PART

I

Banking Business, Bank Capital and Debt Market Instruments

Part I is something of a primer on banking, and is designed to set the scene for beginners, be they students or practitioners. We need to be familiar with the nature of banking business, as well as the types of instruments used in money market trading. We also need to be familiar with banking capital and financial statements, the former preparatory to a discussion of regulatory capital and the Basel rules, the latter simply for general knowledge purposes. So the first part of this book covers all these areas.

We begin with a look at the fundamentals of banking business, and the different elements of bank capital. This is essentially an introduction into the nature of banking. We then look at financial statements, which comprise balance sheet and profit and loss account. The contents of this chapter may appear more at home in a textbook on accounting, but an understanding of ratio analysis is vital for the ALM practitioner, who is concerned with issues such as return on capital.

The remainder of Part I looks at financial market debt instruments, which are the main products issued and traded by banks. Chapter 3 discusses money market instruments and Chapter 4 is concerned with capital market instruments or bonds. For undergraduate students and junior practitioners we cover elements of financial arithmetic, which are essential to an understanding of ALM, in the Appendix at the back of the book.

"[Cassandra is] a bit like me – an achiever. I've always been an achiever ……I've never actually achieved anything, mind…but I've always been up there with a shout."

– Derek 'Del-Boy' Trotter, "The Jolly Boys Outing"
Only Fools and Horses
BBC TV 1989

CHAPTER

1

Bank Business and Bank Capital

Banking has a long and honourable history. Today it encompasses a wide range of activities, of varying degrees of complexity. Whatever the precise business, the common denominators of all banking activities are those of risk, return and the bringing together of the providers of capital. Return on capital is the focus of banking activity. The coordination of all banking activity could be said to be the focus of asset and liability management (ALM), although some practitioners will give ALM a narrower focus. Either way, we need to be familiar with the wide-ranging nature of banking business, and the importance of bank capital. This then acts as a guide for what follows.

In this introductory chapter of the first part of the book, we place ALM in context by describing the financial markets and the concept of bank capital. Subsequent chapters look at money market instruments and the basics of bank financial statements. We begin with a look at the business of banking. We then consider the different types of revenue generated by a bank, the concept of the banking book and the trading book, and financial statements. The chapter concludes with an introduction to the money market, the key area of involvement for an ALM desk.

Banking business

We introduced the different aspects of banking business in the Preface. For the largest banks these aspects are widely varying in nature. For our purposes we may group them together in the form shown in Figure 1.1. Put very simply, "retail" or "commercial" banking covers the more traditional lending and trust activities, while "investment" banking covers trading activity and fee-based income such as stock exchange listing and mergers

and acquisition (M&A). The one common objective of all banking activity is return on capital. Depending on the degree of risk it represents, a particular activity will be required to achieve a specified return on the capital it uses. The issue of banking capital is vital to an appreciation of the banking business; entire new business lines (such as securitisation) have been originated in response to a need to generate more efficient use of capital.

As we can see from Figure 1.1, the scope of banking business is vast. The activities range from essentially plain vanilla activity, such as corporate

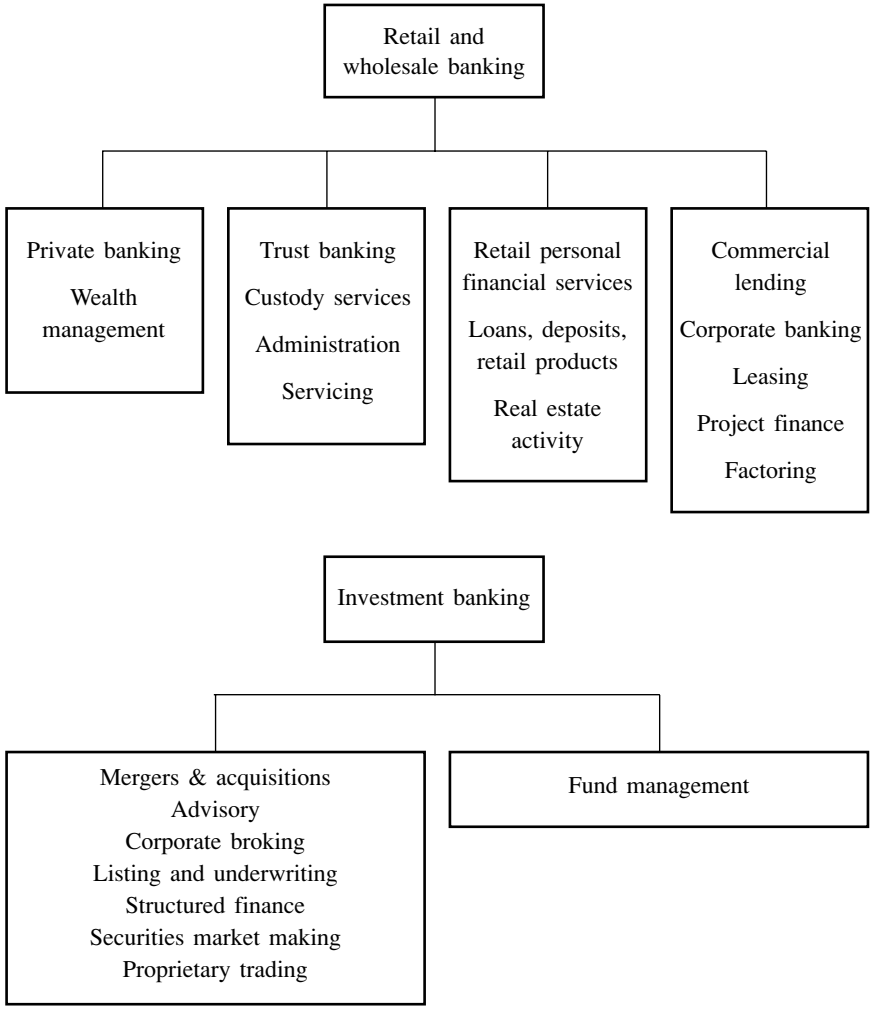

Figure 1.1 Scope of banking activities

lending, to complex transactions such as securitisation and hybrid products trading. There is a vast literature on all these activities, so we do not need to cover them here. However, it is important to have a basic general knowledge of the basic products, so subsequent chapters will introduce these.

