the definition used by the UK regulator is:

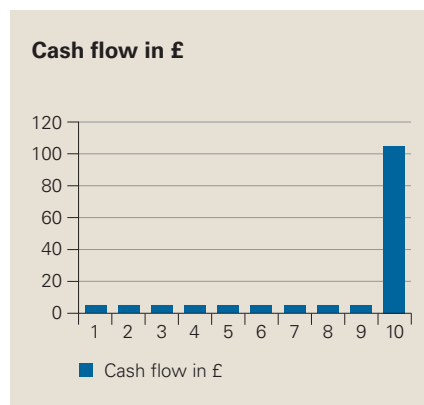
- Short term: 1 to 7 years.
- Medium term: 7 to 15 years.
- Long term: 15 to 30 or more years.

The meaning of duration

Bond experts use a lot of shorthand when talking about bond duration, which can be a bit confusing. Generally, they mean a bond price's sensitivity to changes in interest rates. But this is just an inference.

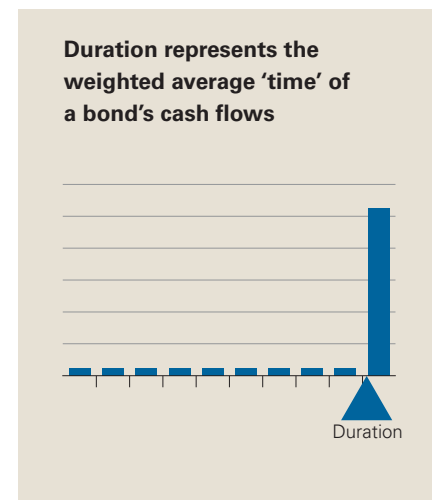
Before we go on to how they use the term, it's worth having a look at how the number is calculated. If you're interested in maths, a simplified way of thinking about it would be the weighted average time (in years) until the cash flows are received, including the return of the loan represented by the bond's par value. Because it's weighted and includes the return of capital at maturity, in practice the number is often very close to the bond's term to maturity.

Here is a simple diagram of the cash flows of a 10-year bond that pays 5%, if the investor does **not** reinvest the individual cash flows.



A physical representation of the weighted average time of those cash flows provides a simple and intuitive way of thinking about duration without having to go into the complicated formulae used to calculate it.

In the hypothetical physical representation below, the triangle represents duration, which would be set at a time when the cash flows would 'balance'. From this, you can see that the duration of a bond will normally be very close to the term to maturity of the bond.

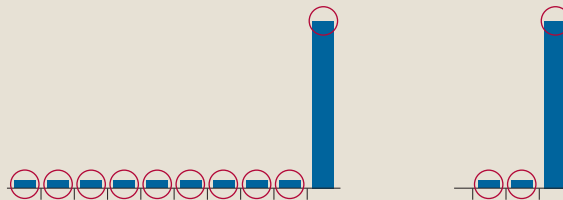


Okay, so what?

Simply put, the longer the duration of a bond, the more sensitive its price is to changes in interest rates. This is usually what bond managers are talking about. They tend to use it as a type of shorthand to talk about how much a price of a bond will change as a result of a given change in interest rates.

Why? Because the change in the value of the bond that results from a change in interest rates is magnified by the number of individual coupon payments left over the life of the bond. A small change in interest rates would thus have a much smaller impact on the price of a bond with three years to run than on one with ten years left to run.

A bond with a higher duration is more sensitive to a change in interest rates than one with a lower duration.



Duration and bond funds

Bond funds regularly report 'average duration' on their fact sheets. This gives you the average duration of all the bonds in the portfolio, weighted by the size of the holding.

Although average duration represents an approximation, from it you can infer how sensitive that portfolio will be to changes in interest rates.

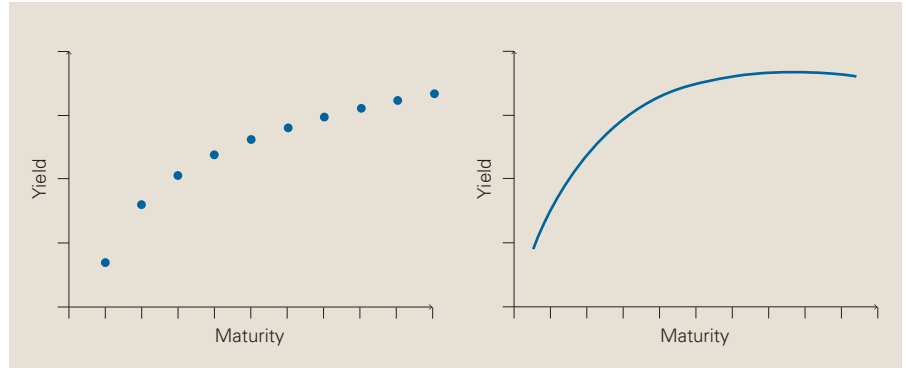
But a word of caution: you are dealing with an average that may take account of a number of different bond maturities and even credit qualities (see section on credit quality below). As a result, a bond fund's sensitivity to changes in interest rates may be more or less than a simple average duration might indicate.

The highs and lows of yield curves

We've touched on yields quite a bit already, now it's time to combine what we've learned about yields with the discussion of duration and talk about yield curves.

Curvy yields

Plotting the yields of a series of bonds of the same type, say, UK government bonds, against their maturity shows the relationship between yield and time. Join the dots and you have a simple yield curve'.



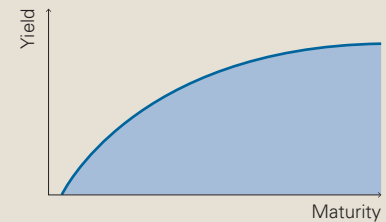
The shape of a yield curve tells investors, economists, businesses, bankers and policy-makers a lot about what bond investors think about the future of an economy, base interest rates and/or inflation. Read on to find out why.

Shapes and changes

Normal

All else being equal, the lower prices, and thus higher yields, of long-dated bonds relative to shorter-dated bonds reflect the fact the longer-dated bonds imply more inflation and interest rate risk. Just as a bird in the hand is worth two in the bush, a pound in the hand today is worth more than the promise of a pound in the future due to the risk it will be worth less (which is what economists call 'the time value of money'). Thus, a 'normal' yield curve will be upward sloping.

It can also indicate that investors believe long-term rates are going to rise and as a result are demanding a higher rate for locking in their money for the longer term.

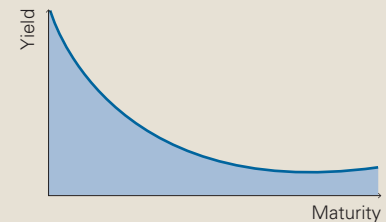


Inverted or 'negative'

If participants in the bond market fear that central bankers are going to cut short-term rates, the shape of the yield curve can go 'inverted', with higher yields (e.g. lower prices) for short-term bonds.

Essentially, investors are demanding longer-term bonds as a safe haven or to match long-dated liabilities. Demand for long-term bonds will drive their prices up, and thus their yields down.

