

# Chapter 1

## The Financial System

Every advanced financial system is composed of *participants*, *securities*, *markets*, *trading arrangements* and *regulations*. In this chapter, we examine each of these components in turn, concentrating in particular on the financial system in the UK (sometimes known as the ‘City’). We conclude by placing the current UK financial system in a temporal context.

### 1.1 Participants

There are three main classes of participant in an advanced financial system: *end-users*, *financial intermediaries* (general and specialist) and *market makers*.

#### 1.1.1 End-users of the financial system

The following identity holds at all times:

$$\begin{aligned} \text{Saving} - \text{Investment} &= \text{Increase in financial assets} - \text{Increase in financial liabilities} \\ &= \text{Net acquisition of financial assets} \\ &= \text{Net financial surplus/deficit.} \end{aligned}$$

For the economy as a whole this identity is zero, but for sectors in financial surplus the identity is positive, while for sectors in financial deficit it is negative. Typically in the UK (although not always), the household and overseas sectors will be in financial surplus and will therefore be net lenders to the financial markets, and the industrial, commercial and government sectors will be in financial deficit and will therefore be net borrowers from the financial markets. So there are two types of end-user of the financial system: *primary lenders* and *ultimate borrowers*.

The ultimate objective of an individual in the household sector, say, is to maximize the expected welfare or utility of his lifetime consumption stream. If the individual is currently not spending all his income on consumption, he will want to find a temporary repository for his current savings until they are required to finance future expenditure. This will involve the purchase of financial assets.

For a given ultimate objective, the individual's proximate objective is to allocate his surplus funds across different assets in such a way as to maximize the expected utility of the characteristics of the portfolio of assets that he holds, taking into account any *aversion to risk*, *preference for liquidity*, etc. The unpredictability of the future consumption profile, the uncertainty attached to the returns from the asset holdings (especially in real terms, taking into account the effects of inflation) and the cost of liquidating assets in terms of both transaction costs and capital value uncertainty (especially before assets have matured), all tend to combine to induce the individual to select the maturity profile of the asset portfolio to match as closely as possible the maturity profile of planned consumption.

This suggests that the optimal portfolio of an individual in the household sector is likely to be one that is held short, i.e., one that is easily liquidated at low cost. The more uncertain the future consumption plan, the more uncertain the portfolio returns, the greater the costs of liquidating assets and the lower the confidence in the solvency of the ultimate borrower, the more liquid will be the optimal portfolio. In the extreme case, only the most liquid asset will be held, and this may not necessarily be a financial asset; for example, during the German hyperinflation after the First World War, cigarettes were more liquid than cash.

Without loss of generality, we can say that the preferred position for an individual in financial surplus is to 'lend short'.

The ultimate objective of a firm, on the other hand, is to maximize the expected utility of its profit stream. If we assume that the firm has a *neutral attitude to risk*, this can be shown to be equivalent to maximizing the long term value of the firm. In order to do this, the firm will need to invest in real plant and equipment. It does this for two reasons. First, it will have to replace worn out or obsolete equipment: this it must do simply to maximize profits and the value of the firm at a given level of output. This is called *replacement investment*. Second, the firm can generate further profits from expanding the level of its activity. This requires investing in additional plant and equipment, a process known as *net investment*. *Gross investment* is the sum of replacement investment and net investment, and it has to be financed in advance of the revenues generated by using the plant and equipment. In addition, there is considerable uncertainty attached to these future revenues. In the extreme case, demand patterns might change and the expected revenues might not materialize at all. So long term investment involves substantial risk.

There are a number of ways of financing long-term investment:

- 1 It can be financed out of the retained earnings from the existing activities of the firm.
- 2 It can be financed by taking out bank loans or by issuing long-term marketable corporate bonds.
- 3 It can be financed by issuing new equity or share capital, a method that extends the ownership of the firm because the new shareholders become part-owners in it, having the right to participate in future decision making and to receive a stream of dividends from its earnings.

So we may summarize the firm's position as follows. Despite a pool of retained earnings, the firm is typically in deficit and wishes to finance that deficit on a long-term basis; that is, it wants to be in a position to 'borrow long'.

One of the fundamental problems in finance therefore is to match the preferences of the surplus sector to 'lend short' with those of the deficit sector to 'borrow long'. Hicks (1939) called this the 'constitutional weakness' of unintermediated financial markets. How can this constitutional weakness

be resolved? Can it, for example, be resolved by the price mechanism? If there is direct trading between the household sector and the industrial and commercial sector, why does the yield on long-term securities not rise sufficiently to induce the individual in the household sector out of his *preferred habitat*, and why does the yield on short-term securities not fall sufficiently to induce the firm out of its preferred habitat? The probable answer is that the yields at the long end would be so high that there would be very little long-term investment, while the yields at the short end would be so low that there would be very little short-term saving. It was this constitutional weakness that led to the development of the second major class of participant in the financial markets, *financial intermediaries*.

### 1.1.2 General financial intermediaries

The simplest role of a financial intermediary is the pure *agency* or *brokerage* role, that is, acting as an *agency broker* for a primary lender or an ultimate borrower in the purchase or sale of a security. In return, the intermediary will receive a fee from the party for whom he is acting as agent. Financial intermediaries can also act on their own account by buying and selling securities for a profit. Such intermediaries are known as *broker-dealers*.

However, the general role of financial intermediaries is considerably more important than this, because they are in a position effectively to resolve the constitutional weakness implicit in direct trading between individuals. Rather than simply on-lending funds that have been deposited with them (i.e., rather than just redistributing liquidity), they create a completely new financial security by issuing a type of liability that the surplus sector prefers to hold as an asset (i.e. the *intermediate security*) and holding as an asset the type of liability that the deficit sector wishes to issue (i.e. the *primary security*). This means that they issue short-term liabilities and hold long-term assets, so that the liability side of their balance sheet is much more liquid than the asset side. But this balance sheet mismatch does not imply a high risk of insolvency, because financial intermediaries maintain sufficient liquidity to meet their maturing liabilities. This is because they make use of economies in the scale of their operations to give themselves sufficient liquidity to meet anticipated liquidations and sufficient illiquidity to fulfil their obligations as providers of long-term investment finance. The ultimate borrower is able to get the required investment funding on long-term guarantee, and the primary lender is able to get both liquidity and reduced risk on his lending. In return for this extra security, the lender will be prepared to accept a lower rate of interest, so that the borrower gets his finance at lower cost than otherwise.

The most important activity engaged in by financial intermediaries is that of *asset transformation*. The intermediary has to transform the extremely risky liabilities of ultimate borrowers into safe assets for primary lenders; it has to transform liabilities with long-term maturities into assets that can be readily liquidated, and it has to transform the high costs involved in direct trading between end-users into the low costs associated with intermediation.

**Transformation of risk.** Financial intermediaries are able to reduce risk through risk spreading and risk pooling. The type of risk that financial intermediaries are able to reduce in this way is known as *specific risk*.

