2 Issuers & Investors

2.1 Learning outcomes

After studying this text the learner should:

1. Understand the reasons for issuing bonds as opposed to short-term securities.
2. Know the categories of bond issuers and understand the factors that may influence their issuing activities.
3. Understand the relationship between government debt and fiscal policy.
4. Identify the holders of bonds and their reasons.
5. Have an appreciation of the risks faced in holding bonds.

2.2 Introduction

The main participants in the bond market are of course the issuers of and the investors in bonds. The value of the bonds in issue represents supply, while the value of bonds held by the investors represents satisfied demand. The rates of interest on bonds (ytm) at any point in time are "discovered" rates reflecting information relevant to the bond market, particularly short-term rates and expectations regarding future short-term rates (we cover this further later).

In the following section we cover the economics of long-term finance, i.e. the reasons why long-term finance is required by investors in the infrastructure of business and government.

In the section on the issuers of bonds we cover the categories of issuers and the factors that may influence their issuing activities.

In the section on the investors in bonds we identify the various holders, their motivations for holding bonds, as well as the risks they face in holding bonds.

2.3 The economics of long-term finance

There are many reasons for borrowing in the bond market, but the fundamental reason is to acquire long-term funds, usually for long-term capital projects (such as the building of a factory or constructing a highway or setting up the infrastructure for a gold mine). The bond market thus facilitates capital formation.

By long-term is meant periods of longer than a year and up to 30 years. In some countries, bonds are also issued for 40 years, and in a few countries (e.g. the UK and the USA) perpetual bonds (also called consoles) were issued in the past (these bonds do not have a maturity date). The other reasons for borrowing long-term (i.e. the advantages of borrowing long-term) are:

- Short-term borrowing entails a series of borrowings, i.e. a new borrowing is required every few months; it is administratively burdensome.
- The rate of interest may be higher when the rollovers take place.
- Short-term funds may not always be readily available on the rollover dates.
- An issuer's creditworthiness may decline at some stage in the short term borrowing cycle, and funds may not be available at all under this changed circumstance.
- Equity finance (which is long-term finance) may at times be too expensive.

The bond market overcomes these financially harmful possibilities. It therefore plays a significant role in the economy, in terms of making fixed investment projects possible, i.e. it facilitates capital formation.

2.4 Issuers of bonds

2.4.1 Introduction

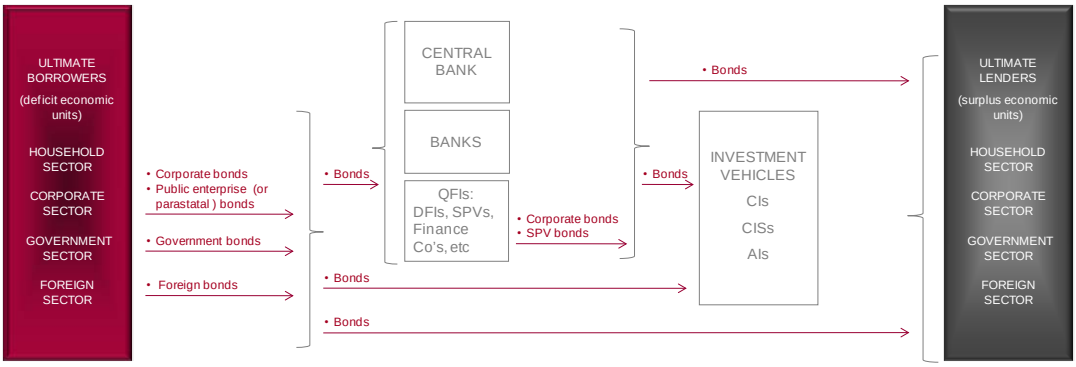

Figure 1: bond issuers

We present a depiction of the financial system and the issuers of bonds that would exist in most countries in Figure 1, and Table 1 displays the same information in table form. This represents our view of the way bonds should be categorised.

ULTIMATE BORROWERS	
HOUSEHOLD SECTOR	-
CORPORATE SECTOR	
Private sector companies (non-financial)	Corporate bonds
Public sector companies (parastatals -non-financial)	Parastatal bonds
GOVERNMENT SECTOR	
Central government	Central govt bonds
Provincial (state) governments	Prov (state) bonds
Local governments (local authorities)	Local govt bonds
FOREIGN SECTOR	
MAINSTREAM FINANCIAL INTERMEDIARIES	
DEPOSIT INTERMEDIARIES	
Central bank (CB)	-
Private sector banks	Corporate bonds
NON-DEPOSIT INTERMEDIARIES (INVESTMENT VEHICLES)	
Contractual intermediaries (CIs)	
Insurers	Corporate bonds
Retirement funds	-
Collective investment schemes (CISs)	
Securities unit trusts (SUTs)	-
Property unit trusts (PUTs)	-
Exchange traded funds (ETFs)	-
Alternative investments (AIs)	
Hedge funds (HFs)	-
Private equity funds (PEFs)	-
QUASI-FINANCIAL INTERMEDIARIES (QFIs)	
Development finance institutions (DFIs)	Parastatal bonds
Special purpose vehicles (SPVs)	SPV bonds
Finance companies	Corporate bonds
Leasing companies	Corporate bonds
Investment trusts / companies	-
Micro lenders	-
Buying associations	-