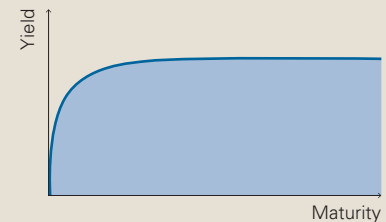
Inverted yield curves have often been correlated with the start of a recession.



Flat

A flat yield curve often indicates that an economy is in transition between a recession and recovery.

It may also indicate that investors expect interest rates to remain stable.



The steeper the yield curve, the greater the gap between long and short-term yields. This in turn reflects the magnitude of the change expected by the market.

The market prices, and therefore yields, of bonds of various maturities change constantly in response to news about the economy, inflation and forward guidance

offered by central banks. As a result, the shape of the yield curve also changes constantly and often unpredictably.

The shape of a yield curve tells investors, economists, businesses, bankers and policy-makers a lot about what bond investors think about the future of an economy, base interest rates and/or inflation.

Perspective on bond types

Up till now we've looked at 'bonds' generically. But bonds actually come in a number of flavours from a variety of issuers. So before going any further, we should delve into the detail of bond types, from corporate bonds to government bonds and from investment-grade to junk bonds.

Government bonds

Governments all over the world issue bonds to finance their spending. Bonds come in a variety of different types with both short and long terms to maturity. And of course because governments borrow in the bond markets all the time, some bonds have been around for many years, even decades.

Many investors consider UK government bonds, or 'gilts', as the standard bond investment since they are backed by the full weight of the British government. You can even buy types of gilts at the Post Office.

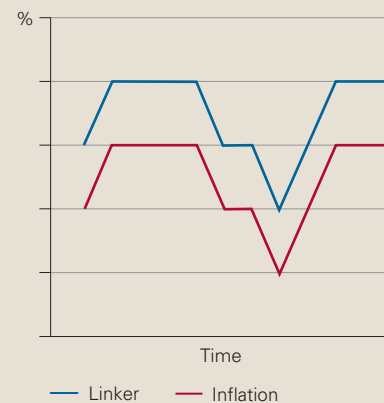
Inflation-linked government bonds

Governments, and increasingly some corporates, also issue a type of bond that links its coupon payments to inflation rates, rather than keeping them fixed. The rise in inflation-linked bonds has rendered the term 'fixed interest' an anachronism, since the interest paid by these types of bonds is anything but fixed. You'll sometimes hear them referred to as 'linkers' or index-linked bonds since they are linked to an inflation index rate.

These types of bonds generally offer a given percentage rate above inflation, often 1%. So, for example, if the inflation rate is 2.5% in a given period, the bond will pay 3.5% for that period. These bonds appeal to investors who expect inflation to rise and want to protect their capital from the resulting erosion in purchasing power.

But again, these bonds are traded in the open market and thus expectations come into play. The prices offered in the open market, and thus indices, reflect the market's expectations about the future course of inflation. Changes in those expectations will change the bonds' prices.

Theoretical yield of an inflation-linked bond



This example is hypothetical and for illustration only. It does not represent any specific time period or investment instrument.

Zero coupon government bonds

The government has sometimes issued 'zero coupon bonds', which actually pay no interest at all. It wouldn't be accurate to refer to these as 'fixed income' or 'fixed interest', since they pay neither. Any gain made by the bond will have to come from the difference in price between what an investor pays and what they receive when it's sold or redeemed.

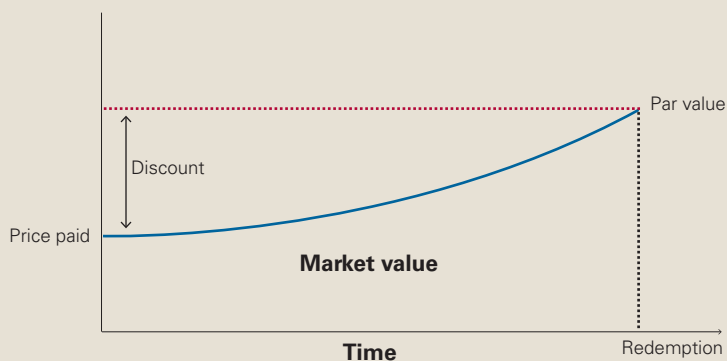
These bonds, sometimes called 'zeros', may offer tax advantages to some investors as any gain will come in the form of a capital gain, rather than an income paid.

In order to sell the bond, the government auctions them off, usually at a steep discount to the bond's par value. The price paid in the market will fluctuate over time, but with a general upward trend as the redemption date approaches.

Supranational bonds

Some supranational, quasi-governmental organisations also issue bonds in various currencies to fund ongoing operations or lending to governments. These include organisations such as the International Monetary Fund and the World Bank. They are generally considered to be nearly as secure as government bonds.

Zero coupon bond pricing



Corporate bonds

Companies in the UK and abroad have a number of ways they can finance their start-up, growth plans or short-term operations, including bank loans, selling shares, overdrafts and private funding. But they can also issue bonds, just like governments. Investors can then trade these bonds among themselves in the open market, just like government bonds.

Just like lending money to your friends, you'll need to think about the chances of getting your money back when you lend to a company by buying its bonds. Just like your friends or family, some companies are more financially responsible and sound than others, as pointed out in the next section on credit quality. For now, remember that companies that have a good reputation can issue bonds at a much lower coupon rate and still find a buyer, while start-up companies, for example, might have to promise a much higher coupon in order to tempt investors into buying their bonds.

Secured and unsecured corporate bonds

Corporate bonds can be secured or unsecured. Secured corporate bonds are backed by specific company assets such as property or machinery. Unsecured bonds are not tied to specific assets that the company has set aside to meet the obligation represented by the bond. Unsecured bonds are therefore only as 'safe' as the issuer.

We cover international bonds in the chapter: Bonds home and away.

The good and bad of credit quality

In effect, bond investors become creditors to the institutions that issue the bonds – they owe money to their bond holders in other words. Therefore, the credit-worthiness of those issuers becomes a key focus for anyone who wants to invest in bonds.

The credit quality 'risk premium'

The credit quality of a bond issuer affects how much they can borrow and at what rate, just as with individual consumers. An individual with a strong visible income stream and a history of meeting their financial obligations can usually borrow from banks more easily and at a lower interest rate than borrowers who do not have these traits.

Similarly, bond issuers with a solid reputation and earnings can offer bonds at a lower interest rate than those who might default on their obligations. Government bonds tend to stand at the top of the list since they have the full weight of the issuing government behind them. However, as witnessed in various crises over the last several decades, including Iceland, Russia and the Eurozone crises, government bonds also entail risk. No investment is ever 'risk free'. Smaller sub-national entities, such as city or regional governments, also can issue bonds in some countries, which are often considered riskier than government bonds.

Corporate bonds go from large, perhaps multi-national companies with strong, diversified and visible revenues and profitability, to start-up companies or distressed businesses that are not making any profits. You would generally receive a lower yield from large, stable companies than from smaller firms with little credit history and uncertain prospects. You would also receive a lower yield from 'safer' secured corporate bonds than you would from unsecured corporate bonds.

But how to make sense of it all?

