Financial System: An Introduction

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1st edition

ISBN 978-87-403-0592-0

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1.1 Learning objectives

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

1. Define the financial system.
2. Describe the elements that make up the financial system.
3. Elucidate the allied (non-principal) financial bodies / entities that assist in facilitating the flow of funds and securities in a financial system.
4. Name and define the sectors of the economy that constitute the non-financial lenders and borrowers.

1.2 Introduction

This text is about the fundamentals of the financial system. By "fundamentals" we mean that we attempt to elucidate the system by going back to the basics, and this is best achieved in our view by splitting it up into its components and illuminating each one. The following are the constituents:

- Lenders & borrowers.
- Financial intermediaries.
- Financial instruments.
- Financial markets.
- Money creation.
- Price discovery.

1.3 Defining the financial system

Every scholar on the financial markets has attempted a definition of the financial system. Ours is:

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.

This definition identifies the six essential elements of a financial system:

- First: the *lenders and borrowers*, i.e. the non-financial economic units that undertake the lending and borrowing process.
- Second: the *financial intermediaries*, which intermediate the lending and borrowing process, meaning that they interpose themselves between the lenders and borrowers.
- Third: the *financial instruments* (marketable and non-marketable), which are created to satisfy the needs of the various participants.
- Fourth: the *creation of money* when required, i.e. the unique money creating ability of banks.
- Fifth: the *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 determination or making of the price of equity and the price of money / debt (the *rate of interest*).

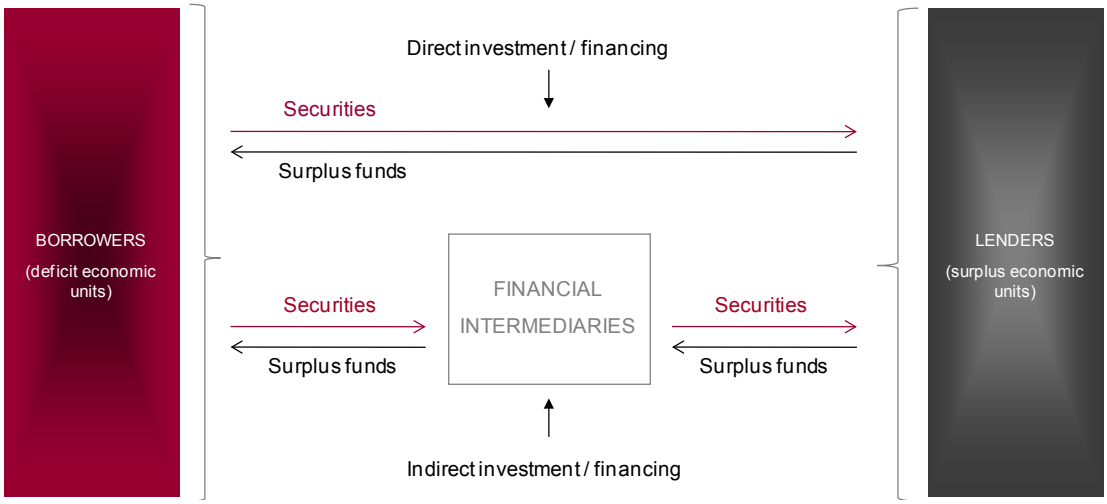

Figure 1: financial systme (simplified)

The definition covers the essence of the financial system. In addition to the mentioned elements, there are also allied participants / players / entities in the system, without which the system would not function efficiently. They are:

- First: the *brokers and dealers*, i.e. the members of exchanges and/or financial intermediaries that facilitate the trade in financial instruments (which we refer to here collectively as *broker-dealers*).
- Second: the *fund managers* (portfolio managers), i.e. the corporate entities or departments of financial intermediaries that manage funds on behalf of principals (owners or holders of money).
- Third: the *financial exchanges* that allow the broker-dealers to facilitate trading in securities, and create the mechanism for clearing and settlement of trades in a risk-minimising manner.

- Fourth: the *credit rating agencies,* which analyse relevant financial and economic data pertaining to the issuers of securities and assign ratings to the securities reflecting the probability of the issuers meeting their financial obligations (interest and principal).
- Fifth: the *financial regulators* that regulate and supervise all players in the financial system.

Given the above information, how does one portray the financial system? The answer is that it is not possible to capture all the elements and players in one single illustration. However, we can go pretty far in this regard. A good to start is with the illustration presented in Figure 1.

This illustration portrays the main players in the system: the lenders, borrowers, financial intermediaries, and hints at the two types of borrowing / lending (discussed in detail later). Not observable here are *the financial* (or *securities*) markets (OTC or formal – the exchanges) and the *broker-dealers*. The *financial markets* may be imagined as being interposed in the flow lines. The *broker-dealers* of the financial markets, as this generic name indicates, facilitate and operate in these markets as brokers (= match buyers and sellers) and dealers (= act as principals = buy and sell for own account). (We will return to and elucidate this later.)

The addition of the financial exchanges and the broker-dealers may be depicted as in Figure 2.

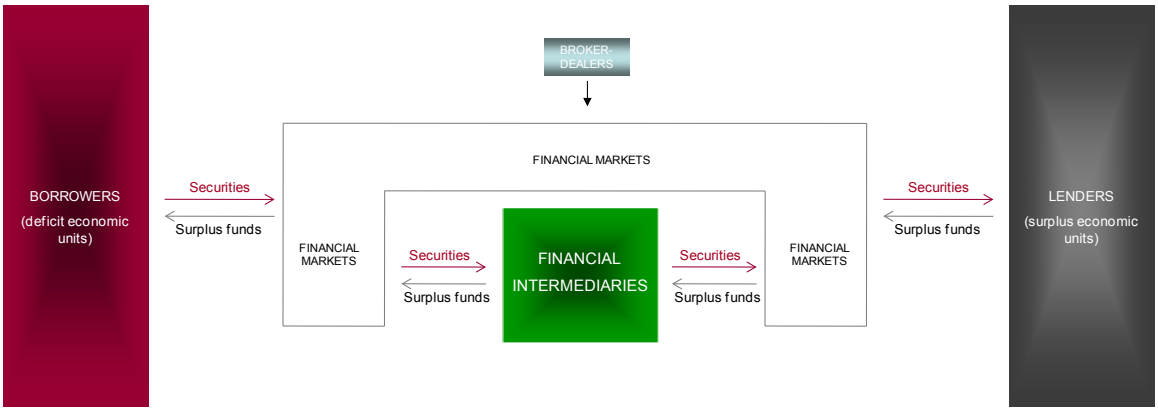

Figure 2: financial markets & broker-dealers in financial system

The remaining elements of, and the other players in, the financial system are the *fund managers*, the *regulators* of the financial system, the *creation of money* and *price discovery*. The former two we are able to add to the illustration: see Figure 3.

The significant elements of the financial system, *creation of money* and *price discovery*, cannot be easily illustrated. The banks, by simply extending new loans (credit) or purchasing new securities on the primary market (also credit, in a different form), create new money.

What is money? It is the amount of bank notes and coins and bank deposits of the non-bank private sector, but overwhelmingly the latter. How is new money (in the form of new deposits) created? By new bank lending; it is the outcome of new bank lending. Often money creation is elucidated by a bank first receiving a new deposit. We will show later that this is not the case; it is misleading because it does not identify where the new deposit springs from.

Many scholars also complicate the money creation process by introducing the (cash) reserve requirement (RR = a ratio of bank deposits to be held with the central bank) and presenting this as the brake on money creation. When a bank makes a new loan a new deposit is created; this requires a topping up of reserves (R), and this is provided by the central bank (discussed in more detail later).

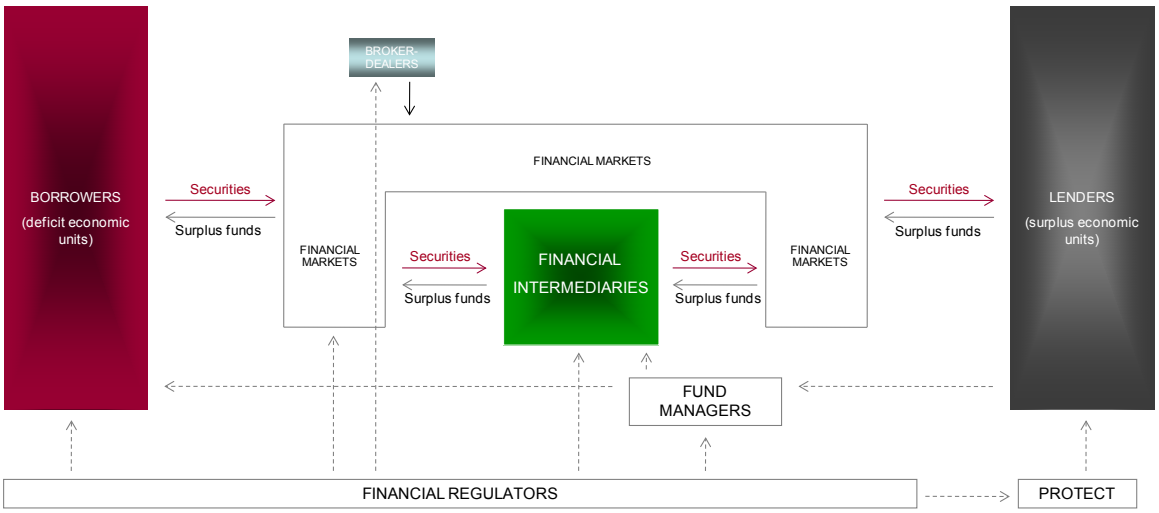

Figure 3: (most) elements of the financial system

Some scholars believe that a central bank does not have to provide the reserves (R), and that this is a form of money "supply" control. However, in most countries the so-called *discount window* (= a term used for central bank lending to banks) is always "open" and the central bank happily supplies the additional R. The brake on the system lies not in the amount of R supplied by the central bank, but in the cost of these borrowed R.

The cost of these borrowed R is an interest rate that is set by a committee of central bankers (in most cases), and it is called *repo rate, discount rate, base rate, Bank rate* (sic), *etc.* (we call it the key interest rate – KIR). This rate has such a substantial influence on the bank-to-bank interbank rate, the call money rate and other interest rates, that it may be said that the central bank governor "governs" interest rates. The KIR is the genesis of all other interest rates and other financial market pricing.

These two vital elements of the financial system (*creation of money* and the *price of money* = part of *price discovery*) may be depicted simply as in Figure 4[1]. The price discovery process of the equity market will be covered later.

The money creation element of the financial system is a crucial one in terms of the supply of capital / funding when required by economic agents and of course in terms of monetary policy. It is to be noted that this brief elucidation of the money creation process and the role of the KIR is elementary; the real story will be covered in a separate section.

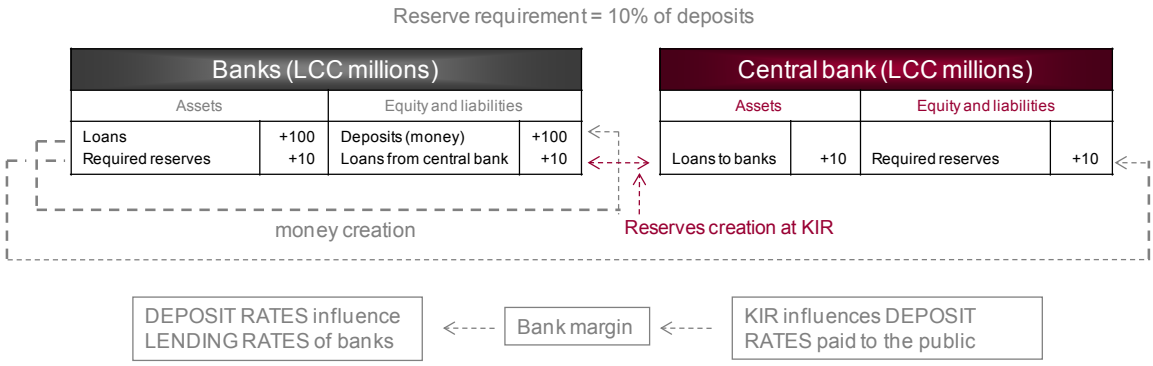

Figure 4: money creation and price of money (interest rates)

In fact, each of the elements of the financial system is covered in a separate section. We begin with the first-mentioned element – without which there is no financial system – the non-financial lenders and borrowers.

1.4 Non-financial lenders and borrowers

It is highly improbable that the savings of (non-financial) economic units will be matched by desired investment. Some economic units will find that their savings out of income will exceed their planned investment, while others will find themselves in a situation where their savings are insufficient to meet desired internal investment. The former are referred to as *surplus economic units* or *ultimate lenders*, and the latter as *deficit economic units* or *ultimate borrowers*.

Gurley and Shaw created these terms in the 1960s[2]. They showed that each of the sectors of the economy conform to the following identity (notation amended):

$$I - E = \Delta FA - \Delta DE.$$

Income (I) minus expenditure (E) is equal to the change in the holding of financial assets (FA) less the change in borrowing (debt or equity – DE). Therefore if E > I, the difference is made up by either reducing holdings of financial assets or increasing debt (or a combination). For example, if I = LCC 50 000 and E = LCC 70 000 in a particular month, I – E = -LCC 20 000. This is equal to either –LCC 20 000 in FA or +LCC 20 000 in DE, or, say –LCC 10 000 in FA and +LCC 10 000 in DE. ΔFA – ΔDE therefore equals –LCC 20 000 [-LCC 10 000 – (+LCC 10 000)].

Similarly, if I > E, then the economic unit has a choice of increasing FA or decreasing DE or combining +FA with –DE. It follows that there are three budget conditions:

- Deficit unit = E > I; therefore ΔDE > ΔFA, meaning that the economic unit is a *net borrower of funds.*
- Surplus unit = I > E; therefore ΔFA > ΔDE, meaning that the economic unit is a *net lender of funds.*
- Balanced unit = I = E; therefore ΔFA = ΔDE, meaning that the economic unit is neither a net borrower of funds nor a net lender of funds.

It is important to remember here that the *net ultimate lenders* are *non-financial* economic units that generate funds that are available for investment, i.e. we exclude the financial economic units (financial intermediaries) here (because they are to a large degree the recipients of the surplus funds). By the same token, the *net ultimate borrowers* are *non-financial* in nature (they borrow from the financial intermediaries and the ultimate lenders).

The ultimate lenders can be split into the four broad categories of the economy: the *household sector*, the *corporate (*or *business*) *sector*, the *government sector* and the *foreign sector*. Exactly the same non-financial economic units also appear on the other side of the financial system as *ultimate borrowers*. This situation arises as different members of the four categories, or even the same members at other times, may be either surplus or deficit units. An example is government: the governments of most countries are permanent borrowers (usually long-term), while at the same time having short-term funds in their account/s at the central bank and the private banks (pending spending).

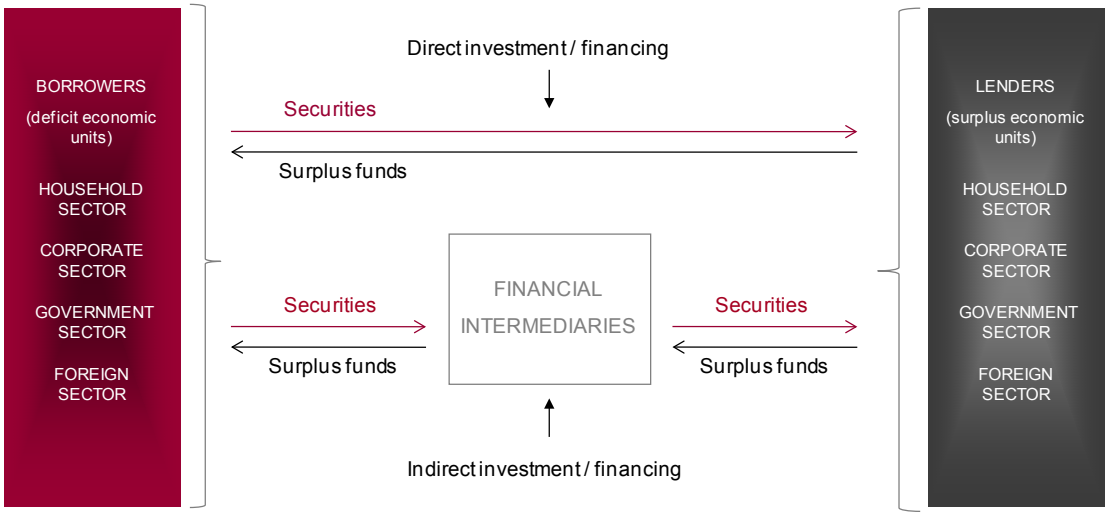

Figure 5: sectors of lenders & borrowers

Figure 5[3] expands the financial system illustration presented earlier in Figure 1 to include the four economic sectors. These four sectors (and the financial intermediaries) form the framework of the so-called National Financial Accounts (= flow of funds per annum) produced by central banks. For purposes of these accounts, central banks usually define these four sectors as follows[4]:

Household sector: consists of individuals and families, but also includes private charitable, religious and non-profit bodies serving households. It includes unincorporated businesses such as farmers, retailers and professional partnerships, as the transactions of these businesses cannot be separated from the personal transactions of their owners.

Corporate sector: comprises all companies not classified as financial institutions and therefore covers business enterprises directly or indirectly engaged in the production and distribution of goods and services.

Government sector: consists of the central government, provincial governments (where they exist), local authorities, and non-financial public enterprises.

Foreign sector: comprises all organisations, persons and assets resident or situated in the rest of the world.

1.5 Summary

The financial sector or system can be dissected into six essential elements:

- Non-financial lenders and borrowers.
- Financial intermediaries.
- Financial instruments.
- Creation of money.
- Financial markets.
- Price discovery.

In addition, there are also allied participants / players / entities in the system, without which the system would not function efficiently. They are:

- Brokers and dealers (collectively: broker-dealers).
- Fund managers.
- Credit rating agencies.
- Financial exchanges.
- Financial regulators.

There are four sectors of the economy that constitute the non-financial lenders and borrowers:

- Household sector.
- Government sector.
- Corporate sector
- Foreign sector.

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2 Financial intermediaries

2.1 Learning objectives

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

1. Explain the concepts of direct and indirect financing.
2. Distinguish between primary and indirect securities.
3. Examine the concept of financial intermediation.
4. Offer an opinion on why financial intermediaries exist.
5. Elucidate the economic functions of financial intermediaries.
6. Examine the logical categorisation of financial intermediaries.
7. Describe the relationship of financial intermediaries to one another.
8. List the financial intermediaries that populate most countries.

2.2 Introduction

Financial intermediaries evolved over many years to perform the financial-related functions desired by the four sectors of the economy: household, corporate, government and foreign sectors. However, some of them have been legislated into being, such as the central bank. We cover the various aspects of financial intermediaries in the following sections:

- Financial intermediation.
- Economic functions of financial intermediaries.
- Financial intermediaries.
- Intermediation functions.

2.3 Financial intermediation

Income does not usually match expenditure; therefore surplus and deficit economic (budget) units exist. Given their existence, which amounts to a supply of and a demand for loanable funds, some *financial conduit* is necessary if the excess funds of surplus units are to be transferred to deficit units. The needs of these units may be reconciled either through *direct financing* or *indirect financing*, i.e. through the interposition of financial intermediaries.

Direct financing involves the bringing together of lenders and borrowers (and often entails the interposition of a broker who would act as a go-between in return for a commission, i.e. s/he distributes the claims on borrowers – debt and equity – among the lenders). However, a clash of interests exists between borrowers and lenders, and it is therefore rare that the *ultimate* lenders and borrowers are able to meet in order *consummate a deal*.

This is so because lenders tend to require investments (buy financial instruments / securities) that differ from those that borrowers prefer to issue, and the differences involve characteristics such as size, term to maturity, quality, liquidity, etc. Put another way, borrowers generally require accommodation (i.e. issue financial instruments / securities) on terms differing from those which lenders are willing or able to grant (i.e. buy financial instruments / securities).

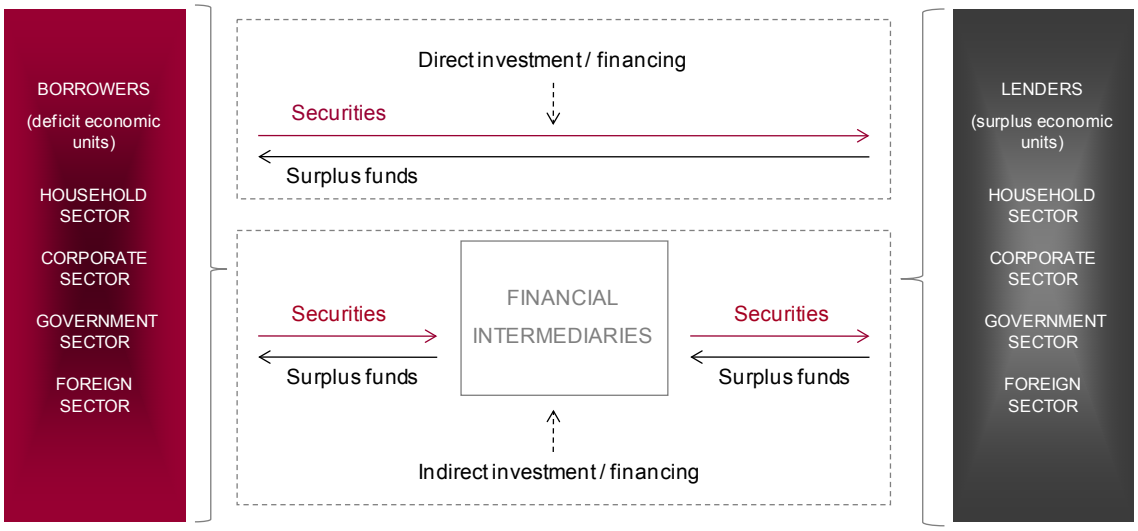

Figure 1: direct & indirect financing

Financial intermediaries, performing so-called *indirect financing*, assist in resolving this conflict between lenders and borrowers by creating markets in two types of financial instruments, i.e. one type for borrowers and another for lenders. They offer claims against themselves, customised to satisfy the needs (in terms of the characteristics of instruments mentioned above) of the lenders, in turn acquiring claims on the borrowers. The former claims are usually referred to as *indirect securities* and the latter as *primary securities*. This is depicted in Figure 1.

The financial intermediaries, of course, receive a *fee*, represented by the difference between the cost of the indirect securities they issue (interest, dividends, capital gains paid) and the revenue (interest, dividends, capital gains) earned from the primary securities they purchase. In the case of banks this is called the *margin*. They of course also levy other fees as well.

Another way of seeing financial intermediaries is that they are financial instrument / security transformers. They transform various primary securities with particular features into others with different features, much like a securitisation vehicle. In the process financial intermediaries bring about a number of economic benefits. These are covered next.

2.4 Economic functions of financial intermediaries

2.4.1 Introduction

As noted, the financial intermediaries essentially metamorphose the unacceptable claims on borrowers into acceptable claims on themselves. From this a number of benefits for the economy arise:

- Facilitation of flow of funds.
- Efficient allocation of funds.
- Assistance in price discovery.
- Money creation.
- Enhanced liquidity for lender.
- Price risk lessened for the ultimate lender.
- Improved diversification for lender.
- Economies of scale.
- Payments system.
- Risk alleviation.
- Monetary policy function.

These benefits are discussed in some detail below. Figure 2 is presented at the outset of this discussion because it may assist in this discussion.

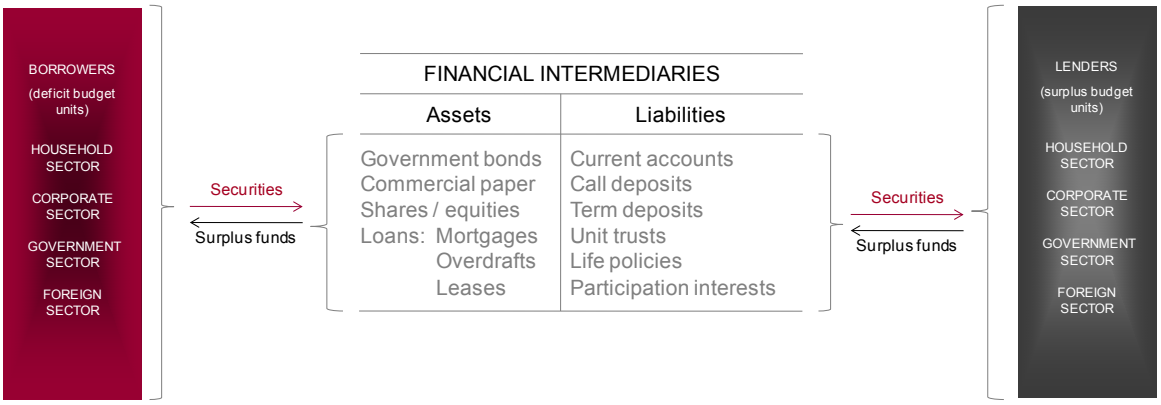

Figure 2: facilitation of flow of funds

2.4.2 Facilitation of flow of funds

In essence, financial intermediaries facilitate the flow of funds from surplus economic units to deficit economic units. Without sound financial intermediaries, much of the savings of the ultimate lenders will not be available to the ultimate borrowers. There are numerous examples in underdeveloped countries where individuals keep their savings in the form of notes and coins (under their proverbial mattresses) as opposed to deposits with unsound banks.

This function may also be described as a *savings and wealth storage function*, i.e. surplus economic units have an outlet for their funds and are thus able to store (preserve) their wealth in low-risk (certain non-government securities) or risk-free (government securities) or even risky (other non-government) financial instruments.

2.4.3 Efficient allocation of funds

Financial intermediaries have the expertise to ensure that the flow of funds is allocated in the most efficient manner. Intermediaries, particularly the banks, are aware of the existence of *asymmetric information* and its two by-products, the problems of *adverse selection* and *moral hazard*.[5] Asymmetric information means that the potential borrower has more information than the bank does about his/her business.

The presence of *asymmetric information* leads to *adverse selection* and *moral hazard* problems. *Adverse selection* means that bad risk borrowers are more likely to want loans than good risk borrowers. *Moral hazard* purports that once a loan is granted the borrower may be inclined to take risks with the money that are not disclosed to the bank in the application. These are two of the many real-life risks faced by banks. They are keenly aware of them, and this ensures that available funds are allocated to borrowers that are expected to utilise the funds prudently, which in turn leads to an increase in economic activity.[6]

2.4.4 Assistance in price discovery

Closely allied with efficient allocation of funds is price discovery. The financial intermediaries are the professionals / experts on the financial system (after all, they also make up a large part of the system), and are therefore keenly involved in price discovery. They are actively involved in the pricing of financial services and securities.

The central bank plays a major role in this regard via its KIR. As we will see in more detail in a separate section, the KIR, when made effective by a liquidity shortage engineered by the central bank, represents the genesis of interest rates. As this is implemented via the banking sector, this sector also plays a major role in the discovery of interest rates.

Certain institutions also play a major role in the discovery of other asset prices. For example, the retirement funds (managed usually by fund managers) are active in differentiating between the market price and the fair value of equities, and influence the pricing of equities via their actions in the equity market. Interest rates are also a major factor in the valuation of equities.

2.4.5 Money creation

Allied with the efficient allocation of funds is money creation. This function may also be termed the bank loan / credit function, because it is this action of banks that creates money in the form of new deposits. Not only are existing funds allocated efficiently, but new loans are allocated efficiently by the banking sector (usually). They have the unique ability to create money literally "with the stroke of a pen", provided of course that the central bank assists in the process through the supply of borrowed cash reserves to the banks, which they willingly do at their KIR.

The banks may thus also be seen as the intermediaries that ease the constraint of income on expenditure, thereby enabling the consumer to spend in anticipation of income and the entrepreneur to easily acquire physical capital (assuming the project is feasible). These activities are crucial in terms of output and employment growth. Money creation is covered more fully later.

2.4.6 Enhanced liquidity for lender

Enhanced liquidity is created for the lender to a financial intermediary. If an individual purchases the securities of the ultimate lenders (such as making a loan to a company), liquidity (explained in detail below) is zero until maturity of the loan. Intermediaries are in the business of purchasing less (or non-) marketable primary securities, and offering liquid investments to the ultimate borrowers.

A good example is the banking sector that makes non-marketable securities such as mortgages, leases and instalment credit contracts, and finances these by offering products that are immediately "encashable" such as call deposit accounts, current accounts and savings accounts.

Similarly, money market funds (also called money market unit trusts or money market securities collective investment schemes) aggregate small amounts of funds for on-lending in larger packages in the form of the purchase of non-negotiable certificates of deposit (NNCDs). The latter are not marketable but the units of the unit trusts are (back to the issuer). Also, individuals may borrow against certain products of financial intermediaries, such as the life policies of long-term insurers.

2.4.7 Price risk lessened for the ultimate lender

Flowing from the above is that financial intermediaries take on price risk and offer products that have little or zero *price* risk. An example is a long-term insurer that has a portfolio mainly of shares and bonds (about 80% in many cases – the other investments being property and money market investments) that involve substantial price risk at times, but offers products that have zero price risk, such as guaranteed annuities.

Another fine example is banks that have a diverse portfolio that includes price-sensitive bonds, loans and share / equity investments, and offer products that have zero price risk such as fixed deposits.

2.4.8 Improved diversification for lender

Allied to the lessening of price risk is the benefit of diversification. Flush members of the household sector (i.e. ultimate lenders) usually have a smaller wealth size and can therefore only achieve limited diversification compared to a financial intermediary that aggregates small amounts for investment in the securities of the ultimate borrowers. Thus, an individual has limited diversification possibilities and therefore carries a higher risk level than financial intermediaries, which are able to hold a wide variety of investments.

The central doctrine of portfolio theory (and practice) is that risk, defined as variability of return around mean return, is reduced as the number of securities in a portfolio is increased, provided that the returns are not perfectly positively correlated. It may be said that part of the investment risk is "diversified away".[7] This concept is illustrated in Figure 3. It shows there are two types of risk: specific risk (the risk that applies to specific securities (assume shares), such as poor business decisions and the taking on of too much debt), and market risk (risk that applies to all securities such as a war of an increase in interest rates).

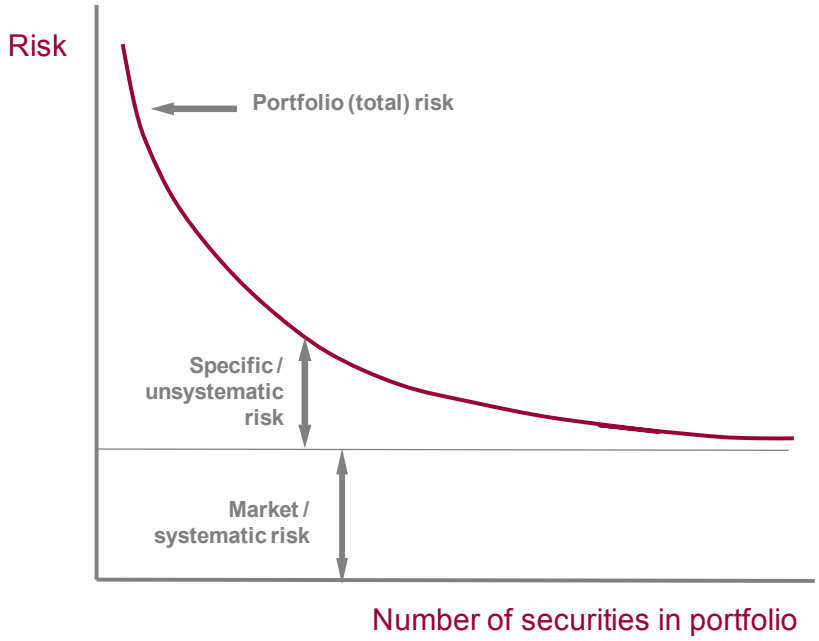

Figure 3: risk and diversification

2.4.9 Economies of scale

Because of the sheer scale of financial intermediaries compared with individual participants, a number of economies are achieved. Two main economies are realised:

- Transactions costs.
- Research costs.

The largest benefit of financial intermediation is the reduction in *transactions costs*; in fact some intermediaries have been formed specifically because of transactions costs (e.g. securities unit trusts). The obvious example is that the (transaction) cost involved in purchasing a small number of shares in a company via a broker-dealer is similar to the cost of purchasing a large number of shares. Even more important is payment system costs. The banking system, through the use of sophisticated technology, provides an efficient payments service (cheque clearing, EFTs, ATM withdrawals, etc.) that is relatively inexpensive. Individual participants in the financial system cannot achieve this reduction in transactions costs.

Another benefit is in terms of *research costs*. An individual holder of a diversified portfolio of shares has the task of monitoring the performance of each company, which involves economic analysis, industry analysis, ratio analysis, etc. Financial intermediaries do have the resources to carry out research, which essentially benefits the holders of its products (liabilities). A good example is the retirement fund. The retirement fund member has a "share" or "participation interest" in the portfolio of the fund (liability of the fund), and the fund has the resources to research the investments (assets) on behalf of the many members.

2.4.10 Payments system

The financial system (specifically the banking sector) provides the mechanism for the making of payments for anything that is purchased (goods, services, securities). Certain financial assets serve as a means of payment and purchases are settled efficiently (assuming an efficient clearing and settlement system). The financial assets that are accepted as a means of payment (i.e. money) are:

- Bank notes and coins (issued by the central bank in most cases)
- Bank deposits [transferred by cheques, credit ("straight" purchases) cards, debit cards, EFTs etc.].

2.4.11 Risk alleviation

Certain financial intermediaries are in the business of offering protection against adverse occurrences such as untimely death, health problems, damage to property and loss of income. In addition, the financial system allows for self-insurance, i.e. the storage and building of wealth in order to protect against adverse life, property and income occurrences.

2.4.12 Monetary policy function

The financial system provides the ideal mechanism for the implementation of government policy in terms of economic growth, stable employment, balance of payments equilibrium and low inflation. The monetary authorities are able, through various means, to exert a powerful influence on interest rates, in turn influencing consumption and investment spending, the demand for loans / credit and so on.

2.5 Financial intermediaries: classification and relationship

2.5.1 Introduction

As expressed earlier, financial institutions exist primarily because of the conflict between lenders' and borrowers' requirements in terms of deal size, term to maturity, quality, price and liquidity. They issue financial liabilities (indirect securities or *claims* on themselves, such as deposits) that are acceptable as financial assets to the ultimate lenders, and use the funds so obtained to acquire claims that reflect the requirements of the borrowers (primary securities = debt and shares).

