1 Context & Essence

1.1 Learning outcomes

After studying this text the learner should / should be able to:

1. Understand the slot the bond market occupies in the financial system.
2. Be acquainted with the general terminology of the bond market.
3. Dissect the bond market definition into its elements.
4. Discuss the characteristics of the plain vanilla bond.
5. Calculate interest payments of a plain vanilla bond.

1.2 Introduction

The purpose of this text is to provide an overview of the bond market and its role in the financial system. We start with a brief introduction to the financial system, and then contrast the money market with the bond market, although together they make up the debt market. We then describe the characteristics of the most common bond, the so-called plain vanilla bond. We then just mention the bond derivatives.

The following sections are presented:

- The financial system in brief.
- The money market in a nutshell.
- The bond market in a nutshell.
- Essence of the plain vanilla bond.
- Bond derivatives.

1.3 The financial system in brief

As seen in Figure 1, the financial system is essentially concerned with borrowing and lending. Lending occurs either directly to borrowers (e.g. equities held by an individual) or indirectly via financial intermediaries (e.g. an individual holds units and the unit trusts holds as assets the liabilities of the ultimate borrowers). Although this is the main function, there are many related others as reflected in the following definition of the financial system:

The financial system is a set of arrangements / conventions embracing the lending and borrowing of funds by non-financial economic units and the intermediation of this function by financial intermediaries in order to facilitate the transfer of funds, to create additional money when required, and to create markets in debt and equity instruments (and their derivatives) so that the price and allocation of funds are determined efficiently.

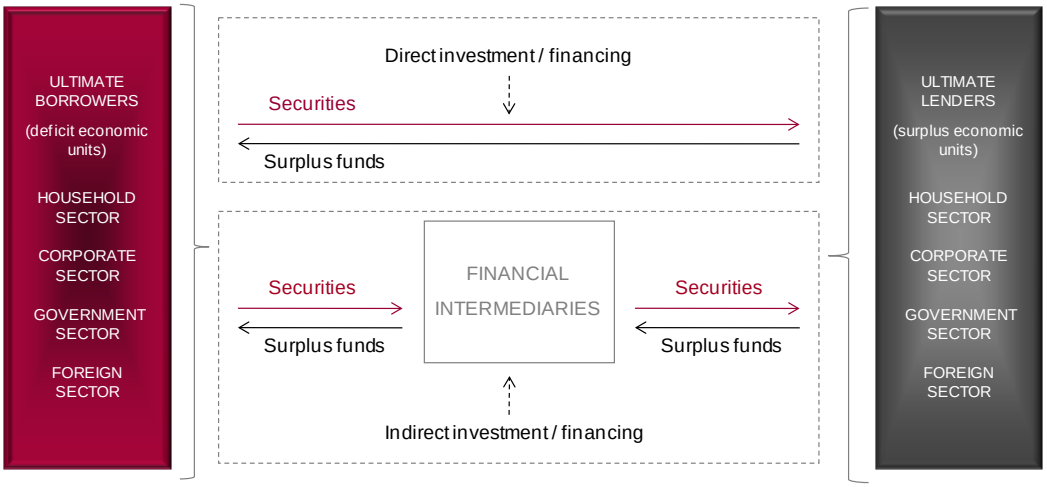


Figure 1: simplified financial system

Dissecting this definition reveals six essential elements:

- First: *lenders* (surplus economic units or surplus budget units) and *borrowers* (deficit economic units or deficit budget units), i.e. the non-financial economic units that undertake the lending and borrowing process. There are four groups of lenders and borrowers: household sector, corporate sector, government sector and foreign sector, and many members of these groups are lenders and borrowers at the same time.
- Second: *financial intermediaries* which intermediate the lending and borrowing process. They interpose themselves between the lenders and borrowers.
- Third: *financial instruments*, which are created to satisfy the financial requirements of the various participants; these instruments may be marketable (e.g. treasury bills) or non-marketable (e.g. participation interest in a retirement annuity).
- Fourth: the *creation of money* when demanded. Banks have the unique ability to create money by simply lending because the general public accepts bank deposits as a medium of exchange.
- Fifth: *financial markets*, i.e. the institutional arrangements and conventions that exist for the issue and trading (dealing) of the financial instruments;
- Sixth: *price discovery*, i.e. the price of shares / equity and the price of money / debt (the *rate of interest*) are "discovered" (made and determined) in the financial markets. Prices have an allocation of funds function.