Credit agencies: credit quality barometers

So remembering investors are lending money to bond issuers, it makes sense that they should have a credit rating, just like any other borrower. Several companies fulfil the role of assigning credit ratings to bond issuers and the bonds (or other debt instruments) that they issue.

A credit rating from one of these companies directly affects the interest rate that an issuer has to pay to find investors willing to buy its bonds. If an issuer, including a government, has a low credit rating for example (such as Greece in 2012-13), it will have to pay a higher interest rate in order to attract investors into buying its bonds. Globally, four agencies dominate the market, including Moody's, Standard & Poor's, Fitch Ratings and DBRS.

An imperfect measure

Following the failure of credit rating agencies to accurately rate the risks of specialist debt instruments that sparked the global financial crisis of 2008-9 has led some commentators to question the role and effectiveness of these agencies. Most market participants would agree that ratings are not perfect, but short of having a dedicated credit analyst team of your own, they're one of the few ways of assessing the relative riskiness of bonds and bond issuers.

Most importantly, the imperfect nature of credit ratings strongly supports the practice of broad diversification, both within domestic bonds and perhaps globally. You can't control what happens to an individual bond issuer, but you can help to offset some of the individual bond risk by holding a broad mix of bonds and bond types.

The main bond credit rating agencies, their ratings and definitions.

Moody's	S&P	Fitch	DBRS	Description
Aaa	AAA	AAA	AAA	Prime
Aa1 Aa2 Aa3	AA+ AA AA-	AA+ AA AA-	AA(high) AA AA(low)	High investment grade
A1 A2 A3	A+ A A-	A+ A A-	A(high) A A(low)	Upper medium investment grade
Baa1 Baa2 Baa3	BBB+ BBB BBB-	BBB+ BBB BBB-	BBB(high) BBB BBB(low)	Lower medium investment grade
Ba1 Ba2 Ba3	BB+ BB BB-	BB+ BB BB-	BB(high) BB BB(low)	Non-investment grade speculative
B1 B2 B3	B+ B B-	B+ B B-	B(high) B B(low)	Highly speculative
Caa1 Caa2 Caa3	CCC+ CCC CCC-	CCC	CCC(high) CCC CCC(low)	Substantial risk
Ca	CC		CC(high) CC CC(low) C(high) C C(low)	Extremely speculative
	C			
C	D	DDD	D	In default

Risks, rates and markets

We've already discussed the role of market expectations in helping to set bond prices. Having explored various aspects of bonds, we can now go further into explaining the sometimes contradictory relationships between inflation rates, interest rates and various types of bonds.

Different bond types, durations, geographies and credit qualities all react differently to things like inflation, base rates, economic shocks, currency movements and market sentiment.

The nature of bond ownership

When you buy a bond, ultimately you are buying a steady stream of periodic cash payments. We previously explored how to price a stream of bond cash payments, but another way to think about it is in terms of the risk of owning it. The three key risks to the value of that income stream are: risk of default by the issuer, risk of inflation or risk of a change in prevailing interest rates.

Credit risk

We looked at credit risk and risk ratings in a previous chapter. Now we can put that in a broader context. If the economy begins to slow or even contract, the credit risk of every type of bond could increase. That's because the revenues that governments and companies depend on to pay a bond's interest could shrink. As a result, certain kinds of bonds, especially at the lower end of the credit spectrum, could begin to lose value, causing their yields to rise.

But, risk is relative

Ownership of a bond means ownership of a set stream of income. Equities, on the other hand, imply no certainty about future cash flows and equity holders come behind bond holders in the queue if a company defaults. As a result, equities are normally a lot more volatile than bonds during times of uncertainty.

It's also why high-quality bond prices often rise during periods of uncertainty. Investors looking for a 'safe' haven might swap out of equities and into government or investment grade bonds when equity markets turn volatile or the economy looks like it might start to slow.

What does it all mean?

This section provides a generalised overview of how bond markets react to news and events. Remember, this is just a general view and reflects what ‘normally’ happens.

This section refers to the prices, or value, of the bond. Remember that the yield moves in the opposite direction to the price of the bond and many bond specialists only talk in yield terms, much to the confusion of everyone else – see the section on bond myths.

Inflation expectations

Inflation reduces the purchasing power of the interest paid by a bond. Therefore, if inflation goes up, or the market expects it to go up, investors will demand more yield to make up for the drop in value represented by inflation. As we saw earlier, for yields to rise on bonds their prices must fall.

The size of the falls should roughly correspond to the market’s consensus view of how much inflation will rise. If the market is unsure, it will still price in the risk that inflation ‘might’ rise. Timing

also matters, in the form of maturity (or duration). The longer the maturity, the more that inflation will erode the value of future cash flows, so longer duration bonds are thus more sensitive to both inflation and interest rate expectations. Inflation expectations respond to central banking policy, a topic covered in the next section.

UK gilts		UK corporate bonds	Inflation linked
Inflation expected to rise	Prices will fall (and yield rise)	Prices may fall (and yield rise), but corporate bonds tend to be more sensitive to business-related inputs and often react like equities. This is especially true of high yield corporate bonds. See section on credit quality for an explanation of high yield bonds.	Prices go up in proportion to the expected rise in inflation
Inflation expected to fall	Prices will rise (and yield fall)	Prices may rise (and yield fall), but corporate bonds tend to be more sensitive to business-related inputs and often react like equities. This is especially true of high yield corporate bonds.	Prices go down in proportion to the expected fall in inflation

Short-term interest rates

Short and long-term bonds react very differently to interest rate expectations. Predicting how a change in interest rates might affect a bond depends on where it lies on the yield curve. Short-term bonds respond to expectations about central bank rates, while longer-term bonds depend more upon the market’s view on future inflation.

Central banks worldwide administer short-term lending rates by setting the ‘base rates’ at which they will lend to

banks in the short term. Central bankers usually set the rate for their country (or region in the case of the Eurozone central bank) based on their dual role of promoting economic growth while checking inflation. Balancing these two, sometimes competing, goals is rarely easy, as economic data usually looks backwards not forwards and different types of data often send mixed signals.

Bond market participants debate and disagree about the appropriate central bank rate in every country or region. The prices (and yields) in the market place

represent an average or composite of all the competing views and expectations. Professional bond investors hang on every press release and speech of central bankers, attempting to discern what they might do and to try to avoid being surprised by a sudden rate move.

Long-term interest rates

For long-term bonds, if the market believes that a central bank has set rates low, it starts to worry that the low rate and easy borrowing will spark future

	UK gilts	UK corporate bonds	Inflation linked
Interest rates expected to rise	<p>On short-term bonds, investors will demand a higher yield, pushing prices down.</p> <p>For long-term bonds, it depends, see text.</p>	<p>Prices may fall if the market thinks the higher rates will negatively affect the ability of the issuers to grow and pay off their debts.</p>	<p>Will depend on whether or not the market thinks the central bank has gone too far or not far enough.</p>
Interest rates expected to fall	<p>On short-term bonds, investors will accept a lower yield, allowing prices to rise.</p> <p>For long-term bonds, it depends, see text.</p>	<p>Prices may rise if the market thinks the lower rates will boost economic growth and thus the issuers ability to pay off their debts.</p>	<p>Will depend on whether or not the market thinks the central bank has gone too far or not far enough.</p>

inflation. As a result, they will demand a higher yield on long-term bonds and prices will fall. Usually this also means that the yield curve will steepen as the difference in yield between short and long-term bonds widens. The opposite happens if the market thinks that rates have moved too high. Long-term rates will fall and the yield curve flattens out.