In so doing they facilitate the flow of funds from surplus to deficit economic units. As noted, the banks also have the *unique ability to acquire financial claims first and thereby increase the financial liabilities in the system, i.e. to create money.*

Many different types of institutions perform the intermediation function. In terms of the fundamental function of intermediation, there is little distinction between banks, finance houses, insurance companies, unit trusts or any other type of intermediary. The distinguishing characteristics lie in the nature of the claims (indirect securities) and services offered to lenders and in the nature of the claims on (primary securities) and services offered to the borrowers. In these respects there are wide differences between intermediaries.

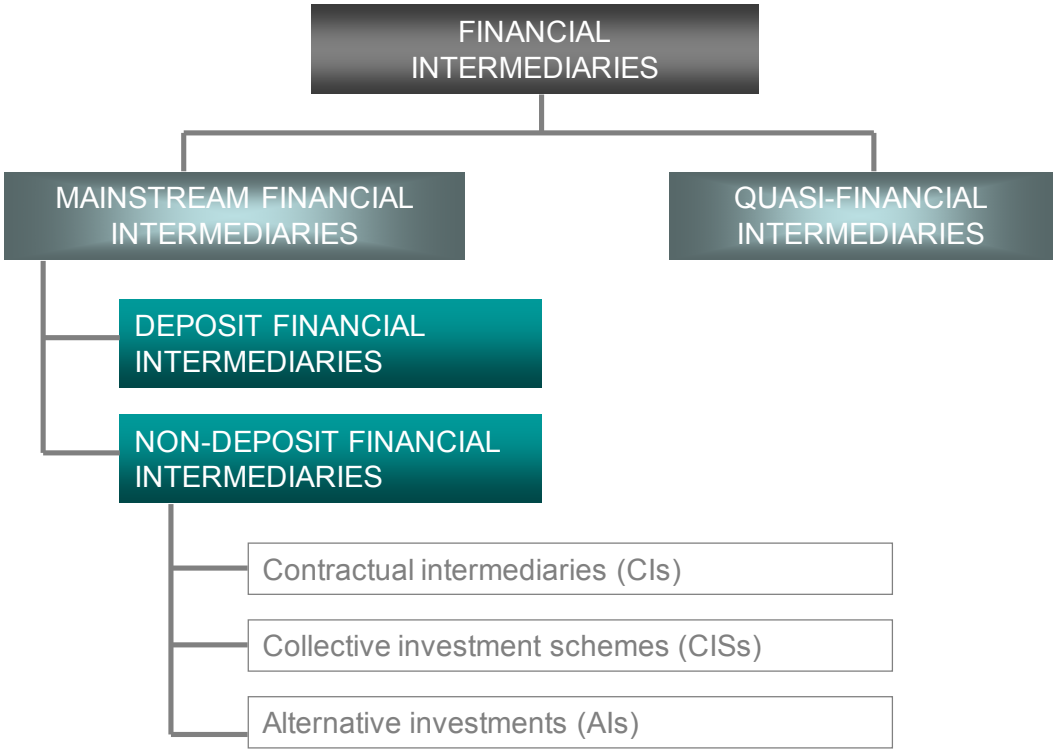

Figure 4: a classification of financial intermediaries

Generally, financial institutions tend to be more specialised on the liability side of their balance sheets. Given this, it would be fitting to classify them according to the nature of the indirect securities they issue.

In addition, in most financial systems there are entities that are closely related to financial intermediaries. They are generally small players in the financial system, but in some systems they can be large (such as vehicle finance companies). These intermediaries we call quasi-financial intermediaries (QFIs).

2.5.2 Classification of financial intermediaries

BOX 1: FINANCIAL INTERMEDIARIES THAT ARE COMMON TO MOST COUNTRIES

MAINSTREAM FINANCIAL INTERMEDIARIES

DEPOSIT FINANCIAL INTERMEDIARIES

Central bank
Private sector banks

NON-DEPOSIT FINANCIAL INTERMEDIARIES

Contractual intermediaries (CIs)

Long-term insurers
Short-term insurers
Retirement funds

Collective investment schemes (CISs) (also called portfolio intermediaries)

Securities unit trusts (SUTS) (also called mutual funds)
Property unit trusts (PUTs)
Exchange traded funds (ETFs)

Alternative investments

Hedge funds (HFs)
Private equity funds (PEFs)

QUASI-FINANCIAL INTERMEDIARIES (QFIs)

Development finance institutions (DFIs)
Special purpose vehicles (SPVs) (securitisations, CDOs, etc)
Investment trusts
Finance companies
Credit unions (also called “savings and credit cooperatives”)
Micro-lenders

Given the existence of QFIs, it is logical to divide financial intermediaries into two broad categories: mainstream financial intermediaries (MFIs) and QFIs. It is then reasonable to classify the MFIs into deposit and non-deposit intermediaries. While the former category is straightforward, the second category may be split up in various ways. A sensible split is into three categories: contractual intermediaries (CIs), collective investment schemes (also known as "portfolio intermediaries") (CISs) and alternative investments (AIs). This classification is presented in Figure 4.

Under the category *deposit intermediaries* a central bank and the private sector banks are always present. In many countries other deposit-taking intermediaries are established for various reasons, such as mutual banks, rural banks, savings and loan intermediaries, a Post Office Bank and so on.

The category *contractual intermediaries* (CIs) is reserved for those intermediaries that offer contractual savings (and other like) facilities: the insurers and the retirement funds.

The category *collective investment schemes* (CISs) applies to securities unit trusts, property unit trusts, and exchange traded funds (ETFs). The latter have become popular indeed over the past decade. Some countries also have other CISs such as participation bond schemes (PBSs).

In many countries another category of financial intermediary has emerged over the past number of years: *alternative investments* comprised of private equity funds and hedge funds.

No two countries have the same *quasi-financial intermediaries*. Some have finance companies, investment trusts, SPVs, credit unions, DFIs, micro-lenders, credit unions, and so on, while others have just one or two of them.

Box 1 presents a summary the categories and the intermediaries that are common to most countries.

2.5.3 Relationships of financial intermediaries

It is appropriate at this stage to show the relationship of the financial intermediaries to one another. This is portrayed in Figure 5[8].

It will be seen that the private sector banks intermediate between all the ultimate lenders and borrowers and take deposits from all the other intermediaries[9]. The lines between the banks and the central bank represent the reserve requirement and the borrowed reserves of the banks from the central bank (which is provided at the KIR). The lines between the banks represent the bank-to-bank interbank market.

The CIs and the CISs take funds mainly from the household sector and invest these in the primary securities of the ultimate borrowers and the indirect securities of the banks and the QFIs (the latter is small, however). The QFIs are also funded from the banks through the purchase of their securities and lend to certain of the ultimate borrowers (mainly the household and corporate sectors).

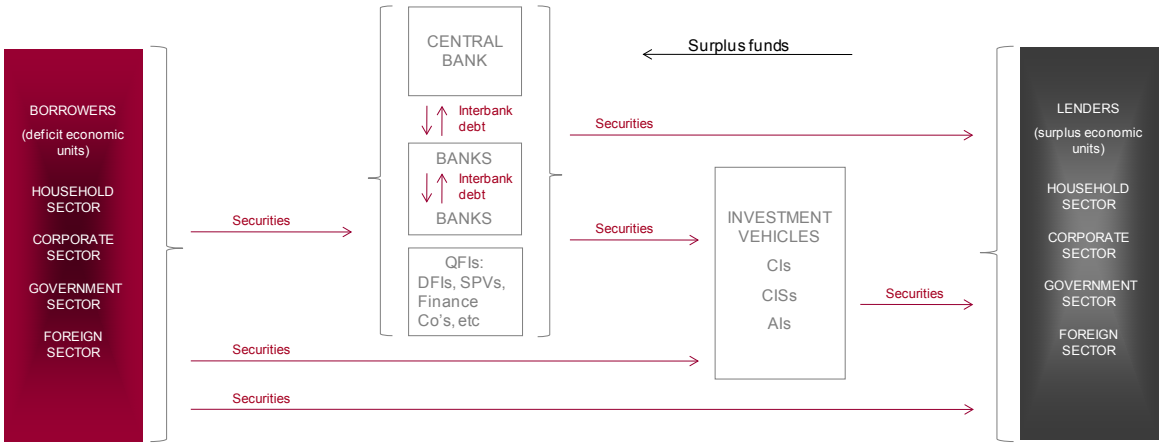

Figure 5: relationship of financial intermediaries

We have portrayed the AIs as issuing liabilities (= participation interests) to all the ultimate lenders. This is only partly correct; they also take in funds from the retirement funds.

The central bank is funded by its issue of bank notes and coins, by the deposits of government and the banks, and by the issue of its own securities (the latter mainly for monetary policy reasons), and its assets are made up of various domestic securities (through the accommodation system) and foreign securities (i.e. foreign exchange reserves).

2.6 Financial intermediaries: intermediation functions

2.6.1 Introduction

This section describes the main intermediation functions of the financial intermediaries as identified in Box 1 in more detail, and a group of intermediaries. We cover:

- Monetary banking sector.
- Central bank.
- Private sector banks.
- Insurers.
- Retirement funds.
- Collective investment schemes.
- Alternative investments.
- Quasi-financial intermediaries.

2.6.2 Monetary banking sector

The group of institutions known as the monetary banking sector (MBS) or monetary banking institutions (MBIs) is mentioned separately because they are the intermediaries that play a substantial role in the financial system as follows:

- They are the custodians of most of the money stock of the country (i.e. private sector deposits with banks).
- They are the keepers of government's surplus balances.
- They are instrumental in providing loans to the government and corporate sectors.
- They are instrumental in purchasing the debt (= loans, but marketable) of the government and corporate sectors.

This group of monetary institutions differs from country to country, but it always includes the central bank and the private sector banks. Some countries have mutual banks, savings banks, co-operative banks, Post Office banks, rural banks, and so on.

Why this grouping? As indicated in the bullet points above, the members play a crucial role in money custody and loan / money creation. Therefore, they are used to calculate the money stock and the balance sheet causes of changes (BSCoC) in the money stock. All central banks on a monthly basis consolidate the statements of liabilities and assets (i.e. the balance sheets) of these intermediaries (in the process netting out interbank claims) in order to arrive at the monetary aggregate numbers and their statistical counterparts (the BSCoC). This is discussed further in a separate section.

2.6.3 Central bank

As is evident from the illustration shown earlier, the central bank intermediates between ultimate lenders (mainly the government in its capacity as government banker, and the household sector in its capacity as issuer of bank notes and coins) and the banks (i.e., their reserves required to be held for solvency and monetary policy purposes) on the one hand, and ultimate borrowers (as represented by its holdings of foreign exchange and domestic securities) and the private banking sector on the other. The last-mentioned would represent the central bank in its function as lender of last resort.

This flow (loans by the central bank to the banks) is illustrated in Figure 5 as (part of) the cb2b IBM (central bank-to-bank interbank market). This is the essence of monetary policy: loans to the banks (which is a permanent feature[10]) at the central bank's accommodation rate (KIR). These are the two variables that have a major bearing on money market interest rates and, therefore, on other interest rates and prices in the economy.

2.6.4 Private sector banks

The private sector banks intermediate between all the sectors that make up the ultimate lenders (i.e. the household, government, corporate and foreign sectors), and virtually all other financial institutions (in the form of deposits and loans), on the one hand, and all ultimate borrowers (in the form of loans, instalment credit and leasing contracts, mortgage advances and the purchase of securities) on the other hand (including the foreign sector).

Banks also have an element of intermediation (on the asset side) with other financial intermediaries. For example, banks make loans to and/or hold the securities of other financial institutions such as the DFIs and the central bank (in the form of the reserve requirement).

2.6.5 Insurers

Insurers may be split into two groups: short-term insurers, long-term insurers (also known as life companies or assurors). There are also re-insurers, but they fall into either of these two groups.

Short-term insurers intermediate between the corporate and household sectors on the liabilities side of their collective balance sheet (i.e. excluding the government and foreign sectors) (this is mainly in the form of insurance policies issued), and the corporate (share / equity and debt securities) and government (government securities) sectors on the asset side of their collective balance sheet. They also have financial intermediary securities (for example, deposits with banks and holdings of, say, SPV bonds) and other assets (such as bank notes and coins) on the asset side of their balance sheet.

Long-term insurers have a similar intermediation function as the short-term insurers. Their liabilities are comprised of various long-term polices, which are held mainly by the corporate and household sectors, while, on the asset side of their balance sheet, they hold the securities of all sectors with the exception of the household sector.

Re-insurers (like short-term insurers) are not regarded as financial intermediaries by purist economists, because their liabilities are not certain. We include them here for the sake of completeness. They intermediate between other insurance companies (because they re-insure a portion of their liabilities) and the corporate and government sectors (in the form of holdings of their securities).

2.6.6 Retirement funds

Retirement funds (also known as pension and provident funds) intermediate between the public (in the form of so-called contractual savings) on the one hand, and ultimate borrowers (mainly in the form of shares / equities and securities of the corporate and government and foreign sectors held) and financial intermediaries on the other. Last-mentioned would be represented by bank deposits and the securities of the banks and the other financial intermediaries.

2.6.7 Collective investment schemes

It will be recalled that in many countries there are three main types of CISs:

- Securities unit trusts (SUTs – also termed CISs in Securities).
- Property unit trusts (PUTs – also called CISs in Property).
- Exchange traded funds (ETFs).

Some other countries also have participation bond schemes (PBSs – also termed CISs in participation bonds).

Securities unit trusts (SUTs) intermediate almost solely between the household sector on the one hand and ultimate borrowers (the corporate and government sectors) and financial intermediaries (mainly banks) on the other. Their assets are made up of almost all the securities of the corporate and government sectors (such as shares, bonds, treasury bills) and bank liabilities such as NCDs and NNCDs.

Property unit trusts (PUTs) differ from the mainstream unit trusts in that they are closed funds (i.e. their investment portfolio is fixed). They intermediate mainly between the household sector and retirement funds, on the one hand, and the corporate sector on the other hand (i.e. the borrowers of funds for property developments).

Exchange traded funds (ETFs) are also appropriately called *tracker funds*. Their assets are comprised of the assets in the proportions that make up a particular index (e.g. the FTSE 100 Index) and their liabilities are the *participation interests* (PIs) of the investors.

Participation bond schemes (PBSs) have on the liability side of their balance sheets funds received from individuals (and minor amounts from other sources), while the asset side is comprised mainly of funds loaned to the corporate sector (in the form of mortgage bonds). They have limited activity with other financial intermediaries.

2.6.8 Alternative investments

As noted, there are two so-called alternative investment vehicles:

- Hedge funds.
- Private equity funds.

Hedge funds (HFs) accept funds from certain high net worth individuals, foreign sector investors, and contractual intermediaries in the shape mainly of retirement funds (although they would only allocate a small portion of their assets to hedge funds). Hedge funds also make use of leverage, i.e. borrow, and derivative instruments and some "go short". They are investors in the corporate and government sectors and have derivatives margin balances.

There are many varieties of *private equity funds* (PEFs). In a nutshell they are large funds that issue PIs and invest in private equity, i.e. non-listed companies that they often "nurse" back to health (and listed companies that they delist, restructure, and list again).

2.6.9 Quasi-financial intermediaries

It will be recalled that there are a number of institutions and funds that border on being classified as financial intermediaries. A reminder:

- Development finance institutions (DFIs).
- Special purpose vehicles (SPVs) (securitisations, CDOs, etc.).
- Investment trusts.
- Finance companies.
- Credit unions.
- Micro-lenders.

These institutions do not borrow and/or lend to the same extent as the mainstream intermediaries, or are not ongoing lenders and borrowers, i.e. they tend to have liability and asset financial portfolios that tend to be static.

The *DFIs* generally intermediate between ultimate lenders and financial institutions (in the form of them taking up the securities of the DFIs or the provision of loans to them) on the one hand and mainly domestic ultimate borrowers on the other. The domestic ultimate borrowers are comprised of the household sector (mainly housing loans and small business loans to them), the corporate sector (in the form of loans and shares) and the government sector (in the form of loans to local authorities).

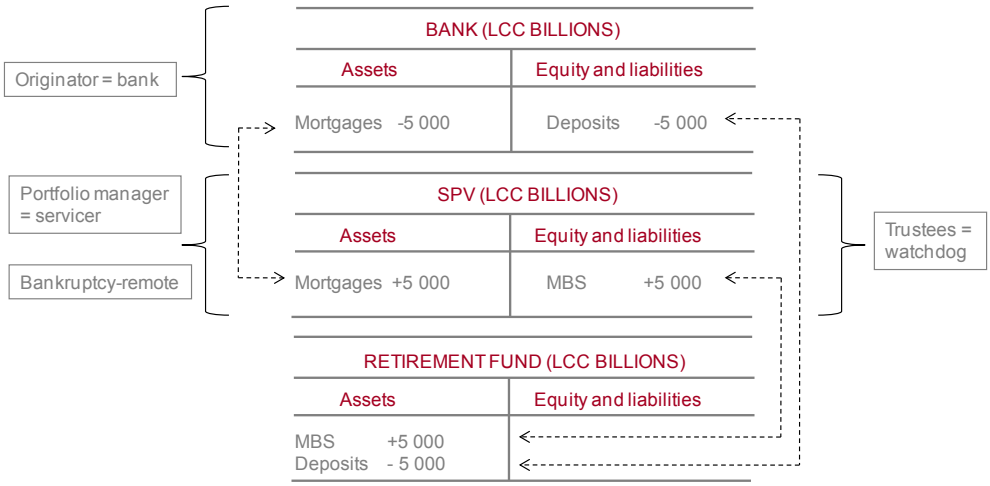

Figure 6: example of bank securitisation of mortgages

Special Purpose Vehicles or SPVs (also termed *securitisation vehicles*) are specialist intermediaries. They may be closed or open. In the case of a closed securitisation vehicle, it may hold a portfolio of, say, mortgages, which are financed by the issue of mortgage-backed securities (MBS) (usually mainly to the CIs and CISs). While it is intermediating, this is usually done on a once-off basis (a closed SPV). Generally, SPVs intermediate between CIs (e.g. retirement funds) and CISs on the one hand and the borrowers (as represented by the securities / assets placed in the SPV) on the other. An example of the securitisation of mortgages funded by the issue of MBS is presented in Figure 6.

Investment trusts / companies tend to be financed by capital and loans and have a portfolio of shares / equities and/or other securities which is largely static.

Finance companies finance themselves by share capital and loans in various forms (from banks or other companies). Their assets are loans in various forms to the household and corporate sectors.

The business of a *credit union*, known also as a *savings and credit cooperative* (SACCO) is similar to that of a bank, but with the difference that it is a co-operative institution. The essence of its business is that of buying and selling money within a group of people who work in the same place or who are members of the same community (i.e. have a common bond).

Micro-lenders lend exclusively to the household sector. On the liability side of their balance sheets they are funded from own capital (i.e. from the household sector) and loans (from the household sector and from the corporate sector).

2.7 Summary

Financial intermediaries exist because of the conflict between the financial requirements of surplus and deficit economic units. There is a wide array of financial intermediaries, and they can be identified by the financial liabilities and assets on their balance sheets. They are usually distinguishable by their liability portfolios, and this is the reference point for categorisation. The categories of financial intermediaries are mainstream and quasi-financial intermediaries, and the former is divided into deposit and non-deposit institutions. There are three categories of the latter: contractual intermediaries, collective investment schemes and alternative investments.

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3 Financial instruments

3.1 Learning objectives

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

- Define financial instruments.
- Distinguish primary and indirect securities.
- Discuss the broad categories of financial instruments.
- Differentiate marketable and non-marketable instruments.
- Categorise all forms of securities.
- Describe all types of securities.

3.2 Introduction

BOX 1: EXAMPLE OF AN EVIDENCE OF DEBT / CLAIM

Source: AP Faure collection.

Financial instruments are comprised of evidences (= claims on the issuers) of:

- Debt (= claims on ultimate borrowers).
- Deposits (= claims on banks).
- Shares / equity (= claims on companies).
- Participation interests (PIs) (= claims on investment vehicles).
- Derivatives.

The latter, strictly speaking, are not financial instruments – if one defines financial instruments as instruments representing the debt, shares / equity, etc. of borrowers – whereas, derivative instruments are contracts which may lead to profits / losses. In other words derivatives are not instruments of debt, shares / equity and so on, but hedging and speculation instruments.

The mainstream financial instruments are issued by borrowers (defined broadly[11]). They are therefore part of the share capital / liabilities of the issuers and, as such, represent the "claims" of the holders on the issuers.

The evidences exist in one of two ways: a certificate (see Box 1 for an example) or a computer printout of an electronic register entry issued by some institution (in the case of dematerialised or immobilised certificates / scrip[12]). We cover these instruments and issues related to them under the following sections:

- Financial instrument types.
- Share instruments.
- Debt instruments.
- Deposit instruments.
- Instruments of investment vehicles.
- Derivative instruments.

3.3 Financial instrument types

As an introduction, it may be useful to be reminded of the financial system: see Figure 1. Lenders lend and borrowers borrow. Financial intermediaries borrow and lend. Financial instruments are borrowing instruments held by lenders (ultimate and financial). How does one categorise financial instruments? Some tantalising questions in this regard:

- Are there two categories: primary securities (issued by ultimate borrowers) and indirect securities (issued by financial intermediaries)?
- Are there two categories: debt and shares / equity, because they are fundamentally different?
- Are there two categories: marketable and non-marketable?
- Are shares / equities borrowing instruments or are they evidences of ownership of companies?
- Do preference shares represent ownership of companies or are they just long-term loans?
- If equity finance in the form of ordinary (common) shares is regarded as permanent capital, are perpetual bonds not the same in nature?
- Are deposit instruments debt instruments?
- Are the liabilities of the investment vehicles debt instruments?
- What do the QFIs issue to fund themselves?

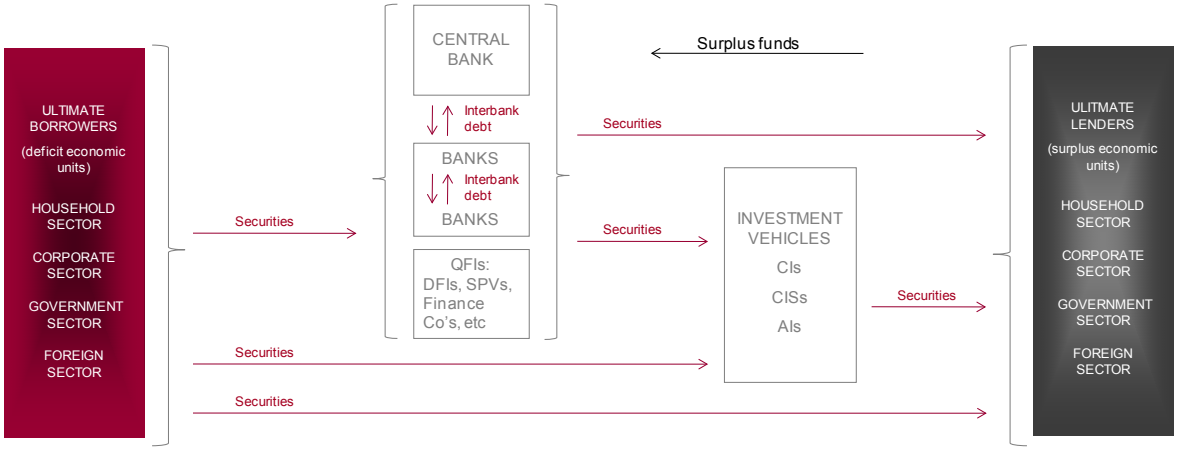


Figure 1: financial system (simplified)

These questions are posed to indicate that there is no definitive answer as to how financial instruments should be categorised. However, in our opinion the most logical and technically correct categorisation is:

- Evidences of shares / equity (because the majority of shares represent ownership of companies and they pay dividends). (Discussed further below.)
- Evidences of debt (because the majority of debt is non-perpetual and they pay interest).
- Evidences of deposits (because they are the liabilities of specialist companies and carry a different risk profile).
- Evidences of investments in investment vehicles (because they are fundamentally different to the rest of the financial instruments).

In addition there are derivative instruments, which, although they do not represent lending and borrowing, cannot be called anything but financial instruments. We discuss each of these in some detail. However, before we do so, we present a further discussion on whether shares / equities can be regarded as financial instruments.

Economic sticklers would maintain that shares / equities are *not* financial instruments. This is based on the premise that shares represent part-ownership of a company and that they are not redeemable. They would also maintain that *finance* means debt, not shares / equity.

There are a number of reasons to classify shares / equities (from here on called shares) as financial instruments:

- Companies may repurchase their own shares (up to a limit), i.e. they are redeemable, although only up to a specified limit.
- It is conventional wisdom to regard shares as financial instruments, and the share exchange in each country is regarded as a *financial* exchange / market.
- Companies have two kind of finance available, shares and debt; thus, they are substitutes for one another.
- Certain types of shares, preference shares, are closer in nature to debt instruments than to ordinary shares (see later).

This fruitless debate will not be entertained further here. We regard shares as financial instruments.

3.4 Share instruments

Shares are issued by corporate entities (local and foreign) (see Figure 2). Shares are listed on an exchange or unlisted. Foreign shares are generally called inward listed shares.

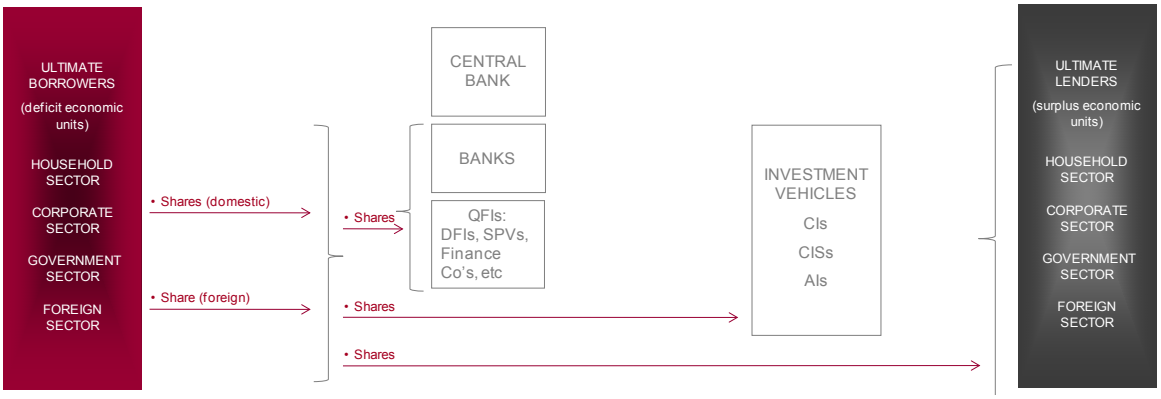


Figure 2: issuers of shares

There are two broad types of shares:

- Ordinary (also called *common*) shares (also called *stocks*). These shares impart to the holder the right to vote on issues that affect the company. However, the shareholder does not have a right to the profits until the board of directors declares a dividend. (See Box 2 for an example.)
- Preference (also called *preferred*) shares. These shares impart to the holder the prior right over ordinary shareholders to the distribution of dividends and capital in the event of the company winding up. These may be perpetual (i.e. do not have a redemption / maturity date) or may have a finite life (like non-perpetual bonds). (See Box 3 for an example.)

There are a number of types of preference shares:

- The "normal" or "common" preference share (= redeemable and pays a fixed dividend).
- Non-cumulative preference share.
- Participating preference share.
- Convertible preference share.
- Hybrids of the above.

Shares stand behind debt in the line-up for payment in the event of the liquidation of the company, and ordinary shares stand behind preference shares. This means that ordinary shares have a *residual value*, or *residual claim, status*. The pecking order (or waterfall) of risk may be portrayed as in Figure 3.

It should be apparent that holders of debt instruments are *creditors* of the issuing companies. They are *not owners* of the issuing companies, but they have a superior claim on the issuing companies' profits and assets in relation to the shareholders.

BOX 2: EXAMPLE OF ORDINARY SHARE CERTIFICATE

Share Certificate No. 1

Roberts' Randfontein Gold Mining Syndicate,
LIMITED.

INCORPORATED UNDER THE LIMITED LIABILITY LAWS OF THE CAPE OF GOOD HOPE
AND OF
THE TRANSVAAL.

CAPITAL £1,500 - - - - - IN 60 SHARES OF £25 EACH.

This is to certify that Mr. Sir Peter Faure, K.C.M.G.
of Cape Town is the Proprietor of one Share, numbered One
of Twenty-five Pounds Sterling, fully paid up, in the abovenamed Roberts' Randfontein Gold Mining Syndicate, Limited, subject to the Syndicate's Trust Deed or Articles of Association, dated the Tenth day of October 1900, and the Rules and Regulations of the said Syndicate, transferable with the approval of the Directors of the said Syndicate by virtue of the provisions of the said Deed.

Given under our hands at Cape Town, this Tenth day of October 1900

ROBERTS RANDFONTEIN GOLD MINING SYNDICATE LIMITED ST. GEORGE'S STREET 10 OCT. 1900 CAPE TOWN.

Directors.

Source: AP Faure collection.

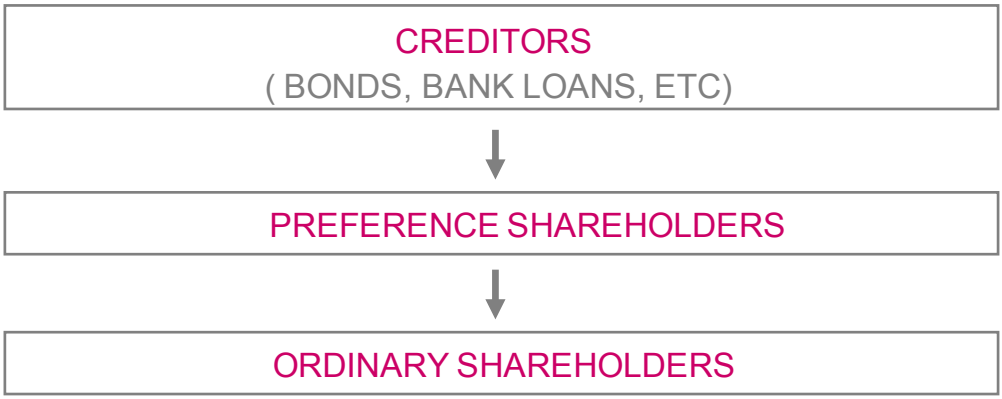


Figure 3: waterfall of claims on company in event of liquidation

BOX 3: EXAMPLE OF PREFERENCE SHARE CERTIFICATE

Source: www.historicstockmarket.com

3.5 Debt instruments

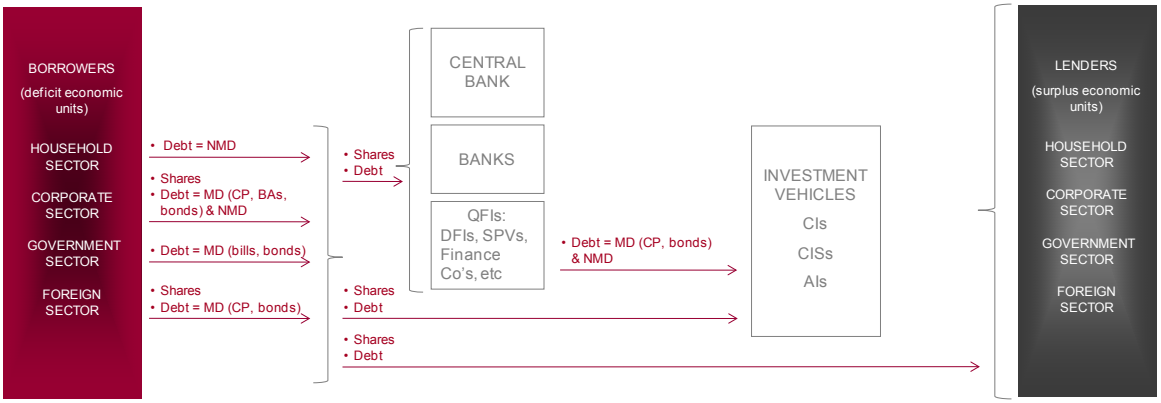
As a result of the processes of borrowing, lending and financial intermediation, there is a wide range of *debt instruments* (evidences of debt / debt claims) in the financial systems of the world. A *debt instrument* can be defined as a claim against a person or company or institution (such as a government entity) for the payment of a future sum of money (the nominal / face / redemption value) and/or a periodic payment of money. In many instances there is no periodic payment of money (as in the case of treasury bills), while in others there is (as in the case of most long-dated bonds, interest on which is payable six-monthly in arrears). Similarly, there may be no promise of a sum of money in the future but a periodic payment only, as in the case of an undated bond (perpetual bond).

The debt market is made up of:

- The short-term debt market (STDM – claims up to a year; but this is an arbitrary term), which (when the deposit market is added) is referred to as the money market. This is our definition of the money market; some scholars prefer to only include marketable STDM instruments in this definition. There are good reasons for the wide definition, the main one being that price discovery largely takes place in the non-marketable part of this STDM.
- Long-term debt market (LTDM – claims from one year onwards). The bond market is the marketable arm of the LTDM, and claims in this market range from a year to deep into the future, in some cases up to 30 years. This does not apply in the non-marketable LTDM.

The most common money market instrument requires the issuer to pay a single amount at maturity, while the most common bond instrument requires the issuer to pay periodic interest and to redeem the claim on the maturity (due) date.

One of the most important characteristics of financial claims is that of *reversibility or marketability*. This refers to the ease with which the holders of securities can recover their investments, and can be achieved in one of two ways, i.e. by recourse to the issuer or by recourse to a secondary market (in which the holder can sell the claim).



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 4: debt instruments (securities) (excluding deposits)

Figure 4 illustrates the financial system and the debt (and share) and securities issued by the ultimate lenders and QFIs. For the moment we exclude the banking / deposit part of the money market.

The *household sector* (as a borrower) is not able to issue marketable securities, for obvious reasons. They may issue IOUs to friends or family, but generally the debt they incur is loans from banks in various forms such as:

- Overdrafts.
- Mortgages.
- Fixed term loans.
- Leasing contracts.
- Instalment credit contracts.

The financial debt instrument (claim / asset) held by the bank is a contract, a mortgage bond, a negative balance on a bank statement, or some other evidence of debt. NMD in these forms make up a large proportion of banks' balance sheets. As we have seen, NMD may be split into short-term debt (= money market debt; e.g. overdrafts belong here), or long-term debt (= long-term debt market; e.g. mortgage advances and leasing contracts fit here).

The *corporate sector* issues NMD in the main because most companies are not large enough to be able to issue marketable debt (MD) (no investor will buy this debt). It is only the large listed companies that are able to issue MD (if the debt is highly rated by a rating agency). The NMD issued by companies is essentially the same as for the household sector, and the NMD of these two sectors makes up the vast majority of banks' balance sheets. The MD issued by the corporate sector is relatively small.