In this series of modules on the bond market we will not cover *money creation* and the *genesis of short-term interest rates* (this takes place in the money market). We do cover the other elements briefly here as they form the context of the bond market. We begin with the financial intermediaries.

The financial intermediaries that exist in most countries are shown in Box 1 in categories. The individual intermediaries or categories are then presented in Figure 2 in terms of their relationship to one another.

BOX 1: FINANCIAL INTERMEDIARIES

MAINSTREAM FINANCIAL INTERMEDIARIES

DEPOSIT INTERMEDIARIES

Central bank (CB)
Private sector banks

NON-DEPOSIT INTERMEDIARIES

Contractual i**ntermediaries (CIs)**

Insurers
Retirement funds (pension funds, provident funds, retirement annuities)

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)

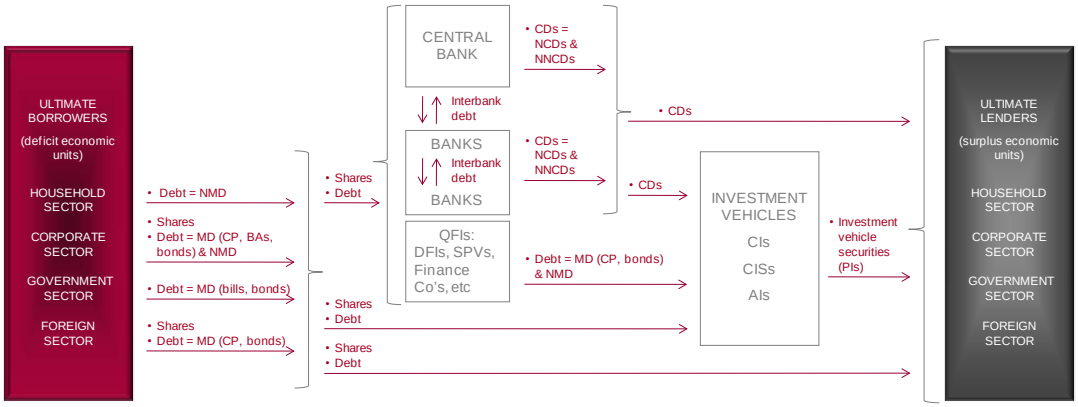
Development finance institutions (DFIs)
Special purpose vehicles (SPVs)
Finance companies
Leasing companies
Investment trusts / companies
Micro lenders
Buying associations

The *financial instruments* issued by the ultimate borrowers and the financial intermediaries are also shown in Figure 2. They can be categorised into:

- debt instruments
- deposit instruments (which are a variation of debt instruments)
- equity instruments.

We focus here on the debt instruments because bonds are such instruments.

Debt instruments represent either marketable debt (MD) or non-marketable debt (NMD) and are either short-term or long-term in term to maturity. The former is usually defined as up to a year and the latter as longer than a year. The MD and the NMD of short duration are part of the money market while only the MD of long-term duration makes up the bond market.



MD = marketable debt; NMD = non-marketable debt; CP = commercial paper; BAs= bankers' acceptances; CDs = certificates of deposit (= deposits); NCDs = negotiable certificates of deposit; NNCDs = non-negotiable certificates of deposit; foreign sector issues foreign shares and foreign MD (foreign CP & foreign bonds); PI = participation interest (units)

Figure 2: financial intermediaries & instruments / securities

The issuers of bonds (long-term MD) are:

- corporate sector
- government sector
- foreign sector
- QFIs.

The detail in this regard will be returned to later.

It will be evident from the above that there exist two *financial markets*: the debt and equity markets; they are depicted in Figure 3 together with the foreign exchange market. Note that:

- The money market is the short-term arm of the debt market; it comprises of short-term NMD and MD.
- The bond market is part of the long-term debt market; the latter is made up of long-term NMD and MD while the bond market is the MD arm.
- The money market (= the short-term arm of the debt market) and the long-term debt market make up the debt market.
- The debt market is also known as the interest-bearing market and the fixed-interest market. The terms *interest-bearing* and *fixed-interest* differentiate the debt market from the equity market because the returns on shares are dividends and dividends are not fixed – they depend on the performance of companies. (Here we are ignoring fixed-interest preference shares.)