One example of specific risk is the risk of a borrower being unable to pay the interest or repay the principal when it is due. (This is also known as *default* or *credit risk*.) The financial intermediary therefore has to assess the risk on each loan that it makes. This is a question of information collection, and it involves the problem of *asymmetric information* sets. A borrower has more information about himself in terms of his ability to repay loans than does any lender. This is the familiar problem of

*adverse selection*: the lender has difficulty in distinguishing good-quality debt from bad-quality debt. This is to the disadvantage of borrowers as well as lenders, because bad-quality debtors may drive out good-quality debtors. The problem is especially important for new or small firms about which there is little or no publicly available information. The large scale of operations of a financial intermediary compared with that of an individual lender enables the intermediary to be much more efficient in gathering information than the individual acting on his own. Once the risk class of the potential borrower and of the prospective investment project have been assessed, an appropriate risk-loading factor can be incorporated into the interest charge for the loan. The intermediary can then control for overall risk by *risk spreading*, that is, by spreading any risky investment across a sufficiently large number of lenders and having adequate capital and reserves to cover the actual defaults that will almost certainly occur from a given set of loans: a classic example is the *syndicated loan*. In this way, financial intermediaries are able to transform high-risk assets (borrowers' loans) into low risk liabilities (lenders' savings).

Another example of specific risk is the uncertainty attached to the income stream derived from an investment project, since the value of the equity investment will rise if the underlying capital stock is used productively and will decline or even vanish if it is used unproductively. (This risk is sometimes called *equity risk*.) It is possible to reduce this type of risk by diversification or *risk pooling*, that is, by constructing portfolios of assets that exploit any offsetting risks between the returns on assets in the portfolio and thereby reducing overall risk. But a sufficiently well-diversified portfolio contains a relatively large number of assets, and this, together with the high transaction costs involved in trading in assets, makes it difficult for individual savers to obtain an adequate pooling of assets at an acceptable cost.

The large scale of financial intermediaries, on the other hand, allows them to exploit fully the benefits from risk pooling. In addition, the unit costs of operating at this level are much lower for the financial intermediary than for the individual because marginal transaction costs decline with the volume of transactions and any fixed costs are spread over a wider total volume of transactions. A classic example of risk pooling is a unit trust or mutual fund.

However, not all risk can be diversified away, either by spreading or by pooling. There will always be some risk that has to be borne, however effective financial intermediaries are in transforming it. This irreducible risk is known as *market risk*, and will be discussed at some length later in the text.

**Transformation of maturities and provision of liquidity.** The second important role of financial intermediaries is the transformation of maturities and the provision of liquidity. An important key to the success of financial intermediaries is the ability to hold assets that are less liquid (e.g. because of greater maturity) than the liabilities that they issue and yet to remain solvent. If, in addition, intermediaries are willing to act as principals in the sense of guaranteeing to repurchase immediately any of the liabilities that their lenders wish to sell, then this is equivalent to guaranteeing complete liquidity. By structuring the maturity profile of their asset portfolios satisfactorily, intermediaries can ensure that they are able to meet any likely claim on their liabilities.

This success depends to a great extent on the large scale of operations of financial intermediaries, which allows them both to estimate fairly accurately what proportion of their liabilities is likely to be liquidated over a particular period and to be in a position to replace the liquidated funds with new sources of funds. Both of these activities can be more easily carried out by a large-scale organization than a small-scale one. For example, the economies of scale of financial intermediaries considerably widen the opportunity set of these intermediaries for tapping different markets compared with the

options available to individuals: this is the case of economies leading to asymmetric opportunity sets. An unscrupulous borrower would be less willing to defraud a large financial intermediary than a single individual when both might very well be equally ignorant of his true intent. This is not a question of differential information or of differential costs: it is a question of differential opportunities.

The additional liquidity provided by the maturity-transforming activities of financial intermediaries means that lenders are prepared, in return, to accept lower interest rates, and so borrowers, in turn, are charged lower interest.

**Transformation of transaction costs.** The third important role of financial intermediaries is to reduce the transaction costs associated with trading in securities between borrowers and lenders, and again the scale of operations of financial intermediaries helps to make this possible. Examples of the different ways in which intermediaries reduce costs include:

- 1 The provision of convenient and safe locations for borrowers and lenders to transact, which reduces search costs.
- 2 The provision of standardized forms of securities, which reduces the information costs from examining a wide range of financial instruments and offers convenience of denomination to borrowers.
- 3 The conducting of activities on a large scale and the specialization in different markets, which reduces operating costs and allows intermediaries to acquire expertise which can be passed on to their clients (for example, marginal and therefore average brokerage costs decline as the volume of transactions increases).
- 4 The creation of tax-efficient financial instruments, which help to reduce capital gains, income or inheritance tax costs.

These cost reductions can be passed on in the form of lower transaction-cost loading factors in interest charges, and so can narrow the difference between borrowing and lending rates.

**Types of general financial intermediary.** There are two main types of general financial intermediary: *bank financial intermediaries* (BFIs) and *non-bank financial intermediaries* (NBFIs). There are two main types of BFI: retail (or high street) banks and investment (or wholesale or merchant) banks.

*Retail banks* deal mainly with households and small businesses. They issue deposits to members of the household and company sectors in surplus and make loans to members of those sectors that are in deficit. They are also involved in providing money transmission services. They are obliged to observe a cash ratio (a ratio of cash to deposits) which gives them sufficient liquidity to meet any likely level of withdrawals from their deposit accounts without having to recall loans. From experience, the banks know that, over a given period, the net flow of withdrawals will be a very small percentage of deposits and will vary within a very narrow range. Therefore, as long as they keep sufficient liquid reserves, they will be able to meet these withdrawals. The remainder of the deposits are then available for loans.

Depositors gain because the BFIs take away the risk of default from borrowers and guarantee a virtually costless withdrawal scheme and a stable return on deposits. Borrowers gain because the banks take away the risk of early recall of loans, guarantee the amount and term of loans and associated

repayments, and offer a stable interest cost (which may be fixed for fixed-term loans or variable for overdrafts). The banks gain because they make their profit from *intermediation*, that is, from the difference between borrowing and lending rates. In return, they accept the risk of default and must maintain a reserve of funds to meet the defaults that arise, although the banks also use credit assessment techniques to develop a specialist knowledge of their potential borrowers in order to minimize default risk.

Retail banks both in the UK and elsewhere have to abide by a common set of *capital adequacy standards* which were established by the Basle Committee of Central Bank Regulators (part of the Bank for International Settlements) in 1987 and came fully into operation in 1993. These standards specify a minimum ratio of bank capital to risk-weighted assets. Some of the assets held by a bank such as cash and gold bullion are zero risk-weighted and so the banks do not have to provide capital to support these assets. Other assets are 100% risk-weighted and the full book value of these assets is included in the capital adequacy calculation; examples are loans to non-bank customers and loans to banks and public sector entities outside the OECD (Organisation for Economic Co-operation and Development). Lying between these extremes are 10% risk-weighted assets (e.g. holdings of fixed-interest securities issued by OECD governments with maturities under a year), 20% risk-weighted assets (e.g. holdings of fixed-interest securities issued by OECD governments with maturities over a year and loans to banks and public sector entities located in the OECD), and 50% risk-weighted assets (e.g. residential mortgages). Also included in the calculation are the net short open foreign exchange position of banks and off balance sheet items such as standby letters of credit and forward asset purchases. Once the risk-weighted assets have been added up, the banks must have capital equal to at least 8 per cent of the value of the total risk-weighted assets. The capital is divided into two types, *Tier 1* or *core* capital and *Tier 2* or *supplementary* capital. Tier 1 capital comprises permanent shareholders' capital, in the form of either equity or perpetual non-cumulative preference shares. Tier 2 capital comprises subordinated debt instruments, provisions and revaluation reserves (which covers the revaluation of the bank's own fixed assets, mainly its premises). Tier 1 capital cannot be less than 4 per cent of total risk-weighted assets. It is possible for banks to convert Tier 2 capital into Tier 1 capital. For example, in February 1989, National Westminster Bank made a scrip issue to shareholders capitalising £600m of property revaluation reserves. The effect was to raise Tier 1 capital from 5.5 per cent to 6.2 per cent, with the total capital ratio standing at 9.2 per cent.