Economic growth expectations

The bond market’s reaction to economic growth expectations all comes back to inflation.

If the economy grows quickly, if it’s too ‘hot’ in other words it could spark inflation fears and cause central banks to raise

interest rates. See the previous section as to what will happen then!

If the economy cools, the market will begin to expect a cut in interest rates and the dynamic above for falling interest rates comes into play.

A ‘just right’ economy, which almost never happens, will result in stability and a gently upward yield curve that reflects mainly the ‘time value of money’.

The ‘safe haven’ effect

In times of political, international or market uncertainty, demand for government bonds can rise as investors seek a safe haven from turmoil in riskier

markets such as equities or corporate bonds. This demand will drive up the price of the bonds, forcing yields down. This safe haven effect helps to explain why government bond markets and equity markets often move in opposite directions – which is why bonds can help to diversify a portfolio.

Corporate bonds, both investment grade, and to a greater degree high yield, often behave more like equities than government bonds, especially in times of uncertainty. Any type of uncertainty can negatively affect the market’s view on the ability of companies to pay the interest and capital of the bonds they’ve issued. As a result, demand may fall causing a fall in their value and rise in their yield.

UK gilts		UK corporate bonds	Inflation linked
Concern over international events	All else being equal, prices will rise and yields fall.	Prices may fall (and yields rise) if the market worries that the uncertainty will affect companies’ ability to repay their debt obligation.	May benefit from a safe-haven effect as they are generally issued by government, but inflation expectations will have a greater effect.

Yields move in the opposite direction to prices of bonds. However, many bond specialists talk in yield terms, much to the confusion of everyone else.

Bonds home and away

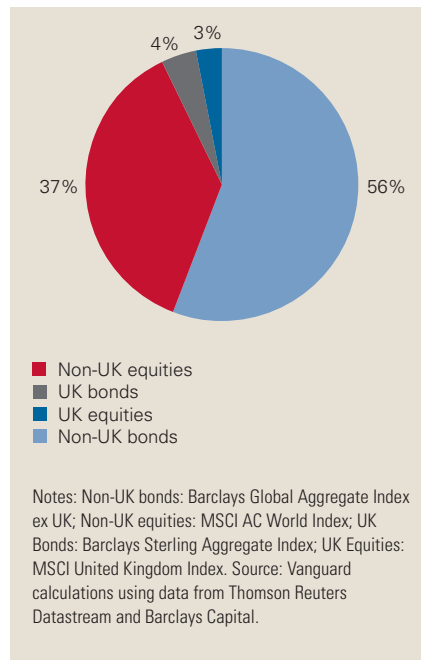
Bonds are issued in nearly every country in the world by governments, corporations and quasi-public bodies such as the World Bank or the European Investment Bank. Although the world is increasingly interconnected and correlated, every country in the world has its own central bank and economy, which entails its own unique set of risks and potential rewards. Those differences present an important opportunity for investors to diversify their exposure to individual countries or regions.

Going global

International government bonds range in quality from highly stable bonds issued by countries with strong economies, to low-quality, higher-yielding bonds from governments with a higher risk of defaulting. But all investing means accepting risk and there are some very good reasons that may cause investors to consider going global.

Opportunity

The international bond sector is one of the fastest-growing and by far the largest areas of the global investment universe. It offers significant potential for new sources of investment growth and income.



Accessibility

Ongoing globalisation of the world's bond markets has made them both accessible and increasingly transparent.

Diversification

Inflation, interest rates and central bank policy differ greatly from country to country and region to region. They are often less correlated with those of the United Kingdom. Given that inflation and interest rates drive bond prices, this suggests that overseas bonds may offer a good opportunity for diversification.

As such, including international bonds in a broadly diversified portfolio may help dampen overall portfolio volatility.

Emerging bonds

Bonds issued in so-called 'emerging markets' are referred to as 'emerging market bonds' or 'emerging market debt'. Both governments and companies in emerging markets can issue bonds. Emerging market bond funds offer exposure to a large and rapidly growing global investment sector.

The common perception is that all emerging market bonds are of low quality. But many emerging market bonds receive investment grade ratings from ratings agencies.

Emerging market bonds offer a risk/return profile that is somewhat similar to that of emerging market equities. They do offer higher yields, but they are accompanied by greater volatility and a high correlation to equity markets.

To hedge, or not to hedge

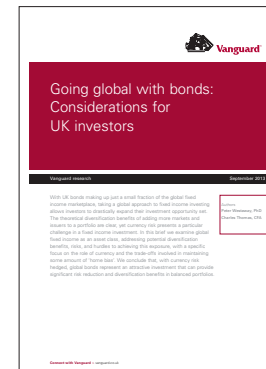
Of course, investing overseas means owning assets that pay income and par value in foreign currencies. Currency fluctuations can add another layer of risk to a portfolio beyond that of the underlying bonds. A foreign currency does not offer a cash flow, like a bond does, so any volatility is purely a matter of its movement relative to the pound.

Investors can minimise this movement using derivative instruments ('hedging'), but these add cost and complexity. So we ask the question: to hedge or not to hedge?

Most advised clients who invest in international bonds will do so within the context of a broadly diversified portfolio. Likewise, most will gain access to the international bond sector via actively or passively managed collective investment funds. The managers of such funds often have the expertise and economies of scale that allow them to hedge the portfolio to their investors' base currency. Vanguard research suggests that within such a fund, hedging away currency movements allows the properties of the underlying bonds to play their traditional role of reducing portfolio volatility, while continuing to receive the interest payments of the underlying bonds.

For a full discussion of the role of international bonds, including the role of hedging, in investment portfolios, please see the research paper: *Going global with bonds: Considerations for UK investors* (Westaway, Thomas, 2013).

See also the section on indices.



Correlations and combinations

Understanding how different kinds of bonds and equities are correlated and behave in combination provides an informed insight into building broadly diversified client portfolios.

Less volatile, lower potential return

Over the last thirty years, bonds have shown a much lower degree of volatility than equities, but with a lower return.