ALM is concerned with, among other things, the efficient management of banking capital. It therefore concerns itself with all banking operations, even if the day-to-day contact between the ALM desk (or Treasury desk) with other parts of the bank is remote. The ALM desk will be responsible for the treasury and money markets activities of the entire bank. So if we wish, we could draw a box with ALM in it around the whole of Figure 1.1. This is not to say that the ALM function does all these activities; rather, it is just to make clear that all the various activities represent assets and liabilities for the bank, and one central function is responsible for this side of these activities.

For capital management purposes a bank's business is organised into a "banking book" and a "trading book". We consider them next; first though, a word on bank capital.

Capital

Bank capital is the equity of the bank. It is important as it is the cushion that absorbs any unreserved losses that the bank incurs. By acting as this cushion, it enables the bank to continue operating and thus avoid insolvency or bankruptcy during periods of market correction or economic downturn. When the bank suffers a loss or writes off a loss-making or otherwise economically untenable activity, the capital is used to absorb the loss. This can be done by eating into reserves, freezing dividend payments or (in more extreme scenarios) a write-down of equity capital. In the capital structure, the rights of capital creditors, including equity holders, are subordinated to senior creditors and deposit holders.

Banks occupy a vital and pivotal position in any economy, as suppliers of credit and financial liquidity, so bank capital is important. As such, banks are heavily regulated by central monetary authorities, and their capital is subject to regulatory rules governed by the Bank for International Settlements (BIS), based in Basel, Switzerland. For this reason its regulatory capital rules are often called the Basel rules. Under the original Basel rules ("Basel I") a banking institution was required to hold a minimum capital level of 8% against the assets on its book.[1] Total capital is comprised of:

[1] There is more to this than just this simple statement, and we consider this in chapters 26 and 27.

- equity capital;
- reserves;
- retained earnings;
- preference share issue proceeds;
- hybrid capital instruments;
- subordinated debt.

Capital is split into Tier 1 capital and Tier 2 capital. The first three items above comprise Tier 1 capital while the remaining items are Tier 2 capital.

The quality of the capital in a bank reflects its mix of Tier 1 and 2 capital. Tier 1 or "core capital" is the highest quality capital, as it is not obliged to be repaid, and moreover there is no impact on the bank's reputation if it is not repaid. Tier 2 is considered lower quality as it is not "loss absorbing"; it is repayable and also of shorter-term than equity capital. Assessing the financial strength and quality of a particular banking institution often requires calculating key capital ratios for the bank and comparing these to market averages and other benchmarks.

Analysts use a number of ratios to assess bank capital strength. Some of the more common ones are shown in Table 1.1.

Ratio	Calculation	Notes
Core capital ratio	Tier 1 capital/ Risk-weighted assets	A key ratio monitored in particular by rating agencies as a measure of high-quality non-repayable capital, available to absorb losses incurred by the bank
Tier 1 capital ratio	Eligible Tier 1 capital/ Risk-weighted assets	Another important ratio monitored by investors and rating agencies. Represents the amount of high-quality, non-repayable capital available to the bank
Total capital ratio	Total capital/ Risk-weighted assets	Represents total capital available to the bank
Off-balance sheet risk to total capital	Off-balance sheet and contingent risk/ Total capital	Measure of adequacy of capital against off-balance sheet risk including derivatives exposure and committed, undrawn credit lines

Table 1.1 Bank analysis ratios for capital strength
Source: Higson (1995)

Banking and trading books

Banks and financial institutions make a distinction between their activities for capital management, including regulatory capital, purposes. Activities are split into the "banking book" and the "trading book". Put simply, the banking book holds the more traditional banking activities such as commercial banking; for example, loans and deposits. This would cover lending to individuals as well as corporates and other banks, and so will interact with investment banking business.[2] The trading book records wholesale market transactions, such as market making and proprietary trading in bonds and derivatives. Again speaking simply, the primary difference between the two books is that the over-riding principle of the banking book is one of "buy and hold"; that is, a long-term acquisition. Assets may be held on the book for up to 30 years or longer. The trading book is just that, it employs a trading philosophy so that assets may be held for very short terms, less than one day in some cases. The regulatory capital and accounting treatment of each book differs. The primary difference here is that the trading book employs the "mark-to-market" approach to record profit and loss (p&l), which is the daily "marking" of an asset to its market value. An increase or decrease in the mark on the previous day's mark is recorded as an unrealised profit or loss on the book: on disposal of the asset, the realised profit or loss is the change in the mark at disposal compared to its mark at purchase.

The banking book

Traditional banking activity such as deposits and loans is recorded in the banking book. Accounting treatment for the banking book follows the accrual concept, which is accruing interest cash flows as they occur. There is no mark-to-market. The banking book holds assets for which both corporate and retail counterparties as well as banking counterparties are represented. So it is the type of business activity that dictates whether it is placed in the banking book, not the type of counterparty or which department of the bank is conducting it. Assets and liabilities in the banking book generate interest-rate and credit risk exposure for the bank. They also create liquidity and term mismatch ("gap") risks. Liquidity refers to the ease with which an asset can be transformed into cash, as well as to the ease with which funds can be raised in the market. So we see that "liquidity risk" actually refers to two related but separate issues.

[2] For a start, there will be a commonality of clients. A corporate client will borrow from a bank, and may also retain the bank's underwriting or structured finance departments to arrange a share issue or securitisation for it.

All these risks form part of ALM. Interest-rate risk management is a critical part of Treasury policy and ALM, while credit risk policy will be set and dictated by the credit policy of the bank. Gap risk creates an excess or shortage of cash, which must be managed. This is the cash management part of ALM. There is also a mismatch risk associated with fixed-rate and floating-rate interest liabilities. The central role of the financial markets is to enable cash management and interest-rate management to be undertaken efficiently. ALM of the banking book will centre on interest-rate risk management and hedging, and liquidity management. Note how there is no "market risk" for the banking book in principle, because there is no marking-to-market. However, the interest rate exposure of the book creates an exposure that is subject to market movements in interest rates, so in reality the banking book is indeed exposed to market risk.