Table 1: Bond issuers

Thus we have four main categories and a number of subcategories of bonds as follows:

- Government bonds:
  - Central government bonds.
  - Provincial (state) government bonds.
  - Local government bonds.

- Parastatal bonds (issued by public enterprises).
- Corporate bonds (issued by private sector companies).
- SPV bonds (bonds issued by special purpose vehicle).
- Foreign bonds (inward listings).

To summarise, we have, according to *issuer*, five main categories of bonds. The details of each of these sectors / categories are covered below.

2.4.2 Central government

In most countries the central government is the largest single issuer of bonds. Its bonds are generally referred to as *government bonds*. The reason a government issues long-term debt obligations is to finance (partly) the budget deficit. This is justified on the grounds of the creation of infrastructure (which is not always the case).

The rates of interest on central government securities (treasury bills and bonds) are generally referred to as risk-free rates. By this is meant that they are credit risk free – in the sense that central governments have the right to raise revenue and/or borrow further in order to honour interest and capital payments.

2.4.3 Provincial / state governments

Some countries have three levels of government. Almost all countries have central governments and local governments, but some also have provincial or state governments. In some countries the provincial / state governments are permitted to raise revenue through bond issues, while in others this is not the case. These bonds are generally referred to as *provincial* or *state government bonds*.

Provincial / state government bonds in some countries are guaranteed by central government.

2.4.4 Local authorities

There are different categories of local authorities in many countries, for example:

- Metropolitan Councils (the large cities)
- District Councils
- Municipalities (or municipal authorities)
- Water Boards.

These bonds are generally referred to as l*ocal authority bonds*. The motivation of local authorities to issue bonds is usually investment in local infrastructure such as sewerage plants.

The bonds of local authorities may or may not be guaranteed by central government.

2.4.5 Public sector companies / enterprises (parastatals)

Public sector companies (i.e. companies whose equity is held by central government to the extent of 100%) are also referred to as *public enterprises* or *parastatals*. The bonds they issue are usually referred to as *parastatal bonds* or *public enterprise bonds*. From here we refer to them as parastatal bonds.

There are two subcategories here:

- Non-financial parastatals.
- Financial parastatals.

Examples of non-financial parastatals are transport companies (e.g. rail and airport) and power supply companies. Their motivation for issuing bonds is, for example, the creation of capital assets such as roads, rolling stock, electricity supply infrastructure (e.g. pylons, power stations and hydro-electric schemes), waterway infrastructure, etc.

Examples of financial parastatals are development banks, land banks, enterprise finance companies and industrial development corporations (which are often referred to as DFIs – development finance institutions). We categorise them under QFIs (quasi-financial intermediaries). Their motivations for issuing bonds are, for example, the provision of finance for emerging farmers, loans to new industrial undertakings, etc.

2.4.6 Private sector companies

The *corporate sector* in many countries is an issuer of bonds and these are logically called *corporate bonds.* There are three sub-categories:

- Non-financial companies.
- Financial intermediaries.
- Quasi-financial intermediary companies (which we categorise as QFIs).

The motivation of the non-financial companies for issuing bonds is generally to finance undertakings that have a long life (capital assets), for example, the building of a car manufacturing plant, the sinking of a mining shaft.

The obvious mainstream financial intermediaries that issue bonds are the banks and the life insurance (also called assurance) companies. Their motivation for issuing bonds is to acquire capital in order to comply with the statutory requirements (sometimes called second tier capital) as they expand business.

Examples of private sector company QFIs are finance companies [such as (fictitious) Fine Car Finance Company Limited and Fine Apparel Finance Company Limited] and leasing companies. Their motivation for issuing bonds is to provide instalment and leasing finance to the purchasers of their products.

The largest issuers of corporate bonds are the banks.

2.4.7 Special purpose vehicles

Special purpose vehicles (SPVs) are also large issuers of bonds in many countries. Generally, the banks create or encourage the creation of SPVs. These vehicles are generally created by banks in order to lighten their capital requirements. SPVs are the products of securitisations, and by the latter is meant the creation of marketable securities (in this case bonds) from non-marketable financial assets that have a regular cash flow.