- The bond and equity markets make up the *capital* market; called as such because companies and governments access long-term non-permanent capital (through bond issues) or permanent capital (through share issues; companies only) in these markets. (Here we ignore exceptions such as perpetual bonds and redeemable preference shares.)
- The foreign exchange (forex) market is not a financial market, but a conduit for foreign investors into local financial markets and for local investors into foreign financial markets.

To the debt and equity (and forex) markets we may add the derivative markets. Although lending and borrowing also do not take place in the derivative markets, they play an important role in the financial system in terms of enabling participants in the real[1] economy to hedge (thereby creating stability in production).

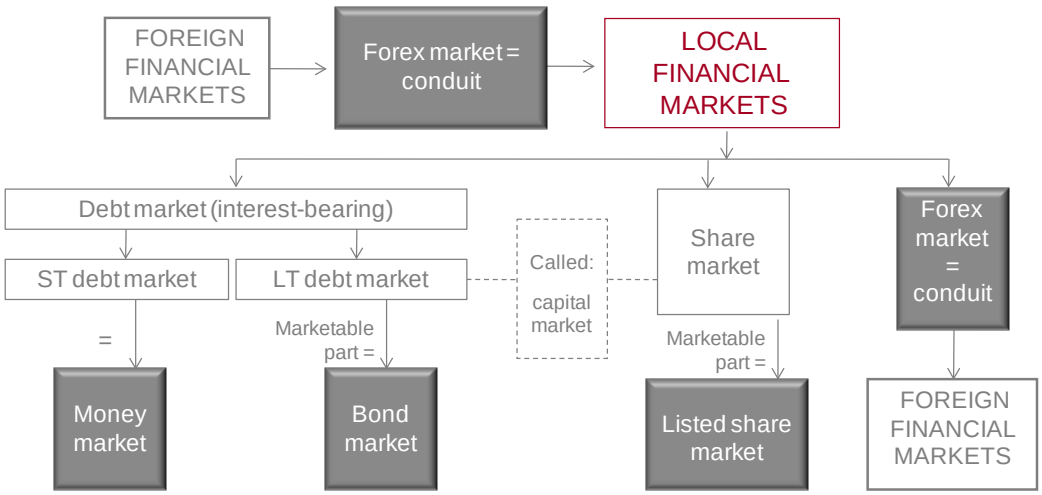


Figure 3: financial markets

Financial markets can be categorised into primary and secondary markets. The former is the market for the issue of new securities and the latter the market for the trading of securities that are already in issue. It will be apparent that non-marketable debt instruments only have primary markets (e.g. a participation interest in a retirement fund) and that MD are issued in the primary markets and traded in the secondary markets (e.g. treasury bills).

Financial markets are either OTC (over-the-counter), such as the money market, or exchange driven, such as the equity market. Next we define the money market which leads to a detailed description of the bond market.

1.4 The money market in a nutshell

The money market is usually defined as the market for marketable short-term debt instruments and the bond market as the market for marketable long-term debt instruments. However, as hinted at above, it is our opinion that the money market is far more than this. It is comprised of the following markets:

- The primary markets that bring together the supply of retail and wholesale short-term funds and the demand for wholesale and retail short-term funds (marketable and non-marketable).
- The secondary market in which existing marketable short-term instruments are traded.
- The creation of new money (deposits) and the financial assets that lead to this (loans in the form of NMD and MD securities).
- The central bank-to-bank interbank market (cb2b IBM) and the bank-to- central bank interbank market (b2cd IBM) where monetary policy is played out and interest rates have their genesis (i.e. where repo is implemented).
- The bank-to-bank interbank market (b2b IBM) where the repo rate has its secondary impact, i.e. on the interbank rate.
- The money market derivative markets (= an addendum).

This is why we define the money market as comprising the entire short-term debt market. Another strong reason is that short-term interest rates are not primarily "discovered" in the short-term marketable debt market; rather they are discovered in the non-marketable debt market (starting with the repo rate, which then influences the interbank rate, then the bank call rates and so on…), and marketable short-term debt rates then take their cues from these rates. It will be evident that the short end of the yield curve is established in the money market.