*Investment banks* deal mainly with large corporations, institutional investors, governments and local authorities. Despite being called 'banks', they do not generally take deposits from the public. Instead they act as agents for their customers. A typical investment bank performs the following functions: corporate finance, asset management, export finance, international investment advice, agency broking and market-making. The bank can also act as an agent of another, possibly overseas bank: this function is known as *correspondent banking*. Accounts kept by one bank with a correspondent bank are called *nostro accounts*.

The first function of an investment bank is that of corporate finance. This involves advising on, arranging (this function is known as *origination*) and underwriting the finances for the investment programmes of its corporate clients. The bank's activities can range from providing corporate loans, through arranging the initial flotation on a stock exchange, to issuing a bond to finance a corporate takeover (this latter activity is generally undertaken by the mergers and acquisitions or M&A team). Corporate loans are provided by the *commercial banking* (sometimes called the *merchant banking*) division of the bank. These can be in the form of corporate credits, syndicated loans (where a large-scale loan is provided by a syndicate of banks), structured finance (sometimes called project finance, where the interest payments on the loan are linked to the cash flows from a large scale project, such as the

Channel Tunnel, where these cash flows are delayed until the project comes on stream) and large scale, specialist loans (such as those involved with property, aviation or shipping finance). This division also provides other credit-related services such as leasing, factoring, forfaiting, and even sovereign debt reschedulings. It will also operate the global credit policy of the bank, including credit monitoring and administration, and counterparty and country risk analysis. In contrast, securitized products (such as bonds and shares) are arranged by the *corporate banking* (sometimes also called the *investment banking*) division of the bank. The finance is drawn mainly from institutional investors (such as pension funds). The bond or equity issue is underwritten by the bank, so that any shortfall in funds raised has to be met from the bank's own resources. Investment banks are also involved in asset management. This can range from managing the short term cash flows of their corporate clients (known as *treasury management*) through to the management of long-term bond and equity portfolios for their institutional and private clients (in the latter case this is known as *private banking*); in many cases they are also responsible for the safe custody of these securities (this is known as *global custody*).

In addition to giving advice and arranging finance for their domestic customers, investment banks provide advice to international clients and arrange export finance (including letters of credit). Finally, and much more recently (since the Big Bang in October 1986), investment banks have begun to engage in agency broking and security market making. They have divisions that are involved in the purchase and sale of securities for clients, and divisions that are engaged in market-making in those securities. (Market making will be discussed later.) The main activities here are the issuing, trading and distribution of financial products.

An investment bank not only provides services to clients, it also operates on its own account. The main examples of this are proprietary trading and equity banking. With *proprietary trading*, the bank uses its own capital to make money from the movements in the prices of financial products; a typical example is the bank's forex trading, whereby the bank attempts to make money from movements in foreign exchange rates. With *equity banking*, the bank itself makes a direct equity investment in a new company, as opposed to arranging a loan or issuing equity which is purchased by, say, a pension fund; the bank hopes to make an adequate return on this investment over the medium term.

The bank must also be concerned about both its own short-term liquidity and long-term solvency. It will therefore have a liquidity control committee that controls and monitors liquidity and all positions with respect to currencies, interest rates and maturities, and an asset and liability management committee for the whole bank whose objective is to maximize the bank's net interest income and return on capital. Related to this there will be a credit committee (which monitors on-going credit exposures, ensures credit policy standards are met and maintained, and reviews problem loans and co-ordinates appropriate action) and a risk management committee (which monitors all business areas where market risks arise and regularly reviews risk limits).

The main categories of NBFIs are finance houses, building societies, insurance companies (both general and life), pension funds, unit trusts, investment trusts and open-ended investment companies (OEICs). This constitutes an important group of institutional investors in Britain (and their investment interests are collectively represented by the Institutional Shareholders' Committee which was set up in the 1970s). They developed for various different and diverse historical reasons, but they can be divided into five broad classes:

- 1 NBFIs to finance the short term durable expenditure of members of the household sector, e.g. *finance houses* which finance hire purchase agreements.
- 2 NBFIs to finance long-term durable expenditure of the members of the household sector, e.g. *building societies* to finance house purchase.

- 3 NBFIs to finance the long-term contingent claims and retirement pensions of the household sector, e.g. *life assurance companies* and *pension funds*.
- 4 NBFIs to finance general contingent claims, e.g. *general insurance companies*.
- 5 NBFIs to facilitate the risk spreading and risk pooling of the savings of the members of the household sector in surplus, e.g. *unit* and *investment trusts* and *open-ended investment companies*.

In each case, there is a mutual benefit enjoyed by both the surplus and deficit sectors. For example, with finance houses, members of the household sector receive their durable goods immediately and are able to pay for them smoothly over time, while members of the company sector face a high demand for their goods and services which is not subject to credit constraints.

In every case, the success of NBFIs at intermediation depends closely on the underlying success of the risky activities undertaken by the company sector, i.e. on the underlying performance of the real economy. For example, the market value of Britain's housing stock is generally about three times the market value of British industry (as measured by the market capitalization of the London Stock Exchange); and part of the success of building societies lies in the fact that the household's liability, the mortgage commitment, is denominated in nominal terms, while the household's asset, the house, grows in real terms, and hence the house-owning members of the household sector experience an increase in their real marketable wealth. But this can be sustained only if British industry is able to generate the increasing level of real incomes necessary to finance new mortgages at the appropriate level. If British industry and hence real incomes collapsed or even just declined, then the market value of houses would fall and households would then hold fixed nominal debts on declining real assets. This would tend to have the effect of reinforcing the decline in industry, either by reducing household mobility, thereby adding to industrial inefficiency, or by forcing households to declare themselves bankrupt if they did have to sell their houses in order to move. In a similar way, the ability of assurance companies and pension funds to guarantee future annuities, such as pensions, depends crucially on the ability of industry to grow in a sustained and stable manner. And again, the benefits from the risk-reducing activities of unit trusts are of little use if there are no anticipated gains to be made from the risky activities of British industry, but only anticipated losses.

Finally, it is important to note that the historical distinction between BFIs and NBFIs is disappearing over time. As a result of technological innovation, increasing competitive pressures and government legislation (such as the 1986 Building Societies Act and the 1987 Banking Act), the traditionally separate areas of activity of banks and non-banks are rapidly disappearing, so that banks, for example, have become involved in housing finance, while building societies have become involved in money transmission services. The outcome is likely to be the emergence of a general or *universal banking system*, in which a single banking group provides the complete range of financial intermediation services.