An example of a securitisation will enhance comprehension, but before we get there we need to clear up the confusion that surrounds SPVs. The terminology surrounding SPVs includes securitisation, CMOs, CDOs, CLOs, MBSs, asset backed securities, securitisation bonds and so on. Research has indicated that definitions differ from country to country. It is our understanding that SPVs are created from securitisations; therefore all bonds issued by SPVs are securitisation bonds. Securitisation was described earlier. All bonds issued by SPVs are also asset-backed bonds (clear from below). The rest of the terminology is cleared up by mentioning the types of securities issued by SPVs:[10]

- Residential property backed securities [also termed collateralised mortgage obligations (CMOs) and mortgage-backed securities (MBSs)].
- Vehicle backed securities.
- Collateral debt obligations [also termed collateralised debt obligations (CDOs); sometimes referred to as repackaged corporate credit; and sometimes referred to as the debt issued by SPVs that hold as assets a portfolio of fixed-income assets].
- Credit card backed securities [sometimes referred to as collateralised loan obligations (CLOs)].
- Aircraft backed securities.
- Equipment backed securities.
- Corporate loan backed securities (also CLOs).
- Commercial property backed securities (also CLOs).

We now return to the elucidation and example. A SPV [also called a special purpose entity (SPE) in some countries] is a corporate body (usually a limited liability company) created by a *sponsor* (e.g. a bank) to fulfil a specific or a temporary objective (for example for a bank to take certain assets off its balance sheet in order to release capital for other lending purposes). The SPV issues debt obligations (bonds in this case) to finance its assets and the assets provide the return (cash flow) to the bondholders.

The SPV is not owned by the sponsor of the deal and is therefore bankruptcy-remote from it, i.e. the bondholders carry the credit risk. The SPV is managed by an administration company that is independent of the sponsor. An example will clarify the above (see Figure 2).

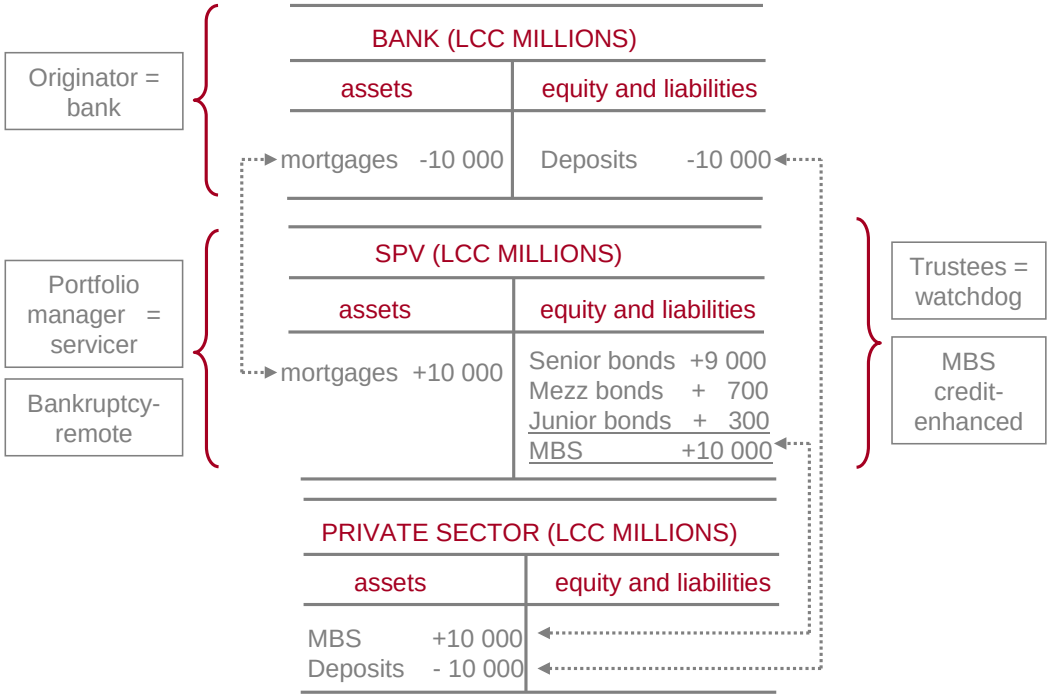

Figure 2: example of bank securitisation of mortgages

The sponsor bank sells mortgages to the SPV; the SPV issues three tiers of bonds (here called MBS) in proportions according to the requirements of the rating agency and subordinates the mezzanine bonds to the senior bonds and the junior bonds to the mezzanine bonds as indicated in the figure. This means that in the event of bankruptcy of the SPV the holders of the senior bonds have first call on the assets, followed by the mezzanine bond holders, and followed by the junior bond holders. This is called credit enhancement – the senior bonds have been *credit-enhanced*[11]. This is why they are usually highly rated (depending on other factors). The mezzanine bonds are rated lower than the senior bonds (but still at investment grade) while the junior bonds are usually unrated (and are usually taken up by some risk-taker because the rate is high)[12].