1.5 Essence of the bond market

1.5.1 Introduction

The long-term debt market is an extension of the money market. The bond market is a part of the long-term debt market: it is the market for *marketable* long-term debt; i.e. debt that is issued in the form of tradable securities. Few borrowers are able to access this market, mainly because of the demands of the lenders in terms of credit risk, marketability, etc. (this will become clearer as we progress this discussion). Formally, we define the bond market as:

The bond market is the mechanism / conventions that exist for the issue of, investing in, and the trading of instruments that represent the long-term undertakings (usually of a fixed capital nature) of the issuers.

If this definition is dissected, we arrive at the following key words:

- Bonds.
- Market mechanism.
- Issue (primary market).
- Investing.
- Trading (secondary market).
- Long-term undertakings of a fixed capital nature.

Each of these key words will be explained briefly.

1.5.2 Bonds

Bonds may be defined as marketable long-term debt obligations of the issuers. Each issuer undertakes to repay the face value at the end of the stated redemption (maturity)[2] period of the bond, plus interest at specified intervals or at the end of the period, and the interest rate may be fixed or floating.

The holder of a bond has a claim on the assets and revenue of the issuer in the event of bankruptcy. This means that the corporate bondholder has a prior claim on assets in relation to equity. In many cases the bond certificate states that the holder has such a claim.

1.5.3 Market mechanism

The *market mechanism* is the structure, systems and conventions that exist to facilitate the issue and trading of bonds. As we have seen, there are two types of market, i.e. the OTC market and the exchange-regulated market. Most bond markets around the world are OTC markets.[3]

1.5.4 Issue (primary market)

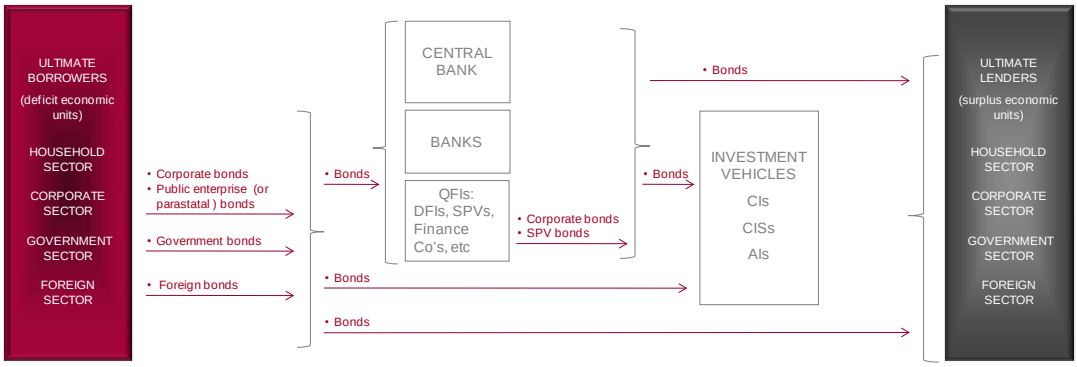


Figure 4: bond issuers

There are five broad classes of *issuers* in the bond market:

- Government sector (usually three levels).
- Corporate sector entities (private sector-owned).
- Corporate sector entities (public sector-owned; called public enterprises or parastatals).
- Special purpose vehicles (SPVs).
- Foreign sector entities (inward listings).

The place of each of the five broad classes of issuers in the financial system may be depicted as in Figure 4. The detail will be provided later.

The largest issuer of bonds in almost all countries is the government sector; in some cases this is 100%.

1.5.5 Investing

The *investors* in (or holders of) bonds are also depicted in Figure 4. Of the ultimate lenders, the foreign sector is the largest investor. The other three ultimate lender sectors are insignificant holders and may be largely ignored in the big picture scenario we are creating. All the mainstream financial intermediaries are investors in bonds, but the largest holders are the retirement funds (a CI), the long-term insurers (a CI) and the bond unit trusts (a CIS).