### 1.1.3 Specialist financial intermediaries

Specialist financial intermediaries are also involved in such activities as the transformation of risk and the provision of liquidity. But their participation in the markets tends to be more active and more short-term than is the case with general intermediaries. They may also act as principals on their own account rather than as brokers for others. The specialists cover the activities of arbitrage, hedging and speculation.

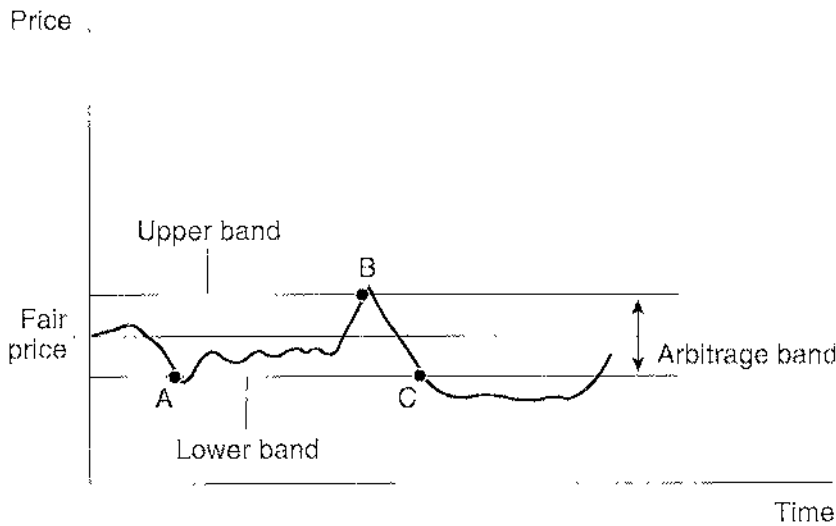
*Arbitrageurs* are specialist financial intermediaries who act to ensure both that the prices of securities do not get out of line with their *fair* or *fundamental values*, and that the prices of identical securities traded in different market-places do not get out of line with each other. We can consider some examples of the two cases.

An equity arbitrageur will constantly check the market price of a share against its fair price based on a fundamental analysis of the firm and its prospects. In an efficient market without transaction costs, the market price of a share would never get out of line with its fair price. But in the real world, the market price will wander around the fair price but within a band (called an *arbitrage band*; see Figure 1.1). The width of the arbitrage band will depend on the level of transaction costs; the higher

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**Figure 1.1** Arbitrage bands: the case of a single market

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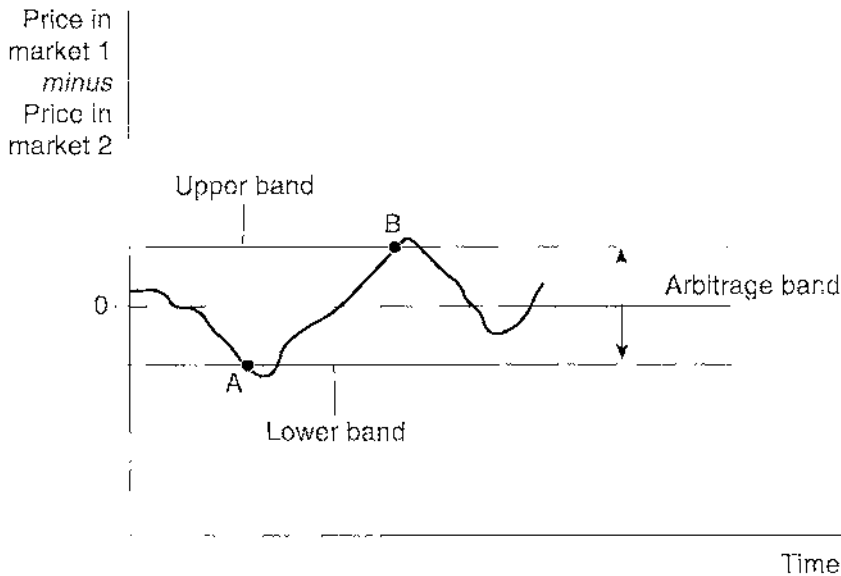
the transaction costs, the wider the band. As soon as the share price wanders outside the band, it becomes profitable for the arbitrageur to act. If the market price falls below the lower band (as just past A in Figure 1.1), it becomes profitable for the arbitrageur to buy the share in large volumes because the share is underpriced compared with its theoretical value. The arbitrageur then waits for the market price to correct itself by rising sufficiently to lie again within the arbitrage band, at which time he sells out and takes his profit. If the market price rises above the upper band (as just past B in Figure 1.1), it becomes profitable for the arbitrageur to sell shares and wait for the market price to fall before repurchasing them. If the arbitrageur does not actually own the shares, the same result can be achieved by short-selling the shares (examined in section 1.4.3 below) or by buying put options on the share (examined in Chapter 9). In all cases, the arbitrageur is not interested in the absolute *level* of the share price; he is interested only in the *difference* between the market price and the fair price.

Arbitrageurs behave in a similar way when dealing with identical securities traded in different markets, e.g. foreign exchange traded in New York and London. What is important in this case is the difference in price between the two markets. Again, there will be arbitrage bands, as shown in Figure 1.2. If the price in market 1 falls too far compared with the price in market 2 (as just past A in Figure 1.2), it becomes profitable for the arbitrageur to buy the security in market 1 and sell it in

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**Figure 1.2** Arbitrage bands: the case of two markets
 

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market 2. If the price in market 1 rises too far compared with the price in market 2 (as just past B in Figure 1.2), the arbitrageur buys in market 2 and sells in market 1.

The second case is an example of *pure* or *riskless arbitrage*, because the security purchased in the cheaper market can be immediately resold in the dearer market. However, the first case involves considerable risk. This is because it is possible for an inefficiency in the market to persist for some time. This is shown to the right of C in Figure 1.1. The arbitrageur might have bought at C with borrowed funds and the position might then have to be held for some time before the market inefficiency is removed.

*Hedgers* are specialist financial intermediaries who wish to lay off risks that they currently face or expect to face in the future. The following are examples of the kinds of risk that hedgers might wish to lay off: they might hold long positions in a cash market portfolio of shares and wish to lay off the risk of share prices falling; they might have debts at market-related rates of interest and wish to lay off the risk that interest rates rise; they might be expecting to receive funds denominated in US dollars in three months' time and wish to lay off the risk that the dollar falls relative to sterling; they might be expecting to make payments in yen in six months' time and wish to lay off the risk that sterling falls against the yen. The list is endless.

Many end-users of the financial system who hold stable long-term portfolios of securities may also be active short-term hedgers and so could be classified as both end-users and hedgers. Hedging itself is also included as a form of financial intermediation because hedgers can be actively engaged in intermediating between different financial markets, as we shall now see.