2.4.8 Foreign sector

In many countries bonds are issued by foreign entities. They are denominated in the local currency and are referred to as *foreign bonds*. Other types of foreign bonds are *Eurobonds* and *Global bonds*. These bond types are discussed in section 3.

All the issuers of bonds may be summarised as shown in Figure 3.

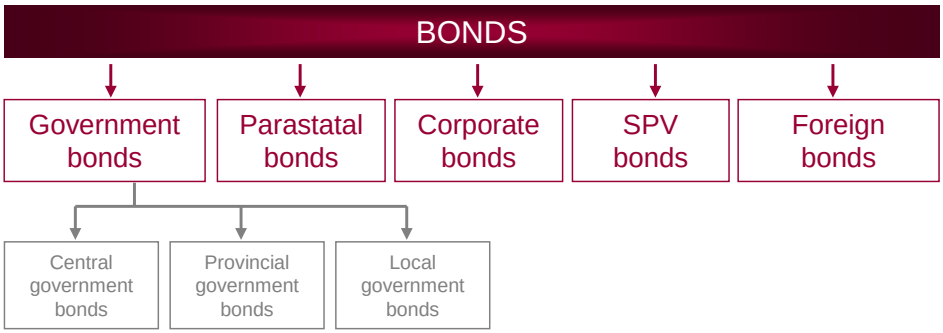

Figure 3: classification of bonds

2.5 Government debt and fiscal policy

As the largest issuer of bonds (in most countries) the central government deserves special mention. Because the central government is the largest issuer by a large margin, the local bond market essentially is a central government bond market (we call it the LCC bond market), and all other non-central government bonds are referenced on the government bonds. This is so in respect of rates and terms to maturity (often called look-alikes).

The amount of LCC bonds in issue is a reflection of the accumulation of the government budget deficits. LCC bonds are not the only instruments used to fund the deficit (the others are treasury bills and foreign loans in the main), but they constitute the main instrument. The *deficit plays an important role in fiscal policy* (defined as the taxing, spending and deficit financing programmes of government and their influence on economic growth and employment).

The management of the outstanding debt of government (called *debt management policy*) also plays a major role in the financial sector of the economy and therefore has an influence on the real sector. For example, a huge debt in relation to GDP will tend to "crowd out" the private sector. Also, the distribution of the debt and the term of the debt play a role in terms of *money creation* by banks. Debt management policy can be used to contribute to the broad economic goals of government or detract from sound policies if poorly managed.

It is notable that central governments in many cases have a legal obligation to carry out fiscal and debt management policy in a proficient manner. In South Africa, for example, the Public Finance Management Act of 1999 determines that:

"The National Treasury must – (a) promote the national government's fiscal policy framework and the co-ordination of macro-economic policy; (b) co-ordinate intergovernmental financial and fiscal relations; (c) manage the budget preparation process; (d) exercise control over the implementation of the annual national budget, including any adjustments budgets; (e) facilitate the implementation of the annual Division of Revenue Act; (f) monitor the implementation of provincial budgets; (g) promote and enforce transparency and effective management in respect of revenue, expenditure, assets and liabilities of departments, public entities and constitutional institutions; and (h) perform the other functions assigned to the National Treasury in terms of this Act."

2.6 Investors in bonds

2.6.1 Introduction

In this section we cover the following:

- Holders of bonds and ownership distribution.
- Motivations for holding bonds.
- Risks faced in holding bonds.
- Role of rating agencies.

2.6.2 Holders of bonds and ownership distribution

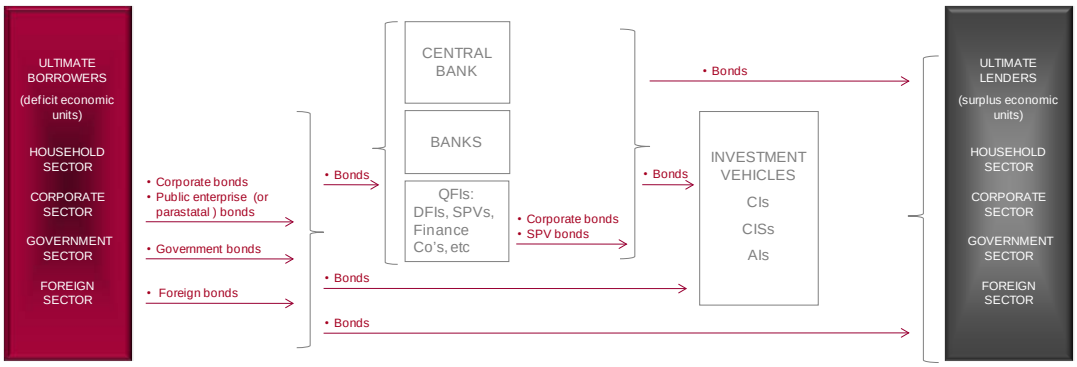

Figure 4: investors in bonds

Figure 4 and Table 2 indicate the holders of / investors in bonds.