The MD issued by the corporate sector is:

- Corporate bonds. These are longer-term (i.e. longer than a year and usually 3–15 years) fixed-interest and variable-rate securities.
- Commercial paper (CP). These are undertakings to pay a certain sum of money on a particular date in the future. They are not endorsed by banks, and are short-term in currency (i.e. in term to maturity).
- Bankers' acceptances (BAs). BAs are bills of exchange drawn on and accepted (guaranteed) by a bank. They usually are drawn for periods of 91 days and 182 days. Countries have different conventions in this respect.
- Securitisation bonds (as the SPVs are usually companies, the paper can be termed corporate bonds). An example is mortgage-backed securities (MBS).
- Collateralised debt obligations (CDOs, also called collateralised loan obligations – CLOs).

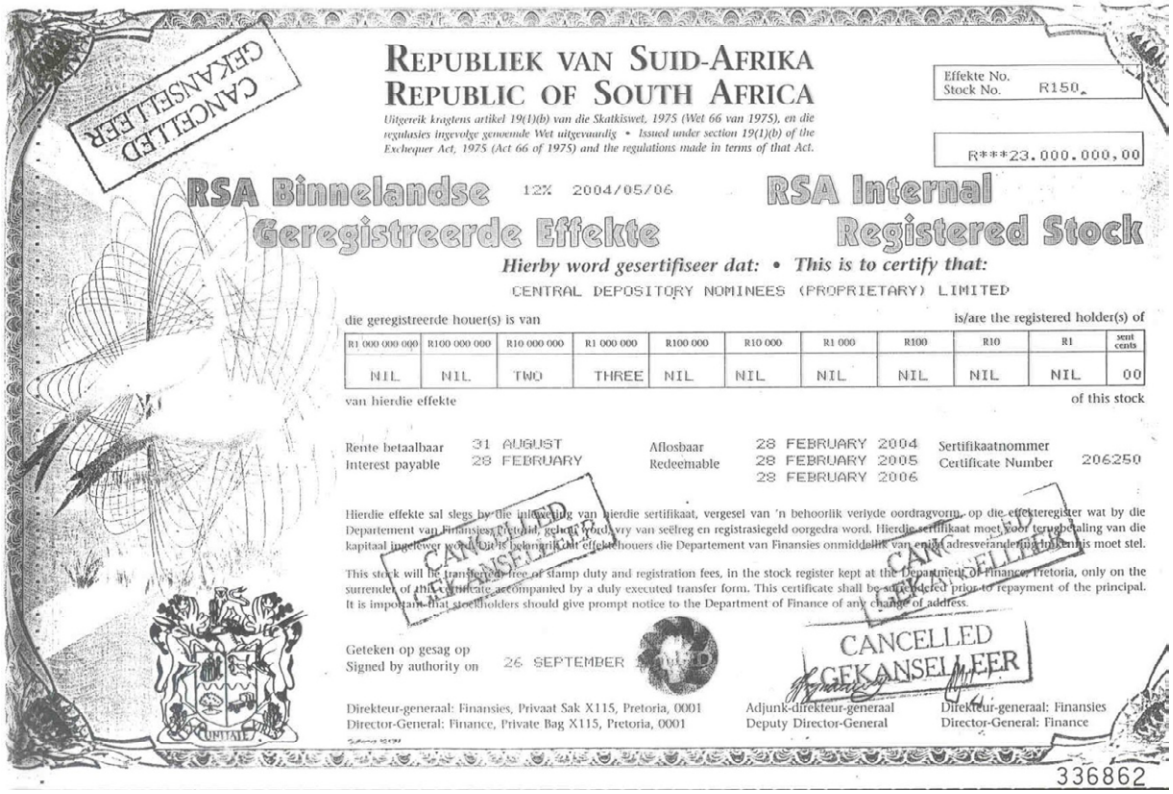
It will be evident that corporate bonds, securitisation (SPV) bonds (CDOs, etc) are part of the bond market, whereas CP and BAs are part of the money market.

The *government sector* differs from country to country, but there are at least two levels: central government and local governments. Some countries have provincial governments. Central governments usually fund part of their budget deficits by the issue of MD (because this form of funding is cheaper):

- Government bonds, which range from a few years to up to 30 years, and make up the major part of bond market. See Box 4 for an example.
- Treasury bills (TBs), which range from 91 days to 273 days (in most countries).

As government bonds and TBs are the debt obligations of the central government, they are repayable out of the revenues and assets of the government of the country. As such they are regarded as risk-free securities and the rates on these are regarded as the risk-free rates[13]. TBs are one of the main instruments of the money market. See Box 5 for an example.

BOX 4: EXAMPLE OF CENTRAL GOVERNMENT BOND



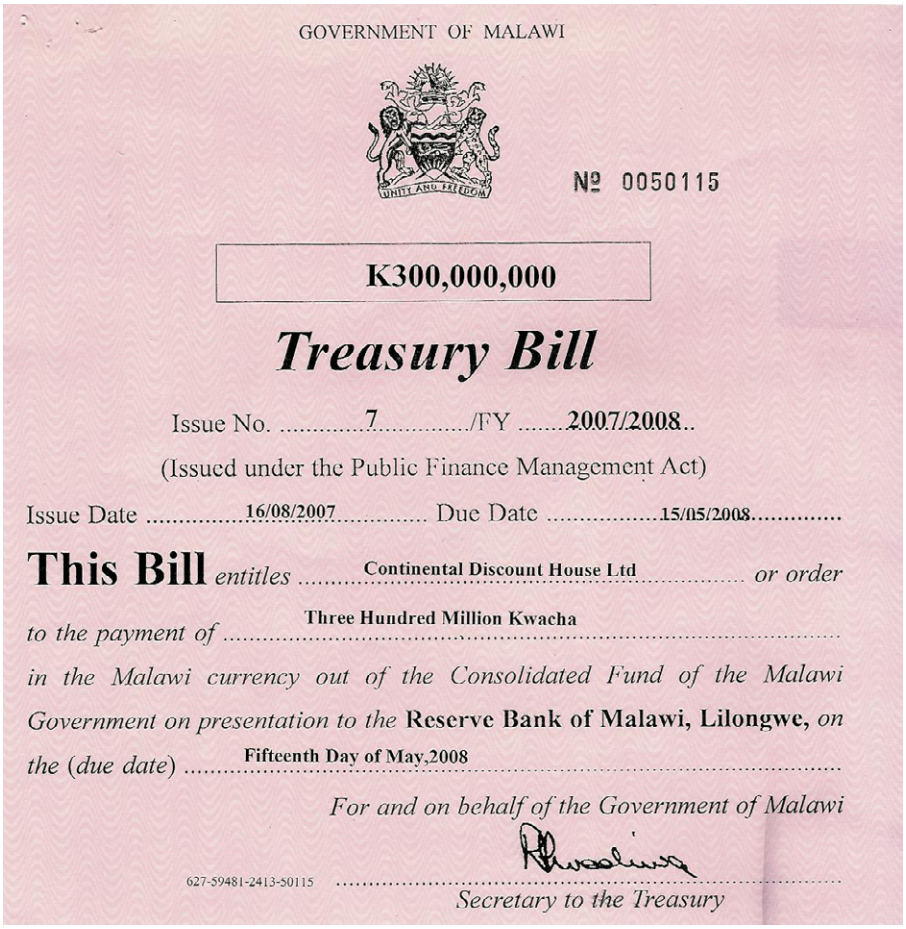
Source: AP Faure collection.

Local authorities usually borrow in the form of NMD and mainly from banks. In some countries the larger local authorities are able to issue MD, which is called by many names such as local authority bonds (bond market) and bridging bonds (money market).

The *foreign sector* (where exchange controls allow this) issues into the local market:

- Foreign bonds (usually corporate entities) (bond market).
- Foreign CP (money market).

BOX 5: EXAMPLE OF TREASURY BILL



GOVERNMENT OF MALAWI

№ 0050115

K300,000,000

Treasury Bill

Issue No. 7 /FY 2007/2008

(Issued under the Public Finance Management Act)

Issue Date 16/08/2007 Due Date 15/05/2008

This Bill *entitles* Continental Discount House Ltd *or order to the payment of* Three Hundred Million Kwacha *in the Malawi currency out of the Consolidated Fund of the Malawi Government on presentation to the* **Reserve Bank of Malawi, Lilongwe,** *on the (due date)* Fifteenth Day of May,2008

For and on behalf of the Government of Malawi

627-59481-2413-50115

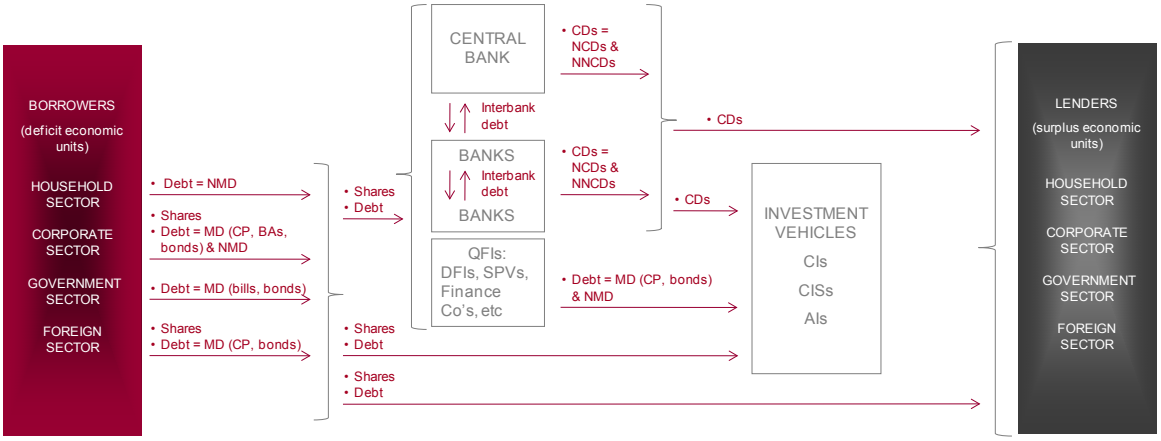
Secretary to the Treasury

Source: CDH, Malawi.

3.6 Deposit instruments

Figure 5 illustrates the instruments of the former illustration (debt and shares) as well as the issuers of deposit securities, i.e. the central bank and the private sector banks. It also indicates the three interbank markets, which we cover in the text on money creation).

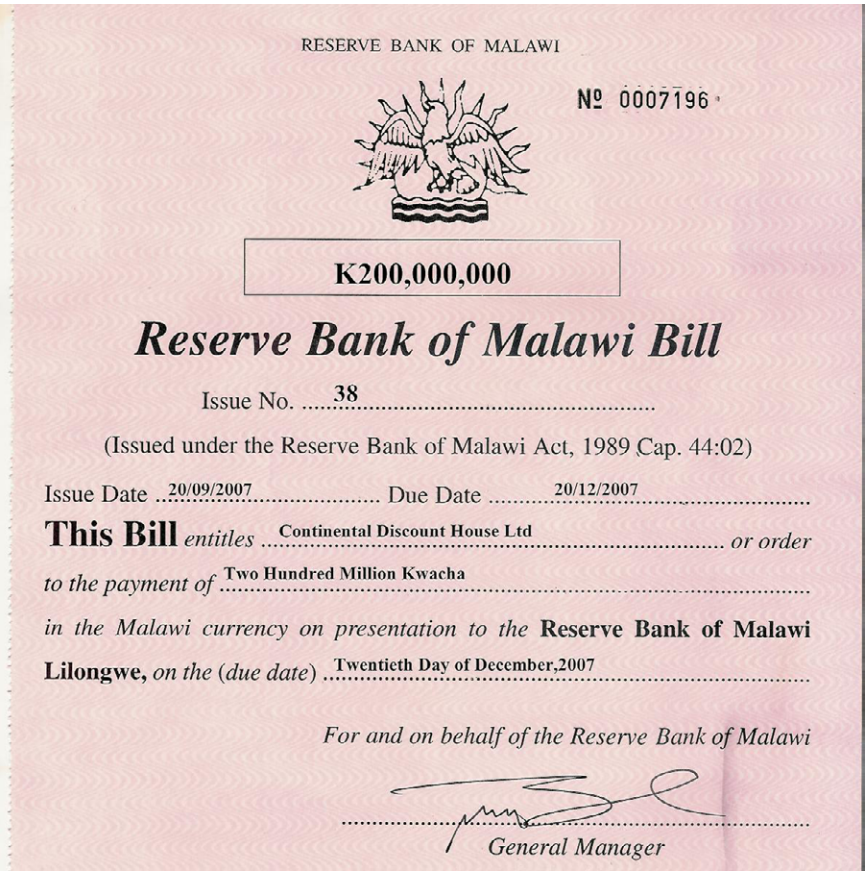
The central bank in most countries is the sole issuer of notes and coins. It may seem strange to call these deposit securities, but they are: the public and banks that hold these have made a deposit with the central bank.



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 5: financial instruments / securities (excluding PIs)

BOX 6: EXAMPLE OF CENTRAL BANK SECURITY



RESERVE BANK OF MALAWI

№ 0007196

K200,000,000

Reserve Bank of Malawi Bill

Issue No. 38

(Issued under the Reserve Bank of Malawi Act, 1989 Cap. 44:02)

Issue Date 20/09/2007 Due Date 20/12/2007

This Bill *entitles* Continental Discount House Ltd *or order to the payment of* Two Hundred Million Kwacha *in the Malawi currency on presentation to the* **Reserve Bank of Malawi Lilongwe,** *on the (due date)* Twentieth Day of December,2007

For and on behalf of the Reserve Bank of Malawi

General Manager

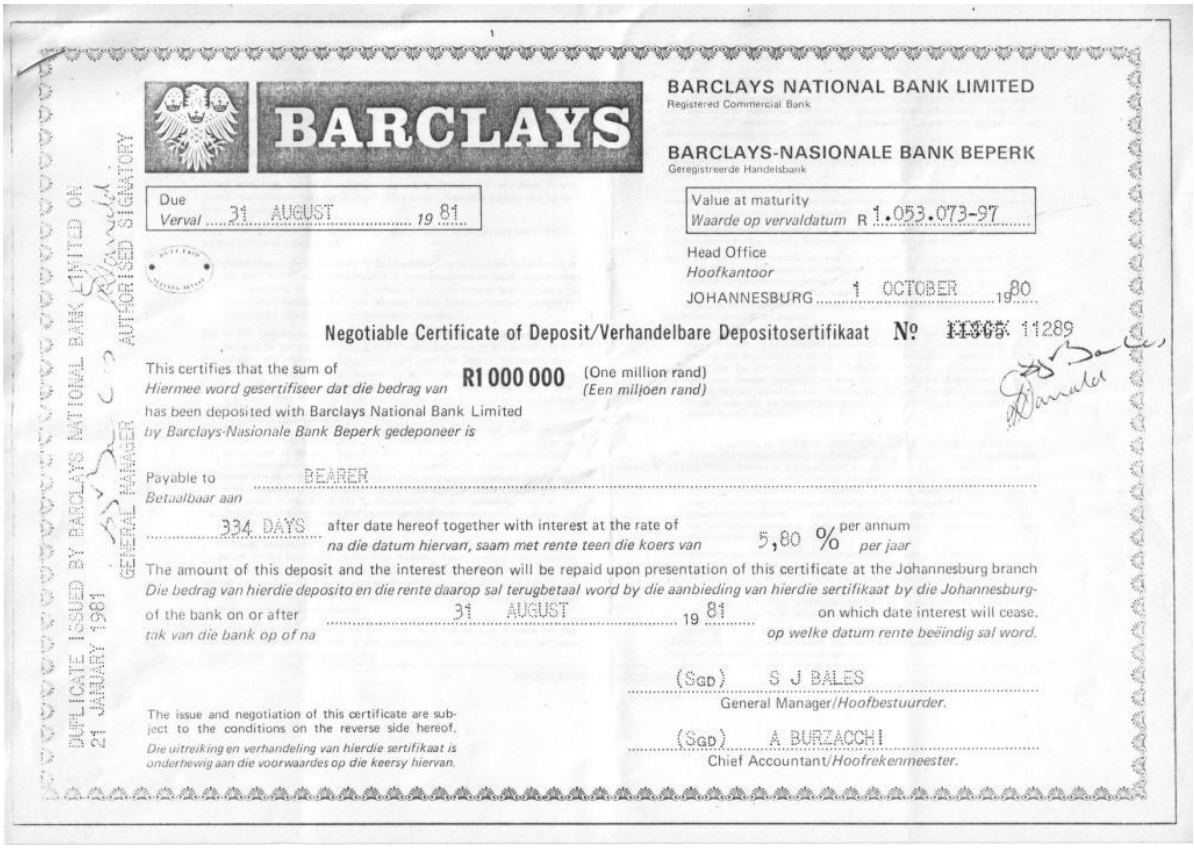
Source: CDH, Malawi.

The central bank is usually the sole banker to government, and these deposits are not negotiable; hence the term NNCD applies here (non-negotiable certificates of deposit). The central bank also takes deposits from other sources; this differs from country to country but usually includes the foreign sector and certain other government entities; the term NNCD applies here also.

Many central banks also issue their own securities (central bank securities – CBS) and many terms apply here: Reserve Bank of Malawi bills, South African Reserve Bank debentures, Bank of Botswana certificates, Bank of Ghana bills, and so on. These are short-term securities and therefore fall into the money market. They are issued solely for monetary policy implementation purposes. Because they are akin to term deposits, and for the sake of simplicity, we refer to these CBS as deposits (NCDs). An example is presented in Box 6.

The private banking sector issues two types of deposit certificates (securities): NNCDs and NCDs. The majority are NNCDs and most are of short term duration, making them money market instruments.

BOX 7: EXAMPLE OF NCD



Source: AP Faure collection.

NNCDs come in various forms, such as call deposits, fixed deposits, notice deposits, savings deposits and so on. NNCDs usually pay interest periodically, while NCDs are usually of the interest add-on form, i.e. an amount is deposited and interest is added to give a maturity value, payable at the end of the deposit period. An example of a NCD is presented in Box 7. NNCDs make up the vast majority of banks' deposits.

3.7 Instruments of investment vehicles

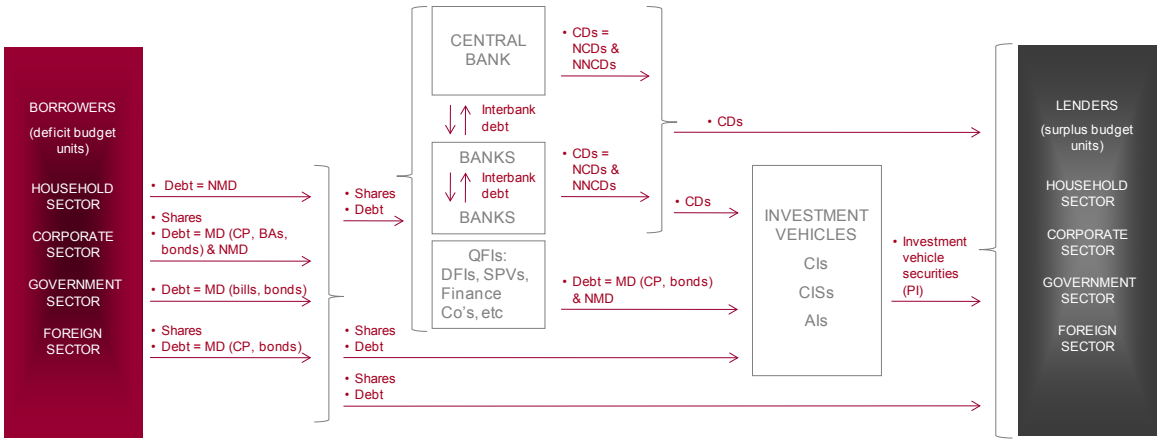
A reminder of the investment vehicles:

- Contractual intermediaries:
  - Insurers.
  - Retirement funds.

- Collective investment schemes:
  - Securities unit trusts (SUTs).
  - Property unit trusts (PUTs).
  - Exchange traded funds (ETFs).

- Alternative investments:
  - Hedge funds (HFs).
  - Private equity funds (PEFs).

Figure 6 completes the picture: all the previous securities as well as the instruments of the investment vehicles, which we call participation interests (PIs).



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 6: financial instruments / securities

The instruments of the investment vehicles fall into a separate category because they are fundamentally different to those outlined above, and because they do not fit into the debt, share or deposit markets. All of them are also non-negotiable (with some exceptions). They invest in the instruments covered above (debt, shares, deposits and others such as property) and issue investment-type instruments suited to the specified needs of investors.

Insurers issue various types of polices, but only endowment policies and annuities are pure investment vehicles. The instruments they issue to the investor can be referred to as PIs. Retirement funds also issue PIs (also called membership interests). SUTs And PUTs issue units which are akin to PIs. ETFs issue PIs, as do the HFs and the PEFs (although these may be termed differently in some countries).

3.8 Derivative instruments

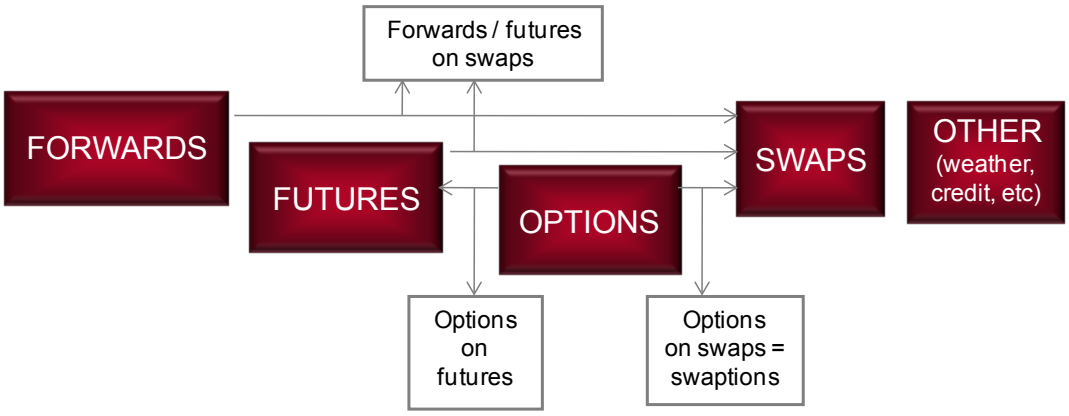


Figure 7: derivative instruments / markets

In addition to the debt, deposit, share and PI securities, there are a number of other related financial instruments that are called *derivatives*. The name arises from the fact that these instruments are *derived* from debt and share instruments, which mean that they cannot exist on their own, and they derive their value from the underlying debt and share instruments.

It must be added that there are also other derivative instruments that are derived not from debt instruments but from commodities (soft, such as grain, and hard, such as metals). In addition there are derivatives that are not derived from debt, shares or from commodities, such as weather derivatives; they are also financial instruments.

The wide array of derivatives can be quite confusing: futures, swaps, options, swaptions, forward rate agreements, forwards, caps and floors, repos, weather derivatives, credit derivatives, etc. Sorting them out in a logical sense is a challenge. Our attempt is presented in Figure 7. Derivatives are found in all markets.

Essentially, forwards and futures are contracts to buy or sell an asset (commodity, financial instrument or index) on a specified date in the future at a price determined upfront. An option is the same, except that the buy or sell is optional and the date is on the contract expiry date or before. Swaps are contracts to exchange cash flows on specified dates in the future, based on a notional amount.

3.9 Summary

Financial instruments are issued by ultimate borrowers and financial intermediaries. There are five categories: debt instruments (short-term and long-term), share instruments (ordinary and preference shares), deposit instruments (NNCDs and NCDs), the PIs of investment vehicles, and derivative market instruments.

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4 Financial markets

4.1 Learning objectives

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

1. Outline the participants in the financial markets.
2. Describe the share and debt markets, and name their collective name.
3. List the instruments of the money and bond markets.
4. Distinguish between fixed-interest and interest-bearing markets.
5. Define the foreign exchange market.
6. List the derivative instruments and briefly describe them.
7. Elucidate the organisation of the financial markets.
8. Define the primary and secondary markets.
9. Discuss the functions of secondary markets.
10. Distinguish between OTC and formal markets.
11. List and describe the primary market issuing methods.
12. Define short selling.
13. Appreciate the clearing and settlement procedures of securities transactions.

4.2 Introduction

The financial markets are simply the mechanisms and conventions that exist for the transfer of funds and their counterparts (i.e. the financial instruments) between the various participants.

All the *ultimate lenders and borrowers* (household, corporate, government and foreign sectors) and all the financial *intermediaries* are participants in the financial markets. And so are the *other financial entities* that facilitate the transfer of funds and securities: the broker-dealers, the regulators, the financial exchanges (which essentially do no more that facilitate the transfer of securities) and fund managers.

The participants in the financial system also include:

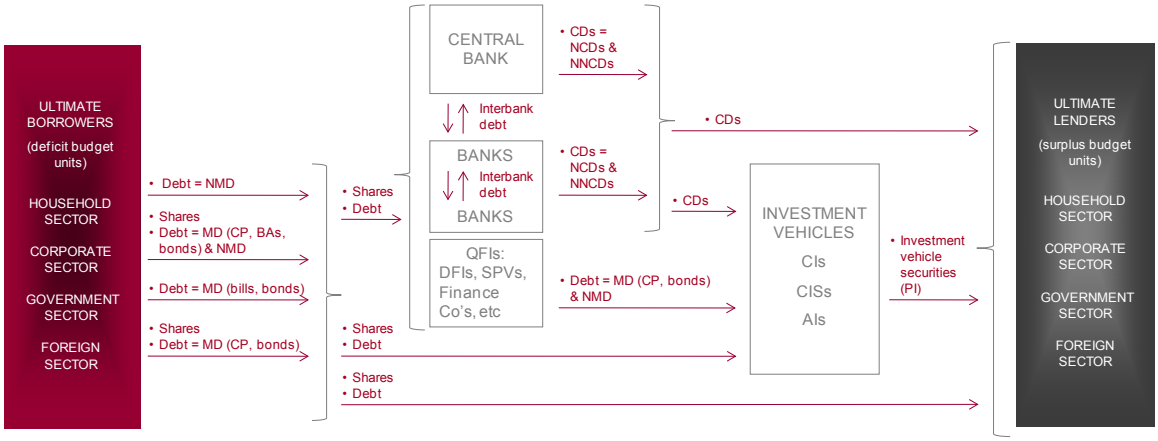
- hedgers,
- speculators and
- arbitrageurs

but they are already included in the participants in the markets mentioned above. For example, banks can also be hedgers, speculators and arbitrageurs. Insurers, retirement funds and even individuals (= members of the household sector) also hedge at times, and individuals also speculate.

In terms of its main economic function the financial markets provide *channels for transferring the excess funds of surplus units to deficit units*. Financial markets thus constitute *the mechanism that links surplus and deficit units*, providing the means for surplus units to finance deficit units either directly or indirectly through financial intermediaries. An allied and vital function is price discovery.

Financial markets provide surplus and deficit units with *additional options*. Surplus units may purchase primary or indirect securities or reduce their debt by purchasing their own outstanding securities. Deficit units, on the other hand, may issue securities or dispose of some financial assets previously acquired. All these options are made possible by the existence of properly functioning financial markets.

To summarise: the participants in the financial markets are the borrowers (issuers of securities), the lenders (buyers of securities), the financial intermediaries (buyers and issuers of securities) and the broker-dealers, fund managers, exchanges and regulators. The term financial market therefore encompasses the participants and their dealings in particular financial claims (debt and shares), groups of claims, and the manner in which their demands and requirements interact to set prices for such claims (interest rates and prices of shares).



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 1: financial system

The terminology and concepts used in the financial markets can be confusing. For example, reference is made to the primary market, the secondary market, the spot market, the options and futures markets, the forward market, over-the-counter markets, order-driven markets, quoted-driven markets, financial exchanges, the money market, the capital market, the debt market, the share market, the foreign exchange market, the swap market, floor trading, open-outcry trading, screen trading, ATS trading, etc. The following sections endeavour to put all these into proper context:

- Money market.
- Bond market.
- Share market.
- Foreign exchange market.
- Derivatives markets.
- "Types" and organisational structure of financial markets.
- Financial market participants and short selling.
- Clearing and settlement.

4.3 Money market

The financial system and its securities may be depicted as in Figure 1. There are two broad categories of securities (excluding PIs):

- Debt and deposits (we place them together because deposits are debt, i.e. claims on banks).
- Shares.

Debt (and deposits) include:

- The securities issued by the ultimate borrowers:
  - Marketable debt (MD) such as CP, TBs and PNs.
  - Non-marketable debt (NMD) such as overdrafts from banks.

- The deposit securities of the banks:
  - Negotiable certificates of deposit (NCDs).
  - Non-negotiable certificates of deposit (NNCDs)
  - Notes and coins (central bank)
  - Central bank securities (CBS – which we regard as deposits for the sake of simplicity).

The debt (and deposit) market is usually also categorised into the *money market* and the *bond market*. The line demarcating the money and bond markets is usually drawn on the basis of term to maturity of the securities traded, and is arbitrarily determined to be one year. *Broadly speaking* then, the bond market is defined as the market for the issue and trading of long-term securities, while the money market is the market for the issue and trading of short-term securities.

These definitions are not very helpful. The demarcation line of a year is useful but the definitions are too simple. A more useful elucidatory approach is to split the debt and deposit market into:

- Long-term debt (and deposit) market (LTDM).
- Short-term debt (and deposit) market (STDM).

The LTDM comprises all forms of long-term debt, marketable and non-marketable. The bond market is the marketable instrument arm of the LTDM. The rest of the LTDM is made up of long-term instruments such as mortgages (which can have terms of up to 20 years). Thus in the LTDM we find MD (= bonds) and NMD.

It is notable that price discovery of long-term debt takes place in the bond market and the rates discovered here are used in the pricing of NMD (if they are fixed-rate instruments). Thus the bond market is the price-maker in the LTDM while NMD is a price-taker.

The STDM can be split into the market for marketable short-term debt and the market for non-marketable short-term debt, and many scholars subscribe to this and use the former as the definition for the money market. We have a different view and it is based on the significance of the short-term NMD (and deposit) market in monetary policy and in price discovery.

Thus in our view the money market should be described as being comprised of the short-term MD (and deposits) and NMD (and deposit) markets. Examples of MD in the money market are TBs, CP, NCDs and so on, and examples of NMD in the money market are short-term NNCDs and loans such as overdrafts.

However, this simple definition ignores two significant parts of the money market and these are money creation by the banks (by making new loans), and the interbank markets where interest rates have their genesis. And these two parts of the money market are closely related. There are three interbank markets:

- Bank-to-bank interbank market (b2b IBM).
- Bank-to-central bank interbank market (b2cb IBM)
- Central bank-to-bank interbank market (cb2b IBM).

Banks are required to settle amounts owed to one another (as a result of deposit shifts) at the end of each business day. This occurs over accounts held with the central bank (which are usually called settlement accounts – SAs). It should be evident that the amounts will balance out, because what one bank loses another gains. This is the b2b IBM.

The bank-to-central bank interbank market (b2cb IBM) does not apply to all countries and an interest rate is not applied in this market (in most cases). It is the *cash reserve requirement* (RR), in terms of which banks are required by statute to hold deposits (called cash reserves or reserves – R) with the central bank equal to a certain proportion of their deposits (or liabilities). In some countries the accounts in which these RR are held are called *reserve accounts*, and in some these RR balances are held in the SAs.

The central bank operates in the money and foreign exchange markets and its actions (called open market operations – OMO) lead to amounts being owed to it and amounts owing to the banks at the end of the business day. Most central banks bring about a situation where the banks owe the central bank [called money market shortage (MMS) or liquidity shortage (LS)] funds on a permanent basis, and they lend the funds (R) to the banks in order to make up the deficit. This market is called the cb2b IBM, and this is where monetary policy is played out.

A crucial part of monetary policy is to bring about this LS and to lend the funds to the banks at the central bank's accommodation rate (called by various names such as repo rate, Bank rate, base rate, discount rate and so on), which we call the key interest rates (KIR). This is a fixed rate and it is determined "administratively" by the central bank's Monetary Policy Committee (MPC).

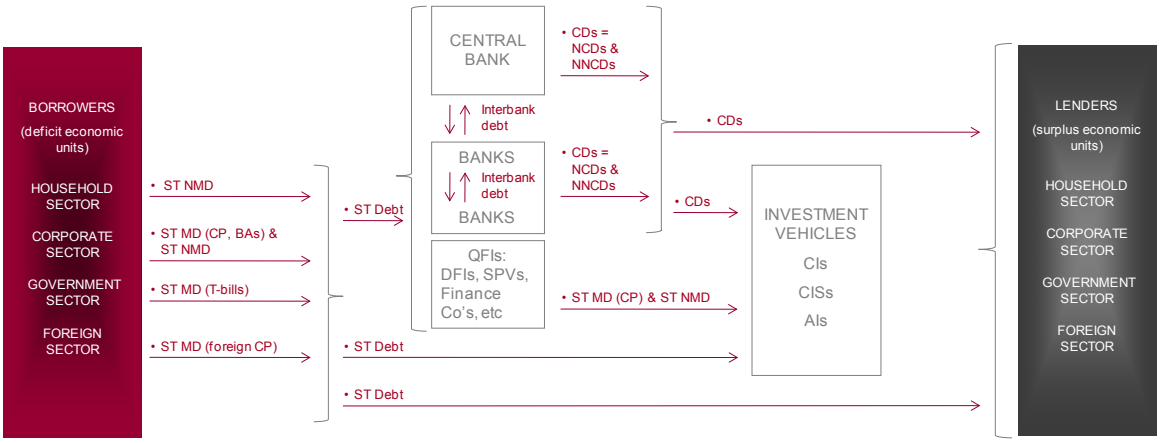
It will be clear that the wider interbank market (i.e. the b2b IBM and the cb2b IBM) does balance out, i.e. clear effectively, but the central bank "recycles" the funds to the relevant banks at a different rate to the b2b IBM rate, i.e. at the KIR. This rate is the genesis of interest rates for short-term money (in the cb2b IBM funds are provided for 1-day or a little longer in some markets).

Thus, the KIR is *made effective* by the existence of a LS and this rate has an immediate impact on the b2b IBM rate (as the banks compete for deposit funds). This is called the *interbank rate* (*federal funds rate* in the US). This rate in turn affects the banks' deposit rates to the public and in turn these deposit rates affect their lending rates. The latter has a major impact on the *demand for loans* – a target of the central bank as this is largely the counterpart of the money stock (this will be explained in more detail later). And, the growth rate in the money stock has an important bearing on inflation, the ultimate target of monetary policy. Inflation is important in that a low rate of inflation is one of the significant factors in a stable economic environment.