Trading book

Wholesale market activity, including market making and proprietary trading, is recorded in the trading book. Assets on the trading book can be expected to have a high turnover, although not necessarily so, and are marked-to-market daily. The counterparties to this trading activity can include other banks and financial institutions such as hedge funds, corporates and central banks. Trading book activity generates the same risk exposure as that on the banking book, including market risk, credit risk and liquidity risk. It also creates a need for cash management. Much trading book activity involves derivative instruments, as opposed to "cash" products. Derivatives include futures, swaps and options. These can be equity, interest-rate, credit, commodity, foreign exchange (FX), weather and other derivatives. Derivatives are known as "off-balance sheet" instruments because they are recorded off the (cash) balance sheet. Their widespread use and acceptance has greatly improved the efficiency of the risk exposure hedging process, for banks and other institutions alike.

Off-balance sheet transactions refer to "contingent liabilities", which are so-called because they refer to a future exposure contracted now. These are not only derivatives contracts such as interest-rate swaps or writing an option, but include guarantees such as a credit line to a third-party customer or a group subsidiary company. These represent a liability for the bank that may be required to be honoured at some future date. In most cases they do not generate cash inflow or outflow at inception, unlike a cash transaction, but represent future exposure. If a credit line is drawn on, it represents a cash outflow and that transaction is then recorded on the balance sheet.

EXAMPLE 1.1 The first banks[3]

Banks have a long and interesting history, and for many centuries have been the leader for economies to follow. The first records of banks come from Ancient Greece. Many private and civic entities conducted various financial transactions in the temple banks. These included loans, deposits, currency exchanges and coin validation. There is also evidence of credit, which was when a Greek port would write a credit note in exchange for the payment of a client. The port would hold the money in the temple for the customer who paid him the money, and he could collect the money in another city when he cashed in the credit note. This would save him having to carry around the gold all the time, because he could collect the money in a different city. This gave rise to a risk of being unbalanced in money at certain times. In Ancient Rome the art of banking was developed to include charging interest on loans, and paying interest on deposits.

The first bank to offer most of the basic banking functions known today was the *Bank of Barcelona* in Spain. Founded by merchants in 1401, this bank held deposits, exchanged currency, and carried out lending operations. It also introduced the bank cheque. Modern banking was introduced in what is now Italy. In the 15th century the Lombards, a group of bankers from the north of Italy began to apply accounting to work around a religious moral repugnance of usury. Accounting principles were used to keep a record of loans, and the loan was paid back "voluntarily". The oldest surviving bank today is *Monte dei Paschi di Siena*, which opened in 1472.

Modern British economic and financial history is usually traced back to the coffee houses of London. The London Royal Exchange was established in 1565 as a centre of commerce for the City of London, and trading of all sorts of commodities took place on its floors. Banking offices at that time were usually located near centers of trade, like the Royal Exchange. In London, individuals could now participate in the lucrative East India trade by purchasing

[3] This section was co-written with Darrell Hellmuth, Year 10, Wilmington Grammar School, Dartford, Kent, and Dan Slater, 2nd year mathematics, University College, Oxford.

bills of credit from these banks, but the price they received for commodities was dependent on the ships returning and on the cargo they carried. The commodities market was very volatile for this reason.

Aside from the central Bank of England, which was founded in 1694, early English banks were privately owned goldsmiths rather than stock-issuing firms. Bank failures were common; so in the early 19th century, stock-issuing banks, with a larger capital base, were encouraged as a means of stabilising the industry. By 1833 these corporate banks were permitted to accept and transfer deposits in London, although they were prohibited from issuing money, a prerogative monopolised by the Bank of England. Corporate banking flourished after legislation in 1858 approved limited liability for stock-issuing banks.

c. 3000 – c. 2000 BC	Development of Banking in Mesopotamia
c. 350 BC	Many banking services offered in Ancient Greece
476 AD	Roman Empire falls. Coins cease to be used as medium of exchange in Britain
1232 – 1253	Gold coins are issued by several Italian states
1401	Bank of Barcelona founded
1403	Charging interest on loans is ruled legal in Florence
1407	Bank of St George, Genoa, founded
1585	Bank of Genoa founded
1587	Banco di Rialto, Venice, founded
1600	The London East India Company is founded
c. 1660	Goldsmiths' receipts become banknotes in England
1694	Bank of England is founded

Table 1.2 Timeline
Source: YieldCurve.com (www.yieldcurve.com)

Financial statements and ratios

A key information tool for bank analysis is the financial statement, which is comprised of the balance sheet and the profit & loss (p&l) account. Assets on the balance sheet should equal the assets on a bank's ALM report, while receipt of revenue (such as interest and fees income) and payout of costs during a specified period is recorded in the p&l report or income statement.

The balance sheet

The balance sheet is a statement of a company's assets and liabilities as determined by accounting rules. It is a snapshot of a particular point in time, and so by the time it is produced it is already out of date. However, it is an important information statement. A number of management information ratios are used when analysing the balance sheet and these are considered in the next chapter.

In Chapter 2 we use an hypothetical example to illustrate balance sheets. For a bank, there are usually four parts to a balance sheet, as it is split to show separately:

- lending and deposits, or traditional bank business;
- trading assets;
- treasury and interbank assets;
- off-balance sheet assets;
- long-term assets, including fixed assets, shares in subsidiary companies, together with equity and Tier 2 capital.

This is illustrated in Table 1.3. The actual balance sheet of a retail or commercial bank will differ significantly from that of an investment bank, due to the relative importance of their various business lines, but the basic layout will be similar.