ULTIMATE BORROWERS	
HOUSEHOLD SECTOR	To a small degree
CORPORATE SECTOR	
Private sector companies (non-financial)	To a small degree
Public sector companies (parastatals -non-financial)	No
GOVERNMENT SECTOR	
Central government	No
Provincial (state) governments	No
Local governments (local authorities)	No
FOREIGN SECTOR	
MAINSTREAM FINANCIAL INTERMEDIARIES	
DEPOSIT INTERMEDIARIES	
Central bank (CB)	Yes
Private sector banks	Yes
NON-DEPOSIT INTERMEDIARIES (INVESTMENT VEHICLES)	
Contractual intermediaries (CIs)	
Insurers	To a large degree
Retirement funds	To a large degree
Collective investment schemes (CISs)	
Securities unit trusts (SUTs)	Bond funds only
Property unit trusts (PUTs)	No
Exchange traded funds (ETFs)	No
Alternative investments (AIs)	
Hedge funds (HFs)	Some specialised HFs
Private equity funds (PEFs)	No
QUASI-FINANCIAL INTERMEDIARIES (QFIs)	
Development finance institutions (DFIs)	No
Special purpose vehicles (SPVs)	No
Finance companies	No
Leasing companies	No
Investment trusts / companies	No
Micro lenders	No
Buying associations	No

Table 2: Investors in bonds

In most countries the largest holders of bonds are the retirement funds (up to 60%) followed by the insurers at about 20%. Next in line are the banks at around 10%. They are followed by the bond funds (i.e. specialised securities unit trusts) at about 3% and the central bank at about 2%.[13]

2.6.3 Motivations for holding bonds

2.6.3.1 Introduction

Above we identified the following holders of bonds:

- Household sector
- Corporate sector
- Foreign sector
- Central bank
- Private sector banks
- Insurers
- Retirement funds
- Securities unit trusts
- Investment trusts / companies
- Hedge funds.

2.6.3.2 Household sector

This sector is a holder of bonds, but to a limited extent, mainly because individuals are not familiar with the bond market compared with the equity market. The latter market enjoys a high profile, whereas the bond market does not. The few that do hold bonds are high net-worth individuals. A number of individuals are also speculators in the bond market, but they tend to work in the financial markets and speculate in their personal capacities.

Over the past few years a number of central governments have encouraged the household sector to invest in bonds through advertising campaigns and the launching of retail bonds (i.e. small denomination bonds).

2.6.3.3 Corporate sector

Non-financial corporates are usually not in the business of investing in the financial markets, but there are a few that have surplus funds at times and make use of this market. Examples are cash-rich companies, such as mining houses and cell phone companies. These companies usually have treasury divisions, or outsource this function to specialist treasury management companies.

2.6.3.4 Foreign sector

In many countries with efficient bond markets the foreign sector is a large holder of bonds. For foreign investors to be attracted to foreign (to them) bond markets a number of criteria must be satisfied, including:

- Safety of the market in terms of settlement practices, scrip handling, scrip custody services and so on (a regulated exchange-traded market is a major attraction).
- A highly liquid market, i.e. they are able to enter and exit the market with ease.
- Existence of a repurchase agreement (repo) market in which bond positions can be "carried" (i.e. funded locally).
- No restrictions on repatriating profits.
- A stable exchange rate.

Foreign investors' motivations for holding bonds are interest rates and capital gains.

2.6.3.5 Central bank

Generally central banks are large holders of bonds as a proportion of their total assets but are small holders in relation to other financial intermediaries. Their motivation for holding bonds is that these instruments are sometimes used in open market operations (particularly short-term bonds).

2.6.3.6 Private sector banks

Many banks hold large amounts of bonds. Their motivations for holding bonds can include:

- Bonds are part of their investment portfolio. Banks earn the coupon rate and they endeavour to profit from capital gains when the prices of bonds increase (rates decrease), which may be termed opportunistic profits.
- In the case of the primary dealer banks: in order to perform this function of market making effectively.
- In order to comply with the liquid asset requirement. The banks tend to hold substantially more short-term bonds (which rank as liquid assets) than long-term bonds (which do not rank as liquid assets). This applies in most countries
- All government bonds, irrespective of term to maturity, may be used to acquire central bank accommodation.