How do hedgers in practice lay off the risk that they face? The principal means of doing this is by using the market for *derivative securities*, such as futures and options (as opposed to the *spot* market for *cash securities*). Take, for example, the case of a portfolio of securities with the risk that

share prices might suddenly fall. The position could be hedged by selling stock index futures contracts (examined in Chapter 8) or by buying stock index put options (examined in chapter 9), in other words by taking out a kind of *portfolio insurance*. Any fall in the value of the cash portfolio could be exactly offset by increases in the value of the futures or options position, thereby effectively locking in the value of the cash portfolio at a predetermined level. The interest rate payable on loans could be locked in by selling interest rate futures contracts or interest rate call options. In a similar way, exchange rate futures and options could be used to hedge long or short currency exposures.

While it is possible to use futures and options to create a 'perfect' hedge and so perfectly protect the cash position from adverse changes in spot security prices, the hedge will give good protection only if the change in spot prices is small. If there are substantial changes in spot prices, the hedge would have to be regularly rebalanced. In this case hedgers will be frequently intermediating between cash, futures and options markets.

*Speculators* or *traders* are specialist financial intermediaries who attempt to make profits by taking a view on where markets are moving. They are not interested in the current level of prices, only in predicting where prices are about to move next. If speculators are expecting the prices of certain securities to rise, they will take long (unhedged or uncovered) positions in those securities. If they are expecting prices to fall, they will take short (unhedged or uncovered) positions. Because transaction costs in cash markets are sometimes higher than in the markets for derivatives, speculators often prefer to take positions in futures and options markets rather than in cash markets.

Speculation is therefore a gamble as to where the markets are moving. If speculators are successful, they can make quick profits. If they are unsuccessful, they can make equally quick losses. To be successful overall, speculators must be able to 'follow the money': that is, they must know both when to 'run their profits' and 'cut their losses'.

Because much speculative activity is conducted with borrowed funds, speculators tend to hold positions in the markets for only very short periods of time. For example, speculators do not generally like holding overnight positions in case adverse news materializes when the markets are closed. Speculators can be in and out of markets several times a day, usually for periods of no more than an hour or so. Sometimes the time periods are much less than this, even as short as a few minutes. For example, there is some evidence from financial futures markets that speculators on average make money if they take futures positions for three minutes or less, and on average lose money if they take positions for longer than three minutes.

Nevertheless, despite being directly comparable with gambling, speculation is very important for the efficient running of financial markets. This is because the most important side benefit from the activities of speculators is the provision of liquidity to the market. If there is a continuous flow of both buy orders and sell orders from speculators while the market is open, then the market will be highly liquid. This, in turn, requires that there is a heterogeneity of view among speculators, with a good balance between speculators believing prices are going to rise and those believing prices are going to fall. Occasionally, however, the balance of view lies in one direction only, with the majority of speculators believing that prices will fall, say. In this case, the liquidity of the market is one-sided: it remains very easy to buy securities but very difficult to sell them. This is what happened on Black Monday (19 October 1987), for example.

However, under most market conditions, where there is a heterogeneity of view among speculators, they will provide good two way liquidity to the market. This is essential for an efficient market and for the activities of other market participants such as hedgers, and long-term investors and fund-raisers. If market liquidity is poor, arbitrageurs will not be able to create an efficient market, hedgers will not be

able to lay off risks, and long-term investors and fund-raisers will not be able to use the capital markets to achieve their objectives.

The second most important side benefit from the activities of speculators is the provision of insurance to hedgers. Hedgers wish to lay off risks from the long or short cash market positions that they hold. In order to this, a hedger has to find someone else who is willing to take the opposite position to himself. This role is undertaken by the speculator, provided he is compensated for doing so. In this way, speculators can be induced to provide *insurance* to hedgers.

### 1.1.4 Market-makers

*Market-makers* (or *dealers*) also intermediate between the end-users of the financial system, but unlike general financial intermediaries, they do not act as agents for the end-users. Instead they act as principals, buying and selling securities for their own account. To do this efficiently, they must hold an inventory of securities on their books, which grows when they purchase securities and declines when they sell them. They are rewarded for their activities in one of two ways. The first way is through the *bid-offer spread*, the difference between the *bid price* at which they will buy a security and the higher *offer price* at which they will sell the security. The second way is through taking a position (or speculation). If they believe that prices will rise in the near future, they will increase their inventory holdings; while if they expect prices to fall, they will reduce or even eliminate their inventory holdings.

## 1.2 Securities

The second component of the financial system is *securities* (sometimes called *investment products*). Every financial transaction creates a security which is simultaneously a financial asset (to the holder) and a financial liability (to the issuer). A security is a claim against real resources either in the form of an income stream or in the form of physical capital or assets. It should never be forgotten that, however bizarre and exotic financial securities can be, the entire financial system is and always will be derivative to the real economy. A substantial part of this book is concerned with describing and valuing different types of securities, so this section will discuss securities briefly and in very general terms.

Securities can be classified in the following ways. They can be classified according to:

- 1 Their issuer.
- 2 Their currency of denomination.
- 3 Their ownership and participation rights.
- 4 The collateral pledged against them.
- 5 Their term to maturity.
- 6 Their income payments.
- 7 The predictability of their capital value.
- 8 Their degree of liquidity.

- 9 Their degree of reversibility.
- 10 Their tax treatment.
- 11 Whether they are derivatives of another security.
- 12 Whether they involve composite securities.

Securities can be classified according to who issues them because this helps to determine the degree of risk attached to them. Two otherwise identical bonds will differ because one was issued by the government while the other was issued by a private corporation. The government bond (also known as a *gilt-edged bond* or simply a *gilt*) has virtually no risk of default, whereas the corporate bond has some risk of default.

Securities can also be classified according to their currency of denomination. For example, most bonds traded in the UK will be denominated in sterling. Sterling-denominated bonds issued by a domestic resident are known as *domestic bonds*, while sterling-denominated bonds issued by a foreign issuer are known as *foreign bonds* or *bulldog bonds*. But many bonds traded in the UK are denominated in currencies other than sterling, such as US dollars or Japanese yen: such bonds are known as *eurobonds*.<sup>1</sup>

Securities can also be classified according to whether they are equity or debt, i.e. according to their ownership and participation rights. Equity-type securities (such as *common stock*) involve rights of both ownership and participation. That is, the holders of common stock own the underlying physical assets of the corporation and also have the right to participate in both the profits and the decision-making of the company. (In practice, they delegate their decision-making powers to a management group.) Debt-type securities (e.g. *corporate bonds*) do not involve rights of ownership or participation. Holders of such securities are merely creditors of the firm. If the firm defaults on its contractual obligations to the debt-holders, they can appoint an administrator under the terms of the Insolvency Act 1986 to look after their interests. An exception here is *income bonds*, where failure to pay interest does not in general lead to insolvency. Some securities have rights of ownership but not participation; certain classes of equity (i.e. non-voting shares) fall into this category, but the most important example is preference shares. *Preference shares* have some of the characteristics of equity and some of the characteristics of debt; while classified as equity in terms of ownership, they are classified as debt in terms of participation in profits and decision-making. This is because the obligation of firms to preference shareholders is fixed, although, because they are also treated as owners, they are unable to have the firm declared insolvent if it does not meet those obligations.