It will now be evident that the definition of the money market is not straightforward. A proper definition is that the money market encompasses:

- The markets in the marketable and non-marketable securities of *ultimate borrowers.*
- The markets in the marketable and non-marketable securities of *financial intermediaries.*
- The interbank market between the private sector banks.
- The interbank markets between the central bank and private sector banks.

The money market may be depicted as in Figure 2.



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;

Figure 2: money market

If the reader likes, the money market derivatives market can be added to this list.

The dominant players in the money market are the private sector banks, the central bank, the retirement funds and the money market unit trusts. Generally the money market is of the OTC variety. In some countries certain of the instruments are listed on exchanges.

4.4 Bond market

As we have seen, the bond market is part of the LTDM. It is in this market that prices (interest rates) for long-term fixed-interest debt are discovered. The other part of the market, long-term floating-rate NMD (such as floating-rate mortgages), is benchmarked on money market rates (the prime lending rate of banks in this example).

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.

Long-term bonds are issued to fund long-term undertakings, such as roads, energy and water delivery infrastructure and factories. Not all long-term borrowers are able to issue bonds. It is the domain (mainly) of government and the rates on government bonds are regarded as risk-free (actually *credit risk-free* because market risk is intrinsic to bonds). The rates on all non-government (i.e. corporate) bonds are benchmarked on the government bond rates.

It is only the large companies that are able to issue bonds, and their bonds are required to be rated by one or more rating agencies before any investor will consider them. In addition to these bonds there are also bonds that are the products of securitisation, such as the bonds of non-bank mortgage lenders, and others such as Collateralised Debt Obligations (CDOs). As these bonds are issued by Special Purpose Vehicles (SPVs) created for this purpose, we refer to them as SPV bonds. They also need to be rated before investors will consider them.

Many countries also allow the inward listing of bonds. By this is meant that foreign entities are permitted to issue bonds in the local market. They are called foreign bonds. Generally, it is foreign banks and other foreign government entities (including central governments) that are able to issue locally. Foreign bonds are also rated.

In summary, there are five broad classes of *issuers* in the bond market:

- Government sector (up to three levels).
- Public enterprises (also called parastatals).
- Corporate entities.
- Special purpose vehicles (SPVs).
- Foreign sector entities (inward listings).

The issuers of bonds / bond market may be depicted as in Figure 3.

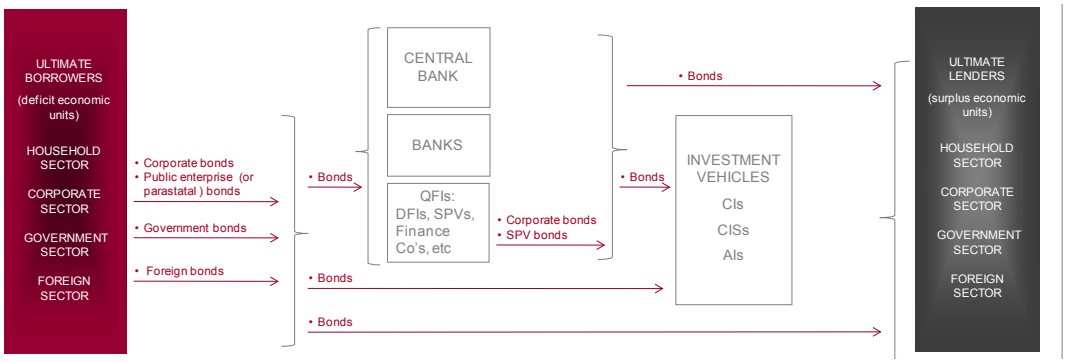


Figure 3: bond market

There are many types of bonds in the bond markets of the world:

- 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.
- Islamic bonds.
- Foreign bonds.
- Eurobonds.
- Global bonds.
- Retail bonds
- Islamic bonds.

The common bond is the first-mentioned, the plain vanilla bond; it has a fixed-term and a fixed coupon rate. Its only variable is its market rate.

The bond markets of the world tend to be formalised, i.e. bonds are listed on an exchange. However, there are some which are of the over-the-counter (OTC) variety.

The *money and bond markets* together are generally termed (apart from *debt market*) the *fixed-interest market* (because the majority of instruments carry fixed rates of interest) and the *interest-bearing market* (because all the instruments bear interest). The sharp reader will recognise the incongruence here: long-term NMD is also fixed-interest / interest-bearing, in other words, the terms apply to the STDM (= the money market) and the LTDM (the marketable part of which is the bond market).

4.5 Share market

4.5.1 Introduction

The share market is part of the capital market (= the market for long-term capital). The capital market is the market in which prime borrowers are able to access long-term and/or permanent funding. A note is required: we also use the term "borrowers" for the issuers of shares because shares includes preference shares which in many markets are redeemable. As we have shown, strictly speaking, an ordinary share represents part-ownership and not a debt of a company.

We define the share market as:

The share market is the mechanism / conventions that exist for the issue of, investing in, and the trading of marketable share instruments that represent the permanent or semi-permanent capital of the issuers (companies).

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

- Shares.
- Market mechanism.
- Issue (primary market).
- Investing.
- Trading (secondary market).
- Permanent or semi-permanent capital of the issuers.

Each of these key words will be explained briefly.

4.5.2 Shares

Shares are issued by companies in terms of the statute that regulates them (usually called the Companies Act) and there are two types:

- *Ordinary shares* (also called common shares or common stock) that represent the permanent capital of companies; they have no maturity date (as such they are much like perpetual bonds).
- *Preference shares* (also called preferred shares or preferred stock). These shares may be redeemable (i.e. have a fixed maturity date), redeemable at the option of the issuer or non-redeemable (have no maturity date). The latter are sometimes called perpetual preference shares.

Shares pay dividends, as opposed to bonds and money market instruments that pay interest. Dividends on preference shares are usually fixed-rate dividends and they have preference over dividends on ordinary shares (explained in more detail later).

4.5.3 Market mechanism

The *market mechanism* is the structure, systems and conventions that exist to facilitate the issue and trading of shares. There are two types of market, i.e. the over-the-counter (OTC) market and the exchange-driven (and regulated) market. Most share markets around the world are exchange-driven markets.

4.5.4 Issue (primary market)

Shares are issued by companies, which may be local or foreign (see Figure 4). In most countries shares issued by foreign companies are rare, and they are usually called inward-listed shares or foreign shares. The original shares of companies are unlisted shares and are issued to the founders of the companies (this is the primary market).

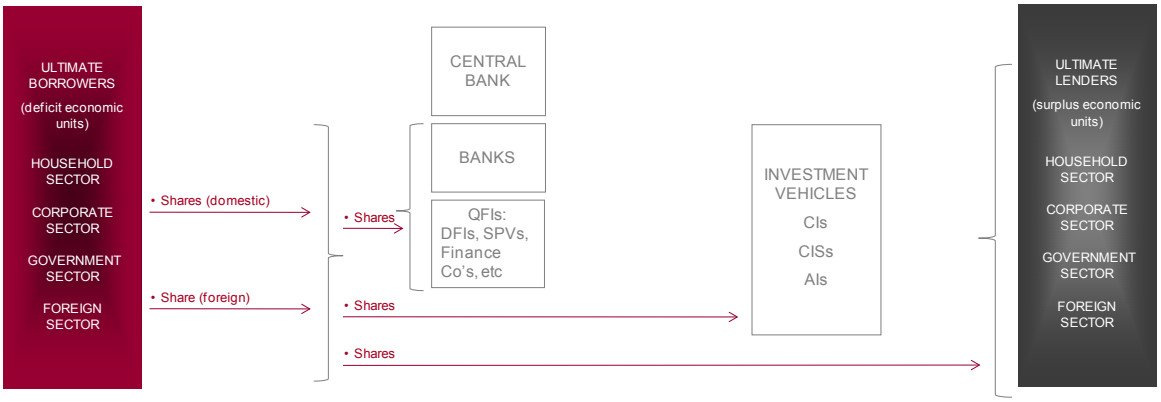


Figure 4: issue of shares

The directors of companies only list the shares (and issue new shares) when they have established a good profit record and are able to comply with the listing requirements of the exchange. The main motivation for listing the shares on an exchange is to have a mechanism to acquire further capital easily and at a good price.

4.5.5 Investing

The *investors* in (or holders of) shares are also depicted in Figure 4. In most countries all the ultimate lenders are holders of shares. The government holds shares in public enterprises. The foreign sector's involvement in the share markets of countries differs widely. In some it is a large investor, while in others it is an insignificant investor. Generally speaking, the household sector is a small direct investor in shares; however, it is a large holder of shares via the investment vehicles.

All the mainstream financial intermediaries are investors in shares, with the exception of the central bank (and most of the QFIs). In most countries the largest holders of shares are the retirement funds (CIs), the long-term insurers (CIs), the securities unit trusts (CISs), the exchange traded funds (CISs) and hedge funds (HFs).

4.5.6 Trading (secondary market)

Trading in shares (i.e. secondary market broking and dealing) is a sizeable business in most financial markets. As noted earlier, the majority of secondary share markets are exchange-driven. The secondary share market participants are:

- *Members of share exchanges*. The members (also called *users* in some markets) of share exchanges are usually separately-capitalised subsidiaries of the *banks*, smaller companies owned by participants and individuals. The generic name we use here for all the members is *broker-dealers*.
- *Issuers of shares*. Companies not only supply shares to the market, but they are, in many countries, permitted to purchase their own shares and hold them as "treasury stock" or cancel them.
- *Investors.* As we have seen, the investors include all the ultimate lenders and certain financial intermediaries. Of the latter the major participants are the retirement funds, the insurers, the exchange traded funds, the hedge funds and the securities unit trusts. In some countries the foreign sector plays a major role.
- *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 share market, thereby contributing to efficient price discovery.

4.5.7 Permanent or semi-permanent capital of the issuers

Common shares and perpetual preference shares (and perpetual bonds) represent the permanent capital of a company. Preference shares (redeemable) and other forms of borrowing (for example bank overdraft facilities utilised in the case of smaller companies and the issue of bonds and commercial paper in the case of the larger companies) represent the semi-permanent capital of a company.

Permanent capital is the capital required to maintain the ongoing business of the company, to invest in plant and equipment and to hold the core of inventories. The holders of common shares are rewarded by sharing in the profits of the company.

Redeemable preference shares are issued when temporary but medium-term funding is required. This medium-term funding is required in preference to bank loans. There are two main financial considerations (and inconveniences) in this regard:

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

The ability to issue preference shares 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 period required. Payments in some cases can be delayed (cumulative preference shares).

Having briefly covered the debt and share markets we are able to present an illustration of the local financial markets: see Figure 5.

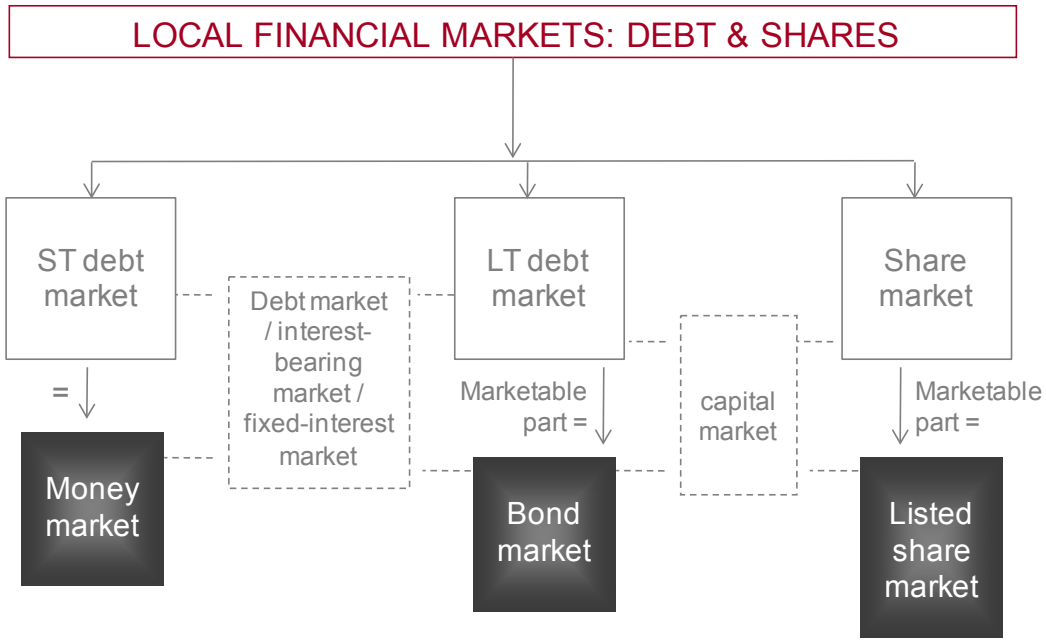


Figure 5: local financial market

4.6 Foreign exchange market

There is a market that is closely related to the money market: the foreign exchange market (from here on *foreign exchange* is termed *forex*). This market, strictly speaking, is not a financial market, because lending and/or borrowing does not take place in this market. The forex market merely makes it possible to *buy and/or sell forex*.

It is important to understand *what is meant by forex* and *buying and selling forex*. Forex means:

- Foreign notes and coins.
- Foreign deposits and investments.

Foreign notes and coins are bought for the purpose of spending in a foreign country[14]. However, this is a tiny part of the forex market. The forex market is comprised mainly of the buying and selling and *foreign deposits*. This may sound a bit odd, but consider the situation of a Local Country (LC) export company. It receives payment for exports in the form of a deposit made by the foreign importer in a foreign bank deposit account. The exporter then sells this (exchanges this foreign deposit) for a domestic deposit (in the forex market).

Conversely, a LC importer company buys a foreign deposit in order to pay for imports, and pays for this by a debit to its domestic deposit account. Assuming that the foreign country is the UK, there is one UK bank, one LC bank, an exchange rate of GBP/LCC 10.00, and the amount is LCC 100 million, the respective balance sheets change as is shown in boxes 1–4.

BOX 1: LC EXPORTER (LCC MILLIONS)			
Assets		Equity and liabilities	
Goods (exported) Deposits at UK bank (earned from exports) Deposit at UK bank (sell for local deposit) Deposit at LC bank	-100 +100 -100 +100		
Total	0	Total	0

BOX 2: LC IMPORTER (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Goods (imported) Deposit at LC bank (pay for UK imports) Deposit at UK bank (bought with LCC) Deposit at UK bank (pay for imports)	+100 -100 +100 -100		
Total	**0**	**Total**	**0**

BOX 3: UK BANK (GBP MILLIONS)			
Assets		**Equity and liabilities**	
		LC exporter deposit (from exporting) LC exporter deposit (sells for LC deposit) LC importer deposit (buys for importing) LC importer deposit (pays for imports)	+10 -10 +10 -10
Total	**0**	**Total**	**0**

BOX 4: LC BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
		LC exporter deposit LC importer deposit	+100 -100
Total	**0**	**Total**	**0**

In this example the forex market cleared perfectly, i.e. demand and supply matched and there was no influence of the exchange rate. Following from the above, it will be evident that the case of a foreign investing, a *deposit* is bought in the first instance, in order to pay for the foreign investment.

There are two types of transactions in the forex market: *spot* and *forward* (called forwards) transactions. Spot means *pay now*, which has a different meaning in different countries, and *forward* means at a date in the future other than spot. The forward market is a derivative market (from the spot market). In addition these are other forex derivative markets, such as futures, options, swaps, etc.

The above should make it clear that the forex market is not a financial market in the sense that borrowing and lending takes place. Rather it is a *conduit* for:

- Foreigners into the domestic goods and services markets (domestic notes and coin and travellers' cheques), to the domestic deposit market (receipts / payments for imports / exports), and to domestic financial markets (debt and share markets) (via the deposit market)

- Residents into the foreign goods and services markets (foreign notes and coin and travellers cheques), to the foreign deposit market (receipts / payments for imports / exports), and foreign financial markets (debt and share markets) (via the deposit market)

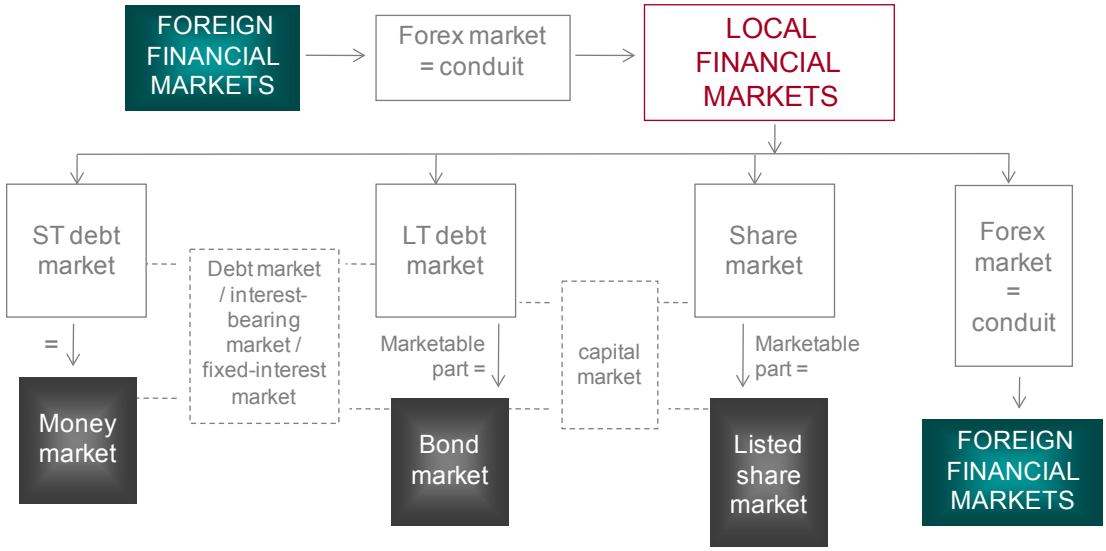


Figure 6: financial markets

However, even though the forex market is not a financial market in the sense that borrowing and lending takes place, it is a conduit to these markets, and the derivatives of this market are financial. Thus we will give it the status of a financial market.

We are now able to expand our illustration (see Figure 6). We now have four financial markets and need to add the fifth: *the derivative markets*.

4.7 Derivative markets

We mention *spot* and *forward* markets earlier, and now need to elucidate these suitably. When a financial instrument is traded and settled on the same or on the following day or even five days hence, it is termed a *spot* transaction. This is usually written as T+0 or T+1 (in the case of most money markets), T+3 (in the case of most bond markets), and T+5 (in the case in most share markets). "T" denotes *transaction* date (or deal date), and the number after the "T" denotes the number of days after the transaction date when the transaction is *settled*. *Settled* means the relevant security is delivered and the consideration (the amount owing) paid for (this is termed *payment versus delivery*). All the instruments mentioned above are traded *spot*.

The spot settlement dates (T+number-of-days mentioned above) are the administratively convenient settlement days for the relevant markets. If, however, the settlement dates are on days other than the spot dates, they are *forward / future dates*. Thus, if a share deal is traded today for settlement in, say, two weeks, it is a *forward* transaction. The price of the forward transaction will be the spot price plus the price of money for a two-week term. A *forward* is thus *derived* from the spot market. Forward markets are derivative markets.

The other products (instruments) that are *derived* from the spot markets are many, and there are also derivatives that are not derived from financial instruments. These derivatives may be categorised as shown in Box 5. Elucidation is required in respect of the categories of derivative instruments:

- The *share, bond, money and forex markets* essentially have all the derivatives mentioned (with one or two exceptions).
- The *money market*, in addition to those already mentioned (which are not widely traded), has other derivatives as part of its arsenal, i.e. repurchase agreements (repos), forward rate agreements (FRAs), and caps and floors (C&Fs).
- It should be noted that some researchers would probably not include *repos* in the list of derivatives. We do because they are derived from other financial instruments, cannot stand alone, and derive their value from the financial markets (the price of money for the relevant period). They can also be used for hedging a desired position.

- The *commodities market* has all the derivatives. These derivative instruments are financial in nature and therefore deserve to be included under financial instruments.
- *Credit and weather derivatives* are not derived or take their value from financial instruments, but they are financial in nature and should be included here.
- Some researchers may not wish to include certain *products of securitisation* in the list of derivatives, because the products are financial instruments themselves (such as MBS, and CDOs and CP). We believe they are derivative instruments because they are derived from other financial instruments (debtors, mortgages, etc) and obtain part of their value from the underlying securities.
- These sticklers should not have much trouble with *products of securitisation* that emanate from the securitisation of the sales of music (as does exist in the US). The products are financial and should be included here.

BOX 5: DERIVATIVE INSTRUMENTS / MARKETS

SHARE MARKET, MONEY MARKET, BOND MARKET AND FOREIGN EXCHANGE MARKET

Forwards
Futures
Options on "physicals" (ie on the actual instrument)
Options on futures
Warrants (in some markets, which in LC are retail options)
Swaps
Options on swaps (swaptions)

MONEY MARKET ONLY

Repurchase agreements (simultaneous spot sale and forward purchase)
Forward rate agreements (FRAs) (= forward)
Caps and floors (= option-type instruments)

COMMODITIES MARKET (BROADLY DEFINED)

Forwards
Futures
Options on "physicals" (ie on the actual commodity)
Options on forwards
Options on futures
Commodity swaps
Options on commodity swaps

OTHER DERIVATIVE INSTRUMENTS

Credit derivatives
Weather derivatives
Products of securitisation

We are now able to complete our illustration of the financial markets (see Figure 7).

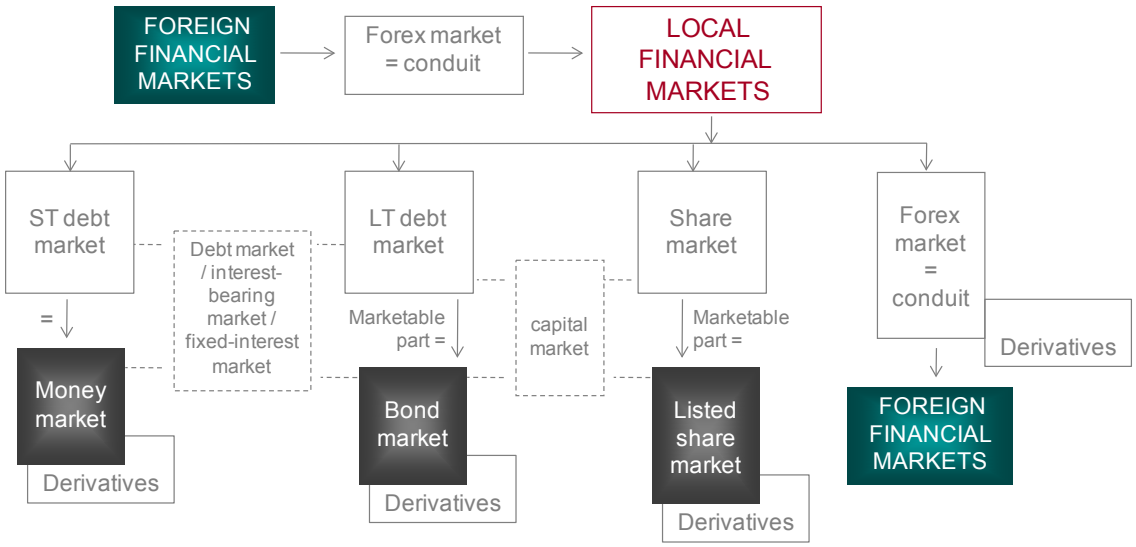


Figure 7: all financial markets

This is one way of presenting the financial markets. Another is shown in Figure 8.

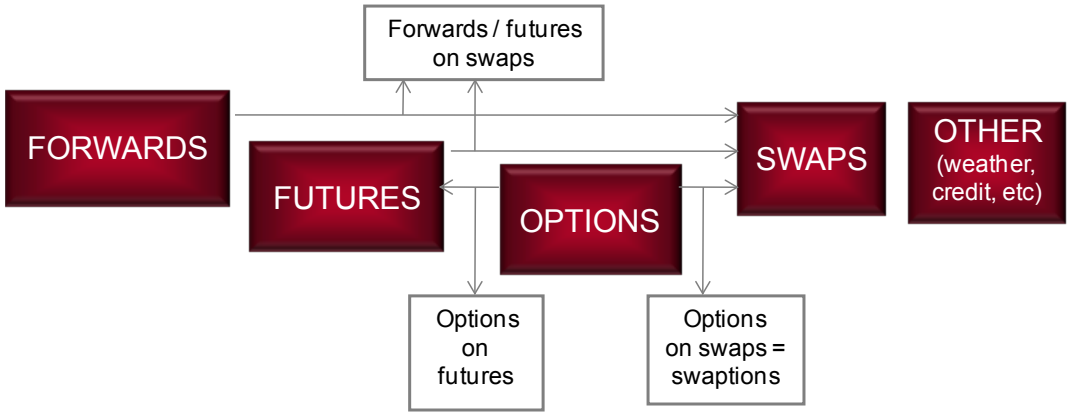


Figure 8: derivative instruments / markets

The spot market instruments were briefly described in the test on financial instrument, but the derivatives market instruments were not. This was not done because it was necessary to first put all the spot instruments into place and perspective. We now briefly describe the derivative instruments.

Forwards were mentioned earlier as the sale or purchase of a financial instrument on a date in the future, i.e. on a date other than the spot market date. The price of a forward is equal to the spot price plus the price of money (the interest rate) for the forward period.

Futures contracts are agreements to buy from, or sell to, an exchange established for this purpose, a standard quantity and quality of an asset (i.e. a financial asset, commodity or notional asset – like an index) on a specific date, at a price determined at the time of negotiation of the contract. Thus the holders are obligated to perform.

Options (on "physicals", i.e. on the actual spot instrument), on the other hand, bestow on the holder the right, but not the obligation, to buy (call option) or sell (put option) the underlying asset at a predetermined price (strike price) during (an *American* option) or at the expiry (a *European* option) of a specified period. It will be evident that the option holders will exercise their options only if it is profitable to do so. Their potential profit is not fixed, while their potential loss is limited to the amount of the premium paid. The writer has the opposite profile.

Options on forwards are options as described above, but the underlying instrument in a forward contract. Similarly, with options on futures the underlying instrument is a futures contract as opposed to a "physical", i.e. a spot market instrument.

Warrants in some countries are retail call / put options on specific shares and on certain indices. In other countries warrants have a different definition: they are issued by companies and holders have the option to take up shares in those companies.

Swaps are contracts in terms of which certain payment obligations are swapped between two parties. With an interest rate swap (IRS), for example, a floating rate obligation is swapped for a fixed-rate obligation. The payments are based on a mutually agreed notional amount that is not exchanged between the parties.

Options on swaps (swaptions), as the name indicates, are call and put options on swaps, such as an IRS.

As noted, these are certain derivative instruments that are unique to the money market, i.e. repos, FRAs and caps and floors. A *repo* is simply the sale of a previously issued security at an agreed rate of interest for a specified period of time, at the market value consideration of the underlying instrument. The rate on the repo is the price of money for the period of the agreement (except in the case of repos with the central bank, where it is administratively determined). The repo can be regarded as a simultaneous spot sale and forward purchase.

A *FRA* is exactly what it denotes, i.e. an agreement that enables users to hedge themselves against unfavourable movements in interest rates, by fixing a rate on a deposit or a notional loan that starts sometime in the future. An example of a FRA is a 3 × 6 (3-month into 6-month) FRA, i.e. the 3 in the 3 × 6 refers to the date in 3 months time when settlement takes place and the 6 to the due date of the FRA. The FRA is a forward.

Caps and *floors* are similar to options. A *cap* purchased makes it possible for a company with a borrowing requirement to hedge itself against rising interest rates. The cap contract establishes a ceiling, but the company retains the right to benefit from falling interest rates. On the other hand, a *floor* contract allows a company with surplus funds to shield itself against declining interest rates by determining a specified floor upfront, while it retains the right to profit from rising interest rates. On the exercise date of the cap or floor contract, the specified strike rate is evaluated against a standard reference-floating rate. The interest differential is then applied to the notional principal amount that is specified in the contract, and the difference is paid by the writer / seller to the holder / buyer.

As noted there are also "other derivatives" and we have identified three: credit derivatives, weather derivatives and products of securitisation.

Credit derivatives are bilateral contracts between a protection purchaser and a protection seller that compensate the purchaser upon the occurrence of a *credit event* during the life of the contract. The *credit event* is objective and observable, and examples are: default (or failure to pay), bankruptcy, rating downgrade.

Weather derivatives are hedges against weather events. They rely on instruments such as caps, floors, collars, swaps, etc., and are settled in the same way as these. The counterparties to the hedgers use data supplied by independent organisations, such as the weather service data stations located at major airports.

Products of securitisation we have already touched upon. Essentially, they are financial securities (products) of an SPV (securitisation vehicle) set up to hold assets that have a cash flow. The assets are financial (such as mortgages), or non-financial (such revenue from the sale of music), and they are financed by the securities issued.

4.8 Organisational structure of financial markets

4.8.1 Introduction

This section is devoted to the types, forms, nature, etc of financial markets, and how they operate / trade in practice ("types" in the heading was placed in inverted commas, because it covers "types, forms, nature, etc."). These words are part of the financial market jargon that is voluminous and quite confusing. A sub-plot of this section is to create some logical order in this regard. This section is comprised of the following exhilarating sub-sections:

- Primary and secondary markets.
- Economic functions of secondary markets.
- Market form: exchange-traded and OTC markets.
- Issuing methods.
- Trading driver: order or quote.
- Trading system.
- Trading form: single and dual capacity.

4.8.2 Primary and secondary markets

The first distinction that must be made is between spot (also called *cash*) and derivative markets, which we covered in some detail above. These fall under the generic heading *market nature.* The next level of distinction in the spot markets is *primary and secondary markets*, which we call *market type*. With this we are able to make a start with our dazzling illustration which is designed to demystify the jargon (see Figure 9).

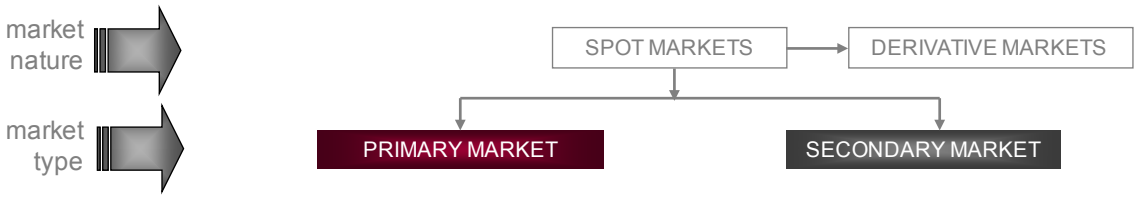


Figure 9: organisation of spot financial markets (1)

The *primary market* is the market for the issue of new securities (debt and shares) in order to borrow money for consumption or investment purposes. It will be evident that the markets in non-negotiable instruments such as mortgage loans, savings deposits and life policies, are entirely primary markets, while NCDs and bonds (for example) are *issued* in the primary market, but are *traded* in the secondary market.

Secondary market is the term used for the markets in which previously issued financial claims are traded. Broker-dealers usually facilitate these secondary market transactions. In the primary market the issuer receives funds, whereas in the secondary market the original issuer does not receive funds; only the seller does. The primary and secondary markets can be portrayed as in Figure 10.

Secondary markets play a significant role in the financial system and the economy. This is covered next.

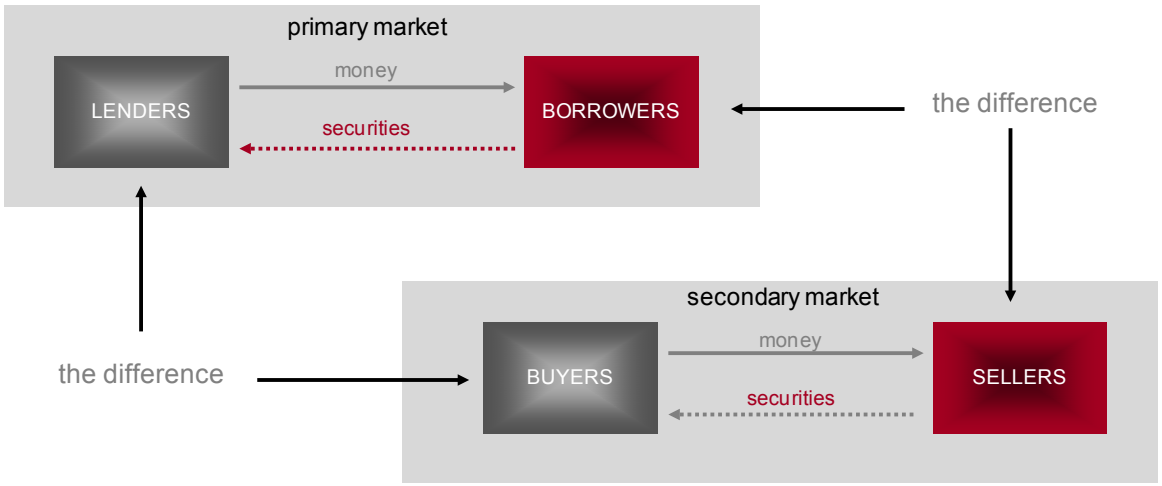


Figure 10: primary and secondary markets

4.8.3 Economic functions of secondary markets

4.8.3.1 Introduction

The economic functions of secondary markets may be summarised as follows:

- Price discovery.
- Liquidity and borrowing cost reduction.
- Support of primary market.
- Implementation of monetary policy.

4.8.3.2 Price discovery

Price discovery is one of the central functions of secondary markets. It is the route through which securities markets arrive at prices for the securities traded. (It must be kept in mind that *prices* in the fixed-interest markets are the *converse of interest rates*.) The "route" refers to the method of trading, and there are various trading methods, which will be discussed later. Price discovery is important because it provides information that influences economic decisions, for example whether a company will expand production and finance this with long-term borrowing or the issue of new shares (rights offer). Price discovery also provides clues as to the prices that need to be offered on new issues of securities.

There are two prices in the various securities markets: *bid* and *offer* (or bid and *ask* in some countries). The *bid price* is the price that buyers are prepared to pay and the *offer price* the price at which holders of securities are prepared to sell. The bid price is always lower that the offer price (the opposite applies in the case of interest rates), and the difference between the two rates / prices is called the *spread*.

The *spread* is a valuable piece of information, for two main reasons. Firstly, it represents the cost of trading, i.e. it is a transaction cost, and this is significant in the creation or lack of liquidity (see below). Secondly, the spread is a reflection of marketability / liquidity. If the spread is narrow, the relevant market is said to be *liquid* (some use the word *thick*, but we will not use it because of its uncharitable connotation), and if the spread is wide the market is *illiquid* (some say *thin*).