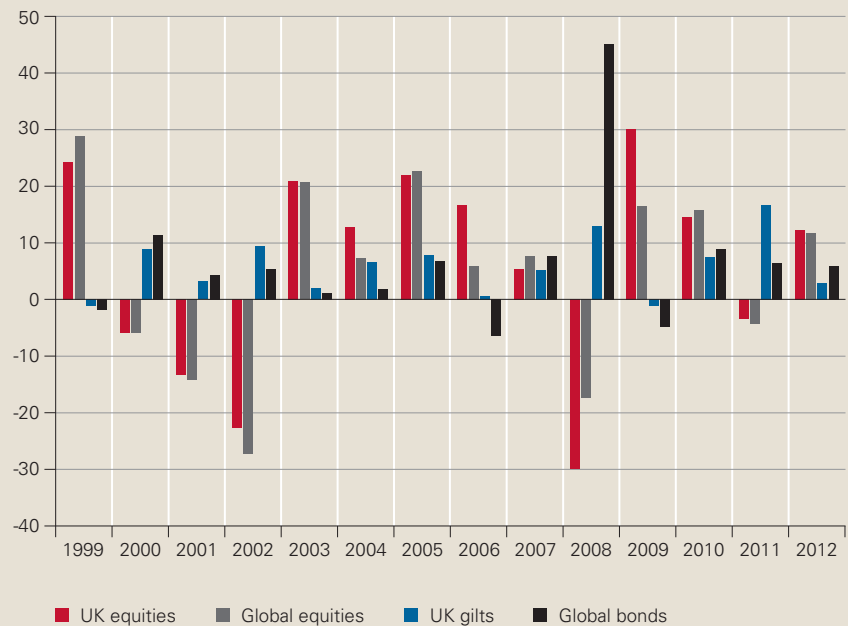


Balancing equities

Within a combined bond/equity portfolio, bonds can serve to both dampen volatility and offer an uncorrelated balance.

Looking at the same idea as the previous graph, but on a yearly return basis (not cumulative, just comparing annual returns in percentage terms), you can immediately see that bonds have proven more stable and have offset equity market drops over the last two equity market cycles. During the market turmoil of 2000-2001 and 2008 for example, people with well-balanced portfolios of bonds and equities had a much smoother ride.

Discrete annual performance of bonds v. equities



Global equities represented by MSCI World Free Index, UK gilts represented by Barclays Sterling Gilts Index, Global bonds represented by Barclays Global Aggregate Index, all on a total return basis, expressed in GBP. Source: Barclays, Morgan Stanley, Thomson Reuters Datastream.

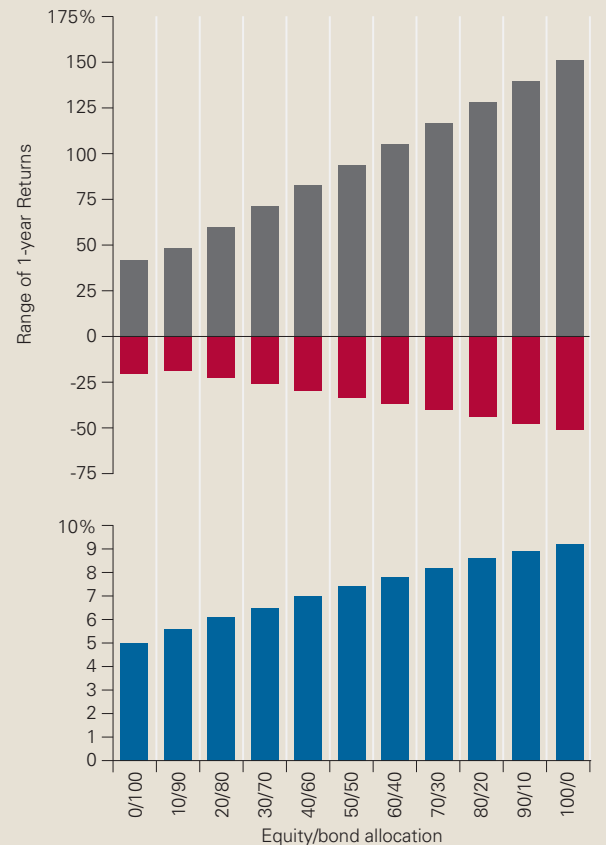
Bond and equity portfolios

So, as you might expect, if you combine equities and bonds together in different proportions, a distinctive pattern emerges over the long term. In the graph, the top part of each bar represents the largest single year gain for a given combination of bonds and equities, while the bottom shows the largest single year loss. The second graph shows the long-term return of that combination of bonds and equities.

You can clearly see the volatility dampening effect of bonds in a portfolio, along with their potential effect on long-term returns.

Range of annual returns for various blends of bonds and equities, 1900-2012.

■ Largest single year gain
■ Largest single year fall



Note: Equities are represented by: Barclays Equity Gilt Study from 1900 to 1964; Thomson Reuters Datastream UK Market Index from January 1965 to December 1969; MSCI UK Index from January 1970 to December 1985; the FTSE All Share Index from January 1986 to present. Bonds are represented by: Barclays Equity Gilt Study from 1900 to 1976; FTSE UK Government Index from January 1977 to February 2000; Barclays Sterling Aggregate Index from March 2000 to June 2013.

Source: Vanguard Asset Management

But which bonds?

The last chart used UK government bonds as an example, but as we've seen, bonds come in a variety of different 'flavours', all of which react differently to different inputs. As a result, when thinking about bonds as investments, you need to think about which type of bonds to include.

The chart opposite ranks various types of bonds by their annual return over the last several market cycles. The number in the box provides their discrete annual return as a percentage. Two of the most striking periods are 2002-2003 and 2008-2009. Both years saw complete reversals of fortune for several bond types, many of which were not expected or predicted by professional investors. Picking winners in bond markets, or any market, is always hard to do, and this graphic shows just how hard that can be.

One answer to this challenge could be to hold the entire bond market by investing in a broadly diversified portfolio of bonds by their market capitalisation. That gives your client the chance to participate in those sectors that gain, while diversifying away much of the volatility and downside risk of individual bond sectors.

Key bond index returns (%), ranked by performance

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
10.86%	9.93%	8.34%	10.71%	32.05%	15.36%	10.99%	11.76%	8.30%	13.63%	57.27%	15.71%	26.17%	19.10%
4.35%	9.57%	6.72%	9.92%	6.80%	8.37%	9.86%	3.30%	5.76%	13.02%	10.32%	8.75%	20.31%	13.15%
1.05%	8.87%	3.70%	9.39%	5.53%	8.27%	8.71%	2.56%	5.18%	7.59%	6.36%	8.75%	16.68%	5.93%
-0.37%	7.81%	3.17%	9.06%	5.23%	8.04%	7.93%	0.65%	2.58%	3.51%	5.30%	8.32%	7.22%	2.91%
-0.78%	4.24 %	-0.88%	8.38%	2.08%	6.83%	7.17%	0.53%	2.39%	-3.78%	-1.19%	7.54%	5.80%	2.85%
-1.06%	0.61%	-0.92%	5.30%	1.16%	6.58%	5.77%	0.10%	1.88%	-26.90%	-4.81%	4.82%	3.39%	0.56%

UK government bonds (gilts)	UK long-duration bonds	Hedge global bonds
UK inflation linked government bonds	UK investment grade corporate bonds	Global high-yield bonds

Source: Thomson Reuters Datastream, discrete annual performance 01/01/1999 – 31/12/2012. Indices used: UK government – Barclays Sterling Gilts Index; Investment grade – Barclays Sterling Non-Gilts Index; UK long duration – Barclays Sterling Gilts 15y+ Index; Hedged global bonds – Barclays Global Agg hedged to GBP; UK inflation linked – Barclays UK Government Inflation Linked Index; Global high yield – Barclays Global High Yield, hedged to GBP. Returns are denominated in GBP and include reinvested dividends and interest.