2.6.3.7 Insurers

The long-term insurers in most countries hold bonds to the extent of about 20% of total assets. This is higher than in the case of short-term insurers, and the reason is that a larger proportion of their liabilities is of a long-term nature (insured pension commitments, life policies, retirement annuities, etc.), i.e. they have a different risk profile to the short-term insurers. Their liabilities are virtually certain compared with the *potential* liabilities (claims) in the case of the short-term insurers.

2.6.3.8 Retirement funds

Generally retirement funds are the largest holders of bonds (in many countries about 40% of total assets). Their motivation for holding bonds is obvious: they have long-term liabilities in the form of annuities (pensions), lump sum payments upon retirement of members and lump sum payments upon death.

2.6.3.9 Securities unit trusts

The specialist securities unit trusts, bond funds, hold the majority of their assets in bonds, and they vary the proportions of long- and short-term bonds according to their interest rate views.

2.6.3.10 Hedge funds

Hedge funds are involved in all financial markets as holders of securities. As opposed to "long-only" funds such as securities unit trusts, they also "go short" of securities, borrow funds and make use of derivative instruments. A few hedge funds specialise in bonds.

2.6.4 Risks faced in holding bonds

2.6.4.1 Introduction

The risks faced by bondholders are as follows:

- Counterparty risk.
- Market risk.
- Credit risk.
- Call risk.
- Reinvestment risk.
- Liquidity risk.
- Volatility risk.
- Exchange rate risk.
- Incident risk.
- Inflation risk.

2.6.4.2 Counterparty risk

Counterparty risk is twofold: the risk of tainted scrip entering the market, and settlement risk. The former involves the sale of tainted (fraudulent) certificates by a seller to a buyer. The latter involves the reneging on a deal by the counterparty to the deal resulting in the buyer / seller having to buy / sell a particular bond at an inferior rate (price).

It is notable that the introduction of an exchange-traded market, accompanied by the certificates of the issuers being dematerialised or immobilised in a CSD, eliminates the risk of tainted scrip entering the market and settlement risk.

2.6.4.3 Market risk

Market risk (also incorrectly called interest rate risk[14]) is the risk of bond rates rising and the holder making a capital loss. This is the same as the price of bonds falling, because the two are inversely related. The risk increases as the term of the bond increases. This risk cannot be avoided except by using the derivatives market to hedge, but the price of derivatives detracts from the yield enjoyed.

An example of the loss incurred in the case of a rate rise is as follows:

Bond:	L186 (a fictitious code)
Maturity date:	21/12/2029
Coupon rate:	10.5% pa
Nominal amount:	LCC10 million
Deal date (buy):	20/06/2005
Rate (ytm) (buy):	12.0% pa
Deal date (sell):	21/06/2005
Rate (ytm) (sell):	12.5% pa
Price on 20 June:	LCC88.19108%
Price on 21 June:	LCC84.82036%
Consideration on 20 June:	LCC8 819 108.00
Consideration on 21 June:	LCC8 482 036.00
Difference (loss -):	-LCC337 072.00.

The above is a true example. It will be apparent that the investor in bonds is also able to make handsome capital profits if rates fall (prices rise).

What is the principle that underlies the inverse relationship between *rate* (ytm) and *price*? It is straightforward, if a ridiculous example is used, as follows:

Bond:	L001 (due 21/12/2009)
Nominal amount:	LCC1 000 000
Coupon rate:	12.0% pa (payable in arrears on 21/12/2009)
Deal date (buy):	21/12/2008 (at 10am)
Rate (ytm) (buy):	12.0% pa (at 10am)
Deal date (sell):	21/12/2008 (i.e. same day, but at 11am)
Rate (ytm) (sell):	24.0% (at 11am)
Price on 21/12/2008 (10am):	LCC100% (or 1.0)
Price on 21/12/2008 (11am):	LCC50% (or 0.5)
Consideration on21/12/2008 (10am):	LCC1 000 000.00
Consideration on 21/12/2008 (11am):	LCC500 000.00
Difference (loss -):	-LCC500 000.00

The bond is issued on 21/12/2008, is due on 21/12/2009, has a coupon rate of 12% pa, and is bought by the investor at a rate of 12%. This means that the investor pays a price of 1.00 for the bond. This s/he does at 10 am and pays LCC1 million for the bond. After one year s/he will receive LCC120 000 in interest. At 11 am a catastrophe occurs and the rate for this bond in the secondary market rises to 24% pa. The investor panics, because s/he is of the opinion that the rate will increase to an even higher level later, and sells the bond at 24% pa.