Assets	**Liabilities**
Cash	Short-term liabilities
Loans	Deposits
Financial instruments (long)	Financial instruments (short)
Fixed assets	Long-dated debt
Off-balance sheet (receivables)	Equity
	Off-balance sheet (liabilities)

Table 1.3 Components of a bank balance sheet

Profit & loss report

The income statement for a bank is the p&l report and it records all the income, and losses, during a specified period of time. A bank income statement will show revenues that can be accounted for as either net interest income, fees and commissions, and trading income. The precise mix of these sources will reflect the type of banking institution and the business lines it operates in. Revenue is offset by operating (non-interest) expenses, loan loss provisions, trading losses and tax expense.

A more "traditional" commercial bank such as a United Kingdom (UK) building society will have a much higher dependence on interest revenues than an investment bank that engages in large-scale wholesale capital market business. Investment banks have a higher share of revenue comprised of trading and fee income. Table 1.4 shows the components of a UK retails bank's income statement.

	%	Expressed as percentage of
Core operating income	100	
Net interest income	64	/ core operating income
Commissions and fee income	31	/ core operating income
Trading income	8	/ core operating income
+ Net other operating income	8	/ core operating income
– Operating expenses	61	/ revenues
Personnel	38	/ revenues
Other, depreciation		
– Loan loss provisions	23	/ pre-provision net income
= Net operating income		
+ Other non-operating income		
= Profit before tax		
– Tax		
= Net income		
– Minority interest		
= Attributable income		

Table 1.4 Components of a bank income statement, typical structure for a retail bank
Source: Bank financial statements.

The composition of earnings varies widely among different institutions, Figure 1.2 shows the breakdown for a UK building society and the UK branch of a US investment bank in 2005, as reported in their financial accounts for that year.

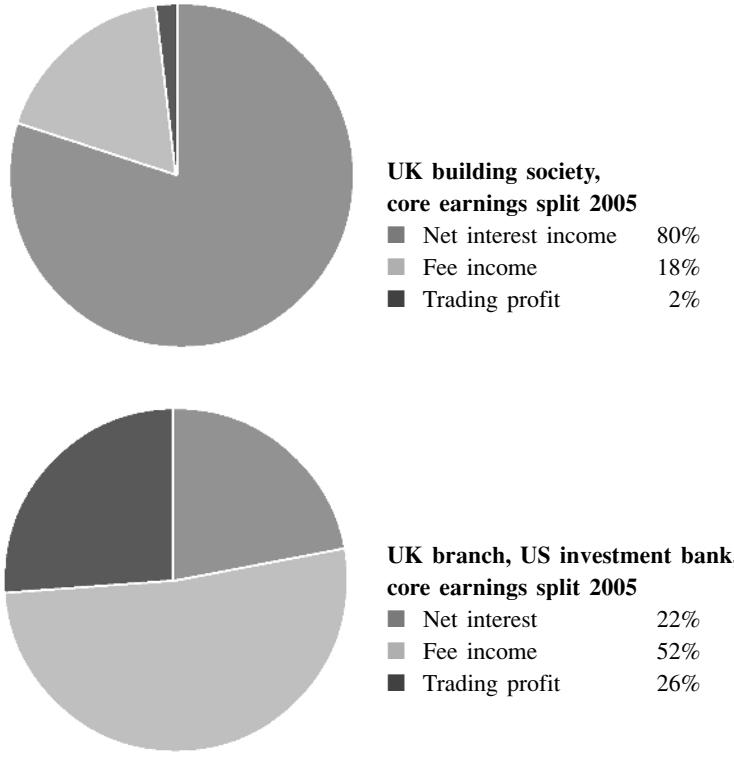

Figure 1.2 Composition of earnings
Source: Bank financial statements.

Net interest income

The traditional source of revenue for retail banks, net interest income (NII) remains as such today (see Figure 1.2). NII is driven by lending and interest-earning asset volumes and the net yield available on these assets after taking into account the cost of funding. While the main focus is on the loan book, the ALM desk will also concentrate on the bank's investment portfolio. The latter will include coupon receipts from money market and bond market assets, and dividends received from any equity holdings.

The cost of funding is a key variable in generating overall NII. For a retail bank the cheapest source of funds is deposits, especially non-interest-bearing deposits such as cheque accounts.[4] Even in an era of high-street competition, the interest payable on short-term liabilities such as instant access deposits is far below the wholesale market interest rate. This is a funding advantage for retail banks when compared to investment banks, which generally do not have a retail deposit base. Other funding sources include capital markets (senior debt), wholesale markets (the interbank money market), securitised markets and covered bonds. The overall composition of funding significantly affects net interest margin, and if constrained, can reduce the activities of the bank.

The risk profile of the asset classes that generate yields for the bank should lead to a range of net interest margins being reported across the sector, such that a bank with a strong unsecured lending franchise should seek significantly higher yields than one investing in secured mortgage loans; this reflects the different risk profiles of the assets. The proportion of NIBLs will also have a significant impact on the net interest margin of the institution. While a high net interest margin is desirable, it should also be an adequate return for the risk incurred in holding the assets.

Bank NII is sensitive to both credit risk and market risk. Interest income is sensitive to changes in interest rates and the maturity profile of the balance sheet. Banks that have assets that mature earlier than their funding liabilities will gain from an environment of rising interest rates. The opposite applies where the asset book has a maturity profile that is longer-dated than the liability book. Note that in a declining or low interest-rate environment, banks may suffer from negative NII irrespective of their asset–liability maturity profile, as it becomes more and more difficult to pass on interest rate cuts to depositors.

While investment banks are less sensitive to changes in rates, as their overall NII expectations are low due to their lower reliance on NII itself, their trading book will also be sensitive to changes in interest rates.

Fee and commission income

Fee revenue is generated from the sale and provision of financial services to customers. The level of fees and commission will be communicated in advance to customers. Fee income, separate from trading income and known as non-interest income, is desirable for banks because it represents a stable

[4] These are referred to as *NIBLs* (non-interest bearing liabilities).

source of revenue that is not exposed to market risk. It is also attractive because it provides an opportunity for the bank to cross-sell new products and services to existing customers, and the provision of these services does not expose the bank to additional credit or market risk. Fee income represents diversification in a bank's revenue base.