Uncorrelated cooperation

Another way to think about this is by giving different pairs of asset classes specific correlation values, known as correlation coefficients. These range from +1.00 (or perfect correlation, where the assets rise and fall identically) to -1.00 (or perfect negative correlation, where one asset rises as strongly as the other falls).

The table shows how a variety of different asset classes are related, based on an analysis of market movements over the last decade. This can provide some guidance on selecting portfolio constituents for diversification.

Correlation of various bond asset classes over the last ten years.

Correlations	Ten years ending 31 December 2012					
	UK equity	Global equity	Global high yield (hedged)	Investment grade corporate	Global bonds (hedged)	UK government
UK equity	1.00					
Global equity	0.91	1.00				
Global high yield (hedged)	0.66	0.61	1.00			
Investment grade corporate	0.42	0.35	0.68	1.00		
Global bonds (hedged)	-0.01	0.01	0.18	0.74	1.00	
UK government	-0.17	-0.07	-0.16	0.34	0.73	1.00

Notes: Correlation of asses classes from 1 January 2003 to 31 December 2012.

Source: Vanguard calultation using Thomson Reuters Datastream data.

A note of caution

Take care with making any portfolio assumptions based purely on correlation, however. Two asset classes with relatively high correlations can still show a significantly different return track over time. For example, UK government bonds and global bonds show a certain level of correlation over ten years, but the return tracks of these can be very different over the shorter term.

Within a combined bond/equity portfolio, bonds can serve to both dampen volatility and offer an uncorrelated balance.

Funds of bonds: Using bonds in portfolios

Because bond funds usually include a number of individual bonds with different prices, yields and maturities, they don't work exactly like an individual bond. They don't have a fixed maturity date, duration, coupon rate or yield. All of these things are averages of the underlying bonds.

Successfully using bond funds in client portfolios depends on a thorough understanding of each fund's unique traits, investment universe, policy and style.

Bonds in funds

Put simply, bond funds offer diversification benefits over holding a single issue. Individual clients can rarely match the diversification inherent in a broadly diversified bond fund. This offers a crucial advantage if bonds are used to anchor portfolios and dampen volatility. Bond funds also offer expertise and efficiencies in terms of selection, trading and custody that could be difficult to replicate for individual clients.

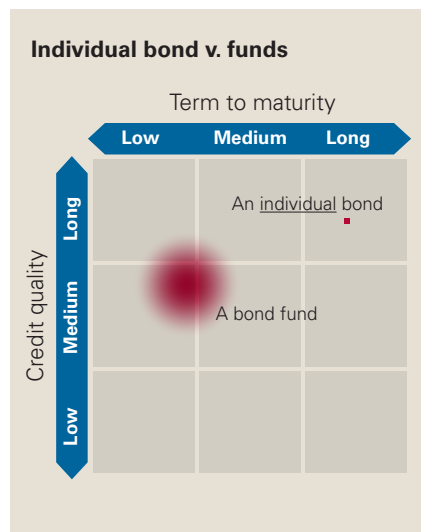
All of the bonds in the portfolio likewise will pay their coupons on various dates throughout the year. The bond funds collect these payments and distribute or reinvest them (depending on whether the investors holds income or accumulation shares) on set dates, often quarterly. This drastically simplifies the administration of the bond allocation.

Bond fund metrics reflect an average

The price, duration and yield of a bond fund reflect the weighted average of all the underlying bonds in the fund. All of the individual numbers you will see on a bond fund fact sheet are just averages. This ultimately means that a bond fund may be more or less sensitive to changes in inflation, interest rates or economic news than the individual metric might otherwise suggest.

Start with costs

Of course all of these benefits have their own costs in the form of fund manager charges. Every penny paid in charges to the manager of a bond fund comes out of the investor's return so it makes sense to try to minimise these costs as much as possible.



Benchmarks and indices

Just like equity funds, bond funds, whether active or passive, are managed against a benchmark, usually in the form of an index. However, unlike equity indices such as the FTSE 100, the diverse nature of bond types and durations means that bond indices can appear a bit baffling at first.

The names of bond indices can include any or all of the following items:

- Index provider
- Bond type: government, corporate, inflation linked
- Average duration target or limit: as in “long,” or in terms of a number, such as 15+ years
- Credit quality: Investment grade, high yield
- Geography: emerging market, UK, Eurozone etc.
- Whether or not it’s hedged (for bonds in foreign currencies) – an unhedged index is exposed to currency movements at the individual bond level
- Special features or rules: float adjust (see the section on understanding the float)

Theoretically you could have a bond index like the one below, but often some of these traits are listed in the description of the index rather than its name.

XYZ (provider) UK corporate short-dated investment grade floated-adjusted bond index

Bond indices tend to include more individual securities than equity indices and are often based on a series of rules as to which type of bonds make up the index. This is a bit different than an equity index that has the 100 largest equities by market cap. The rules allow fund managers to have clarity on which bonds qualify for the index.

An example of a real index name and description:

The Barclays Capital Global Aggregate Float Adjusted Bond Index

This market-weighted index is designed to reflect the total universe of the major investment-grade and government bond markets with maturities greater than one year.

Understanding the ‘float’

“Float adjusted” refers to an index that has been adjusted to reflect the fact that not all the bonds that fall within the index selection criteria are traded on the open market. For example, several types of government bonds have been purchased by the government and effectively taken out of circulation. Although they technically still exist, they can’t be bought by investors. Adjusting bond indices this way gives fund managers the ability to use an index that reflects the actual investable market, rather than a theoretical one.

Fund types and categories

Fund names usually reflect exactly what the funds invest in. Some, however, may require some explanation. For example, a bond fund called a UK Government Bond Fund is fairly self-explanatory. But if it's UK Long-Duration Government Bond Fund, you will need to look further to find out how the manager defines 'long duration'. Likewise, a fund called Global Income Select fund, could be either bonds, equities or both.

Bond funds with 'strategic' in their name offer a particular challenge to advisers as they often have a wide remit. The prospectus of each fund will give the details of a fund's investment universe and process and deserves a close read, especially for vaguely named funds or those with flexible or unconstrained remits.

Exploring categories

In the UK, bond funds tend to fall into six main general categories.

UK gilts	Invests mainly in bonds issued by the UK government. Depending on their prospectus, they might invest in some other instruments in small quantities.
UK index linked	These should invest mainly in bonds linked to inflation. These will normally be issued by the UK government, but might also include a small percentage of foreign government inflation-linked bonds.
Sterling corporate bond	Normally hold mainly corporate bonds that fall into the 'investment grade' category. Keep an eye on the prospectuses, but only rarely would they invest in lower credit quality bonds. Some may have the potential to invest in a certain percentage of government bonds.
Sterling high yield	Normally invest at least half their assets in below-investment-grade bonds. These offer a much higher yield, as pointed out elsewhere in this guide, but at a higher level of potential risk.
Global bonds	Predominantly invests in non-UK bonds, which could be government, investment grade or non-investment grade corporate.
Strategic bonds	Funds in this category are the hardest to pin down and it's extremely diverse. They invest across the other categories in search of returns, income and/or volatility dampening. It's worth taking a very close look at any fund in this category to ensure you fully understand its investment universe and process.
Multi-asset	Bonds appear in a variety of different multi-asset funds in combination with other asset types, which can include equities, property and cash in any number of different weights.