Securities are also classified according to the collateral that is pledged against them. This is particularly important for debt securities because it helps to determine the riskiness of the debt. The most secure form of debt and therefore the least risky is *debentures*: these are secured against specific assets of the firm. The least secure and therefore the most risky form of debt is *unsecured loan stock*: holders of this rank with other unsecured creditors in the event of default. In turn, particular categories

<sup>1</sup> Following the introduction in January 1999 of the *euro* as the currency for countries participating in European monetary union, there has been some confusion over terminology. The securities that were known as 'eurobonds' are now frequently referred to as 'international bonds' in listings of prices in the financial press. The term 'eurobond' remains, though, in informal use. Similarly, 'eurocurrency' interest rates are now formally known as 'international currency rates' although the CMB, for instance, still lists a 'eurodollar' short-term interest rate futures contract (see Chapter 8). In the absence of a new terminology that is universally accepted, we will continue to use such terms as 'eurobonds', 'eurocurrencies' and 'euromarkets' as traditionally defined.

of debt can be subordinated or unsubordinated. For example, subordinated debentures rank below unsubordinated debentures in the event of default.

Some securities have fixed maturity or redemption dates, some have variable maturity dates, while others have no maturity dates at all. A 3-month Treasury bill is an example of a short term security with a fixed maturity date. At the end of the period, the holder receives the face value of the bill, namely £100. A government bond with a single redemption date is an example of a long-term security with a fixed maturity date (e.g. Exchequer 10.5 per cent 2005 matures in the year 2005, at which time, the holder receives the face value of the bond, also £100). Some securities have variable maturity dates, either because they are callable or because they are puttable. A *callable bond* is one that can be redeemed at the option of the issuer; e.g. Exchequer 12 per cent 2013-17 can be redeemed by the government on any one of the coupon payments dates between 2013 and 2017. Similarly, if the bond has a purchase fund or sinking fund attached to it, a fraction of the bonds will be retired each year before maturity, e.g. by lottery. A *puttable bond* is one that can be redeemed at the option of the holder. A *convertible bond* is an example of this because it can be converted at the option of the holder either into another bond or into common stock and so the original convertible will have variable redemption dates. Some securities have no maturity dates at all. Examples of this are current and deposit accounts, perpetual floating rate notes and irredeemable bonds (e.g. 2.5 per cent Consols), preference shares and equity. Current and deposit accounts can, of course, be closed, in which case the security as such disappears; but if they are not closed, they will survive indefinitely. The other examples will also survive indefinitely unless they are terminated through insolvency, for example.

Securities can be classified according to their income payments. Some securities pay income monthly (certain deposit accounts), quarterly (certain deposit accounts and one government bond, i.e. 2.5 per cent Consols), semi-annually (all other government and local authority bonds, bulldogs, most corporate bonds, preference shares and equity) or annually (certificates of deposit, eurobonds). Some securities never make explicit income payments at all. The reward from owning them accrues entirely in the form of capital appreciation: they therefore sell at a discount to their face value (Treasury bills, commercial bills, commercial paper, bankers acceptances, zero-coupon bonds). Some securities make fixed income payments (e.g. fixed coupon bonds, income bonds, preference shares), while for others (e.g. deposit accounts, variable-rate gilts, index-linked gilts, equity), the payments vary for one reason or another. With deposits and variable-rate gilts, the interest payments are linked to current market interest rates; with index-linked gilts, the interest payments are linked to the retail price index; while with equity, the dividends depend on such factors as the firm's profitability, retained earnings and its current investment programme.

The predictability of capital value provides another way of classifying securities. This depends partly on whether or not the security is marketable. For non-marketable securities such as deposits, the value of the principal is always completely certain, at least in nominal terms. For some marketable securities, the capital value is perfectly predictable only at certain times. For example, with government bonds having a single redemption date, the capital value is known with certainty only on the maturity date. At other times, the capital value is uncertain, although the known terminal value of such bonds helps to place bounds on the possible range of capital values prior to maturity. A similar situation arises with Treasury bills; other things being equal, the value of a Treasury bill will rise between issue and redemption in a reasonably predictable way to reflect the accrued interest on the bill. For other securities, the capital value can never be perfectly predicted at any future date; the best example here is equity. Also, it is difficult, if not impossible, to place bounds on the capital values of such securities: equity has no theoretical finite upper bound to its value.

The degree of liquidity and reversibility are measures of the marketability of different securities.

*Liquidity* is measured by the time and/or cost of converting a security into cash. A perfectly liquid security can be converted into cash instantaneously and at zero cost. Only cash itself has this property (by definition). Even securities that are regarded as very close substitutes for cash, such as current accounts, are less than perfectly liquid; it takes time to go to the bank to cash a cheque and there is also some cost (often implicit) to cashing a cheque. Time and cost are, of course, substitutes that can be traded off against one another. For example, a deposit account requiring seven days' notice of withdrawal can be liquidated either instantly but at the cost of losing seven days' interest, or at no cost, if seven days' notice is given. All other securities (apart from cash) are therefore less than perfectly liquid. For example, to convert bonds or shares into cash involves time (although with the technology currently available the time required to liquidate securities has been reduced to an absolute minimum) and cost in the form of brokerage commissions.

*Reversibility*, on the other hand, is measured by the bid-offer spread. If a security is perfectly reversible, it is possible (in the absence of brokerage commissions) to move from cash into that security and immediately back into cash without any loss of value. Only cash and other non-marketable securities such as deposits are perfectly reversible. All marketable securities are imperfectly reversible, because the market-maker's spread has to be paid when the security is traded.

So liquidity and reversibility are different but related aspects of the *marketability* of securities. A market involves both brokers and market-makers. The size of the broker's commission defines the degree of liquidity of a security, while the size of the market-maker's spread defines the degree of reversibility of a security. A security is highly marketable if it is both highly liquid and highly reversible. A security is regarded as non-marketable if it is illiquid or irreversible. For example, the pension fund assets of a non-retired worker are non-marketable because they are both completely illiquid and irreversible: there is no price at which they can be converted back into cash before retirement. But note that deposit accounts, despite being very liquid and perfectly reversible, are also non-marketable: they cannot be sold to another individual.

The tax treatment of securities is another important way of classifying securities. Of course, the incidence of taxation falls on individuals and corporations rather than on the securities themselves. The payment of tax therefore depends on the circumstances of those individuals and corporations. In general terms, income from securities attracts income or corporation tax, while realized capital gains attract capital gains tax. But there are many exceptions to this, as the following examples show. Tax-exempt organizations such as charities do not have to pay income tax or capital gains tax on their investments. Gilt-edged securities are not liable for capital gains tax. Individuals or corporations who trade rather than invest in securities are liable for income or corporation tax on all the proceeds of their trading whether these are in the form of income or capital gains. The proceeds on discount instruments such as Treasury bills or commercial paper attract income tax even though no explicit interest is paid. Some securities, e.g. gilts, are free of tax to residents abroad (FOTRA). The income on many other securities is liable to withholding tax rather than income or corporation tax if the owner is an overseas resident; such tax is generally offsettable against the domestic income or corporation tax liabilities of such individuals or corporations.

In general, then, the income from securities is taxed at the highest marginal rate of income tax or corporation tax payable by the individual or corporation. In most cases, income tax at the basic rate (22 per cent from April 2000) is deducted at source and the holder of the security is provided with a tax credit indicating the amount of tax deducted. The tax is reclaimable by individuals and organizations not liable for tax, except in the case of bank and building society deposit accounts and UK equities. Higher rate tax (currently 40 per cent) may also have to be paid. With some types of securities (e.g.