4.8.3.3 Liquidity and borrowing cost reduction

Liquidity (some say *marketability* – these two terms mean the same in the financial markets) refers to the ability to trade a security with ease, i.e. without impacting significantly on its price. It will be apparent that in liquid markets, prices will not be adversely affected by large orders, whereas in thin markets prices may be shifted markedly by small orders. It may be said that a liquid market is more likely to create a *state of equilibrium* in the market. By this is meant that if the buyers and sellers are equally matched in terms of orders, the price will not be affected adversely (up or down), i.e. the price is a market-clearing price. As indicated, in a thin market, the market may clear at a vastly different price, depending on whether buyer orders outweigh sell orders (higher price), or vice versa (lower price). Equilibrium is disturbed in thin markets.

Liquidity is significant for two main reasons. Firstly, it enables investors to rapidly adjust their portfolios in terms of size, risk, return, liquidity and maturity. This in turn has a major influence of the *liquidity premium* investors place on liquid securities. This of course means that the issuer is able to *borrow at a lower cost* than in the absence of liquidity. It is for this reason that many issuers of bonds attempt to create their own markets by acting as market makers (quoting buying and selling prices simultaneously) in their own securities, or by outsourcing this function to an investment / merchant bank/s. It is notable that central governments usually jumpstart the bond market by market making in their own securities (or outsourcing this to the central bank).

An important question is how to enhance liquidity. The answer is, firstly, the active participation of the role-players in the financial markets, secondly, the existence of market makers, and thirdly the existence of arbitrageurs and speculators. These will be covered in more detail in a later text on the broker-dealers

4.8.3.4 Support of primary market

The secondary market plays an important role in terms of *supporting the primary market*. We noted above that price discovery in the secondary market assists the primary markets in terms of providing clues as to the *pricing of new issues*. In addition to this important function, the secondary market provides clues as to the *receptiveness of market for new issues* (which is reflected in the spread). Clearly, a liquid market improves the ability of issuers to place securities, and lowers the price.

4.8.3.5 Implementation of monetary policy

An active secondary market enables the central bank to buy and sell securities in order to influence the liquidity of the banking system, with a view the ultimately influencing interest rates. This is termed *open market operations*, which means that the central bank buys and sells securities in the *open market*.

4.8.4 Market form: exchange-traded and OTC markets

Markets may be of the form over-the-counter (OTC) or of the form exchange-traded (also called *formalised*). These fit into our growing financial markets illustration as portrayed in Figure 11.

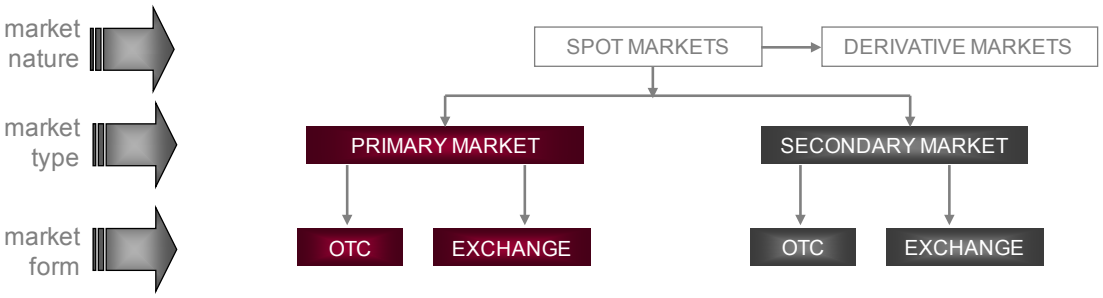


Figure 11: organisation of spot financial markets (2)

Most markets in an economy are informal, i.e. OTC or not legislated, and examples are the labour market, the vegetable market, the fish market, and the market for elephants. In the case of the financial markets, however, all the markets start out as informal and some progress to formalised markets. For example, the forward markets are extremely useful markets and some have progressed into futures markets, not because the authorities want them so, but because the participants want them to be well-functioning, liquid and safe markets.

Some of the markets, such as the spot money market and the spot and forward foreign exchange markets never become formalised, and the reasons are straightforward: they work well as they are (i.e. without official intervention) and because they are the domain of intermediaries who themselves are sufficiently regulated.

4.8.5 Issuing methods

4.8.5.1 Introduction

As an introduction, we present our expanding financial markets illustration (see Figure 12). There are four methods of primary issue: public issue, private placement, auction and tap issue.

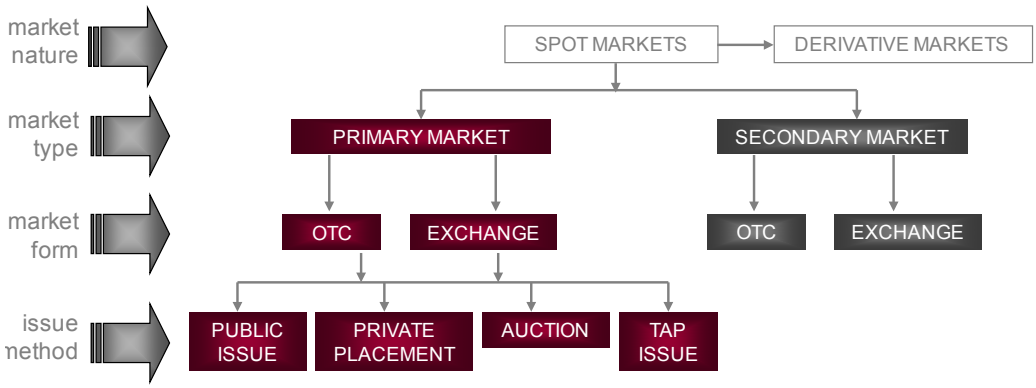


Figure 12: organisation of spot financial markets (3)

4.8.5.2 Public issue

Public issue (also called public offer or offering) is the *process of offering securities to the general public*. This is done through the issue of a *prospectus* or *placing document*, i.e. an offer for the public to subscribe for the securities at a stipulated price. When shares are offered to the public for the first time it is called an *initial public offering* (IPO).

A *public issue* may be either:

- An offer for subscription
- An offer for sale.

In the case of the *offer for subscription*, the public is invited to subscribe for a specified number of previously unissued (or new) shares. The *proceeds accrue to the company*.

In the *offer for sale*, shareholders invite subscribers to purchase a certain number their existing shares. The *proceeds do not accrue to the company*, but to the existing shareholders.

When a bank or broking firm is appointed to manage the issue of securities for a company, it is called the *originator* or the *bookrunner*. The bank or firm is responsible for all aspects of the issue: the legal and financial exchange requirements, appointment of the auditor and lawyer to the issue, etc.

There may also be an *underwriter* to a public issue, i.e. an undertaking to take up the remaining securities if the offer is not fully subscribed. This undertaking by the underwriter (done for an agreeable fee of course), which is usually an investment / merchant bank, gives comfort to potential investors – if the underwriter is prepared to take up the securities, they must be of good quality and the pricing is fair!

With underwriting there may also be more than one underwriter, termed *syndicated underwriting*.

4.8.5.3 Private placement

Private placement is the placement of securities by the issuer or an *originator* with a single investor, or with a small group of investors, such as a selected number of "institutions"[15]. This may also be termed a *limited public offer*. Some countries use the terminology *bookbuilding* to describe the activity of the placement of securities with a small group.

A form of private placement is an *underwriter* taking up all the securities himself at a specific price and then on-selling them to investors at a higher price. The difference between the two prices is called the *underwriting spread*.

4.8.5.4 Auction

Many issuers make use of the auction method. There are various forms of auction:

- *Dutch auction*. This is an auction where the seller starts at a high price and continuously lowers the price until a buyer "takes" securities at this price. US companies have repurchased their own shares using this method of auction.[16]
- *English auction*. This is an auction where a party starts the auction by bidding a price, and then others follow with bids at ever-increasing prices. When the bidding ceases, the last highest price is the price paid. There are variations to this auction method.
- *Descending price sealed auction* (also called *first-price sealed auction*). This is the auction type where sealed bids are ranked from highest to lowest price and allocation takes place in descending price order, until all securities are allocated. This means of course that the highest prices bid receive full allocations and bidders lower down the price scale receive partial allocations on a pro rata basis.

The majority of treasury bill issues in the world are done according to the latter method. Many bond markets also operate in this fashion. In many countries this is the preferred method of issue of bonds, and this is executed exclusively with the market makers (usually called primary dealers). The central bank conducts the auction tenders on behalf of National Treasury for specific amounts of government bonds, and the market makers are obliged to tender for a specified minimum amount.

Bidder	Price bid	Amount bid	Allocation	Allocation %
Bank A	LCC 97.125%	LCC 20 million	LCC 20 000 000	100%
Bank B	LCC 97.120%	LCC 50 million	LCC 50 000 000	100%
Insurer A	LCC 97.115%	LCC 10 million	LCC 10 000 000	100%
Insurer B	LCC 97.110%	LCC 25 million	LCC 4 762 000	23.810%
Broker-dealer A	LCC 97.110%	LCC 50 million	LCC 9 524 000	47.619%
Broker-dealer B	LCC 97.110%	LCC 30 million	LCC 5 714 000	28.571%

Table 1: Example of descending price sealed auction

An example of the latter method is presented in Table 1 (assumption: LCC 100 million treasury bills offered). The first three tenders (bids) are allocated in full (LCC 80 million), leaving LCC 20 million to be distributed amongst the other bidders on a pro rata basis (percentage of total remaining bids, i.e. 25/105, 50/105 and 30/105).

4.8.5.5 Tap issue

The tap issue method of issuing securities is where the issuers are open to bids at all times for their securities. They of course reserve the right accept or reject bids according to their view of the markets and need for funds. Most banks issue NCDs according to this method.

Many issuers approach potential investors and offer securities to them at offer prices, i.e. they "tap out" their own securities in this manner. Issuers of securities that make markets in their own securities also "tap out" their securities by being net sellers.

4.8.6 Trading driver: order or quote

Secondary financial markets are driven by one of two different types of trading: *order* and *quote* (see Figure 13.)

Order-driven markets are where clients place *orders* with their broker-dealers and the latter execute the order on the market. The orders may be:

- market orders
- limit orders
- day orders
- good-until-cancelled orders, etc.

The *etc.* is added because many financial markets have different types of orders or different terms for the main ones mentioned here.

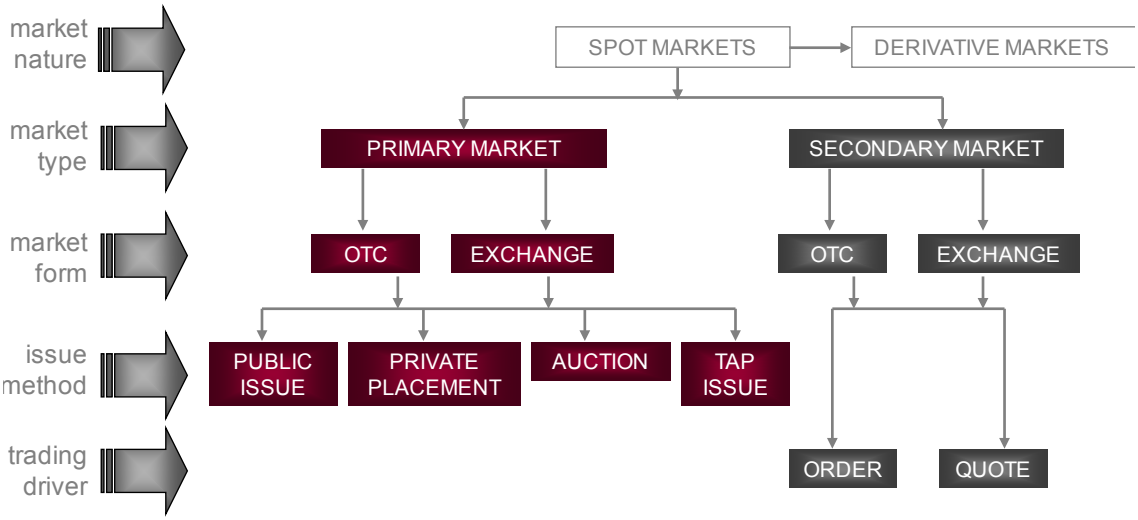


Figure 13: organisation of spot financial markets (4)

Market orders (also known as *at-best orders*) are those that are placed with broker-dealers with the request that the broker-dealer executes the deal at the best current market price. The client is banking on the broker-dealer's intimacy with the market to execute when s/he thinks the price is "best".

Limit orders are buy orders (sell orders) where the client states a price or price-range below (above) the current price; the broker-dealer executes when the price falls (rises) to the limit price / range.

Variations on market and limit orders are *day orders* and *good-until-cancelled orders*. *Day orders* are where the order is live until the end of the day. *Good-until-cancelled orders* are live until the client cancels them.

Quote-driven markets are also called *primary dealer markets* or *professional markets* or *market-made markets*. Essentially this means that certain participants (usually the large investment / merchant banks) quote firm buying and selling rates / prices simultaneously and the client is permitted to deal on either side of the quote. Issuers appoint market makers, as in the case of government bond issues (called primary dealers).

It will have been noted that up to this point we have used the terms *broker-dealers* (plural) and *broker-dealer* (singular). The reason is that there exist *brokers,* which can be defined as members of exchanges that execute deals *on behalf of* clients, *dealers*, which may be defined as members of exchanges and banks that deal for own account, and *market makers* (usually the banks) that operate as explained above. The latter two we refer to as *dealers* for the sake of simplicity, and to all three as *broker-dealers*. The term also encompasses the brokers who may act as dealers at times and the dealers and market makers who also act as brokers (on behalf of clients) in certain deals or markets.

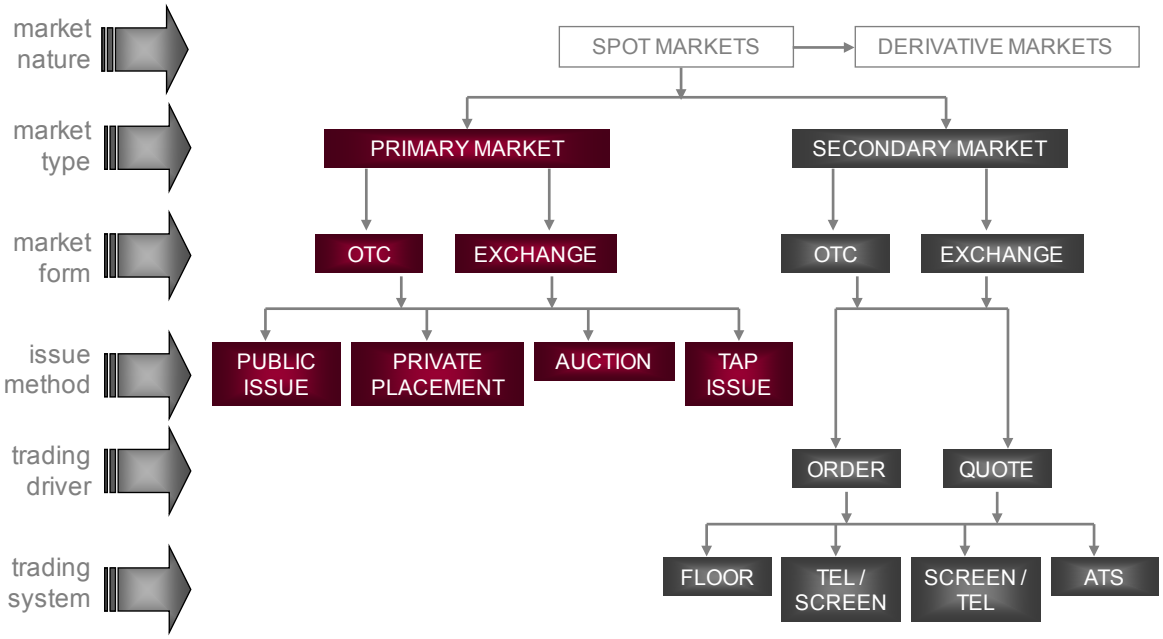


Figure 14: organisation of spot financial markets (5)

4.8.7 Trading system

As seen in the expanded illustration (see Figure 14), there are essentially four types of trading systems:

- Floor trading.
- Telephone-screen trading.
- Screen-telephone trading.
- Automated trading [on an automated trading system (ATS)].[17]

Floor trading involves the physical presence of broker-dealers (i.e. members of the exchanges) in a large room (a room has a *floor*) and they *cry out* (also called open-outcry trading) or *hand signal* (in case of some derivative markets) the orders they have from their clients (or their own orders in the case of dealers) to other members in the hope that their orders match those of the other members. Orders are amended in the case of market orders until orders are matched.

Floor trading usually implies an order-driven market (in which dual capacity trading is allowed), and a formalised market – because rules of trading and behaviour by members are required to make the market credible.

Telephone-screen trading is where negotiation by broker-dealers of deals takes place over the telephone, and where a screen (communications system such as Bloomberg's / Reuters) is used to advertise prices / rates. Deals are consummated on the telephone. The screen prices / rates are usually indication rates, i.e. not binding. This trading system implies that the relevant market is an OTC market, but this market may also be formal.

Screen-telephone trading involves the advertising by broker-dealers of firm prices / rates for specified maximum amounts of securities on an internal trading system or a communications system, and the deals are also consummated on the telephone. Quite often the trading system is used to communicate deals struck to a clearinghouse (within an agreed period of time), meaning that this type of trading system is used in exchange-driven markets and that the trading is quote driven.

The *automated trading system* (ATS) is an internal electronic system (only available to the members, but not always so) where all *orders* of clients (indicating an order-driven market) are placed in the *central order book* of the ATS by the member broker-dealers and the system matches the orders when they coincide in price. Orders are price-time prioritised, and may be partly fulfilled. ATS systems are usually found in exchange-driven markets.

4.8.8 Trading form: single and dual capacity

Trading in dual capacity or single capacity (see Figure 15) was covered earlier under different terminology. *Single capacity* means that a broker-dealer deals only as a broker on behalf of clients *or* as a principal for own account (but not both). *Dual capacity* means that the exchange member or broker-dealer at a bank in the case of the informal markets trades as both a broker and a dealer for own account (which may be called an *agency versus principal problem*).[18] In exchange-driven markets there are usually strict rules in this respect – a client's order must always be executed first. Strict surveillance by the exchange ensures this.

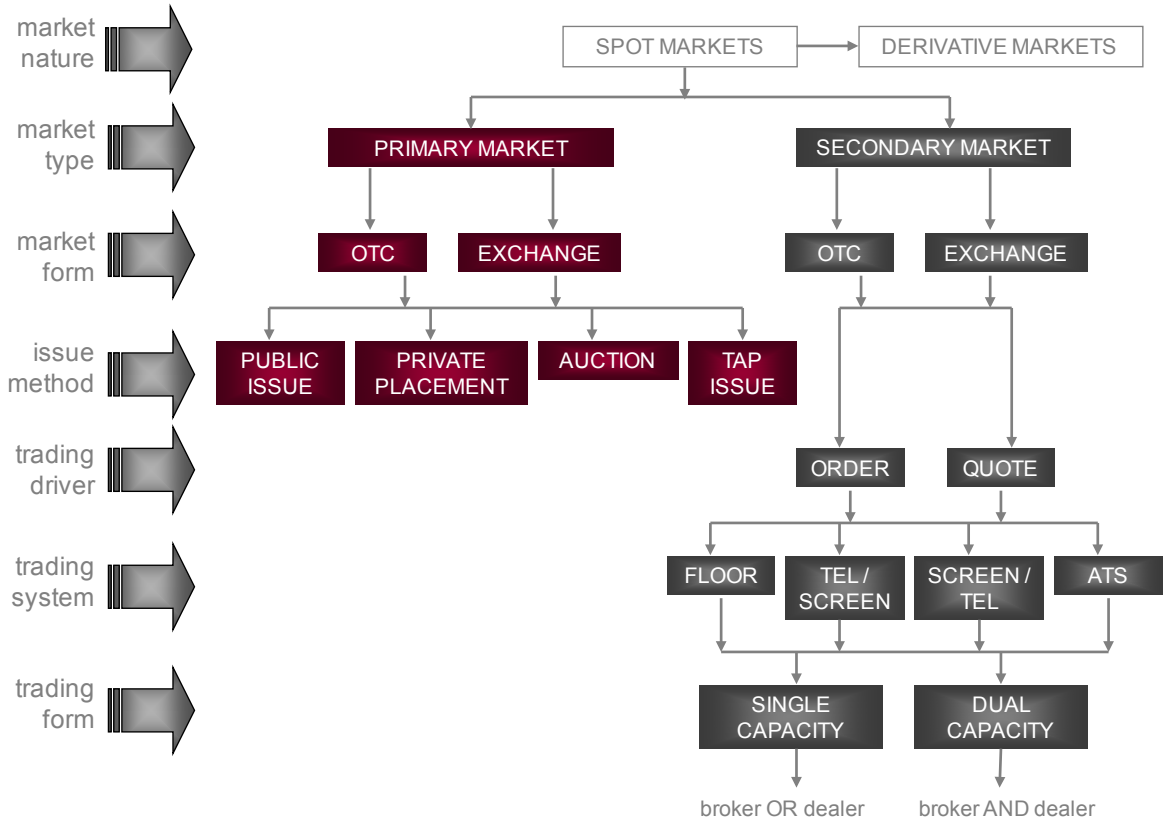


Figure 15: organisation of spot financial markets (6)

4.9 Financial market participants & short selling

The participants in the financial markets are:

- Non-financial lenders = buyers of financial securities.
- Non-financial borrowers = issuers of financial securities.
- Financial intermediaries = issuers and buyers of financial securities.
- Broker-dealers (facilitate trading and trade for own account).
- Fund managers (act of behalf of investors).
- Financial exchanges (facilitate trading).

- Financial regulators (see that the financial markets operate efficiently and safely).
- Hedgers; this is not a separate category; they are part of the above [mainly investors (lenders) and borrowers].
- Speculators and arbitrageurs; this is not a separate category; they are part of the categories:
  - financial intermediaries (mainly the banks)
  - broker-dealers (some of them).

Speculators play a substantial role in the financial system for two main reasons:

- They increase the activity in the financial markets, adding to the liquidity and efficiency of the markets.
- They take on risk from the shedders of risk (the hedgers).

One of the ways in which speculators take on risk is by selling short (or maintaining a "short position"). Short-selling is the converse of holding a long position, i.e. the holding of an investment. Speculators endeavour to make money by buying a security at a price and selling it at a *higher* price. Short selling is the converse and involves the selling of a security at a price and buying it back later, hopefully at a *lower* price.

It will be understood that a short sale must involve the delivery of the security to the buyer. In order to achieve this the speculator has to *borrow* the security for the period of the short sale. At the end of the period the speculator buys the security and then sells it to the lender. An example of a short sale is portrayed in Figure 16 (term = 20 days).

In this example, the speculator makes a profit of LCC 29 945.

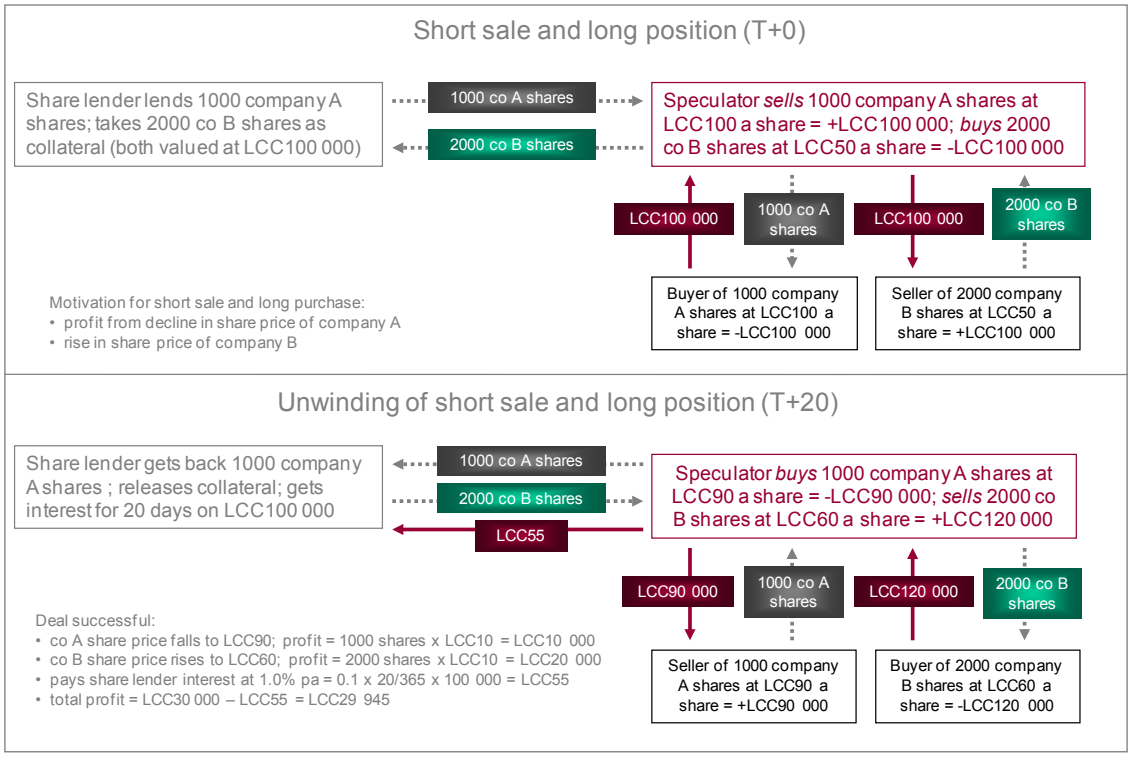


Figure 16: short sale and long purchase and unwinding thereof (shares as collateral)

4.10 Clearing and settlement[19]

Efficient clearing and settlement are essential elements in financial market transactions. *Clearing* is usually defined as:

"…the process of determining accountability for the exchange of funds and financial assets among the parties to a financial transaction…. Clearing involves reporting details of the trade to counterparties, clients, exchanges, regulatory bodies, and others. It also involves matching or comparing the details of the trade with clients and counterparties to make certain all the parties agree."

Settlement is defined as the fulfilment by each party to a deal of its obligation, in the case of the financial markets by the transfer of funds and scrip[20] certificates.

There are a number of risks inherent in clearing and settlement. They are:

- *Credit risk* is the risk that a deal will not be fulfilled in full, and is also called *default risk*. If a party defaults on a deal the counterparty either does not receive scrip of funds. On default, the counterparty faces replacement cost risk or principal risk.
- *Replacement cost risk*. The counterparty to, for example, a failed bond market transaction (in terms of not receiving the security), and not paying, faces the risk of recreating the deal at a different price which could be worse, involving him/her in a loss. There may also be a settlement timing difference, which could make the counterparty a defaulting party to another transaction. The danger of a *domino effect* exists.
- *Principal risk* is the risk that *after the transaction is settled* a party defaults. In the above example this amounts to the counterparty not receiving scrip after payment has been completed. The opposite case is where one party receives scrip but does not pay. Included in this type of risk is the *risk of tainted*[21] *scrip* (which is discovered after settlement).
- *Liquidity risk* is where a party either delivers scrip or payment after the settlement date. This is called a *failed transaction*, and may also set in motion a *domino effect*.
- *Operational risk* is where there is a failure of some facet of the computer system (hardware) or software or communications system.
- *Systemic risk* is the risk that large defaults or failed transactions threaten the entire financial system.
- *Errors risk* is where the deal is different to that intended, for example the wrong scrip, the incorrect amount, buying as opposed to selling, the incorrect order (market order instead of limit order), etc.
- *Other risks* include one of the entities involved in a deal failing, such as the broking firm, the clearinghouse, the central scrip depository, the exchange, etc. Also in cross-border deals there may be complications in laws or the rules of exchanges.

The *procedural methods* of dealing with *clearing and settlement risk* are as follows:

- *Netting*. Netting involves the offsetting of obligations by trading entities, and is applied to payments and securities transfers. Netting reduces obligations substantially and therefore reduces *costs* and *credit and liquidity risks*. Netting can be bilateral (between two parties) or multilateral (between groups of trading entities).
- *Settlement day*. As noted earlier, the risk of replacement cost exists prior to settlement risk. For this reason markets around the world continue to reduce the time period between deal / transaction date and settlement date.
- *Delivery versus payment on settlement day*. When settlement day arrives, risk management is focussed on the reduction of *principal risk*. The key here is to secure *delivery versus payment*, i.e. to ensure that both settling parties exchange assets (money and scrip) at the same time.

- *Margin*. Here one needs to distinguish between the spot debt and share markets and the derivative markets. In the latter case, all the parties to a deal are obliged to put up margin, which is a *performance guarantee*. The individual places the margin with the broker-dealer, the broker-dealer places this with the relevant clearing member (which is usually a bank of substance), s/he places this with the exchange, which deposits it at different banks. In the case of the debt and share markets, the individual speculator (not institutions) is required to put up margin, which is a *down payment*, with the broker-dealer lending the remainder of the purchase price. Margin is based on the volatility of the underlying instrument.

The *institutions* put in place in many markets to deal with *clearing and settlement risk* are as follows:

- *Clearinghouses*. A clearinghouse (CH) is an entity that handles clearing and some aspects of settlement, such as deal matching and netting. In some markets the CH interposes itself between the parties to a deal and itself becomes the counterparty to both these parties. Many CHs have clearing members (as noted above), which usually are the large banks, and all other broker-dealers are obliged to clear through them.
- *Common agreements*. In many markets of the world, parties to certain transactions use agreements issued by international organisations. This reduces the risk of legal misconstruction. An example is the Master Agreement of the International Swap Dealers Association (ISDA).

- *Central scrip depositories* (CSDs). CSDs are entities that accept deposits of securities and account for the transfer of these securities among participants. *Immobilisation* and *dematerialisation* is applicable here. In many markets scrip is *immobilised* in a CSD to eliminate the physical movement of scrip in transfers of ownership. Transfers of ownership become book entries (in accounts that participants have). In the case of dematerialisation, scrip no longer exists, and proof of ownership becomes electronic.
- *Global custodians*. Global custodians are usually banks that hold scrip in safe custody on behalf of clients and ensure that clients' transactions are settled and registered accurately. They are also responsible for the collection of dividends, interest, share splits, etc on behalf of clients.
- *Communications networks*. Communications networks such as the well-known SWIFT (Society for Worldwide Interbank Financial Telecommunications) assist in clearing and settlement. Participants use SWIFT to send details on transactions and confirmations for the transfer of funds and securities.

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5 Money creation

5.1 Learning objectives

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

1. Comprehend what money is.
2. Outline the financial intermediaries make up the monetary banking sector.
3. Describe the different measures of money.
4. Evaluate the money identity.
5. Describe the essence of the creation of money.
6. Expound the meaning of bank liquidity.
7. Elucidate the role of the central bank in the money creation process.

5.2 Introduction

One of the great mysteries and elegant features of the financial system in general and of the banking sector in particular, is the creation of new money. The largest component of the money stock, bank deposits, is literally created by accounting entries, and the amount created or the growth rate "allowed" is the territory marked by the central bank whose main function is the implementation of monetary policy. The latter expression means "a policy on money".

Why must there be a "policy on money"? It is because there is a relationship between the growth rate in the money stock and price developments (the rate of inflation). This relationship is not even debated any longer (except by some diehards) and there is much evidence to support the strong relationship, the latest being the rate of inflation (a few quintillion million percent per annum, the highest in the history of the world) in a particular African country that has resulted from the excessive creation of money (in this case government borrowing from the banking sector and the printing of bank notes). The highest denomination bank note in this country was ZWD 100 trillion (this was after 13 zero's had already been lopped off the currency!).

What are the consequences of inflation? The consequences are profound in terms of the destruction of economic growth and employment when inflation is high.

The consequences of even slight excesses in money growth (15–20%) can be severe, such as occurred in the developed world in 2007–2009. The cause (excessive money stock growth) took place for a number of years prior to the consequences being felt, and these consequences were inevitable to many who keep an eye on world money growth.

What is too high money stock growth? It is when money growth (which reflects additional demand for goods and services) exceeds the country's ability to satisfy the additional demand in terms of production capacity (i.e. capacity, being "sticky", cannot keep up with rapidly rising demand). When this happens worldwide, balances of payments become skewed, currencies become volatile and inflation occurs worldwide, as evidenced in the increasing costs of transport and food.

The reaction of the central banks of the world to this situation is to raise interest rates, and it is this that can trigger large-scale defaulting on loans (particularly in the case of sub-prime borrowers). This can lead to large-scale banking solvability issues and government bailouts (as happened in 2007–2009).

What underlies money growth? In the main it is *bank loan growth*, and banks are able to create loans / credit at will to satisfy demand (and money as a consequence), assuming the borrower is creditworthy / the project funded is sound. This rests on the fact that the public generally accepts bank deposits as the main means of payments / medium of exchange.

The issue of creditworthiness / project-soundness is critical: because some banks evidence promiscuity in this regard, the banking system is inherently unstable. It is the job of the central bank to ensure financial system stability and therefore to curb the growth rate in bank loans / credit (and its counterpart money) and this they do via the manipulation of interest rates. These critical issues are the subject of this text, which we cover in the following sections:

- What is money?
- Measures of money.
- Monetary banking institutions.
- Money and its role.
- Uniqueness of banks.
- The cash reserve requirement.
- Money creation does not start with a bank receiving a deposit.
- Money creation is not dependent on a cash reserve requirement.
- There is no such thing as a money "supply".
- The money identity and the creation of money.
- Role of the central bank in money creation.
- How does a central bank maintain a bank liquidity shortage?

5.3 What is money?

What is money? Money is anything that complies with the following criteria:

- Medium of exchange.
- Store of value.
- Unit of account.
- Standard of deferred payment.

The best example of the total erosion of these criteria in a currency is the currency of the country referred to earlier (with the highest inflation rate ever recorded). In 2009 the stage was reached when the particular currency was no longer accepted as a medium of exchange, a store of value, a unit of account or a standard of deferred payment. The mediums of exchange in this country became the USD and the ZAR. Inflation fell to low numbers almost instantaneously

It will be evident that of the four criteria, medium of exchange is paramount, and the other criteria are subordinated to this one. Consequently, we can think of money being anything that is *accepted as a means of payments / medium of exchange*.

So what is the medium of exchange? It made up of two parts:

- Bank notes (usually issued by the central bank) and coins (usually issued by the central bank and in some cases by government) (N&C).
- Bank deposits (BD).