Note that although fee-based business may not expose the bank to market risk directly, it does bring with it other risks, and these can include indirect exposure to market risk.[5] In addition, an ability to provide fee-based financial services may require significant investment in infrastructure and human resources.

Trading income

Trading income arises from the capital gain earned from buying and selling financial instruments. These instruments include both cash and derivative (off-balance sheet) instruments, and can arise from undertaking market-making business, which in theory is undertaken to meet client demands, and from proprietary business for the bank's own trading book. Note that interest income earned while holding assets on the trading book should really be considered as NII and not trading income, but sometimes this is not stripped out from the overall trading book p&l. There is no uniformity of approach among banks in this regard.

Trading income is the most volatile form of bank revenue. Even a record of consistent profit in trading over a long period is no guarantee of future losses arising out of market corrections or simply making the wrong bet on financial markets. Trading activity was the first type of banking activity whose risk exposure was measured using the VaR methodology, which replaced duration-based risk measures in the 1990s.

Operating expenses

Banking operating costs typically contain the human resources costs (remuneration and other personnel-related expenses) together with other operating costs such as premises and infrastructure costs, depreciation charges and goodwill.[6] Cost is generally measured as a proportion of revenue. A number of cost–income ratios are used by analysts, some of which are given in Table 1.5.

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[5] For example, a strategy pursued by banks in the 1990s was to merge with or acquire insurance companies, so-called *bancassurance* groups. Although much insurance business is fee-based, the acquisition of insurance portfolios brought with it added market risk to the banking group.

[6] These are accounting terms common to all corporate entities, and are not just used to describe bank operating costs.

Ratio	Calculation	Notes
Pre-tax ROE	Pre-tax income / Average shareholders' equity	Measures the pre-tax return on equity. A measure above 20% is viewed as above average and strong
ROE	Attributable net income / Average shareholders' equity	Measures return on equity. A measure above 10% is considered strong
ROA	Net income / Average assets	Measures return on assets. A measure above 1% is considered strong
Cost–income ratio	Non-interest costs / Total net revenues	Non-interest costs minus non-cash items such as goodwill or depreciation of intengible assets. The cost to produce one unit of net interest and non-interest income. The lower the ratio, the more efficient the bank
Net interest margin	Net interest income / Average earning assets	The difference between tax-equivalent yield on earning assets and the rate paid on funds to support those assets, divided by average earning assets
Loan loss provision	Loan-loss provision / Pre-provision, pre-tax income	The proportion of pre-tax income that is being absorbed by loan losses. This is the credit cost of conducting the business
Non-interest income	Non-interest income / Net revenues	Non-interest income includes service charges on deposits, trust fees, advisory fees, servicing fees, net trading profits from trading books, and commissions and fees from off-balance sheet items. Generally, the higher the ratio, the greater the bank's sensitivity to changes in interest rates

Table 1.5 Common bank cost–income ratios

The return on equity (ROE) measure is probably the most commonly encountered, and is usually part of bank strategy, with a target ROE level stated explicitly in management objectives. Note that there is a difference between the accounting ROE and the market return on equity; the latter is calculated as a price return, rather like a standard p&l calculation, which is taken as the difference between market prices between two dates. During the 1990s, and certainly into 2005, the average required ROE was in the order of 15% or higher, with investment banks usually set a higher target of 20%, 22%, or even higher for certain higher risk business. The ROE target needs to reflect the relative risk of different business activity.

The return on assets (ROA) is another common measure of performance. This is calculated as follows:

$$\frac{\text{Current income (Interest income + Fees)}}{\text{Asset value}}.$$

Both financial statement p&l reports and measures such as ROE and ROA are bland calculations of absolute values. They do not make any adjustment for relative risk exposure so cannot stand too much comparison with the equivalent figures of another institution. This is because the risk exposure, not to mention the specific type of business activity, will differ from one bank to another. However, there are general approximate values that serve as benchmarks for certain sectors, such as the 15% ROE level we stated above. Banks also calculate risk-adjusted ratios.

Provisions

Banks expect a percentage of loan assets, and other assets, to suffer loss or become unrecoverable completely. Provisions are set aside out of reserves to cover for these losses each year, and are a charge against the loan revenues of the bank. The size of the provision taken is a function of what write-offs may be required against the loan portfolio in the current portfolio in the current period and in the future, and the size and adequacy of loan loss reserves currently available. In some jurisdictions there are regulatory requirements that dictate the minimum size of the provision.

Provisions fund the bank's loan loss reserve, and the reserve will grow in size when the bank provides more for expected credit losses than the actual amount that is written off. If the bank believes subsequently that the size of the reserve built up is in excess to what is currently required, it may write back a percentage of it.

The money markets

The money markets are part of the global financial system. The various markets that make up this system are all, in one form or another, channels through which fund flows between the users and the suppliers of capital move. This flow of funds takes place in different markets, depending on the characteristics of the funds themselves and the needs of the market participants. The money market is where transactions in short-term funds take place. This is the borrowing and lending of funds that have a repayment date of within 12 months of the loan start date. However, the money market is not just made up of loans or cash products. As we shall see, there is a wide range of instruments used in the market, both cash and *derivative*, and it is these products and the uses to which they are put that are a significant focus of this book.

So, the money market is the centre in which market participants, which can be governments, banks, other corporate institutions, fund managers or individuals, meet to transform a short-term shortage (or surplus) of funds into a surplus (or shortage). As such, the money market enables market participants to manage their liquidity positions.

The suppliers of funds in financial systems worldwide are generally commercial banks, as well as savings institutions such as money market mutual funds. Other institutions such as local authorities and corporations are also long of cash at certain times. The borrowers of funds include the government, banks (again), local authorities and corporations (also, again).