1.5.6 Trading (secondary market)

Trading in bonds (i.e. secondary market broking and dealing) is a sizeable business in most financial markets. As noted earlier the secondary market is either OTC or exchange-driven. The market is "made" / facilitated by a number of players:

- *Members of bond exchanges* where such exchanges exist.[4] The members are the *banks*, smaller *broker-dealers* and *interdealer brokers*. In some countries the banks act as primary dealers (a subset of market makers), which is dealt with later. The broker-dealers are smaller firms that trade for own account or for clients. Interdealer brokers exist in some markets; they offer a brokerage service exclusively between the members of the exchanges.[5]
- *Discount houses*. In some countries where exchanges do not exist and the banks are reluctant to make a market in bonds, the discount houses (which are specialised banks) act in this capacity.
- *Banks*. In some countries where exchanges do not exist the banks act as market makers / primary dealers.
- *Issuers*. Certain issuers make a market in their own paper, with the objective of enhancing the liquidity of their paper, thus reducing the rate of interest (cost) for them.
- *Speculators / arbitrageurs*. These may be members of exchanges (the members that only deal for themselves) or non-members. Most of them trade intra-day in order to avoid settlement outlays. Their usefulness lies in increasing the turnover in the bond market, leading to efficient price discovery.
- *Investors*. The investors play a significant role in the bond market. The major investors as noted are the retirement funds and insurers), the foreign sector (mainly foreign retirement funds) and bond unit trusts.

1.5.7 Long-term undertakings of a fixed capital nature

The *long-term undertakings of a fixed capital nature* of issuers are what give rise to the issue of bonds. Many companies and governments and public enterprises (also called parastatals) have a requirement for long-term funds to finance projects such as infrastructure (roads, telecommunications systems, deep mining, etc). The financial planning side of a long-term project would be problematical if the company was only able to issue short-term instruments (like commercial paper – CP). There would be two main financial considerations (and inconveniences) in this regard:

- The uncertainty of obtaining the funds at each rollover at maturity.
- The uncertainty of the rate of interest to be paid at each rollover date.

The ability to issue long-term bonds removes these uncertainties. The issuer has a fixed (i.e. a known) rate that is paid at known intervals and the funds are available for the full long-term period.

1.6 Essence of the plain vanilla bond

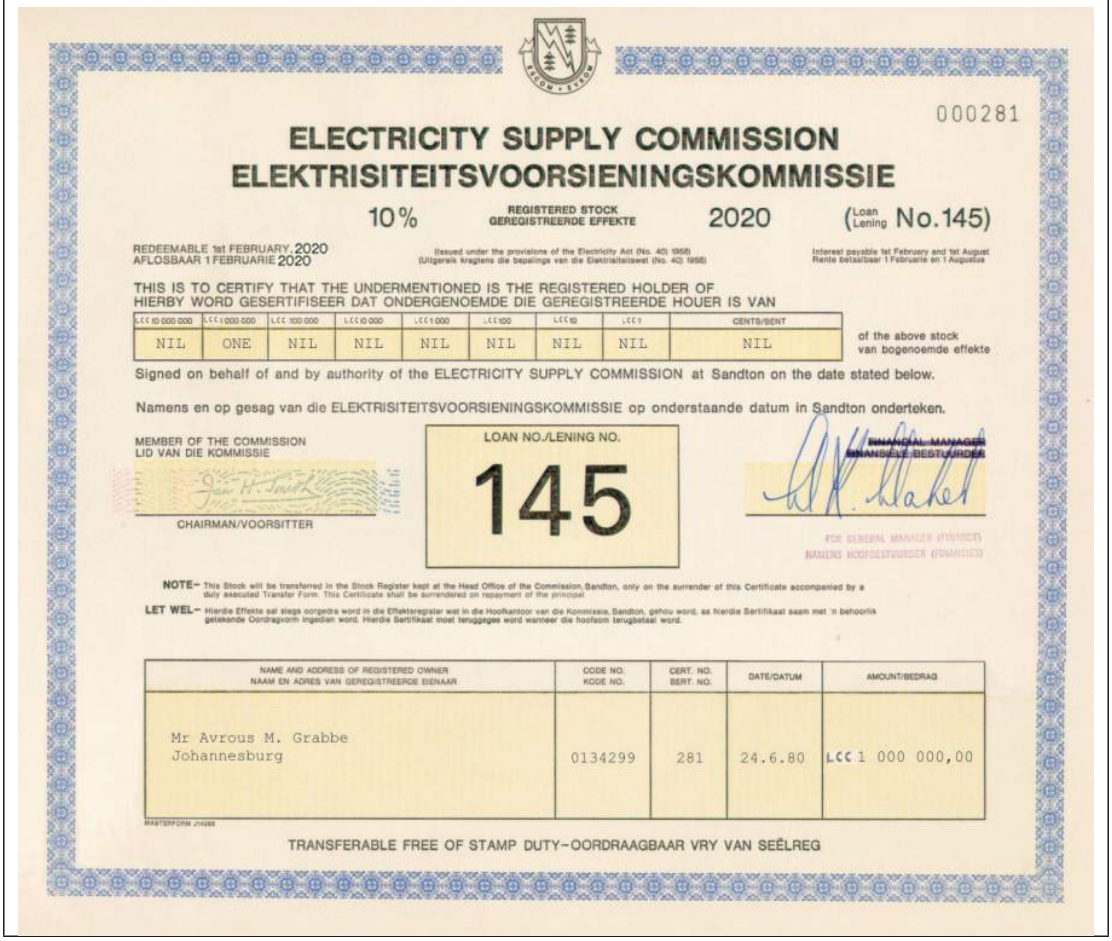
There are many types of bonds in the bond markets of the world, and we mention them here (they are discussed in detail later):