Bank notes and coins are well known as a medium of exchange; we use them every day to make purchases and to repay debts. However, bank deposits acting as a medium of exchange is often a little confusing. Consider how many payments are made by bank cheques (diminishing fast) and electronic funds transfers (EFTs). When an EFT payment is made (best example = internet banking) the payer's deposit account at the bank is debited (made less by the amount) and the payee's deposit account at the bank is credited (added to). Similarly, a payment by cheque results in the cheque writer's deposit account being debited and the cheque receiver's account being credited (when s/he deposits the cheque of course).

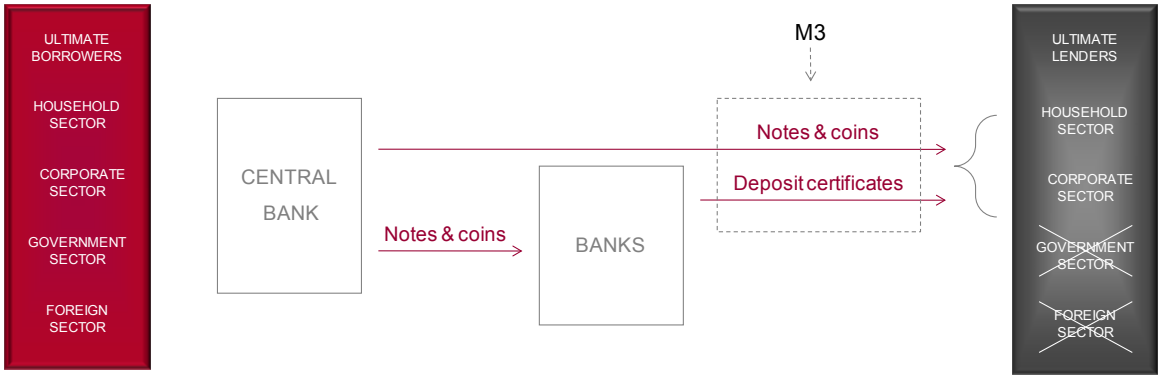

Figure 1: what is money?

Money is not the EFT or the cheque. They are merely instruments that lead to the shifting of a deposit amount from one bank account to another. The deposit is money, as is N&C. Thus the total stock of money (M3 – see below) at a point in time is the total amount of N&C and BD in the possession of individuals and companies:

$$M3 = N\&C + BD.$$

The individuals and companies can be called the "non-bank private sector" (NBPS[22]). This of course excludes money in the possession of banks (= N&C), the foreign sector and government deposits. Figure 1 endeavours to provide an image of "what is money?"

5.4 Measures of money

We know that N&C can be used immediately for payments. We also know that current / cheque account (and some other) deposits can be used as such. We also know that other deposits can be used as money after a short notice period, and so on.

The central banks of the world have developed many definitions of money, ranging from M0 to M4. In the interests of pedagogy (overlook detail and stick with principles) we will use the definition of money M3. This includes N&C all BD of the NBPS. We will not be far off the mark in terms of liquidity because for the most part NBPS bank deposits are short-term.

It is notable that in most developed countries NBPS BD makes up 96–98% of M3 (and N&C the balance of course). In some developing countries this number can be quite low, indicating a low confidence level in respect of banks.

5.5 Monetary banking institutions

Most countries have some or all of the following deposit intermediaries:

- Private sector banks.
- Central bank.
- Land Bank.
- Rural banks.
- Mutual banks.
- Building societies.
- Post Office Bank.

These intermediaries are usually also referred to as the *monetary banking institutions* (MBIs) and they are the intermediaries that make up the *monetary banking sector* (MBS). These intermediaries play a substantial role in the financial system as follows:

- As the custodians of the major part of the money stock of the country (i.e. NBPS deposits).
- As issuers of N&C (in some countries certain private banks issue bank notes).
- As the keepers of government's surplus balances.
- In providing loans to the public sector (usually lower tiers of government).
- In purchasing the debt securities of the central government (= loans which are marketable).
- In providing loans to the household and corporate sectors.
- In the creation of money.

Each central bank on a monthly basis consolidates the statements of liabilities and assets (i.e. the balance sheets) of these intermediaries (in the process netting out interbank claims) in order to arrive at the monetary aggregate number/s and their balance sheet counterparts (BSCs). As we have seen, there are various definitions of money, but the one usually given much attention is:

M3 = N&C (outside the banking sector) + BD (of NBPS with MBIs).

In this text we will refer to the balance sheets of the banks collectively (representing all non-central bank banks) and the central bank.

5.6 Money and its role

This topic leads to impassioned debating and views range from a passive role to a key role. However, we will not contaminate the core issues we are busy with here by engaging in what is often futile debate. We will simply state our view.

The importance of the availability of bank loans / credit (from here on referred to as *loans*) on demand cannot be overemphasised, in a negative and positive sense. In a negative sense, a too high growth rate in the stock of money can be devastating to economic growth because of its influence on inflation. When economic units pay too much attention to inflation (when it is rising at a fast pace) it affects their spending and investment decisions and economic output and employment suffer.

In a positive sense, money creation oils the wheels of industry: the availability of *new* loans / money is essential for economic growth to take place, but the proviso is that it should be monitored and "controlled" so as not to outpace the capacity of the economy to satisfy the increased demand (consumption – C – and investment – I) that underlies the increase in loans / money. (Note that loans make up the majority of the asset side of the MBS and money the liability side.)

Scholars of Economics will know that C + I (needed to increase production capacity) are the main components of GDE (Gross Domestic Expenditure = domestic demand) and that GDE + exports (X) less imports (M) (X – M = net external demand) = GDP (Gross Domestic Product – expenditure on). They also know that new production capacity creation is a function of increased consumption demand, and that there is often a lag between increased demand and the increased capacity to supply. Thus if consumption demand is allowed to increase too rapidly, inflation will be the result (if not at first, because of imports satisfying the demand, then later when the poor balance of payments numbers prompt a restrictive monetary policy – in the form of higher interest rates).

As a conclusion to this section we repeat the essential element of this discussion: to a large degree new money creation underlies the increased demand (and the monetary numbers of all countries corroborate this). Therefore money does play a significant role in the economy. As we shall see, underlying money creation is the lending rate of banks (prime rate and rates related to this rate), and underlying this is the lending rate of the central bank, which has to be "made effective" to work effectively. We will return to these issues later.

5.7 Uniqueness of banks

The uniqueness of the banks lies therein that they are able to literally create money (NBPS BD) by responding to the demand for loans[23] by borrowers, i.e. the government, household and corporate sectors. Providing new means making *new* loans and buying *new* evidences of debt – debt securities. It is notable that banks respond to the demand for loans without even knowing that they are creating money.

The reaction of many readers to the above and the further elucidation below may be incredulous. How can banks be in such a unique situation? Surely this must mean that banks can create their own assets (= new loans) and liabilities (= new BD = money) to an unlimited extent?

The banks are in this unique situation for a simple reason: because *the public accepts their deposit as money*, i.e. a means of payments / medium of exchange. And this issue has a long history starting with the goldsmiths in London in the 17th century. However, we do not have the space to delve into this interesting history.

The answer to the second question is yes, they can and do so. However, they can only do so as long as there is an increased demand for loans. This is largely a function of the lending interest rate, as we said earlier. However, there exists a major difficulty in this regard and it manifested itself on a grand scale in 2007–2009: this is, as we have said, that the banks are *inherently unstable*. It is the job of the monetary authorities to see that this innate weakness is kept at bay (through bank supervision). As we now know, they failed in this function in a breathtaking fashion before and in this period.

The basic functions of banks and the creation of money may be depicted as in Figure 1. It is correct to say that banks take money on deposit and lend the money to borrowers. And, certainly, the individual banks operate in these terms in their daily activities: they vie for deposits and the making of loans. However, this is an *ex post* situation / declaration. When *new* loans are made *new* deposits are created.

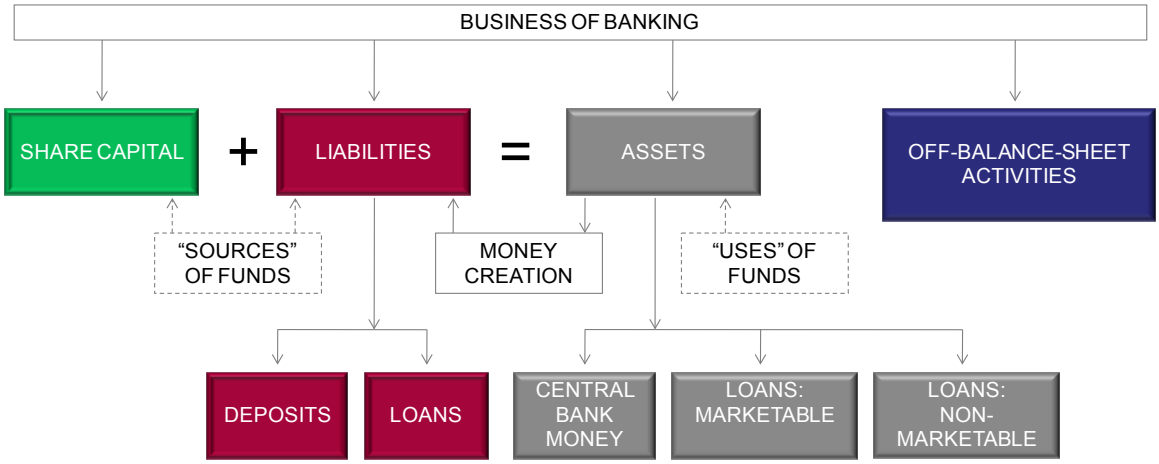

Figure 2: the business of banking

A simple but real life example is required. Company L produces goods required by Company B and the latter approaches the bank (for the moment we assume there is only one bank) to borrow the funds required to purchase the goods (LCC[24] 100 million). The bank (after a viability study) agrees, opens a current account for Company B and provides it with a loan of LCC 100 million by crediting the account with LCC 100 million. The bank has increased its loans by LCC 100 million and has a new deposit of LCC 100 million, while Company B has a new deposit and incurred a liability (loan) of the same amount, as indicated in Boxes 1 and 2.

BOX 1: COMPANY B (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Bank deposits	+100	Loans from bank	+100
Total	**+100**	**Total**	**+100**

BOX 2: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Loans (Company B)	+100	Deposits (Company B)	+100
Total	**+100**	**Total**	**+100**

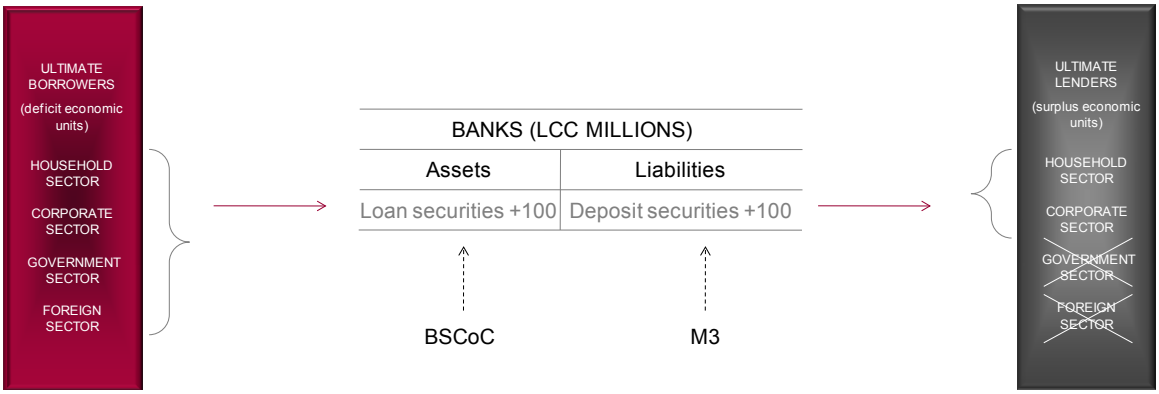

Figure 3: money creation

Note that when we measure the money stock and changes therein we analyse the banks' balance sheets (we will add the central bank later). The money stock in the form of BD (= deposit securities) has increased by LCC 100 million, and the balance sheet counterpart (BSC) or balance sheet cause of change (BSCoC) is an increase in bank loans (= loan securities) (Δ denotes change):

ΔM3		= +LCC 100 million
BSCoC	= Δbank loans	= +LCC 100 million.

This is illustrated in Figure 3. The actual real life cause is the additional demand for loans which was satisfied by the bank. The bank was able to create the new deposit (= M3) by an accounting entry, and rests on the fact that the public regards BD as the means of payment. Of course Company B undertook the loan in order to pay Company L for the goods. When it does so, the balance sheets appear as indicated in Boxes 3–5.

While the above can and does happen, it is more likely that the bank will provide Company B with an overdraft facility of LCC 100 million (= opens a current account with a zero balance and provides Company B with the right to overdraw the account by LCC 100 million. When Company B makes an EFT payment to Company L, its account is debited by LCC 100 million and Company L's account is credited by this amount. When Company L gets confirmation of the transfer it delivers the goods to Company B. The changes in the balance sheets are the same as indicated in the simpler example above (and indicated in Boxes 3–5).

BOX 3: COMPANY L (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Goods Deposits at bank	-100 +100		
Total	**0**	**Total**	**0**

BOX 4: COMPANY B (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Goods	+100	Loans from bank	+100
Total	**+100**	**Total**	**+100**

BOX 5: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Loans (Company B)	+100	Deposits (Company L)	+100
Total	**+100**	**Total**	**+100**

Note that the all the balance sheets balance.

5.8 The cash reserve requirement

Before the next part of this story can be presented, we need to introduce the cash reserve requirement (RR; it also denotes the amount of required reserves). Most countries have a RR, but some do not, which divorces money creation from it – a tenet of this text which we shall return to. This is a statutory requirement in terms of which banks are required to hold on deposit with the central bank (CB) an amount of funds called cash reserves or just reserves. The amount of RR is a proportion of the amount of deposits the banks have (we assume 10% for the sake of simplicity – we denote this RR percentage as *r*). Thus if the banks have LCC 100 billion in deposits they are obliged to have 10 billion on deposit with the CB.

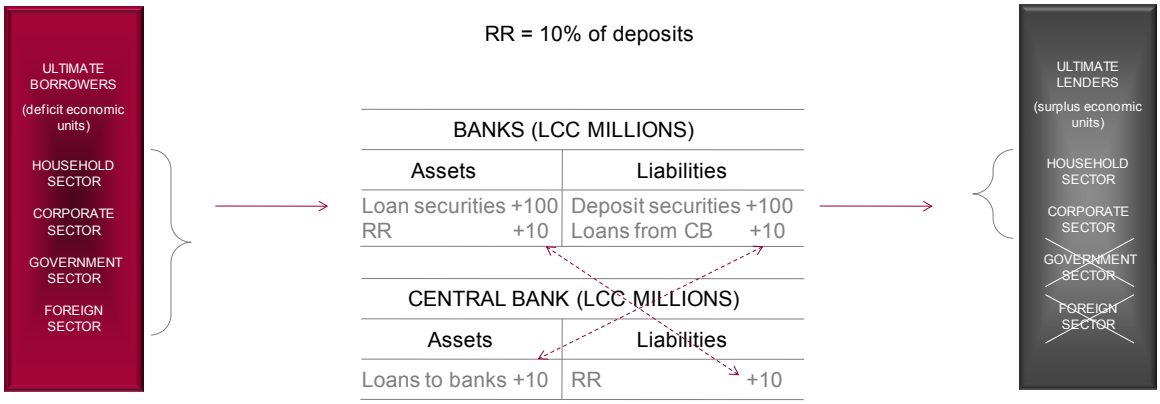

Figure 4: money creation & PR

A number of essential notes are required here:

- As noted, although rare, there are some countries that do not have a RR.
- In some countries the banks have two accounts:
  - Reserve account (RA), in which the RR balances are held.
  - Settlement account (SA), over which interbank settlements take place.
- At times banks have reserves in excess of RR, denoted as ER. RR + ER = the total of reserves (denoted as TR).
- In some countries the banks have just one CB account: a SA in which reserves are held and over which interbank settlement takes place.
- Central banks do not pay interest on banks' TR. This is usually the case, but there are exceptions[25].
- Because of the latter, the banks have no reason to hold ER with the CB; i.e. they endeavour to hold the minimum RR.
- In this discussion we assume there is one account: the SA and that interest is not paid on TR.
- In many countries N&C rank as RR; therefore if the RR is LCC 100 million and the banks have N&C in portfolio (in ATMs, teller tills, etc) to the extent of LCC 10 million: only LCC 90 million is required to be held on the SA as RR.

- In some countries N&C cannot be used to satisfy the RR. We assume this in the text.
- Banks' N&C and their CB account balances are referred to as CB money (CBM).
- No bank can create CBM; only the CB can do so – by buying an asset from the bank or making a loan to the bank (against collateral of eligible assets = government securities usually).
- When the CB makes a loan to a bank (= provides borrowed reserves – BR) it does so at an "administratively" determined rate (set by the Monetary Policy Committee – the MPC): this rate is called by many names such as repo rate, base rate, discount rate, bank rate and so on. We will refer to it at the CB's key interest rate (KIR).

The above will become clearer as we progress. For the moment see figure 4: when banks make loans of LCC 100 million and create deposits of LCC 100 million they are obliged to have LCC 10 million in RR with the CB. This can only be supplied by the CB by making loans to the banks, and this is done at the KIR.

5.9 Money creation does not start with a bank receiving a deposit

5.9.1 Introduction

Many text books on money and banking lead the scholar astray with the starting point of money creation being a bank receiving a deposit. They postulate that if a bank receives a deposit of LCC 100 million, it is obliged to place LCC 10 million (r = 10%) with the CB. Once this is executed it can lend out LCC 90 million (see Boxes 6–7).

BOX 6: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
RR Loans	+10 +90	Deposits	+100
Total	**+100**	**Total**	**+100**

BOX 7: CENTRAL BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
		RR	+10
Total	**0**	**Total**	**+10**

When the loan of LCC 90 million is made, this amount ends up as a deposit with the bank (again we assume there is one bank[26]). The bank places 10% (= LCC 9 million) with the CB and lends out the rest (= LCC 81 million) (see Boxes 8–9 = a continuation of Boxes 6–7).

BOX 8: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
RR RR Loans Loans	+10 +9 +90 +81	 Deposits Deposits	 +100 +90
Total	**+190**	**Total**	**+190**

BOX 9: CENTRAL BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
		RR RR	+10 +9
Total	**0**	**Total**	**+19**

This process continues until the full original deposit amount of LCC 100 million is "used up", i.e. equal to the RR amount, which may be expressed as:

New deposit creation = Original deposit of LCC 100 million / *r*
= LCC 100 million / 0.10
= LCC 1 000 million.

Thus we have a so-called *money / credit multiplier* and it is expressed as the reciprocal of *r*; therefore:

Money / credit multiplier = 1 / *r*.

In this example the multiplier = 1 / 0.10 = 10. So, for every LCC 10 million increase in the original bank deposit the money stock increases by LCC 100 million. It will be evident that if *r* is 8%: the multiplier = 1 / 0.08 = 12.5, meaning that for every LCC 10 million increase in the original bank deposit the money stock increases by LCC 125 million (assuming a demand for loans exists).

This is misleading, and it is so for the following reasons:

- Where does the original deposit come from? One cannot just suck a deposit out of the air. Someone's balance sheet would have changed in the direction of deposits + LCC 100 million, but what other balance sheet item changes compensate for this?
- Note that the CB's balance sheets do not balance
- No bank can create CBM; only the CB can; therefore the transactions shown above cannot happen.

5.9.2 Notes and coins deposited

A condition under which the above is plausible is if the original deposit is made in N&C, assuming that N&C do rank as reserves. Let us explore this. First of all, N&C are issued by the CB. Thus, if Mr A deposits LCC 100 million N&C (which he had in a tin under his bed) at the bank his balance sheet will change as indicated in Box 10.

BOX 10: MR A (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Bank notes and coins Deposits at bank	-100 +100		
Total	**0**	**Total**	**0**

The bank's balance sheet in Box 11 shows the deposit and an asset in the form of N&C. The bank now has a deposit on which it is paying interest and an asset that does not earn interest.

BOX 11: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
N&C	+100	Deposits (Mr A)	+100
Total	+100	Total	+100

Because N&C are liabilities of the CB, the bank will deposit them immediately with the CB; the results are shown in (continuous) boxes 12 and 13.

BOX 12: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
N&C (deposited by Mr A) N&C (sold to CB) RR ER	+100 -100 +10 +90	Deposits (Mr A)	+100
Total	+100	Total	+100

BOX 13: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
		N&C RR ER	-100 +10 +90
Total	0	Total	0

Because bank deposits increased by LCC 100 million, ΔRR = +LCC 10 million. The balance of +LCC 90 million is reserves that are in excess of RR, i.e. the bank now has LCC 90 million = ER. Like in the case of holding LCC 100 million in non-interest-bearing N&C, it now also has an asset (ER) that also bears no interest. If this bank liquidity state was permitted by the CB, interest rates will fall sharply and the bank will feverishly make loans in order to create a balance sheet that will produce an income.

How is this done? It is done by making loans, which *creates* deposits (= money); and this can take place *up to the point where ER is absorbed into RR*. This level is reached when new loans and deposits created are equal to:

Maximum deposit increase = ER / *r*
= LCC 90 million / 0.10
= LCC 900 million.

The total deposit increase of course = LCC 1 000 million = this LCC 900 million + the original LCC 100 million N&C deposited. It will be evident that the M3 creation of LCC 900 million was based on the *loans* made by the bank and this could take place up to the point where the ER = RR. The outcomes are shown in Boxes 14 and 15 (continuous).

BOX 14: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
N&C N&C RR ER ER RR Loans	+100 -100 +10 +90 -90 +90 +900	 Deposits Deposits 	 +100 +900
Total	+1 000	Total	+1 000

BOX 15: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
		N&C RR ER ER RR	-100 +10 +90 -90 +90
Total	0	Total	0

As these boxes may not be easy to follow, and to properly elucidate this issue, we present the net changes to all the balance sheets in Boxes 16–19.

BOX 16: MR A (LCC MILLIONS)			
Assets		Equity and liabilities	
N&C Deposits at bank	-100 +100		
Total	0	Total	0

BOX 17: REST OF NBPS (LCC MILLIONS)			
Assets		Equity and liabilities	
Deposits at bank	+900	Loans from bank	+900
Total	+900	Total	+900

BOX 18: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
RR Loans	+100 +900	Deposits	+1 000
Total	+1 000	Total	+1 000

BOX 19: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
		N&C RR	-100 +100
Total	0	Total	0

The above is just a pleasant and neat exercise, and it is presented in the interests of completeness and as an introduction to what follows. As we saw earlier, N&C make up a small part of M3, and while the above example is possible, it is unrealistic. However, it did demonstrate a critical point: that the banks can only "get rid of" ER in the manner shown. We will touch upon this later again.

5.9.3 Government spends

It is often expounded that government spending (when government uses the CB as its banker) leads to money creation. In this example government spends LCC 100 million on goods bought from the NBPS (see Boxes 20–23).

BOX 20: GOVERNMENT (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Government deposits Goods	-100 +100		
Total	**0**	**Total**	**0**

BOX 21: CENTRAL BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
		Government deposits RR ER	-100 +10 +90
Total	**0**	**Total**	**0**

BOX 22: NBPS (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Goods Deposits at bank	-100 +100		
Total	**0**	**Total**	**0**

BOX 23: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
RR ER	+10 +90	Deposits (NBPS)	+100
Total	**+100**	**Total**	**+100**

The banks have ER of LCC 90 million. They can now lend up to the point where ER is fully transmuted / absorbed into RR. The end point is the same as in the N&C example: M3 can increase up to ER / r = LCC 100 million / 0.10 = LCC 1 000 million.

As in the above N&C example, this exposition is nonsense, and it is so because the original transaction is omitted from the story. It is a critical part of the story. *The original transaction is that government either receives revenue from taxes or borrows the money*. We will explore the latter case: government borrows LCC 100 million by the issue of bonds (bought by the banks) and spends this on goods bought from the NBPS (see Boxes 24–27).

BOX 24: GOVERNMENT (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Government deposits Government deposits Goods	+100 -100 +100	Bonds	+100
Total	**+100**	**Total**	**+100**

BOX 25: CENTRAL BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
		Government deposits Government deposits	+100 -100
Total	**0**	**Total**	**0**

BOX 26: NBPS (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Goods Deposits at bank	-100 +100		
Total	**0**	**Total**	**0**

BOX 27: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Bonds	+100	Deposits of NBPS	+100
Total	**+100**	**Total**	**+100**

Note the difference from the previous example where the original transaction was omitted: M3 (deposits of the NBPS) increased by LCC 100 million and the BSCoC is bank loans (buying new bonds = new loans extended). The previous example gives a starkly different picture: the creation of ER.

In fact the correct story is that the banks are actually *short of RR* – because bank deposits have increased (that carry an *r* of 10%). We omitted this issue in the interests of simplicity. We now correct the issue in Boxes 28–29.

BOX 28: CENTRAL BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Loans to bank @ KIR	+10	Government deposits Government deposits RR	+100 -100 +10
Total	**+10**	**Total**	**+10**

BOX 29: BANK (LCC MILLIONS)			
Assets		**Equity and liabilities**	
Bonds RR	+100 +10	Deposits of NBPS Loans from CB @ KIR	+100 +10
Total	**+110**	**Total**	**+110**

As we have said before, the banks are not able to create CBM; only the CB itself can do this. The bank is therefore obliged to take a loan from the CB at the KIR rate.

5.9.3 Money creation starts with a bank loan

In real life the causation path on money creation runs from bank loans (= bank asset) to money (= bank liability). Note the following:

- All money creation takes place this way when N&C do not rank as reserves (as is the case in some countries).
- The vast majority of money creation takes place this way when N&C do rank as reserves. The latter is so small that it can be ignored.

The RR is often presented as a crucial factor in money creation. It only comes into play in that as NBPS bank deposits (= money) increase, as a result of *new bank loans or bank purchases of newly issued securities* (= loans in a different form), the amount of RR increases. The banks can get the additional RR only by borrowing from the CB (remember the banks cannot create CBM).

The previous example of the government borrowing and spending is a true life example. Here we provide another (see Boxes 30–33). It is the same as the first one presented earlier but with the RR and the CB included.

BOX 30: COMPANY L (LCC MILLIONS)			
Assets		Equity and liabilities	
Goods Deposits at bank	-100 +100		
Total	0	Total	0

BOX 31: COMPANY B (LCC MILLIONS)			
Assets		Equity and liabilities	
Goods	+100	Loans from bank	+100
Total	+100	Total	+100

BOX 32: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
Loan (Company B) RR	+100 +10	Deposits (Company L) Loan from CB @ KIR	+100 +10
Total	+110	Total	+110

BOX 33: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
Loans to bank @ KIR	+10	RR	+10
Total	+10	Total	+10

The introduction of the RR here does not indicate that the RR is an important element in money creation. *It is not; in fact it is a quantity that is a consequence of money creation and not a quantity that steers money creation*. It is just one of the many factors that affect bank liquidity, an issue that CBs deal with every day. We will return to this issue, which is part of monetary policy, but in a different form.

Essentially, monetary policy is about the item "CB loans to banks" and the KIR that is applied to these loans. The existence of CB loans to banks, the outstanding amount of which is also called the *money market shortage* (MMS) or the *liquidity shortage* (LS), is what makes the KIR effective and influences the banks' interest rates on both sides of their balance sheets, and through this the demand for loans.

It needs to be swiftly added that in exceptional times (as during the recessionary period of 2008/09), some CBs resort to creating ER for the banks, but buying large amounts of government bonds. This policy "encourages" interest rates down to very low levels and thereby an increased demand for loans (remember underlying an increase in bank loans / money is an increase in C + I = GDE). This vital issue is not discussed in detail here.

5.10 Money creation is not dependent on a cash reserve requirement

The next step in this discussion is to cement the fact that money creation is not dependent on the existence of a RR. Take a country that does not impose a RR on its banks (as noted, they do exist). The banks of this country still create new money (NBPS deposits) by making new loans. Omitting a RR in the previous example produces a balance sheet of the bank as indicated in Box 34.

BOX 34: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
Loans (Company B)	+100	Deposits (Company L)	+100
Total	+100	Total	+100

In this example M3 increases by LCC 100 million and the BSCoC is bank loan extension by the same amount. The real cause of the change in M3 is the additional demand for loans that is satisfied by the banking sector. So the starting point is the demand for loans; if satisfied by the banking sector, it leads to an increase in M3. A RR had nothing to do with the creation of money.

However, scholars of money and banking will know that because of the relationship between the RR (where it exists) and bank deposits, a CB can "control" the creation of money quantitatively. This is sometimes called the "strict-money-rule model"[27]. In text books it is known as the "monetary base model". According to this model (assuming that N&C do not rank as reserves – for the sake of simplicity) the money "supply", i.e. stock (see next section), cannot increase by more than the reciprocal of the reserves supplied by the CB. An example will be useful: the CB creates LCC 100 million ER by purchasing treasury bills (TBs) from the bank (see Boxes 35–36). An assumption is required here: the bank has no outstanding borrowings from the CB.

BOX 35: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
Treasury bills	+100	SA – ECRs	+100
Total	+100	Total	+100

BOX 36: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
Treasury bills SA – ECRs	-100 +100		
Total	0	Total	0

The bank is now able to create new loans and money to the extent of:

$$(1 / r) \times \text{ER} = 1 / 0.1 \times \text{LCC } 100 = \text{LCC } 1\,000$$

and the ER of the bank is transmuted into RR (see Boxes 37–38). The banking system cannot create any further loans and its counterpart, money.

BOX 37: CENTRAL BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
TBs	+100	ER ER RR	+100 -100 +100
Total	+100	Total	+100

BOX 38: BANK (LCC MILLIONS)			
Assets		Equity and liabilities	
TBs ER ER RR Loans	-100 +100 -100 +100 +1 000	Deposits (money)	+1 000
Total	+1 000	Total	+1 000

As the scholars of money and banking will know, essentially this is a theoretical money "supply" (i.e. money stock creation) model. Some central banks flirted with this model in the past but rejected it because its sideshow was extremely volatile interest rates. The focus (in normal times) is to manipulate interest rates in order to influence the additional demand for loans (= money creation) to a level consistent with the economy's production elasticity.

5.11 Is "money supply" a misnomer?

We know that money is NBPS BD (plus N&C) and we know that new money is created by new bank loans. When money is measured by CBs (see below for more detail) they consolidate the balance sheets of the members on the MBS and derive M3 from this (and the BSCs). Many economists call this magnitude the money *supply*.

Is this a useful term when ΔM3 it is the outcome of new bank loans (mainly – see below)? Does "supply" not fit better with the supply of loans, which is theoretically unlimited (subject to the demand for loans, which is a function of the level of interest rates as determined by the CB – specifically bank lending rates), as indicated in Figure 5.

Once new money is created, has the *stock* of money, i.e. the amount of money in circulation, not increased, rather than the *supply*? Is the amount measured hereafter (= held) not the outcome of portfolio decisions, rather than the *demand* (for transactions, speculative…reasons) for money? Is it not true to say that if some people want to hold more bonds instead of money when rates are high, that the money stock will not change – because the bond sellers will get bank deposits and the buyers of bonds will lose deposits?

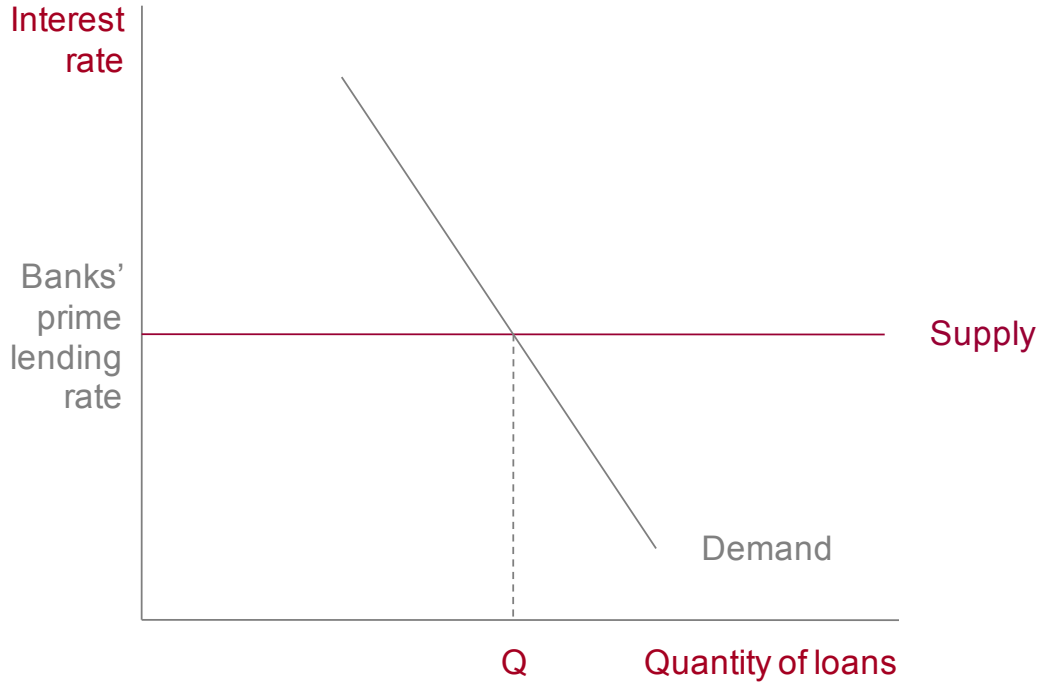

Figure 5: supply of & demand for bank loans

5.12 The money identity and the creation of money

BOX 39: CONSOLIDATED BALANCE SHEET OF MBIs (LCC MILLIONS)	
Assets	**Equity and liabilities**
D. Foreign assets E. Claims on government F. Loans to private sector	A. Notes and coins B. Deposits 1. Private sector 2. Government sector C. Foreign loans

Bank loan extension is the main BSCoC of the addition to the money stock. There is another: certain activities in the foreign exchange market. In this section we present the money identity, which shows all the BSCoCs. It is derived from consolidated balance sheet of the MBIs (in a consolidation all interbank claims are netted out). The consolidated balance sheet of the MBIs is shown in simplified form in Box 39.

M3 was defined earlier as N&C in circulation (i.e. outside the banking sector) and all NBPS deposits with the MBIs. These are items A and B1 in the consolidated balance sheet. Clearly, because a balance sheet balances [liabilities (plus equity that we include here in liabilities) are equal to assets], items A and B1 = M3 must be equal to items:

$$(D + E + F) - (B2 + C)$$

It will be evident that certain items are closely related, specifically:

- Item D (foreign assets) and item C (foreign loans).
- Item E (claims on government) and item B2 (government deposits).