The *market rate* of 24% pa means that there are buyers that are prepared to accept a return on the investment at this level. The coupon rate cannot change because it is a *fixed rate*. Thus, the element that has to give way is the *price* of the bon*d*. A return of 24% means that the price of the bond has to fall to 0.5 in order for the buyer to get a return of 24% pa (12.0 / 0.5). Thus, the new buyer pays LCC500 000.00 for the LCC1 million nominal value bond. On due date s/he receives LCC120 000.00 interest which means that the return is 24.0% [(LCC120 000 / LCC500 000) × 100].

If the 1-year bond rate had fallen to 6% pa, the price of the bond would have increased to 2.0. The bond would cost LCC2 000 000.00, because the new buyer wanted a return of 6% pa [(LCC120 000 / LCC2 000 000) × 100].

Thus, price and rate are inversely related. The following will now be evident:

- When the coupon rate is equal to the market rate, the price is par, i.e. 1.0.
- When the coupon rate is higher than the market rate, the price is higher than par, i.e. it is *trading at a premium*
- When the coupon rate is lower that the market rate, the price is lower than par, i.e. it is *trading at a discount*
- Changes in the price and rate of a bond are inverse.

The two main features of bonds that impact on rate/price are:

- Term to maturity
- Coupon rate.

In general, the longer the bond and the lower the coupon rate, the more price sensitive it is to changes in the market rate.

Because of the abovementioned features of bonds, investors require a measure of the price sensitivity of bonds in relation to changes in market rates. The measure developed for this purpose is called *duration*, and this will be discussed in some detail in a separate section.

Market risk is the chief risk faced by bondholders.

2.6.4.4 Credit risk

Credit risk is the risk of the issuer of the bond *defaulting* on its issued bonds, i.e. not being able to pay all or part of the maturity value and/or the interest on the bond. It is common wisdom that government bonds are risk-free, i.e. that governments never default on their issues of securities. This is not necessarily factual. As recently as 2002, a government defaulted on its debt. Other holders of government bonds have had the same fate in the distant past.

However, generally speaking, when countries are stable politically and economically, it is almost impossible for their governments to default on their debt. Thus in the stable parts of the world the rates on government securities are regarded as risk-free rates. All other rates on bonds are referenced on these risk-free rates.

The rates on a non-central government bonds are made up of two elements: the *risk-free rate* and the *risk premium*. The latter is the premium paid by the non-government issuer at issue (demanded by the buyer at issue and in the secondary market) as compensation for taking on a measure of the risk of default.

In mature bond markets non-central government issuers of bonds have their bonds rated by a rating agency (and possibly by more than one agency). Investors rely on the ratings of the credit rating agencies to gauge the quality of the borrower and to "set" the risk-premium demanded.

In conclusion we mention two variations of credit risk that flow from the above:

- Rating-downgrade risk.
- Risk-premium risk.

Rating-downgrade risk is where the business of the issuer undergoes changing business conditions (or a "shock") which leads to a downgrading by the rating agency/agencies. This of course leads to an increase in the *risk premium* on the particular bond.

Risk-premium risk refers to the risk of the overall risk-premium on corporate bonds increasing as a result of changing business conditions generally. For example, in economic recession periods, corporate bond investors may feel that the risk of companies defaulting on principal and/or interest increases. This leads to an increase in the risk premium demanded, which means that the prices of corporate bonds fall.

2.6.4.5 Call risk

Call (or prepayment) risk applies to bonds that have call provisions, i.e. the issuers have the option to "call" (prepay) their bonds. The corollary is that the holder is uncertain in respect of the future cash flows on the bond.

Issuers that have a call provision on their paper usually call the paper when the market rate has dropped below the coupon rate. The consequence of this is that the benefits of capital gains are smaller than in the case of option-free bonds, i.e. when rates decline they decline less on callable bonds.

It will be apparent that call bonds are also exposed to *reinvestment risk* (see next). When a bond is called the investor is left with the problem of investing the proceeds of the called bond in other bonds, the rate on which may be lower than the rate enjoyed on the call bond. However, this is only part of reinvestment risk, to which we now turn.

2.6.4.6 Reinvestment risk

Reinvestment risk is the risk of investing the proceeds of called call bonds at lower rates (as mentioned in the previous section) and the investment, in the case of plain vanilla bonds, of coupon interest at lower rates than the *assumed reinvestment rate*. As will be seen in the mathematics section, the bond pricing formula assumes that the coupons received are invested at the rate paid for the bond, i.e. this is an important assumption of the formula. However, this is not certain, and the rate may be lower. It is for this reason that certain investors favour zero coupon bonds.

2.6.4.7 Liquidity risk

Liquidity risk is the risk that a bond is sold below its true value, i.e. at a price that is lower than the prices of recent trade in bonds of the same maturity/duration (which is the same as selling the bond at a rate which is higher than recent trades in the relevant bond or similar bonds). This may happen if the bond market happens to be less liquid at the time of selling. The most accepted measure of liquidity risk is the spread between buy and sell rates. The wider the spread, the higher the liquidity risk.