In terms of trading volumes the money markets are the largest and most active market in the world. As money market securities are securities with maturities of up to 12 months, they are short-term debt obligations. Money market debt is an important part of the global financial markets, and facilitates the smooth running of the banking industry, as well as providing working capital for industrial and commercial corporate institutions. The diversity of the money market is such that it provides market users with a wide range of opportunities and funding possibilities, and the market is characterised by the range of products that can be traded within it. Money market instruments allow issuers to raise funds for short-term periods at relatively low interest rates. These issuers include sovereign governments, who issue Treasury bills, corporates issuing commercial paper, and banks issuing bills and certificates of deposit. At the same time investors are attracted to the market because the instruments are highly liquid and carry relatively low credit risk. The Treasury bill (T-bill) market in any country is that country's lowest risk instrument, and consequently carries the lowest

yield of any debt instrument. Indeed, the first market that develops in any country is frequently the T-bill market.

Although the money market has traditionally been defined as the market for instruments maturing in one year or less, frequently the money market desks of banks trade instruments with maturities of up to two or three years, both cash and off-balance sheet.[7] In addition to the cash instruments that go to make up the market, the money markets also consist of a wide range of over-the-counter off-balance sheet derivative instruments. These instruments are used mainly to establish future borrowing and lending rates, and to hedge or change existing interest-rate exposure. This activity is carried out by both banks, central banks and corporates. The main derivatives are short-term interest rate futures, forward rate agreements, and short-dated interest rate swaps. But as we shall see, other derivatives like total return swaps are also used.

Financial transactions

Irrespective of the market we are speaking of, all financial systems exist to facilitate one basic transaction: the moving of funds from cash-rich entities to cash-poor ones. This transaction involves the exchange of money for financial assets, or an interest in a financial asset. This exchange can be undertaken directly between participants, via an intermediary or indirectly.

Direct finance

This involves two parties, one of which lends funds directly to the other for an agreed term and rate of interest. This transaction is shown in Figure 1.3. The funds can be lent in exchange for security (known as *collateral*) or on an *unsecured* basis. Direct financing is the simplest method for undertaking a financial transaction. Its drawbacks are that parties must know about each other and each other's requirements; they must also possess sufficient information on their counterparties such that they are satisfied in entering into the transaction. For this reason, direct financing, while very common among larger institutions or where the central government is involved, often gives way to financing via intermediaries.

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[7] The author has personal experience in market-making on a desk that combined cash and derivative instruments of up to two years' maturity, as well as government bonds of up to three years' maturity. In his current capacity on the Treasury desk he is part of trades in loans and deposits and overnight-index swaps of up to 18 months' maturity and medium-term notes (MTNs) of up to 24 months' maturity.

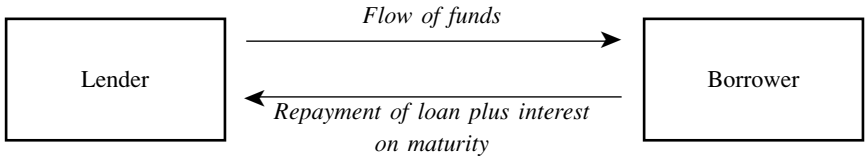

Figure 1.3 Direct financing

Financing via intermediary

In terms of volume, the majority of money market transactions are carried out in semi-direct form, via intermediaries. We include banks among our list of intermediaries, which can be distinguished into two types:

- Brokers: a broker simply acts to bring lenders and borrowers together, and charges a commission for doing so. However, the involvement of a broker introduces greater transparency and information into the market.
- Market-makers: known as *dealers* in the US market, who also serve as intermediaries between borrowers and lenders, but take the cash position onto their own books and charge a two-way price in this cash to all other market participants. As such, dealers run a risk exposure position in the cash they own directly, as their profit depends on the value of the cash, which fluctuates in line with market dynamics and supply and demand.

Of course, the same institution can act in both capacities, according to who its counterparties are or what market it is trading in.

This transaction is illustrated in Figure 1.4.

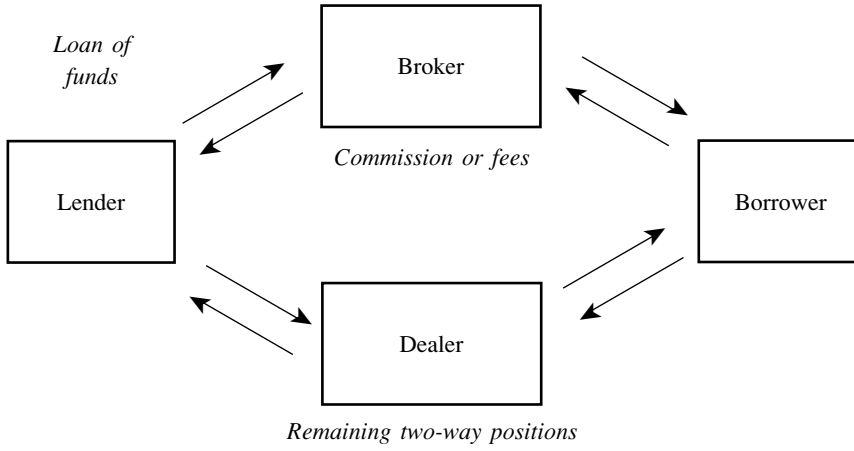

Figure 1.4 Intermediary financing

Indirect financing

The existence of an active secondary market in money market securities reflects the extent of indirect financing. This covers a number of areas, such as banks issuing their own securities to fund their loans to corporates and individuals, and the trading of these securities after the initial finance has been raised. Financial intermediaries that are part of this market include commercial banks, insurance companies, credit institutions such as automobile manufacturer credit arms, finance companies, savings and loan associations (known as building societies in the United Kingdom), pension funds, mutual funds and so on. Their role in the market is to act essentially as both borrowers and lenders themselves in a way that serves the market's ultimate borrowers and lenders. Table 1.6 lists the types of firms involved in indirect financing.