If one is trying to "explain" changes in M3 it makes sense to deduct the liability items mentioned from their asset counterparts. Having done this, we now arrive at the *balance sheet identity*.

$$M3 = (D - C) + (E - B2) + F.$$

This can be verbalised as:

$$\begin{aligned} M3 &= D - C && = \text{net foreign assets (NFA)} \\ &+ E - B2 && = \text{net claims on government (NCG)} \\ &+ F && = \text{loans to private sector (LPS).} \end{aligned}$$

We can make the identity even simpler by grouping NCG and LPS and calling it domestic loan extension (DLE – in the examples we presented earlier "Loans to…" should be seen as DLE). Now:

$$M3 = NFA + DLE.$$

Thus the BSCoCs in M3 are changes in NFA and changes in DLE:

$$\Delta M3 = \Delta NFA + \Delta DLE$$

As we have said before, the *actual causes* of changes are the dynamics that underlie the changes in NFA and DLE. This analysis requires more elaboration, but a space limit thwarts it.

5.13 Role of the central bank in money creation

The role of the CB in money creation also requires much consideration; again we are limited. As a conclusion to this text we present a brief discussion on the role of the CB in money creation (in this and the next section). We touched upon this earlier and endeavour to cement it here.

In much of the developed world monetary policy is conducted through an operational variable: interest rates. Following is a summary of the KIR's transmission path to the banks' lending rates [prime rate (PR) is the benchmark; all lending rates are related to PR], inflation and economic growth:

- The CB, through open market operations (OMO) creates a liquidity shortage (LS) and, in most countries in normal circumstances, maintains it permanently. This means it "forces" the banks to borrow from it at all times. The borrowing term is short (usually 1 day to 7 days).
- It levies its KIR on these borrowed reserves.
- The bank-to-bank interbank rate (b2b IBM, the market in which banks settle interbank claims on one another) takes its cue from the KIR.
- The b2b IBM rate has a major impact on the banks' deposit rates (wholesale call money rates in the first instance and other short-term deposit rates in the second, and so on).
- As the banks maintain a steady margin, deposit rates impact on bank lending rates.
- Thus the KIR impacts on the banks' PR (in one country the correlation coefficient between the KIR and PR for the period 1960 to the present = 0.99).
- The level of PR (especially in real terms) influences the NBPS's demand for bank loans (governments tend to be interest rate insensitive).
- Interest rate changes also have a major impact on asset prices which through the "wealth effect" influence consumption and investment (C + I = GDE) behaviour.
- ΔDLE is the main counterpart of ΔM3.
- The growth rate in demand (ΔGDE), financed to a large degree by ΔDLE and reflected in ΔM3, has a major impact on price developments (inflation).
- The inflation rate is a major input in business decisions
- Business decisions impact on economic growth and employment.

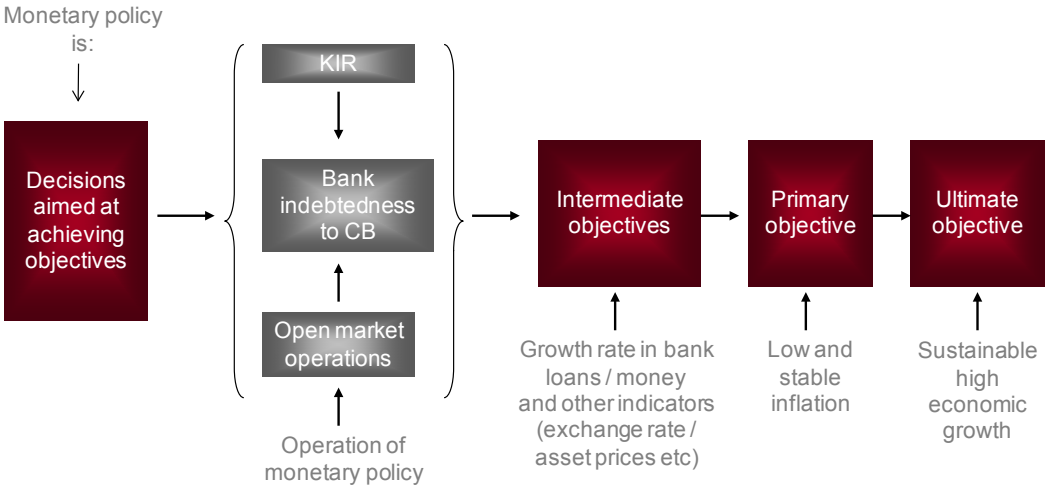

Figure 5: monetary policy

The above is a brief synopsis of monetary policy and of part of the so-called monetary policy transmission mechanism (MPTM). The MPTM may be depicted minimally as in Figure 5.

5.14 How does a central bank maintain a bank liquidity shortage?

In the previous section we stated that "The CB, through open market operations (OMO) creates a LS and maintains it permanently." This is a significant and interesting topic and will be covered here in brief.

Box 40 presents the balance sheet of the central bank in simplified form (we have left out unimportant items such as *other assets*, *other liabilities* and *capital and reserves*). From this balance sheet we can create what can be called a *money market identity* as follows:

On the left of the identity we have the net excess reserves (NER) of the banking sector, an indicator of bank liquidity (as far as CBM is concerned). This is made up of the ER of the banking sector (item B2b)[28] less the extent of loans to the banking sector (at the KIR), i.e. the LS (item F, also called borrowed reserves – BR):

$$NER = B2b - F.$$

BOX 40: CENTRAL BANK (LCC MILLIONS)	
Assets	**Equity and liabilities**
E. Foreign assets F. Government securities (claims on govt) G. Loans to banks (LS) (BR) @ KIR	A. Notes and coins B. Deposits 1. Government 2. Banks (Total reserves – TR) a. RR b. ER C. Foreign loans D. Central bank securities

On the right hand side of the identity we have all the remaining liability and asset items (the BSCs); thus:

$$NER = B2b - G = (E + F) - (A + B1 + B2a + C + D.$$

If we group the related liability and asset items we have:

$$NER = B2b - G = (E - C) + (F - B1) - A - B2a - D.$$

It will also be evident that:

$$\Delta NER = \Delta(E - C) + \Delta(F - B1) - \Delta A - \Delta B2a - \Delta D.$$

Thus, a change in the NER (and the LS which is its main component) of the banking system is *caused* by changes in the BSCs (i.e. the BSCoC):

$\Delta NER =$

$\Delta(E - C)$	= net foreign assets (NFA)
$+ \Delta (F - B1)$	= net claims on government (NCG)
$- \Delta A$	= notes and coins in circulation
$- \Delta B2a$	= required reserves (RR)
$- \Delta D$	= central bank securities (CBS).

The actual causes of change are the transactions that underlie the BSCoC. It will be evident that the instruments of OMO are NFA (usually forex swaps), NCG (purchases / sales of government securities in the main) and CBS (issues) and that RR can also be used (and is at times) to manipulate bank liquidity (NER). For example, the sale of forex to a bank (a forex swap) will decrease NER (increase the LS). The BSCoC is a decrease in NFA. Similarly the sale of TBs to the banks will decrease NER (increase the LS). The BSCoC is a decrease in NCG. Thus, the CB has total control over bank liquidity (assuming efficient markets).

The above illustrates that bank liquidity is firmly under the control of the CB, and that the RR is just one of the many factors that influences bank liquidity. Most countries' monetary policy approach rests on creating and maintaining a liquidity shortage (in normal circumstances) in order to make the KIR effective. Thus, to maintain that money creation revolves around the RR is misleading. In fact, because it takes time for banks to compile their statements of assets and liabilities, they, in most countries, are required to top up their RR up to 7 weeks after deposit increases[29].

This exposition does not ignore the existence of a loan / credit / money multiplier (maximum deposit increase = ER / *r*), i.e. the CB is able to create ER and force the multiplier on banks. However, this implies quantitative restriction and interest rate freedom, the consequence of which is extremely volatile interest rates. Central banks and the business sector do not like this state of affairs. Rather, they like stable interest rates and use them (the PR in particular – via making KIR effective) to manipulate the demand for loans. New bank loans create new bank deposits (money).

It is a fine system, provided new loan / money creation (which to a large degree reflects $\Delta C + I$) is congruent with economic output elasticity.

5.15 Bibliography

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6 Price discovery

6.1 Learning objectives

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

1. Define and explain the meaning of price discovery.
2. Understand the relationship between information and price discovery
3. Describe and illustrate the mechanics of price discovery.
4. Explain the role of the central bank in price discovery.
5. Elucidate the components of interest rates.
6. Explain the connection between price discovery and security valuation.
7. Expound on the role of interest rates in security valuation.

6.2 Introduction

Earlier in this text on the financial system we identified the six essential elements that make up a financial system:

- First: the *lenders and borrowers*, i.e. the non-financial economic units that undertake the lending and borrowing process.
- Second: the *financial intermediaries*, which intermediate the lending and borrowing process, meaning that they interpose themselves between the lenders and borrowers.
- Third: the *financial instruments* (marketable and non-marketable), which are created to satisfy the needs of the various participants.
- Fourth: the *creation of money* when required, i.e. the unique money creating ability of banks.
- Fifth: the *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 determination or making of the *price of shares* and the price of money / debt (the *rate of interest*).

We have covered the first five, and are now at the last-mentioned. Prices for *shares and debt* (and *deposits*) are discovered in the secondary financial markets. We have already discussed various aspects of the secondary market that are pertinent here such as liquidity, spreads, and so on, and will confine ourselves here to the concepts that relate closely to price discovery. The concepts covered are:

- What is price discovery?
- Price discovery and information.
- The mechanics of price discovery.
- Role of the central bank in price discovery.
- The composition of interest rates.
- Price discovery and security valuation.
- Role of interest rates in security valuation.
- Market efficiency.

6.3 What is price discovery?

Price discovery is the process / mechanism through which market participants attempt to find what economists call an equilibrium price. It is the price at which the market clears / deals, and can therefore also be called the market-clearing price.

Thus the equilibrium price is the price at which a buyer and seller have agreed to transact a certain quantity of securities. This does not mean that the number of securities have to match exactly, because deals in the financial markets are partially fulfilled at times. For example, a seller of Company A shares may wish to sell 1 000 shares at a price of LCC 100, but the buyer may wish to buy only 500 Company A shares at LCC 100. If there are no other buyers at LCC 100 or if there are buyers at inferior prices, the seller's order will be partially fulfilled. S/he will sell only 500 shares to the buyer.

The financial markets are *dynamic* markets; therefore the equilibrium price is a *moving price*. For example, once the deal in the example above is transacted, this new information (price and volume of deal) is an input into the body of information that participants have.

This new information may affect the next market clearing price. The buyer at the next best bid price (say LCC 99), who was about to increase his/her bid price to LCC 100 may decide not to or to make it even lower – on the basis that a selling order was only partially fulfilled. If s/he decides to leave the bid unchanged at LCC 99 the seller may well amend his selling price to LCC 99. In this case a deal will then be struck at LCC 99 and the market clears (fully or partially).

In summary, *price discovery* is the process of discovering / determining the price of a security in the market place (order-driven or quote-driven market; OTC or exchange) through the bids and offers of buyers and sellers, based on a body of information at their disposal at that time.

In conclusion we need to point out that:

- the equilibrium price is not necessarily the final price paid by the buyer / received by the seller, and
- the equilibrium price often is removed from the Fair Value Price (FVP) of the relevant security.

6.4 Price discovery and information

Discovered prices are founded on information available to the market participants and the sometimes irrational behaviour of certain participants (the "herd instinct"). While prices are determined by solid information and irrational participant behaviour, at the same time financial instrument prices provide useful information that is used in the making of economic decisions. Examples are:

- The obvious one: prices assist in decisions regarding the allocation of the scarce resource: capital.
- Debt / share prices provide information on the market's perception of the value of these assets (this can be different from the FVP of the securities).
- These secondary market prices assist in the determination / setting of the prices of primary market issues.
- Some economic indicators include share / debt prices (for example the leading economic indicator).
- Derivative instrument prices provide information on the market participants' views on spot prices in the future.
- Long-term interest rates provide information on market participants' views of short-term interest rates in the future.
- The pricing of derivative instruments provides information that assists in decisions on the hedging of naturally long or short positions. Examples are maize farmers (naturally long) and flour millers (naturally short). The removal of risk has major economic benefits.

6.5 The mechanics of price discovery

As we have seen, there are two "types" of markets:

- Order-driven markets.
- Quote-driven markets.

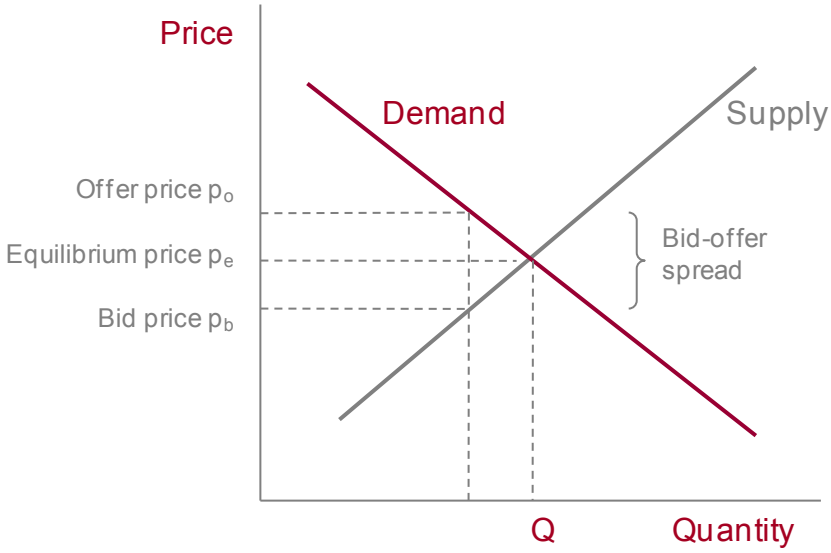


Figure 1: bid and offer prices and spread

The below analysis applies to both markets, which are dynamic, i.e. bid and offer prices change constantly in the light of market information, including the last price and quantity / volume traded, the present best bid and offer prices and quantities, and the other "inferior" bid and offer prices and quantities at these prices. "Inferior" refers to the prices that are away from the best prices (in most markets these are visible to participants, making the market transparent).

Bid (buying), *offer* (selling) prices and *spread* (difference between bid and offer) are terms usually confined to quote-driven markets and they are therefore the bid and offer prices quoted simultaneously by market makers. However, the best bid and best offer prices may not be from the same market maker, as in order-driven markets. This is good motivation to apply these terms to order-driven markets. There is another, and it is that these markets (like many quote-driven markets) are usually ATS markets where an electronic order book matches orders. When they do not match they are much like the bids and offers of market makers, with the differential simulating the spread.

In Figure 1 we present the traditional demand and supply curves. The equilibrium price (p_e) is at the intersection of the demand and supply curves, and this also indicates the volume of the deal, i.e. the quantity Q which was dealt at the p_e.

It will be evident that this illustration does not fit well with a dynamic market. The bid price p_b is correctly lower than the offer price p_o, but p_b should intersect the demand curve and p_o should intersect the supply curve (which they don't). Therefore we should delete the curves on the left of the p_e and illustrate this as in Figure 2.

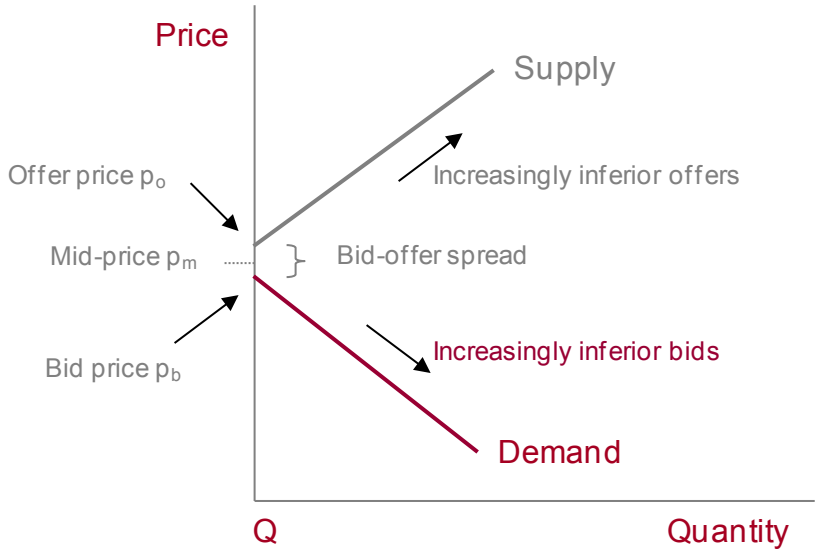


Figure 2: bid and offer prices, spread & mid-price

This is a more sensible illustration. The best bid and offer prices at quantity Q will be at the extreme left of the curves and the inferior bids and offers to the right on the curves. Generally, inferior bids and offers will be at higher quantities, because buyers / sellers will be prepared to deal in larger quantities at inferior prices.

As we saw earlier, the spread is the difference between the *best* bid and offer prices. The mid-price p_m is midway between the best bid and offer prices $[p_b + (p_o - p_b) / 2)]$. The equilibrium price is established when the bid and offer prices coincide at a quantity acceptable to the buyer and seller.

The spread should be seen as the reward for the market maker for risk inherent in quoting bid and offer prices simultaneously (in quote-driven markets), and simply the views of buyers and sellers in order-driven markets.

An example will be useful (see Figure 3). At an (equilibrium) price of LCC 10.0 and a quantity of 10 shares of ABC Company a buyer and a seller do a deal (via an ATS system which operates on a price-time priority basis). At this point the demand and supply conditions required (price and quantity) coincide. The only other bids that can exist are the unfulfilled (inferior) ones that lie further down the demand curve, for example 40 shares at LCC 9.8. Similarly, the only other offers that can exist are the unfulfilled (inferior) ones that lie up the supply curve, for example 30 shares at LCC 10.2.

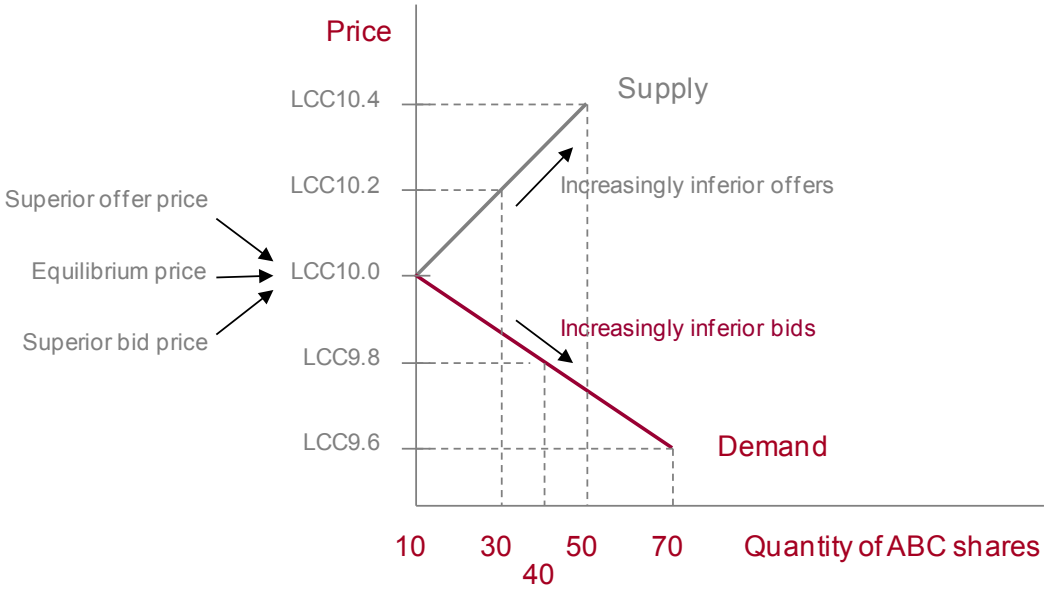


Figure 3: buying and selling prices and equilibrium price

Obviously these inferior bids and offers are unfulfilled because the selling prices are above where the buyers wish to buy. Once a deal is done at LCC 10.0 for 10 shares as indicated in Figure 3, the next best bid and offer prices (and quantities) become the superior prices (and are "advertised" on the ATS for all participants).

Let us assume that the next best bids and offers are a bid deal of 40 shares at LCC 9.8 and a supply deal of 30 shares at price LCC 10.2 (see Figure 4). There is no equilibrium price but it can be estimated to be at the mid-point between the bid and offer prices, i.e. LCC 10.0. Given the superior bid and superior offer, the market will now reassess. If they are keen to deal they will most likely adjust their prices to the level of LCC 10.0 and the demander will have his demand for 40 shares partially fulfilled (see Figure 5).

Note that LCC 10.0 is not the actual price received by the seller or paid by the buyer. Transactions costs (commissions mainly) need to be added / subtracted.

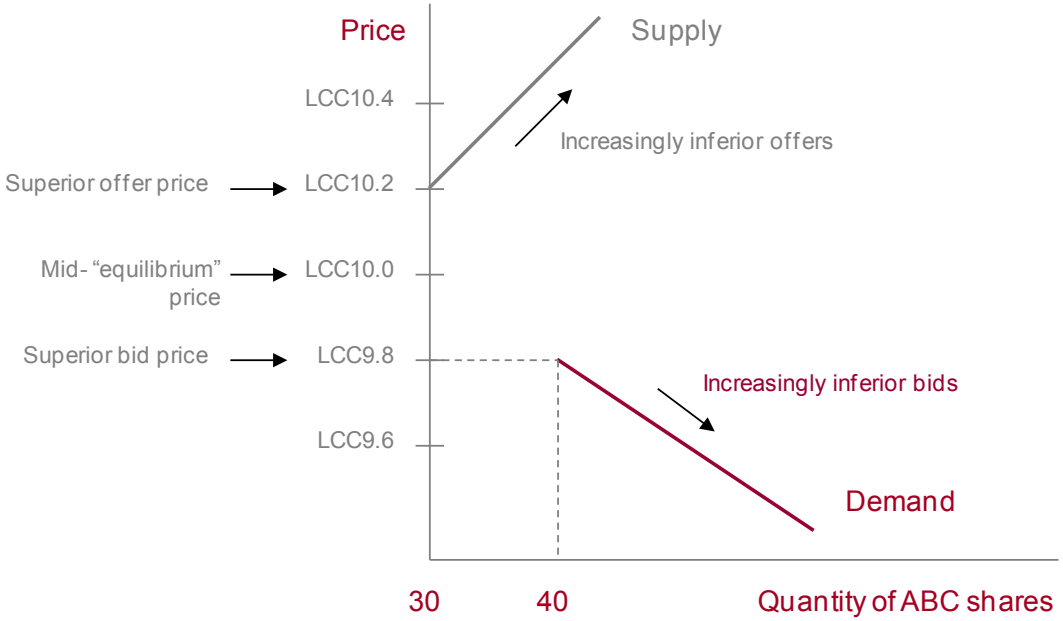


Figure 4: "superior" buying and selling prices

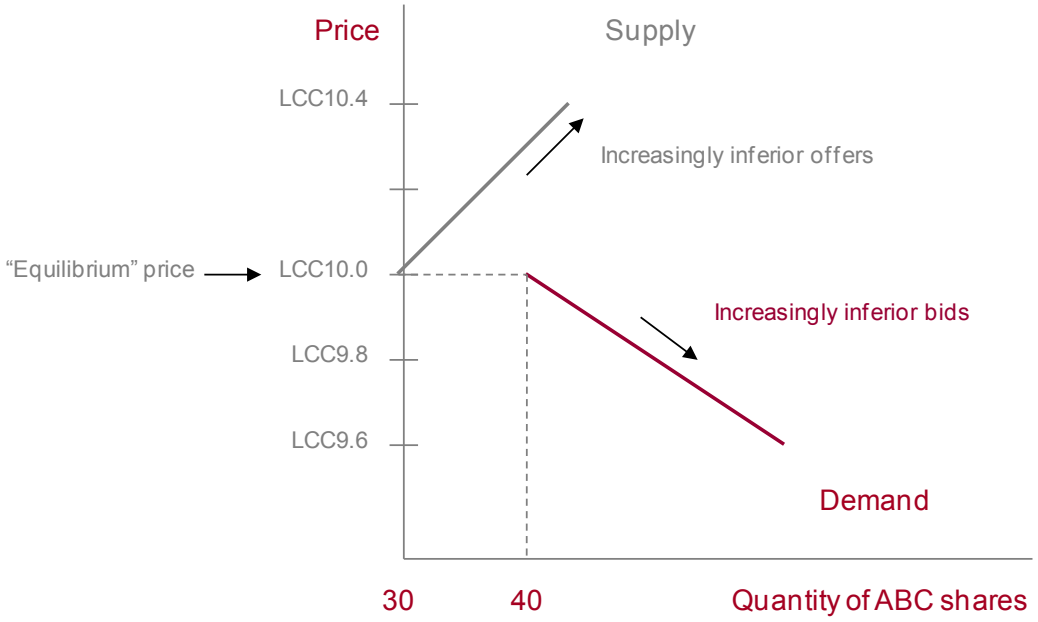


Figure 5: deal consummated

6.6 Role of central bank in price discovery

Monetary policy in most countries is directed at influencing interest rates, specifically bank lending rates, and this certain central banks are able to achieve in spectacular fashion. As we have covered this issue in a previous section, we will not repeat it here.

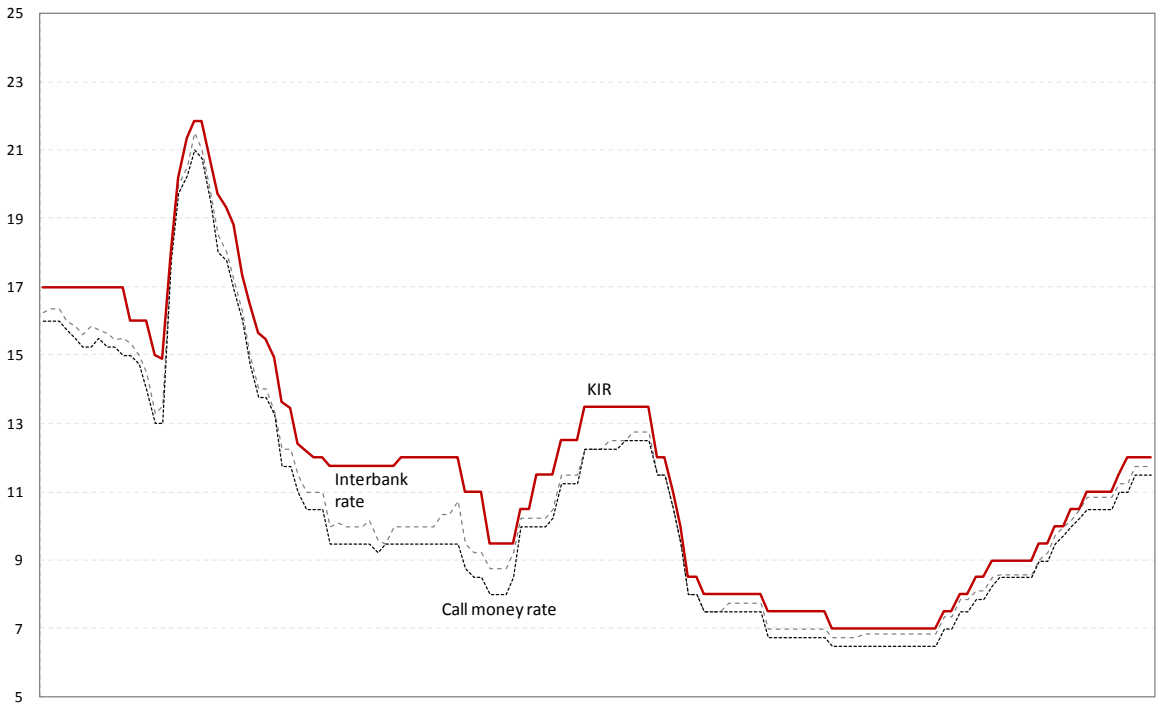


Chart 6: call money rate, interbank rate & KIR

What we need to point out is that central banks are able to achieve this provided they "make the KIR effective" and this achieved by ensuring that the banks are indebted to it at all times. Under this condition of a permanent liquidity shortage the KIR has a major impact on the b2b IBM and on bank call deposit rates (see Figure 6: this figure applies to a particular country for 13 years) and on banks' other deposit rates. This is so because banks compete aggressively to avoid borrowing from the central bank at the KIR (= the highest short-term rate).

Because banks endeavour to maintain a healthy margin, the KIR therefore has a major impact on the banks' prime lending rate (PR – see Figure 7). This rate has a major influence on the demand for loans and therefore on the rate of money creation.

What does this mean in terms of price discovery? It means that short-term rates are always *discovered with reference to the KIR*. Even longer rates (see Figure 8) can be said to be determined with reference to KIR – because the short end of the yield curve is largely "determined" by the central bank's KIR.

This brings us to the composition of interest rates.

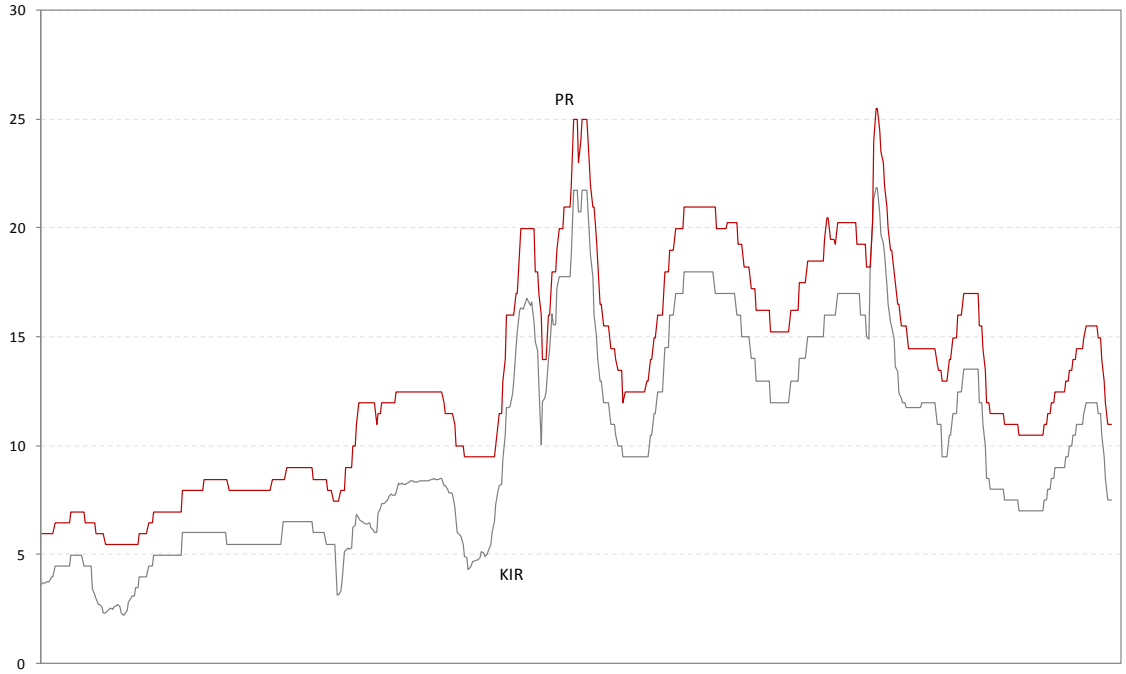


Figure 7: KIR & PR (month-ends over 50 years)

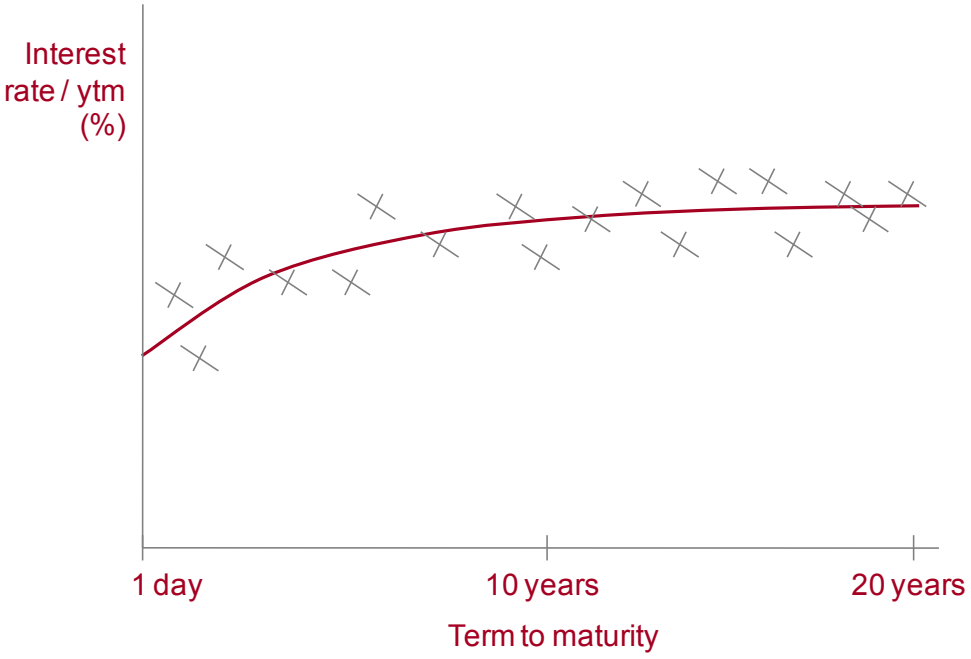


Figure 8: normal yield curve

6.7 Composition of interest rates

6.7.1 Introduction

Prices discovered in the debt markets (i.e. interest rates) are made up of a number of elements. Many versions of this analysis exist in scholarly works. We present an alternative analysis that begins with the 1-day risk-free rate (*rfr*), i.e. the rate on a 1-day treasury bill (see Figure 9).