- Plain vanilla bonds
- Bearer bonds versus registered bonds
- Perpetual bonds versus fixed term bonds
- Floating rate bonds versus fixed rate bonds
- CPI bonds
- Zero coupon bonds versus coupon bonds
- Call bonds
- STRIPS
- Convertible bonds
- Exchangeable bonds
- Bonds with share warrants attached
- General obligation bonds
- Revenue bonds
- Serial bonds
- Catastrophe bonds
- Asset-backed bonds

- Senior, subordinated, junior and mezzanine bonds
- Junk bonds
- Guaranteed bonds
- Pay-in-kind bonds
- Split coupon bonds
- Extendable bonds
- Foreign bonds
- Eurobonds
- Global bonds
- Retail bonds.
- Islamic bonds

About 95% of all bonds in issue are of the *plain vanilla* variety; in some countries this number is 100%. This variety of bond is elucidated below with the assistance on an actual bond (see[6] Box 2).

BOX 2: EXAMPLE OF PLAIN VANILLA BOND



000281

ELECTRICITY SUPPLY COMMISSION
ELEKTRISITEITSVOORSIENINGSKOMMISSIE

10% REGISTERED STOCK / GEREGISTREERDE EFFEKTE 2020 (Loan / Lening No.145)

REDEEMABLE 1st FEBRUARY 2020 / AFLOSBAAR 1 FEBRUARIE 2020

(Issued under the provisions of the Electricity Act (No. 40) 1958) (Uitgereik kragtens die bepalings van die Elektrisiteitswet (No. 40) 1958)

Interest payable 1st February and 1st August / Rente betaalbaar 1 Februarie en 1 Augustus

THIS IS TO CERTIFY THAT THE UNDERMENTIONED IS THE REGISTERED HOLDER OF
HIERBY WORD GESERTIFISEER DAT ONDERGENOEMDE DIE GEREGISTREERDE HOUER IS VAN

L.CC 10 000 000	L.CC 1 000 000	L.CC 100 000	L.CC 10 000	L.CC 1 000	L.CC 100	L.CC 10	L.CC 1	CENTS/SENT
NIL	ONE	NIL	NIL	NIL	NIL	NIL	NIL	NIL

of the above stock / van bogenoemde effekte

Signed on behalf of and by authority of the ELECTRICITY SUPPLY COMMISSION at Sandton on the date stated below.

Namens en op gesag van die ELEKTRISITEITSVOORSIENINGSKOMMISSIE op onderstaande datum in Sandton onderteken.

MEMBER OF THE COMMISSION / LID VAN DIE KOMMISSIE

CHAIRMAN/VOORSITTER

LOAN NO./LENING NO.

145

FINANCIAL MANAGER / FINANSIELE BESTUURDER

FOR GENERAL MANAGER (FINANCE) / NAMENS HOOFBESTUURDER (FINANSIES)

NOTE– This Stock will be transferred in the Stock Register kept at the Head Office of the Commission, Sandton, only on the surrender of this Certificate accompanied by a duly executed Transfer Form. This Certificate shall be surrendered on repayment of the principal.

LET WEL– Hierdie Effekte sal slegs oorgedra word in die Effektegister wat in die Hoofkantoor van die Kommissie, Sandton, gehou word, as hierdie Sertifikaat saam met 'n behoorlik getekende Oordragvorm ingedien word. Hierdie Sertifikaat moet teruggegee word wanneer die hoofsom terugbetaal word.