National Savings accounts and accounts held off-shore in places like the Channel Islands), interest is paid gross and UK residents are liable for basic and higher rate tax.

Since the Budget of March 1988, realized capital gains have been taxed at the same rate as income, currently 22 per cent (basic rate) and 40 per cent (higher rate) for individuals, and 20 per cent (smaller companies rate) and 30 per cent (standard rate) for corporations. However (for individuals though not for corporations), the first £7100 of realized capital gains in any one year is free of tax.

The tax treatment of securities has the following main effects on the willingness to hold different types of securities. Tax-exempt organizations, like charities, are completely indifferent to income or capital gains, other things being equal. Therefore they would be as willing to hold high-coupon (i.e. high-income) bonds, for example, as low-coupon (i.e. low-income) bonds, other things being equal. Individuals and corporations liable for tax have a preference, other things being equal, for capital gains rather than income. This is because, even though income and capital gains are taxed at the same marginal rate, capital gains tax can be deferred until the capital gains are actually realized, and, for individuals at least, some of the capital gains each year are tax free.

Finally in this section, we will consider derivative securities and composite securities. A *derivative security* is one that delivers another security at some future date. This future delivery can be either obligatory or contingent. Examples here are financial futures and financial options contracts. A *financial futures contract* delivers a cash instrument (or sometimes even cash) at some date in the future at a price that is determined today. With a futures contract, future delivery of the instrument is obligatory unless the futures position is closed out with an offsetting transaction. A *financial option contract* also delivers a cash instrument at some date in the future at a price that is determined today. But with an option, delivery is at the option of the holder of the contract and is not obligatory; in short, an option is a contingent claim. Futures and options are known as derivative instruments because their values are derived from the values of the underlying cash instrument.

A *composite security* is one that is a mixture of two (or more) different securities. Examples here are convertible bonds, swaps and synthetic securities. A *convertible bond* is one that converts at some future date into equity at the option of the holder. A convertible bond is therefore a mixture of a bond and an option on equity. A *swap contract* (or a *contract for differences*) is, for example, a mixture of a fixed-rate security and a floating-rate security, or a mixture of two current securities and a forward exchange rate contract. A *synthetic* long put option on a security can be constructed from a short position in a cash instrument and a long position in a call option.

## 1.3 Markets

### 1.3.1 The classification of financial markets

The third component of a financial system is the markets in which securities are traded. An organized financial market is a place where, or a system through which, securities are created and transferred.

Financial markets can be classified in a number of ways:

1. Physical v. over-the-counter markets.
2. Continuous v. call markets.

- 3 Money & capital markets.
- 4 Primary & secondary markets.
- 5 Stock & flow markets.

A financial market does not have to have a *physical* location. Indeed, since the Big Bang in October 1986, most securities in Britain have not traded in a physical market. Shares, bonds and money market instruments are traded *over-the-counter* using a system of computer screens and telephones. Only financial futures and financial options are still traded in a physical market, namely at LIFFE (the London International Financial Futures and Options Exchange).

Most markets operate on a *continuous* basis during opening hours, implying that trading can take place at any time that the markets are open. Examples here are the markets for shares, bonds and money market instruments. However, some markets trade at specific times during opening hours. Such markets are known as *call* markets because the securities are 'called' for trading. There has to be sufficient time between calls to allow offers to buy and sell securities to accumulate and so make trading worthwhile. Examples here are the pit trading of some financial futures and financial options and certain precious metals such as gold.

Markets can also be classified according to the maturity of the securities traded in them. A major distinction is usually drawn between money markets and capital markets. *Money markets* deal in securities with less than one year to maturity, whereas *capital markets* deal in securities with more than one year to maturity. Examples of money market instruments are Treasury bills, commercial bills, commercial paper, bankers acceptances and negotiable certificates of deposit. Examples of capital market instruments are bonds with more than a year to maturity and shares.

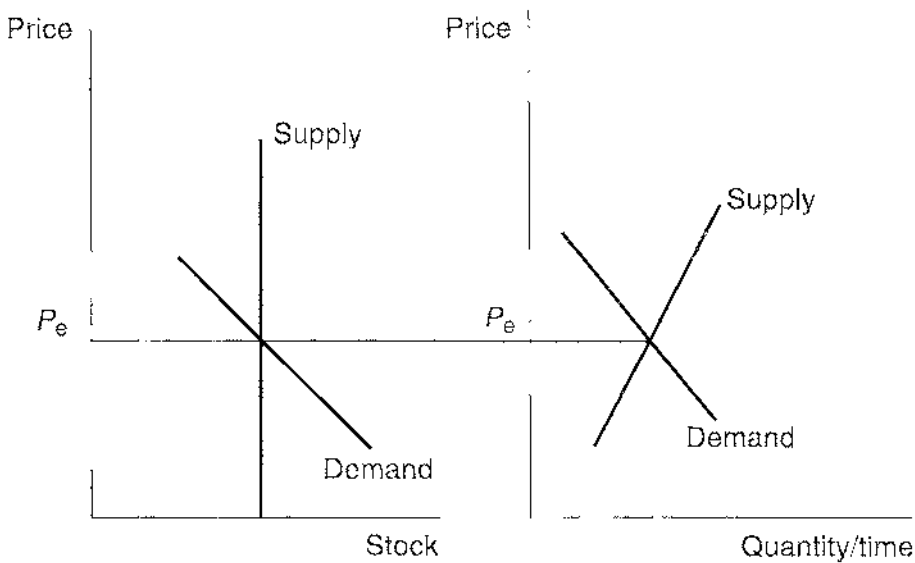
An important distinction can also be drawn between primary and secondary markets. The *primary market* is the new issues market. When an investment bank brings a new company to flotation, its shares are issued on the primary market (as an *initial public offer*). If this company subsequently decides to gear up by issuing bonds, these are also floated on the primary market. Similarly, if a company decides to expand using either equity finance or bond finance, the additional shares or bonds are floated on the primary market (known as a *secondary public offer*). The most difficult problem facing an investment bank involved in a new issue is deciding on the offer price of the issue. If the offer price is too low and there is an excess demand for the new shares or bonds, then the issuing company will be annoyed because it could have raised additional revenue from the issue. But if the offer price is too high and there is insufficient demand for the new shares or bonds, then the investment bank as underwriter will be involved in often considerable losses. The important point about the primary market is that the initial price of the security is set rather than determined by the market, unless the security is issued through a tender offer or by auction.

The *secondary market* is the market in which existing securities are subsequently traded. There are two main reasons why individuals transact in the secondary market: *information-motivated* reasons and *liquidity-motivated* reasons. Information-motivated investors believe that they have superior information about a particular security than other market participants. This information leads them to believe that the security is not being correctly priced by the market. If the information consists of good news, this suggests that the security is currently underpriced, and investors with access to such information will want to buy the security. On the other hand, if the information consists of bad news, the security will be currently overpriced, and such investors will want to sell their holdings of the security. Liquidity-motivated investors, on the other hand, transact in the secondary market because they are

currently in a position of either excess or insufficient liquidity. Investors with surplus cash holdings (e.g. as a result of an inheritance) will buy securities, whereas investors with insufficient cash (e.g. to purchase a car) will sell securities.