Deposit-taking institutions	Contractual institutions	Wholesale market counterparties
Commercial banks	Life insurance companies	Investment banks
Retail banks	Life assurance companies	Securities houses
Non-banking institutions:	Pension fund managers	("Broker-Dealers")
– Savings & Loan	Mutual funds	Brokers
("Building Societies")	("Unit Trusts")	
– Credit Unions	Investment trust companies	
Mutual funds ("Unit Trusts")		
– Money market funds		
Finance companies		
Government-lending institutions		

Table 1.6 Financial institutions and intermediaries active in the money markets

Characteristics of the money market

The money market, worldwide, acts as a channel through which market participants exchange financial assets for cash, or raise cash on a secured and unsecured basis. Its key defining point is that it serves short-term needs. This is the short-term financing needs of participants who are short cash, and the short-term investment needs of participants who are temporarily long cash. Figure 1.5 shows a stylised structure of the money market as it would exist in most countries.

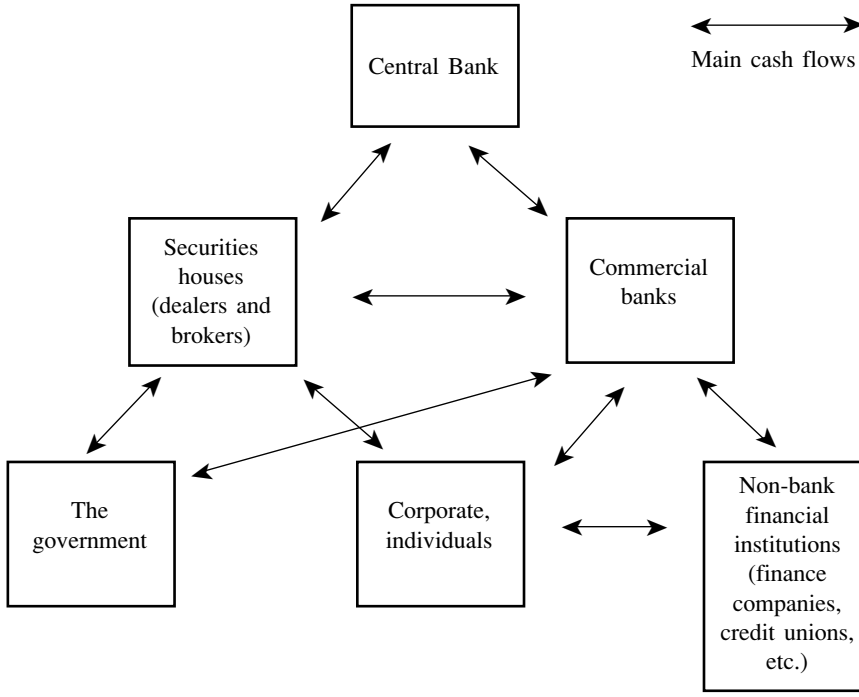

Figure 1.5 The structure of the money market

Interest rates set in the money market (well, one key interest rate) act as benchmarks and guidelines for all other rates used. The importance of the money markets to this activity is often over-looked, but cannot be denied.

The size of the market means that it, in most countries and certainly in all developed economies, carries considerable breadth and depth. It is possible to transact very large volumes of business and for this not to impact the money market in an observable way. Like most financial markets these days, money market dealing is "over-the-counter", meaning it is not conducted on an exchange but over the telephone or computer terminal.

Interest rates in the money market – the rates at which participants borrow and lend funds – are set by the market and reflect a number of factors, from macroeconomic issues such as global supply and demand, to more market-specific issues such as liquidity and transparency. There are a large number of interest rates, for different products and different counterparties. The cornerstone of the market's various rates is the T-bill rate. T-bills are issued by the government to raise short-term cash (the

typical maturity is 90 days). Because the bills are backed by the government, they carry no (or little) default risk. Hence the rates payable on these bills are the lowest in any market. All other rates in the market (and the bond market) will be at a positive spread over the T-bill rate.

In the following chapters we look in detail at the various instruments that go to make up the money markets. For beginners, we include a primer on financial markets arithmetic in the Appendix at the back of the book. This is required background for an understanding of interest rate mechanics.

Money market conventions

We will see from the following pages that many money market instruments trade under similar market conventions. For example, for most currencies the basis used to calculate interest on a loan assumes a 360-day year, although sterling is an important exception to this. Again, while it is the norm for many currencies to float freely, their exchange rates to other currencies set by market supply and demand, some other important currencies are pegged to the US dollar and move with that currency. A very small number of currencies are not convertible and cannot be traded in the market.

Table 1.7 shows the characteristics of a sample of world currencies. It serves to highlight the individual detail differences that exist in the market. Terms such as "day-count" and "value date" will be fully explained in the following chapters.

Practitioners with access to Bloomberg can look up individual currency details by selecting:

[Ticker] [Currency yellow key] DES <Go>.

We show this page for Australian dollars, Brazilian reals and Egyptian pounds in Figures 1.6, 1.7 and 1.8 respectively.

Country	Currency	FX rate	Day-count	Spot FX value date
Argentina	Peso	Free-floating	ACT/360	T+2
Australia	Dollar	Free-floating	ACT/365	T+2
Brazil	Real	Free-floating	ACT/360	T+3
Canada	Dollar	Free-floating	ACT/365 (domestic)	T+1
			ACT/360 (int'l)	T+2
Czech Republic	Koruna	Free-floating	ACT/360	T+2
Denmark	Krone	Free-floating	ACT/360	T+2
Egypt	Pound	Free-floating	ACT/360	T+2
Euro Area[1]	Euro	Free-floating	ACT/360	T+2
Hong Kong	Dollar	Pegged to USD, HKD 7.70 per USD 1	ACT/365	T+2
Hungary	Forint	Managed floating	ACT/360	T+2
Japan	Yen	Free-floating	ACT/360	T+2
Estonia	Kroon	Pegged to euro	ACT/360	T+2
Latvia	Lats	Pegged to Special Drawing Right (SDR)[2]	ACT/360	T+2
Lithuania	Litas	Pegged to euro, LTL 3.4528 to EUR 1	ACT/360	T+2
Malaysia	Ringgit	Pegged to US dollar	ACT/365	T+2
New Zealand	Dollar	Free-floating	ACT/365	T+2
Norway	Krone	Free-floating	ACT/360	T+2
Poland	Zloty	Free-floating	ACT/365	T+2
Singapore	Dollar	Managed floating	ACT/365	T+2
South Africa	Rand	Free-floating	ACT/365	T+2
South Korea	Won	Free-floating	ACT/365	T+2
Switzerland	Franc	Free-floating	ACT/360	T+2
Taiwan	Dollar	Free-floating	ACT/365	T+2
Thailand	Baht	Free-floating	ACT/365	T+2
United Kingdom	Pound	Free-floating	ACT/365	T+2
United States	Dollar	Free-floating	ACT/360	T+2

[1] Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovenia and Spain.