2.6.4.8 Volatility risk

Volatility risk only applies in the case of a call bond, as in the case of *call risk*. Volatility in bonds (i.e. the extent of price/rate changes around the mean in the past) and expected volatility is one of the major inputs in the price of an option. Thus, the rate/price of a call bond will change as volatility and expected volatility change. In general:

Price of a call bond = price of option-free bond – price of embedded call option.

The higher volatility is the higher is the value of the call option. The reverse also holds, i.e. in the case of putable bonds:

Price of put bond = price of option-free bond + price of embedded put option.

2.6.4.9 Exchange rate risk

Exchange rate risk only applies in the case of bonds that are not denominated in the local currency of the holder. The holder has the risk that the currency in which the bonds are denominated depreciates, in which case the holder will receive less periodic interest and less of the principal amount on maturity in the local currency. This risk is also referred to as *currency risk*.

2.6.4.10 Incident risk

Incidents may take place that affect the interest and/or principal payments on bonds. There are many examples of this variety of risk but most analysts categorise them as follows:

- *Regulatory risk*. Laws or regulations may change that affect the status of a security and therefore its rate. For example, in some countries government bonds of a maturity of 3 years or less rank as liquid assets for banks (who are required to hold a certain minimum of these); if this status changes, the supply of these securities will increase, driving up the rate (driving down the price).
- *Political risk*. A new government may alter the terms and conditions of repayment of existing issues of bonds.
- *Disaster risk*. A company may be affected by a natural disaster (e.g. an earthquake), which could impair its ability to pay the interest on and/or principal of its issued bonds.
- *Takeover risk*. A company may be taken over and this could prejudice its obligation to bond holders.

2.6.4.11 Inflation risk

Inflation risk is the risk that the *real rate* of interest earned on a bond falls, due to inflation. For example, if an investor buys a bond at a rate of 10% pa and the annual inflation rate is 2% pa, s/he is earning a *real rate* of 8% pa. At the time of purchase the real rate is known and accepted by the purchaser. However, if the inflation rate rises to 4% pa, the holder receives a real rate of only 6% pa. This is because the rate on the bond is a *fixed rate* of return.

2.6.5 Role of rating agencies

The ratings assigned by rating agencies to the bonds of non-central government issuers have a major impact on the *rate premium* that they are obliged to pay above the benchmark risk-free rates.

The agencies collect and analyse all available accounting and other financial subjective and objective information in order to arrive at a rating that reflects the issuer's ability to pay the interest and repay the principal of the debt. Another way of putting this is that they endeavour to arrive at a *probability of default*. They make use of complex financial ratio analyses, industry analyses and economic analyses.

The financial ratios used are many, including profitability, leverage, coverage, and liquidity ratios. The three principal agencies are Moody's, Standard & Poor's (S&P) and Fitch IBCA. The rating categories of the first two agencies, as well as brief explanations of selected categories, are shown in Table 3.

	Moody's	S&P
Best quality; smallest degree of risk	Aaa	AAA
High Quality; slightly more long-term risk than top rating	Aa1	AA+
	Aa2	AA
	Aa3	AA-
Upper medium grade; possible impairment in the future	A1	A+
	A2	A
	A3	A-
Medium grade; lack outstanding investment characteristics	Baa1	BBB+
	Baa2	BBB
	Baa3	BBB-
Speculative issues; protection may be moderate	Ba1	BB+
	Ba2	BB
	Ba3	BB-
Very speculative, small likelihood of interest and principal payments	B1	B+
	B2	B
	B3	B-
Issues in poor standing; may be in default	Caa	CCC
Speculative in a high degree; with marked shortcomings	Ca	CC
Lowest quality; poor prospects of attaining real investment standing	C	C
Source: Saunders and Cornett (2001).		

Table: Moody's and S&P ratings and succinct explanation

2.7 Summary

This section discusses the many advantages long-term bonds offer over short-term securities for borrowers that borrow for capital projects. There are five groups of borrowers: government, parastatals, the corporate sector, the foreign sector and SPVs. They each have particular motivations for issuing bonds

The largest issuer is the central government and their motivations are tied in with fiscal policy.

The groups of bond holders are the four sectors that make up "ultimate lenders" and the various financial intermediaries. Each has a particular motivation for holding bonds. The largest holders are the retirement funds and insurers because of the duration of their liabilities: they seek to match them.

Bonds have many risks inherent in them such as market risk and credit risk. The rating agencies play a major role in the establishment of the risk premium paid by companies over the risk free rate.

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