The cost of doing something

Advisers face another key decision when recommending bond funds to their clients, and that's the choice between active and passive funds. Choosing an active fund centres on the fund's performance and whether or not you believe that performance can continue for as long as you plan for the client to hold the fund.

Active bond fund managers face the challenge of attempting to outperform an index with relatively small return differential, compared to equities. In other words, because bond fund price movements are often small relative to equity movements, they have less opportunity to add large amounts of value from active management. This brings the role of costs to the fore.

Calculating the cost of charges

A bond fund leaves the starting line behind its benchmark by exactly the percentage of its costs. For a hypothetical bond fund that costs 2% per year for example, this means making up 1.85% before it begins to add value over an index fund that costs 0.15%. In year two, it is handicapped by a further 2% and so on. So over two years, it needs to outperform the index by 3.7% to add any more value than the index fund. These charges are hypothetical. The could be more or less than this and will vary by provider.

This suggests that high-cost managers face a steep uphill battle to add any value over the long term. Vanguard research shows just how hard this is, with an overwhelming majority, and in some cases 100%, of bond managers in some categories failing to beat their own prospectus benchmark.²

Low-cost bond managers have a much easier time of it, but the cost calculation certainly points to the potential value of low-cost, easily accessible index bond funds and ETFs.

² See: *The case for index fund investing for UK investors*. (Westaway et.al.), April 2013.

Busting bond myths: persistent misconceptions

Many of your clients will come to you with misconceptions about bonds and how they work. This chapter outlines some of those that you can expect to hear, along with some help in busting the myths.

Myth: Bonds are 'risk free'

Occasionally you might get a client that believes that bonds are 'risk free'. But even if a government issues a bond, including the UK government, that doesn't make it completely free of risk. Prices rise and fall and there's always the chance that a government will default, even if that risk is considered fairly low.

If there is anything that the first decade of the 21st Century should have taught all investors, it's that there is no such thing as a risk-free investment.

Myth: The income from bonds is 'fixed'

The term 'fixed income' is a bit of a misleading phrase. Of course, on most bonds the coupon might be fixed (and thus that is what you would receive for the life of the bond), but the price you pay to invest in a bond moves freely in the market. That means that the yield on the bond changes constantly. And of course many bonds, such as inflation-linked bonds, have variable interest payments, while zero-coupon bonds don't pay any income at all.

Myth: Bonds are too complicated

Bonds can seem very complicated to your clients and it's easy to go down a rabbit hole of complex yield calculations and curves. But at the most basic level, a bond is just an IOU to some organisation that pays you back some interest.

This fact makes bonds simpler than equities in some ways. Remember equities represent part ownership of a business, with no fixed income, and comparatively volatile and unpredictable income and capital returns.

Myth: When interest rates rise, bonds gain in value

This common misperception comes from the fact that bond managers think in yield terms and the financial press reports in yield terms. But when they report rising yields, they're actually reporting a fall in the price, and thus the value, of the bond. You might need to spend some time talking through the concepts introduced in the chapter on yield with your client if this comes up.

Myth: Bonds trap your money for ages

A client might hear about a thirty-year bond, or even a bond fund with a long average duration, and worry that they won't have access to their money for thirty years.

But, as discussed, both bonds and bond funds offer liquidity and can usually be sold when needed.

Myth: Bond funds are like 'investment/insurance/with profits bonds'

The fact that the insurance industry calls its investment vehicle a 'bond' causes considerable confusion to both clients and sometimes within the industry. To simplify it for your client, you just need to explain that an 'investment bond' or 'insurance bond' is actually a type of investment product offered by the insurance industry. These products invest in all kinds of underlying assets, not just bonds.

Ultimately, a bond is just an IOU to some organisation that pays you back some interest.

Glossary

Bond types:

- **UK government (gilts):** Issued by the Bank of England on behalf UK government, these are typically considered among the safest type of bonds. They are guaranteed for their full principal and interest if held until their maturity date.
- **Overseas government:** Issued by foreign governments. Market perceptions of the safety of these bonds differs by country, with those issued by emerging markets considered less safe than those issued by more mature economies.
- **Inflation (or index) linked:** Issued by either the UK or foreign governments. The value of these bonds changes with inflation rates, offsetting the effect of inflation.

- **Investment grade corporate:** Issued by private corporations seeking to raise funds to finance and grow their business. Their level of risk depends on the strength and reputation of the company that issues them. Investment-grade corporate bonds are considered less risky than non-investment-grade corporate bonds and can thus offer lower yields and still find buyers.
- **Non-investment grade corporate:** Also known as high yield or junk bonds, these types of bonds are thought to be at a higher risk of default (e.g. fail to meet their repayment obligations). Issuers with a low credit rating must offer a higher yield in order to compensate for that higher level of risk in order to get investors to buy their bonds.

Coupon: The amount the bondholder receives in annual interest payments and is shown as a percentage of the par value. Fixed rate bonds have a rate of interest set when the bond is first issued. Index-linked or floating-rate bonds pay an interest rate linked to an underlying figure, such as LIBOR or inflation rates (RPI in the UK). The coupon is expressed as an annual rate but may be paid at more frequent intervals, most usually six-monthly.

Credit quality or credit rating: Used to rate a bond's perceived credit worthiness or risk of default. For government bonds, it is generally based on a government's taxation resources. For a corporate entity, the rating is derived from the company's total debt picture, its profits and rate of growth, how it compares to similar entities and to the government, and the state of the economy. A bond's credit rating is assigned by independent rating agencies, such as Standard & Poor's and Moody's. For Moody's, investment grade ratings range from Aaa to Baa3, and for Standard & Poor's, from AAA to BBB. Ratings from BB+ (Ba1 Moody's) through CCC (Caa2 Moody's) are considered non-investment grade (high yield, or 'junk').

Current yield: The bond interest expressed as a percentage of the bond's current price. This percentage will fluctuate throughout a bond's lifetime. The current yield is calculated by dividing the interest (coupon) by its price (interest/price = current yield).

Duration: A measure used to gauge a bond's interest rate sensitivity. Expressed in years, it indicates how much the bond's price will react to each percentage point change in interest rates. For example, when interest rates fall by 1%, the price of a bond whose average duration is 4 years will rise by 4%. Conversely, if interest rates rise by 1%, the same bond's market price will fall by 4%. The greater the duration, the greater the bond's sensitivity to interest rate changes.

Maturity: The date when the final payment of principal and interest is due back to the bond holder, which is set when the bond is issued. Most bonds set maturity dates between one year and 30 years from the issue date.

Issuer: The corporation, government or agency borrowing money by issuing the bond.

Par value: The face value or principal of a bond when issued. When a bond trades above its par value, it's being sold at a **premium**. When it's sold below its par value, it's being sold at a **discount**. While par value is fixed, the **bond's price** will fluctuate throughout the bond's lifetime in response to a number of variables. This is also the amount repaid by the issuer at maturity.