[2] The "currency" of the International Monetary Fund.

Table 1.7 Selected global currency conventions
Sources: Bloomberg L.P. and Reuters

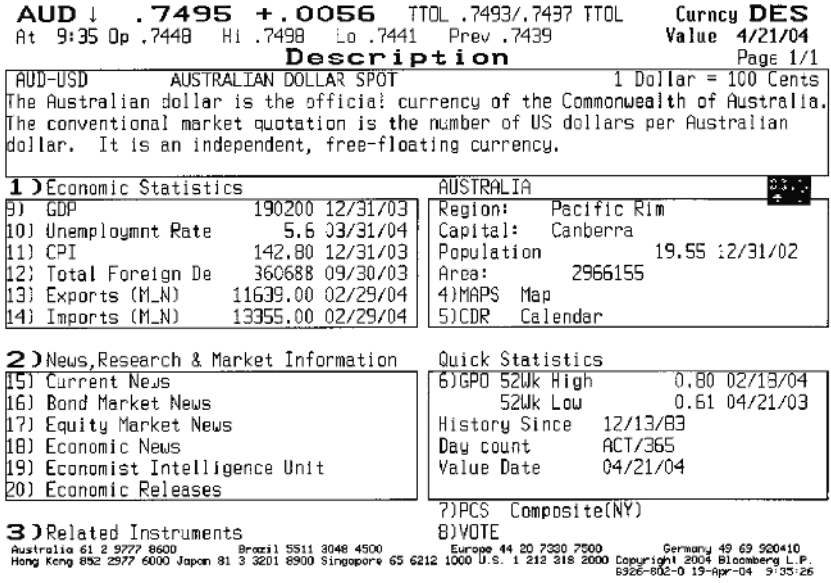

Figure 1.6 Bloomberg page DES for Australian dollars

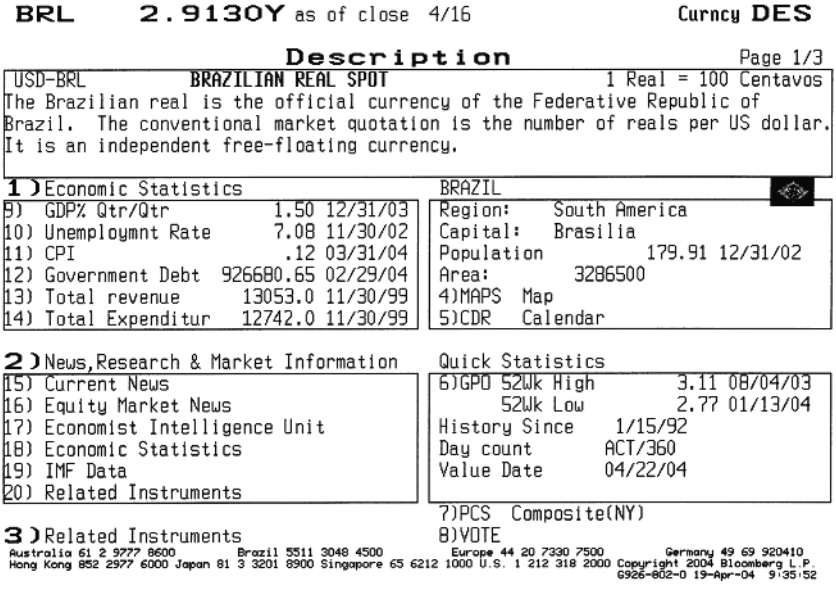

Figure 1.7 Bloomberg page DES for Brazilian real

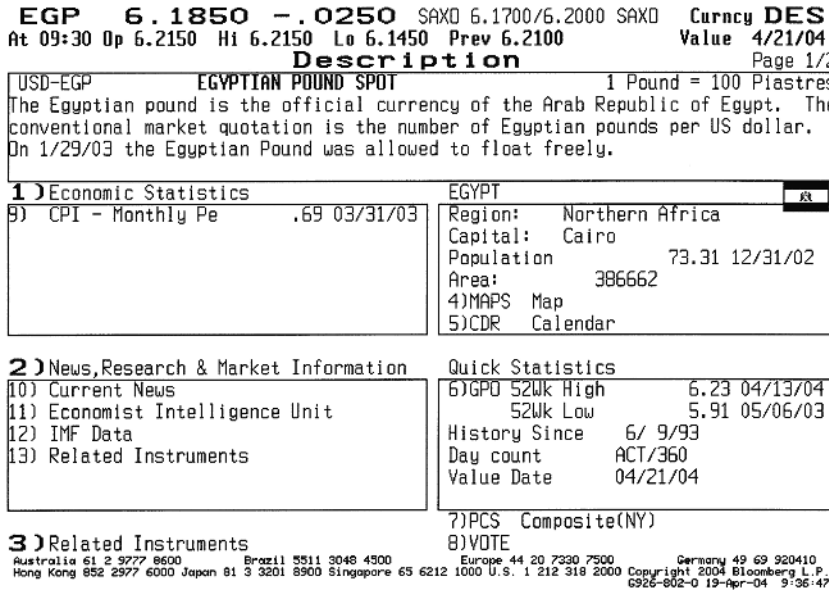

Figure 1.8 Bloomberg page DES for Egyptian pound