NAME AND ADDRESS OF REGISTERED OWNER / NAAM EN ADRES VAN GEREGISTREERDE EIENAAR	CODE NO. / KODE NO.	CERT. NO. / SERT. NO.	DATE/DATUM	AMOUNT/BEDRAG
Mr Avrous M. Grabbe Johannesburg	0134299	281	24.6.80	L.CC 1 000 000,00

MASTERFORM J14/86

TRANSFERABLE FREE OF STAMP DUTY–OORDRAAGBAAR VRY VAN SEËLREG

This plain vanilla bond[7] has a number of features:

- The *issuer* is Escom. Escom is the borrower. The bond is a debt obligation of Escom.
- The face value of the bond is LCC1 million. Face value is also referred to as *nominal value, par value* and *maturity value*. This is the amount payable to the holder on maturity date, which of course is a *future value* (this is discussed further in a separate section).
- The *maturity date* (due date or redemption date) of the bond is 1 February 2020.
- The *loan number* is 145. This is an internal administration number and is also used by the exchange (if there is one) to designate (code) the bond (e.g. E145).
- The *certificate number* (000281) is also an internal administration number.
- The *name and address of the registered owner* is obvious. The bond is registered in the name of Mr Avrous M Grabbe. *Registered* means that a register is kept by a Transfer Secretary and by the issuer in which the holders (owners) and their holdings (nominal value) appear.[8]
- The *coupon rate* is 10% per annum. This is significant in that this rate of interest is *fixed* for the term of the bond. Every year, the holder of this bond will receive interest of LCC100 000 (LCC1 000 000 × 0.10).
- The *interest dates* (which are difficult to read on the certificate) are 1 February and 1 August. This means that the interest amount of LCC 100 000 is paid in instalments of LCC50 000 on each of the two dates.

- The words "This stock will be transferred in the stock register kept at the head office of (Escom)… only on the surrender of this certificate accompanied by a duly executed Transfer Form… This certificate shall be surrendered on repayment of the principal" mean that the certificate represents proof of ownership. This of course does not apply in the case of immobilisation and dematerialisation.
- The word *stock* is an outmoded name for *bond*.

The two main characteristics of this bond are the *fixed term* and the *fixed rate*. These plain vanilla bonds are therefore also referred to as *fixed-rate, fixed-interest bonds.*

It should also be clear that the coupon rate of 10% pa is *not the true rate of return* on the bond for the purchaser (unless the market rate on the issue date was 10% pa), and this is so for three reasons:

- In real life the bond would most likely have been purchased at a discount to face value (i.e. for less than LCC1 million) or at a premium to face value (i.e. for more than LCC1 million).
- Compounding takes place because the cash flows prior to maturity date are reinvested.
- The reinvestment rates are not known in advance.

These "complications" indicate the need for a different measure of the rate of return, and this is the *average annual rate for the period*, termed the *yield to maturity* (ytm). To this interesting measure we shall return later.

In conclusion it is important to reiterate that over the life of the bond the *coupon does not change*. However, the market rate (ytm) changes in the secondary market on a second-to-second basis, making the price of the bond less or more than LCC100%, i.e. the value of the bond changes continuously.

1.7 Bond derivatives

In the many bond markets of the world there exist vibrant markets for the derivative instruments that have been created for the purpose of transferring interest rate risk / transforming assets and liabilities. We merely mention them here:

- Forwards.
- Futures.
- Options:
  - options on "physicals"
  - bond warrants[9].
- Swaps:
  - interest rate swaps
  - bond-equity swaps.

- Hybrids:
  - options on futures
  - swaptions.

1.8 Summary

Debt is comprised of short-term debt (part of the money market) and long-term debt. The marketable instruments of the latter group are called bonds. The bond market and the equity market together are referred to as the capital market.

There are four groups of bonds: corporate bonds (private and public sector bonds), government bonds (of different levels), foreign bonds and SPV bonds (the bonds issued by special purpose vehicles – product of securitisations).

The bond market can be described as the mechanism / conventions that exist for the issue of, investing in, and the trading of instruments that represent the long-term undertakings (usually of a fixed capital nature) of the issuers.

The most common bond is the fixed-interest rate, fixed-maturity date bond. A change in the rate (called yield to maturity – ytm) on a bond changes the price, given the fixed coupon rate.

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