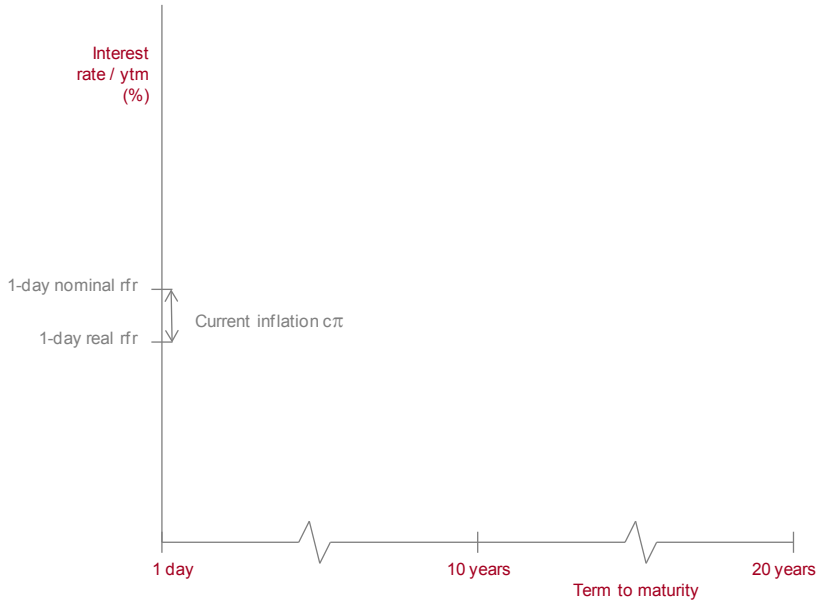


Figure 9: composition of nominal rates

6.7.2 Fisher hypothesis

Irving Fisher in his *Theories of interest* in 1930 was the first scholar to "split" the nominal interest rate. He postulated that the nominal interest rate (i.e. the observed interest rate) (*nr*) is approximately equal to (and is therefore comprised of) the real rate (*rr*) and the expected inflation rate ($e\pi$). At low levels of rates and inflation this may be expressed as:

$$nr \approx rr + e\pi.$$

Essentially Fisher hypothesised that lenders demand a premium over the real rate of interest to compensate for the inflation-induced erosion of their monies lent. He asserted that nominal interest rates adjust in line with expected changes in the rate of inflation. In other words, the nominal rate, determined by market forces, is comprised of expected inflation and the real rate of interest (which is determined by the marginal productivity of capital[30]). Fisher did not state the term of asset he was referring to or its status in terms of risk. Neither did he refer to the *rfr*.

6.7.3 Composition of the nominal risk-free rate

If we apply the Fisher equation of our definition of the 1-day *nominal rfr* (*nrfr*), it could be expressed as:

$$nrfr = rrfr + c\pi.$$

The 1-day nominal *rfr* (*nrfr*), which is determined by market forces, is equal to the 1-day *real rfr* (*rrfr*) plus the *current* rate of inflation ($c\pi$). Note that the *rfr* does exist and can be obtained from the market. The latest inflation rate can be termed *current*, because the last published inflation rate, at worst is 6 weeks old and at best 2 weeks old[31]. Also, in a low inflation environment, it is unlikely that the next published inflation rate will differ much from the last one (it may differ by a few decimal points – e.g. change from 2.2% to 2.4%).[32] This is small enough to disregard. The composition of the nominal *rfr* may be depicted as in Figure 9.

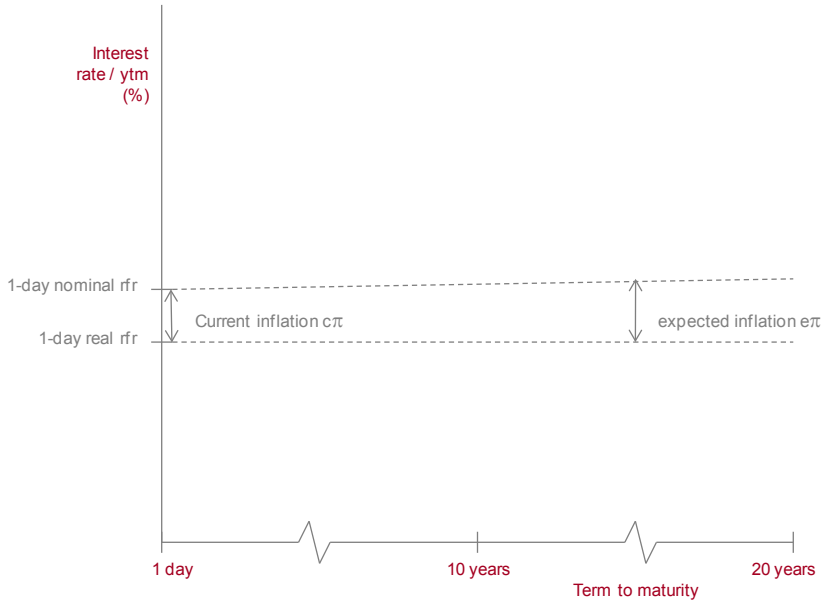


Figure 10: composition of nominal rates

The 1-day *rrfr* can also be seen as the component of the *nrfr* that represents lenders' sacrifice of consumption for 1 day in a steady price setting. It may also be seen as being determined by the interplay of the supply of and the demand for funds, i.e. a measure of the equilibrium point of the eagerness of the lenders to lend and the eagerness of borrowers to borrow (for one day). We hasten to add that this statement is extremely simplified but it will do for this purpose.

6.7.4 Expected inflation

Current inflation can be a component of the *nrfr* as term to maturity lengthens, but this is only so in the short term maturity area and in a low and stable inflation environment. As term to maturity lengthens current inflation is replaced increasingly by expected inflation ($e\pi$) (as in the Fisher equation), which could he higher or lower. The equation is (see Figure 10):

$$nrfr = rrfr + e\pi.$$

6.7.5 Liquidity-sacrifice premium

The component that takes us to the many risk-free-rates (rates on government securities) that exist is what is generally called the liquidity-sacrifice premium (*lsp*).

In the case of short-term securities, liquidity (i.e. command over money) is sacrificed only for a brief period, and therefore there is little rate premium involved (it is zero at 1-day maturity, of course). However, as the term to maturity of government securities increases, the lender moves *further away from a state of liquidity*, and requires compensation for this. This may be explained as follows:

Lenders favour short-term investments because they have better command over their resources. Although liquid government bond markets exist in many countries and lenders can dispose of long-term bonds at will, this is never 100% certain, or the markets can be non-efficient at times in terms of price discovery. Therefore, lenders require a higher level of inducement as term increases to part with liquidity.

Borrowers prefer to borrow long rather than short because:

- Corporate entities usually borrow to purchase capital goods that have a long-term life.
- The availability of funds in short-term rollovers is uncertain.
- The short-term borrowing rate at each rollover is uncertain.

This is particularly pertinent to certain fledgling markets because rollover of short-term debt at market rates, or rollovers per se, cannot be taken for granted. Borrowers are prepared to pay a rate premium for the availability of funds for longer periods (assuming that the productivity of the project to be funded allows this).

For these reasons (i.e. the asymmetry of demand and supply), the rate premium is positive[33] and increases with term to maturity. It however, increases at a decreasing rate as the term to maturity increases because the lender differentiates less at the long end. For example, lenders will differentiate less between 25-year and 30-year bonds compared with 1-year and 5-year bonds in terms of the rate premium demanded.

We now arrive at the many points that make up the zero coupon government bond yield curve[34] (government ZCYC). The components of each point are shown in Figure 11 (keep in mind that the *rrfr* is a 1-day rate):

$$nrfr = rrfr + e\pi + lsp.$$

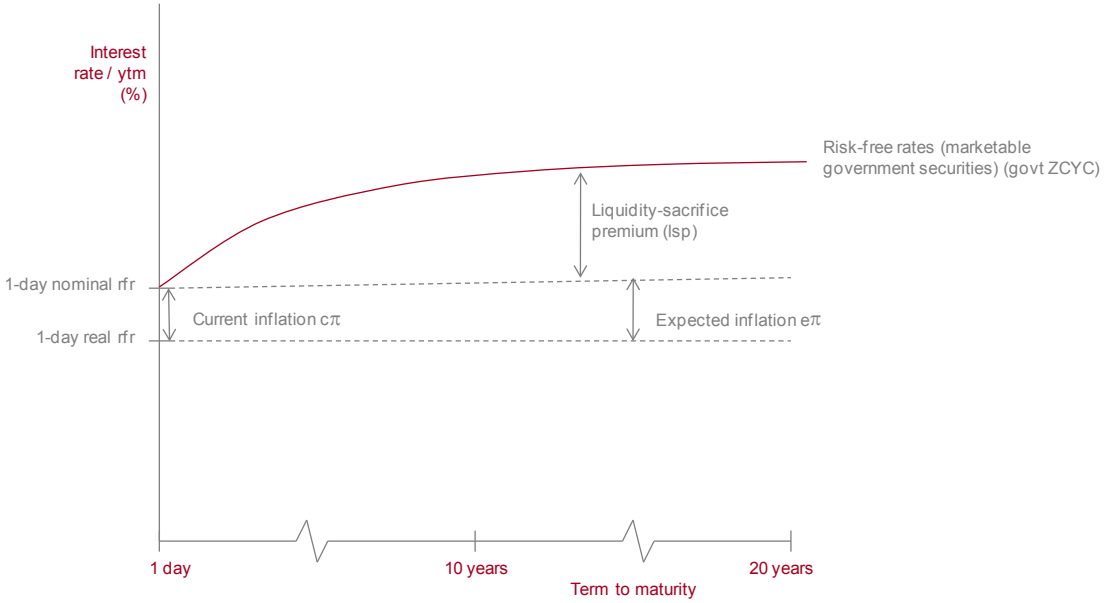


Figure 11: composition of nominal rates

The above explanation is not entirely hypothetical: we know from practice that the *normal* shape of the yield curve is upward-sloping and that it levels-off at the longer end.

6.7.6 Credit risk premium

The rates of interest on government securities are the lowest in the markets because they are risk-free. The rates of interest on the debt instruments of other non-government issuers are benchmarked against the equivalent term rates on government securities. For example, the 10-year bonds of prime-rated ABC Company may trade at 100 basis points (bp) over the 10-year government bond rate. This is the credit risk premium demanded by the lenders.

The credit risk premium and the yield curve for corporate securities may be depicted as in Figure 12. It is assumed that the yield curve is also a ZCYC and that the rates apply to the bonds of AAA-rated borrowers (i.e. homogenous corporate bonds in terms of risk).

The credit risk premium becomes larger with term to maturity. This is simply because the *probability* of the various risk-events attached to non-government securities taking place increases with term to maturity.

With the addition of the credit risk premium ($c\sigma$) to the equation, we are now "explaining" the nominal rates of AAA-rated companies (nrc); each point on the corporate ZCYC is composed as follows:

$$nrc = rrfr + e\pi + lsp + c\sigma.$$

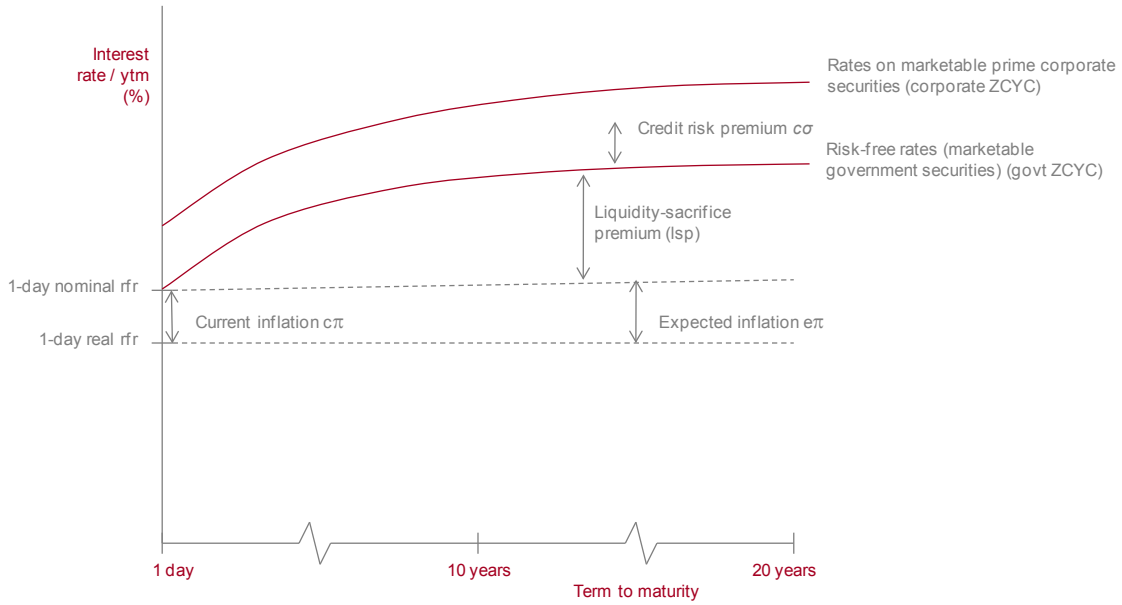


Figure 12: composition of nominal rates

6.7.7 Marketability

A number of countries have fledgling financial markets and they are generally illiquid, i.e. it is difficult to sell securities in the secondary market at what should be the fair market price. Others may not have secondary markets at all. In such markets lenders may still have a need for long-term securities (for example an assurer wishing to match annuity liabilities). The government or a corporate entity may also have a need to issue long-term bonds to finance a long-term project (for example government for the construction of a power plant).

It will be evident that in illiquid secondary markets or where such markets do not exist the lenders will demand what can be called an *illiquidity premium* (*ip*) (illiquidity here referring to lack of secondary market turnover). Clearly in such markets a yield curve will not exist (because it is unlikely that government will borrow at enough maturity points).

On the ridiculous assumption that an active market does exist and that government wishes to borrow by the issue of non-marketable securities, the non-marketable risk-free yield curve will be benchmarked on the risk-free rates on marketable securities and the equation becomes:

$$nrfr \text{ (non-marketable government securities)} = rrfr + e\pi + lsp + ip.$$

Figure 13 depicts this unlikely equation.

Figure 13: composition of nominal rates

6.8 Role of interest rates in security valuation

6.8.1 Introduction

We have stated before that the market prices of securities and their fair value prices (FVP) can be poles apart (see Figure 14). This is where *behavioural finance* makes its appearance. We will not delve into this fascinating branch of Finance here. However, we would like to state the obvious: the strength of the herd instinct has a major impact on price discovery in the short term, and sometimes longer.

Interest rates play a central role in security valuation. All major assets (debt, shares and property) have a cash flow in the future. The future cash flows on these assets are all future values (FVs) and the valuation of these essentially amounts to the discounting (at an appropriate rate) the FVs to present value (PV = FVP).

We present examples of the calculation of the PVs of shares and bonds, but before this we present a simple illustration of the principle (see Figure 15). In this figure we assume we have an asset which has 12-months to maturity and a future value of LCC 110 000 (= the amount it will mature at). If this asset is valued at the current interest rate of 5% pa, its PV is LCC 104 761.90 (the FV is discounted at its current rate).

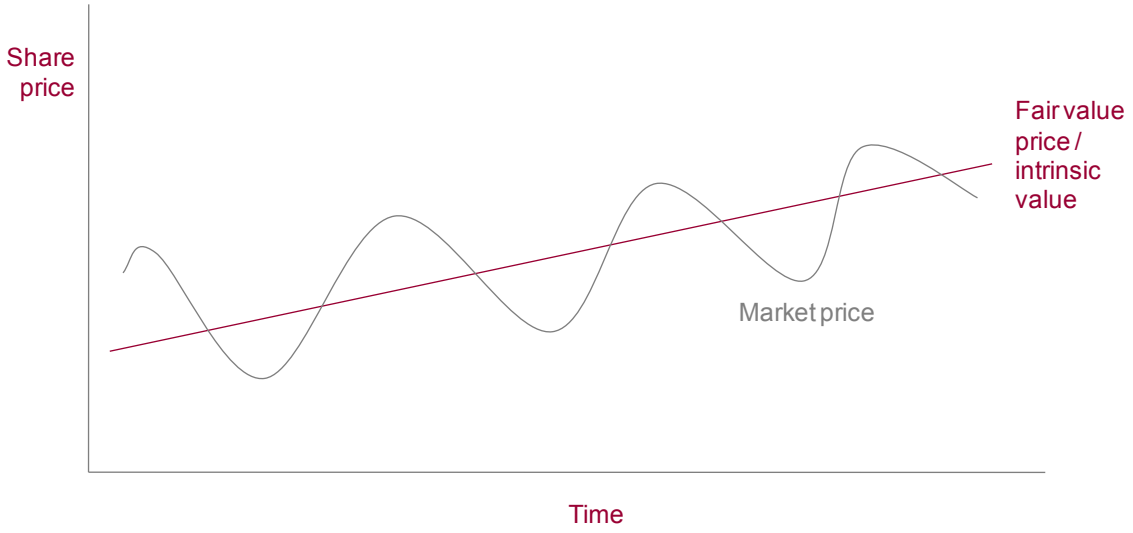
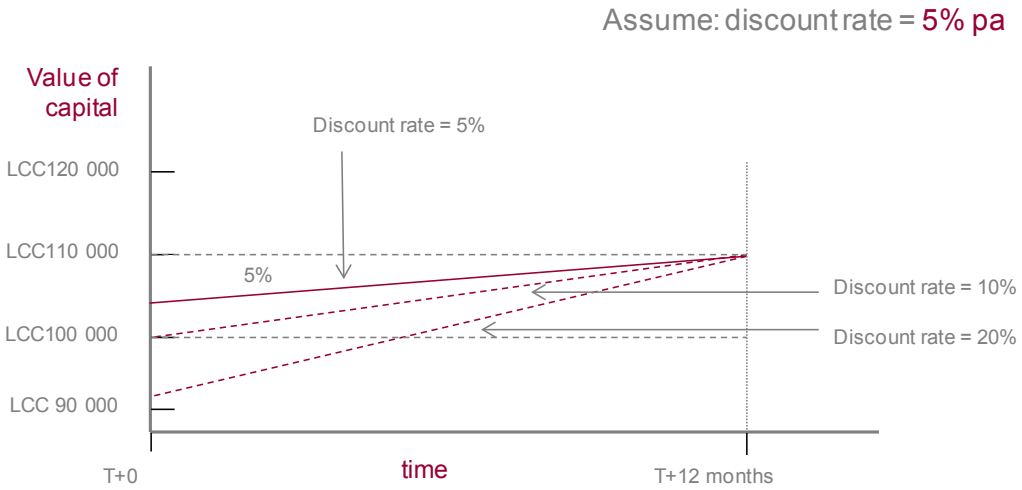


Figure 14: market price (MP) versus fair value price (FVP)



PV = FV / [FV x (ir x t)]
= FV / [1 + (0.05 x 1)]
= FV / 1.05
= LCC110 000 / 1.05
= LCC104 761.90

Figure 15: valuation of interest rate security (FV to PV): one period

Note the red dotted lines: if the discount rate is increased, the PV falls. Thus, generally in financial markets, when interest rates increase, the values of income-producing assets fall. The principle is the time value of money – the PV / FV concept.

6.8.2 Bonds

Bonds are long-term securities and typically[35] pay interest in arrears six-monthly at a fixed rate called the *coupon*. This means that there are a number of cash flows in the future: the coupon payments and the principal amount that is payable at maturity. These are FV amounts that have to be discounted to PV. What rate does one use? It is the *yield to maturity* (ytm). It is a *measure of the rate of return* on a bond that has a number of coupons paid over a number of years and a face value payable at maturity. It may be seen as an *average return* over the life of a bond. Its reciprocal price may be described as the price that buyers are prepared to pay now (present value LCC) for a stream of regular payments and a lump sum at maturity.

Formally described, the ytm is the rate that equates the price of a bond with the present value of all the coupon payments and the present value of the principal amount (i.e. nominal / face value). Another way of stating this is: the *price* is merely the *discounted value of the income streams (i.e. the coupon payments and redemption proceeds), discounted at the current market rate (ytm).*

A basic example (where interest is payable once pa) may make this clear:

Settlement date:	30 / 9 / 2012
Maturity date:	30 / 9 / 2015
Coupon rate:	9% pa
Face value:	LCC 1 000 000
Interest date:	30 / 9
ytm	8% pa.

Table 1 shows the cash flows that occur in this example; they are discounted using the now familiar PV-FV formula shown earlier, except that we now introduce compound interest [PV = FV / (1 + ytm / cp)$^{y.cp}$] (y = years; cp = coupon payments per annum = 1 in this example):

Date	Coupon payment	Nominal / face value	Compounding periods	Present value = FV / (1 + ytm/cp)$^{y.cp}$
30/9/2013	LCC 90 000	-	1	LCC 83 333.33
30/9/2014	LCC 90 000	-	2	LCC 77 160.49
30/9/2015	LCC 90 000	-	3	LCC 71 444.90
30/9/2015	-	LCC 1 000 000	3	LCC 793 832.24
Total	**LCC 270 000**	**LCC 1 000 000**	-	**LCC 1 025 770.96**

Table 1: Bond valuation example

It will be evident that the value of the bond (PV) is LCC 1 025 770.96 (see also Figure 16 = price per LCC 1.0), and that the price of the bond is 1.02577096 or 102.577096%. The above may be written as the following formula for bonds (because there is only one coupon payment pa):

$$\text{Price} = [cr / (1 + ytm)^1] + [cr / (1 + ytm)^2] + [cr / (1 + ytm)^3] + [1 / (1 + ytm)^3]$$

where:

cr = coupon rate pa
ytm = yield to maturity.

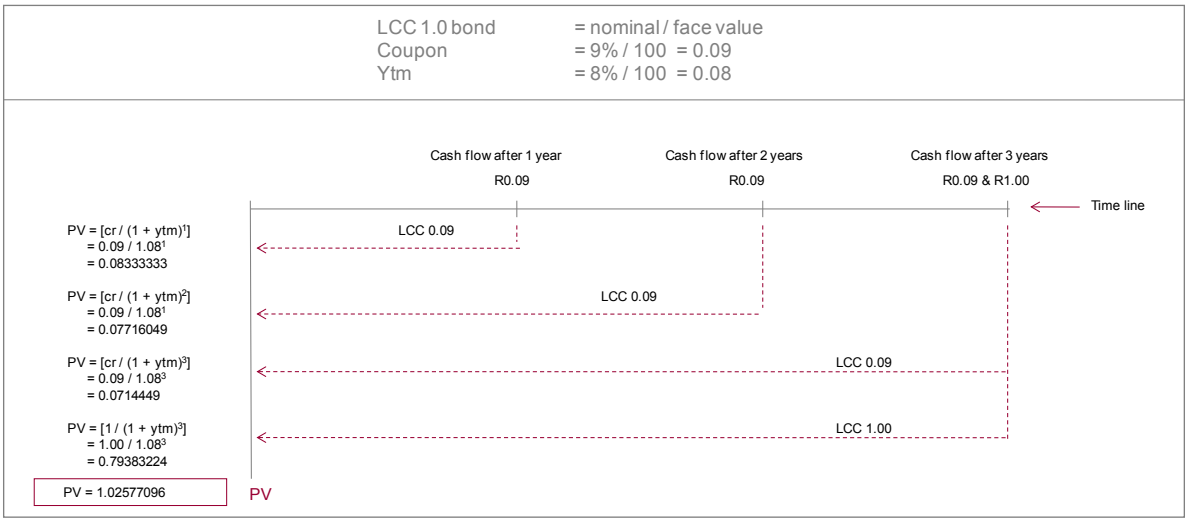


Figure 16: valuation of interest rate security (FV to PV): multiple periods: fixed-rate bonds

Using the same numbers as above, i.e. coupon rate 9% pa and ytm 8% pa:

$$\begin{aligned}\text{Price} &= (0.09 / 1.08) + (0.09 / 1.166400) + (0.09 / 1.259712) + (1 / 1.259712)\\ &= 0.08333333 + 0.07716049 + 0.0714449 + 0.79383224\\ &= 1.02577096\\ &= \text{LCC } 102.577096\%.\end{aligned}$$

It will be apparent that the coupon rate (0.09) for the periods and the face value that is paid at maturity (all FVs) are discounted at the ytm to PV.

6.8.3 Shares

In the share market the income on shares is not interest but dividends, and dividends grow, in many cases at a constant growth rate. The formula developed to account for this is the Gordon CGDDM (constant growth dividend discount model).

The PV of a share that has a past dividend of D_0 and expected dividend growth rate (gr) is:

$$PV = [(D_0 (1 + gr)^1] / [1 + rrr)^1] + [(D_0 (1 + gr)^2) / (1 + rrr)^2] + \ldots + [(D_0 (1 + gr)^\infty) / (1 + rrr)^\infty].$$

Because shares do not have a finite life, this translates to:

$$PV = [D_0 (1 + gr)] / (rrr - gr).$$

The interesting part of this formula is the rrr, which stands for *required rate of return*. This is a concept borrowed from the *capital asset pricing model* (CAPM).

According to the CAPM the rrr is equal to the rfr plus a multiple of the market risk premium as represented by the share's beta coefficient:

$$rrr = rfr + [\beta \times (mr - rfr)]$$

where

β = beta[36]
mr = market rate of return, i.e. the return observed over the period chosen
mr – rfr = the risk premium.

For example, if the rfr = 10%, the β = 1.7, the mr = 15%, then:

rrr = rfr + [β × (mr – rfr)]
= 10.0 + [1.7 × (15.0 – 10.0)]
= 10.0 + (1.7 × 5.0)
= 10.0 + 8.5
= 18.5%.

If, for example, the rrr required is 25%, the dividend now is LCC 10 (i.e. last dividend), and the gr is 5%, the fair market price (PV) is:

PV = [D_0 (1 + gr)] / (rrr – gr)
= [LCC 10 (1 + 0.05)] / (0.25 – 0.05)
= [LCC 10 (1.05)] / (0.25 – 0.05)
= LCC 10.50 / 0.20
= LCC 52.50.

The investor will be prepared to pay no more than LCC 52.50 for the share. This is the PV (= FVP).

6.8.4 Derivatives

The interest rate (particularly the rfr) plays a major role in the valuation of derivative instruments, particularly forwards, futures and options.

With *forwards and futures* the relevance of PV-FV is the most obvious. The FVP of forwards and futures is determined as follows:

Forward price (FV) = SP × [1 + (ir × t)]

where

SP = spot price (i.e. the PV)
ir = interest rate for the forward period
t = term of the forward period.

Money market derivatives, such as repos and FRAs, are also forwards. With caps and floors the PV-FV concept is also applicable (even though they are option-like instruments).

The formula for valuing *options* is more elaborate (the Black-Scholes and Binomial valuation models are used), but a major input is the rfr (for the term of the option).

6.9 Market efficiency

It is appropriate to end this section on price discovery with a brief discussion on the concept of *financial market efficiency*.[37] Market efficiency is concerned with how well the financial market functions in terms of price discovery, i.e. (in the case of the share market) the degree to which share prices reflect available information about the listed companies and change to reflect new information.

There are three standards (some call them measures) of market efficiency and all have been intensely researched in order to determine whether share prices do indeed reflect all information. The reason for the research was (and is) of course to make a return if the markets do not reflect all available information. The three standards are:

- Weak form market efficiency.
- Semi-strong form market efficiency.
- Strong form market efficiency.

Each standard has a different *objective* in terms of market efficiency:

- Weak form market efficiency – does the market reflect all past *market* information?
- Semi-strong form market efficiency – does the market reflect all information about *listed companies* that is available to the *public*?
- Strong form market efficiency – does the market reflect all possible information about companies, *including private information* (i.e. insider information)?

It should be apparent that the three forms are concerned with *how efficient* the share market is. The degree of efficiency is significant because it determines the value the investor places on various *types of analysis* undertaken to select shares.

The evidence supports *weak form market efficiency* and holds that current prices reflect all historic information about *the market*. Thus stale news, price trends, trading volume data, rates of return, etc, are already incorporated in current prices, and are of no use in explaining or forecasting current and future prices. Thus, *weak form market efficiency* says that investors cannot earn more than the fair (or required) return, by using past information. This of course means that if a market is *weak form efficient* then technical analysis is of little use. However, it does suggest that superior fundamental research can produce returns that are in excess of the return that is consistent with the risk undertaken.

This theory is consistent with the *random walk hypothesis*, i.e. that *changes* in share prices follow a *random walk*, are independent of past price performance. Note the emphasis on *changes*; this is emphasised because the *levels of prices* are not determined randomly. They are efficiently determined by many factors such as earnings, interest rates, dividend (retention) policy, economic environment, etc, and any changes in these variables are rapidly reflected in share prices. However, new information is random because it is unpredictable (if it were predictable it would be incorporated in prices), and therefore prices *change* in response to new information.

Semi-strong form market efficiency is concerned with achieving abnormal returns upon the release of *new public information*. Thus, a market is s*emi-strong form efficient* if new public information is imputed into prices immediately.

The evidence suggests that this is the case. The test here is the quickness with which share prices adjust upon the release of new information about specific companies. In the case of share markets that are quote-driven, the market is s*emi-strong form efficient* if the bid/offer quotes of the market makers are adjusted immediately without any transactions being done that someone can profit from. If the market adjusts slowly to the new level, based on many transactions that bring this about, then the market is *not semi-strong form efficient.*

Thus, no person / institution can achieve superior results to the market when the market is s*emi-strong form efficient*. However, there is one exception to the contention that the market is s*emi-strong form efficient*: when someone has insider information. The possessor of this information is able to achieve return results that are superior in a market that is s*emi-strong form efficient*.

In the case of *strong form market efficiency* it is said that a market is *strong form efficient* if market prices fully reflect *publicly* announced and *private* information. This standard is difficult to test, because *inside information* is not available to the public (by definition). However, logic dictates that abnormal returns can be made on information that is not publicly available. It will be evident then that if this insider information is later made available to the public, and prices adjust immediately, it would not reflect *strong form efficiency*, but s*emi-strong form efficiency.*

There have been cases where "insider trading" has taken place, and some perpetrators have been caught out because the relevant share price changed for "*no reason at all*". This would be the comment of observers without the information. The *reason* of course becomes apparent after the release of the information. Investigations then take place as to why the share price changed "for no reason at all", and the perpetrator is usually identified.

This of course means that the holder of private information is able to outperform the market, which points to the market *not* being *strong form efficient.* This is manifested in most countries having laws prohibiting this behaviour (usually called the Insider Trading Act).

A final note: the *efficient market hypothesis* (EMH) declares that financial markets are *informationally efficient* and this means that investors cannot consistently achieve returns in excess of average market returns, because all investors have and act on the same information. The EMH is largely ignored in modern investment theory, and its remaining practical usefulness lies therein that the participants in the market who act on new information and expected future information, including the speculators, all contribute to *efficient price discovery* (EPD) and *market liquidity* (ML, which contributes to EPD). ML is important in that investors can buy or sell shares with ease, meaning with no or little effect on market prices in the short term.

6.10 Bibliography and references

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7 Endnotes

1. LCC is a currency code for the monetary unit (Corona) of fictitious country, Local Country (Local Country Corona).
2. See Gurley and Shaw, 1960. See also Rose (2000: 33).
3. This and subsequent adapted from Gurley, 1965.
4. Definitions of the South African Reserve Bank.
5. See Mishkin and Eakins (2000:395).
6. This is an obvious footnote: the credit / banking crisis 2008 / 09 partly refutes these statements. "Partly" is applicable here because there are many banks that did not suffer the problems of some of the world's largest banks.
7. Note here that the words "part of the risk…" were used. This is because portfolio theory teaches us that these are two types of risk: systematic risk and unsystematic risk, and that only the latter can be diversified away.
8. Note that it is not possible to show all the flows of money and securities. Some flows shown are also misleading: for example, the foreign sector does not lend to all financial intermediaries and all ultimate borrowers.
9. Except the DFIs, because they are not in the business of investing in deposits (although most of the DFIs will hold working balances with the banks).
10. Not in all countries (covered in a separate section).
11. In the interests of word economy we regard shares as instruments of borrowing. The reader will know that a share represents ownership of a share of the relevant company. From the point of view of the lender / holder a share is not permanent capital supplied but an instrument which can be liquidated (by selling it). This is discussed further later.
12. Note that we include examples of certificates (even though dematerialisation and immobilisation are prevalent today) because they have a pedagogical role and are aesthetically pleasing Further justification is that they still exist in some parts of the world. An interesting point: the amount of paper generated in the age of dematerialisation and immobilisation (a monthly printout) surpasses that generated in the materialised age (just the one certificate).
13. In the sense that they will be repaid (= no credit risk); however, market risk remains.
14. Or in some poorer countries with high inflation as a hedge against the local currency.
15. A reminder: the "institutions" means the insurers, retirement funds and CISs.
16. See McInish (2000: 212)
17. Note that there may also be hybrids of these main trading systems.
18. This phrase is usually used by economists in respect of a moral hazard problem that arises with share ownership and the management of that company. It fits well here though.
19. This section draws heavily on McInish (2000:100–127). The text in quotation marks is attributed to this source.
20. Security certificate. In the age of dematerialisation, proof of ownership in the form of scrip is being replaced by electronic entries and electronic printouts.
21. Also called fraudulent scrip, such as photocopied scrip.
22. Note that "domestic" applies as the deposits of the foreign sector (= small) are excluded.

23. It will be pretty obvious that banks only lend when they consider the borrower to be creditworthy or the project to be viable (in the case of corporate borrowing).
24. LCC is the currency code for fictitious country Local Country (LC); the monetary unit of LC is called Corona (C).
25. This is a separate and interesting issue, which will detract from the principles we are discussing; therefore it will not be discussed here.
26. As we will show in a separate section, if there was another bank, the interbank market will make the market balance. We do not introduce this here in the interests of sticking to the principles.
27. A term used by my supervisor, mentor and boss, Dr JH Meijer, when I was a junior employee and he the Head of the Money and Banking Division of the central bank. Dr Meijer went on to become Deputy Governor.
28. At times banks do have excess reserves (usually as a result of an interbank settlement error). In certain developing countries banks have chronic ER (this is an interesting topic on its own). The concept NER accommodates this situation.
29. An extreme example: if its deposits (as a result of new loans) increase by LCC 100 million on 1 June, a bank, on the basis of its 30 June asset and liability return (which is submitted on say 21 July), is required to increase its reserves by LCC 10 (assuming an *r* of 10%) on 21 July. By that time many other items in the CB's balance sheets will have changed (such as the bank notes issue). The CB's job is to maintain a level of bank liquidity it deems appropriate for making the KIR effective.
30. Note that because this discussion is not about the theories of interest, this and related issues will not be discussed here.
31. In many countries inflation numbers are usually published two weeks after a month-end for that month.
32. This of course will not apply in high inflation countries.
33. Not always: when short-term rates are expected to fall sharply lenders sacrifice this premium (however, this is a short-term strategy).
34. There is no time to go into the merits of a zero coupon yield curve. Suffice it to say that it is the most appropriate yield curve to use in the analysis.
35. There are variations but as we are dealing with the basics here, they will not be considered.
36. Beta is a measure of risk of a share in relation to the market of which it is a part.
37. This draws on Mayo (2003, pp. 271–283) and Reilly and Brown (2003, pp. 176–181).