Term: The life span of a bond, which begins at the bond's issue date and ends on its maturity date.

- Short term: 1 to 7 years.
- Intermediate term: 7 to 15 years.
- Long term: 15 to 30 or more years.

Generally, the longer a bond's term, the higher the interest rate offered. Longer-term bonds are also usually more sensitive to interest rate changes.

Yield-to-maturity (YTM): The rate of return on a bond if the bond is held until its maturity date. The YTM is different from the coupon, as it expresses the total return on a bond rather than just its interest component. A bond's YTM will be higher than the coupon rate if the bond is currently priced at a discount because of the extra return received when the bond receives its full par value at **Maturity**. The reverse is true when a bond is priced at a premium.

What next?

With a solid foundation of knowledge about bonds and bond funds, you may wish to start to delve deeper into the nature of bond investing by reading some of Vanguard's world-class research, using tools to explore and compare bond funds. You might find value in some of our accredited CPD courses as well.

This chapter highlights just a few of the value resources you have access to from Vanguard. New research, guides and materials are published all the time on our website, or you could give our Adviser Support team a call to find out more. See the back of this guide for contact details.

Cutting-edge bond research

Vanguard’s Investment Strategy Group regularly publishes research and commentary on bond investing and the bond market. A few key research papers that you might find useful include:

Paper	Description
How to use bonds in client portfolios	<p>This paper takes the general concepts introduced in this guide and applies in-depth research to them to see how they work in the real world.</p> <p>It delves deeply into some of the key practical issues faced by investors and their advisers when making bond investment decisions.</p>
Case for global fixed income investing	<p>This paper explores international bonds in depth, from a UK investor’s point of view, to assist in making the decision about whether or not to go global with bonds.</p>
Case for index fund investing for UK investors	<p>This paper presents the empirical evidence for index investing in both equities and bonds on the part of UK investors. It concludes that cost is the key issue facing bond investors and that the case for indexing is even stronger in bonds than it is in equities.</p>

Fund comparison tools

Our website contains some handy tools that can help you research fund choices. These include:

- A portfolio comparison tool that can help you see how including different bond funds can make a difference to a client portfolio.
- A fund comparison tool that allows you to compare different bond (or equity) funds against a benchmark.
- A sophisticated risk profiling tool to help you explore your client's emotional tolerance for risk. This can help to inform your decision about how much to allocate to bonds for a given client.

Continuing Professional Development

You can also explore the concepts and information explored in this guide online at **vanguardlearning.co.uk**, as interactive, independently CPD certified learning modules.

Our Adviser Support team and regional representatives can also help you with web-based or face-to-face discussion and workshops around any of the concepts in this guide. See the back of this guide for how to get in touch.

About us

Vanguard aims to offer UK investors the highest value investment products and services available. The Vanguard Group launched its first index fund in 1976 in the US, and investors worldwide now trust it to manage \$2.6 trillion worth of their assets (as at 30 September 2013).



Connect with Vanguard™

vanguard.co.uk
Adviser Support
0800 917 5508

Important information

This document is designed only for use by, and is directed only at persons resident in, the UK. The material contained in it is not to be regarded as an offer to buy or sell or the solicitation of any offer to buy or sell securities in any jurisdiction other than the UK. The information on this presentation does not constitute legal, tax, or investment advice. You must not, therefore, rely on the content of this presentation when making any investment decisions. Vanguard Asset Management, Limited only gives information on products and services and does not give investment advice based on individual circumstances.

The value of investments, and the income from them, may fall or rise and investors may get back less than they invested. The value of funds that invest in overseas markets may fall or rise as a result of changes in exchange rates. Emerging markets can be more volatile than more established markets. As a result the value of your investment may rise or fall. Investments in smaller companies may be more volatile than investments in well-established blue chip companies. Corporate bonds may provide higher yields but as such may carry greater credit risk increasing the risk of default on repayment and erosion of the capital value of your investment and the level of income may fluctuate. Funds investing in fixed interest securities carry the high risk of default on repayment and erosion of the capital value of your investment and the level of income may fluctuate. Movements in interest rates are likely to affect the capital value of fixed interest securities. ETF shares can be bought or sold only through a broker. Investing in ETFs entails stockbroker commission and a bid-offer spread which should be considered fully before investing.

All rights in the FTSE All World Developed Europe ex U.K. Index, FTSE All World Developed ex U.K. Index, FTSE All-Share Index and the FTSE U.K. Equity Income Index Fund (the "Index") vest in FTSE International Limited ("FTSE"). "FTSE®" is a trademark of London Stock Exchange Group companies and is used by FTSE under licence. The Vanguard FTSE Developed Europe ex-U.K. Equity Index fund, the Vanguard FTSE Developed World ex-U.K. Equity Index fund, the Vanguard FTSE U.K. Equity Index fund, the Vanguard FTSE U.K. Equity Income Index fund, The Vanguard SRI Global Stock Fund and the Vanguard SRI European Stock Fund (the "Product") have been developed solely by Vanguard. The Index is calculated by FTSE or its agent. FTSE and its licensors are not connected to and do not sponsor, advise, recommend, endorse or promote the Product and do not accept any liability whatsoever to any person arising out of (a) the use of, reliance on or any error in the Index or (b) investment in or operation of the Product. FTSE makes no claim, prediction, warranty or representation either as to the results to be obtained from the Product or the suitability of the Index for the purpose to which it is being put by Vanguard.

Standard & Poor's®, S&P® and S&P U.S. Total Market® are registered trademarks of Standard & Poor's Financial Services LLC ("S&P") and have been licensed for use by The Vanguard Group, Inc. The Vanguard mutual funds are not sponsored, endorsed, sold or promoted by S&P or its Affiliates, and S&P and its Affiliates make no representation, warranty, or condition regarding the advisability of buying, selling, or holding units/shares in the funds. The Funds or securities referred to herein are not sponsored, endorsed, or promoted by MSCI, and MSCI bears no liability with respect to any such Funds or securities. For any such Funds or securities, the Prospectus or the Statement of Additional Information contains a more detailed description of the limited relationship MSCI has with The Vanguard Group and any related Funds. Vanguard ETFs are not sponsored, endorsed, sold, or promoted by Barclays Capital. Barclays Capital makes no representation or warranty, express or implied, to the owners of Vanguard ETFs or any member of the public regarding the advisability of investing in securities generally or in Vanguard ETFs particularly or the ability of the Barclays Capital Index to track general bond market performance. Barclays Capital hereby expressly disclaims all warranties of merchantability and fitness for a particular purpose with respect to the Barclays Capital Index and any data included therein. Barclays Capital's only relationship to Vanguard and Vanguard ETFs is the licensing of the Barclays Capital Index which is determined, composed, and calculated by Barclays Capital without regard to Vanguard or the Vanguard ETFs. Barclays Capital is not responsible for, and has not participated in, the determination of the timing of, prices of, or quantities of Vanguard ETFs to be issued.

Issued by Vanguard Asset Management, Limited which is authorised and regulated in the UK by the Financial Conduct Authority.