The prices of securities in the secondary market are determined by the market makers in those securities. Precisely how those prices are determined can be seen once we have discussed the final way in which securities markets can be classified, namely as stock or flow markets. This classification leads us directly to the concept of *equilibrium*. Once a security has been issued, it exists in the marketplace until it matures and is redeemed. Although a security can be sold, it can be sold only to someone who is willing to buy it. Clearly, it is impossible for *everyone* to sell their holdings of a particular security. Therefore there is a market for the entire stock of a particular security, and there is also a market for the flow purchases and sales of that security over time. These are shown in Figure 1.3. The left-hand diagram, which shows the *stock market*, indicates a fixed stock supply and a downward-

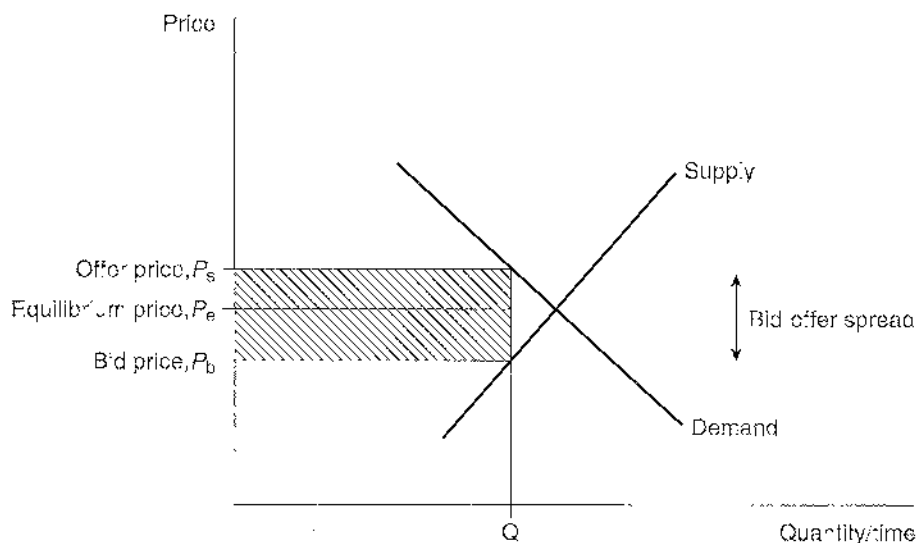
**Figure 1.3** The stock and flow markets for a security



sloping stock demand with respect to the price of the security. The lower the price of the security, the higher the stock demand. The right-hand diagram shows the *flow market* per unit of time. If the time period is a day, for example, the diagram indicates a downward-sloping daily demand curve and an upward-sloping daily supply curve for the security. Equilibrium in the stock market is defined as the situation in which the entire stock supply of the security is voluntarily held. This occurs when the stock market price of the security is  $P_e$ . Equilibrium in the flow market is defined as the situation in which the flow supply of the security on the market equals the flow demand. This occurs when the flow market price of the security is  $P_e$ . Overall equilibrium occurs when both the stock and flow markets are simultaneously in equilibrium. This occurs when the stock and flow market equilibrium prices are identical. Out of equilibrium, prices will adjust to clear both markets.

Figure 1.4 shows the *equilibrium price*, but this price is never actually observed in the marketplace. What is observed are *transaction* (or *trade*) prices, and these take into account the bid-offer

Figure 1.4 The bid-offer spread



spread of the market-makers. The transaction price at which a market-maker buys securities is the *bid price* and the transaction price at which he sells security is the *offer price*. The difference between the two is the *bid-offer spread*. If there is more than one market-maker, then the difference between the highest bid price and the lowest offer price is known as the market bid-offer spread or the *touch*. The equilibrium price lies within the touch, as Figure 1.4 shows for the flow market. When the market maker makes a sale at the offer price, he will often say that he has been *lifted* (or *taken* or *lost*); in contrast, when he makes a purchase at the bid price, he will often say that he has been *hit*.

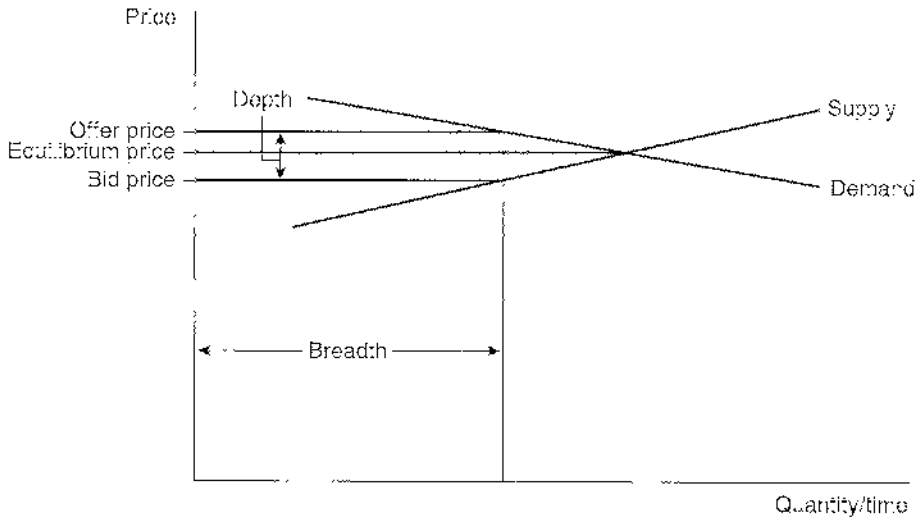
What determines the bid-offer spread? This can be answered once we have examined the role of a market-maker. In an organized financial market, the role of a recognized market-maker is to provide continuous and effective two-way prices (i.e., both bid and offer prices) in all market conditions. In short, the market-maker has the responsibility of keeping an orderly market. To do this effectively, he must hold an inventory of securities to smooth out price fluctuations. The market-maker must be compensated for holding these inventories, and the bid-offer spread is the way in which the market-maker receives his compensation. The bid-offer spread will be determined to compensate the market-maker for the cost of and risk to the capital that he has tied up in the inventory of securities. The total compensation to all the market-makers is given by the shaded area in Figure 1.4, i.e.  $(P_S - P_B)Q$ .

The costs and risks of market-making depend on such characteristics of the market as its *breadth*, *depth* and *resilience*. They also depend on the ratio of information-motivated investors to liquidity-motivated investors.

A market for a particular security is said to have *breadth* if it has a substantial volume of both buy and sell orders at the equilibrium price, i.e. if it has a good two-way flow of orders. Markets with few buyers and sellers are called *thin* markets. A security will be regarded as highly liquid if the market for that security has substantial breadth. Market-makers in a broad market will operate with lower bid-offer spreads than those in a thin market, because broad markets provide a bigger volume of business and are also less risky.

A market for a security is said to have *depth* if it has a continuous flow of buy and sell orders at prices above and below the equilibrium price. This means that both the flow demand curve and the flow supply curve must be continuous at prices above and below the equilibrium price. It also means that both the demand curve and the supply curve must be highly elastic (i.e. quite flat) at prices around the equilibrium price. If these conditions hold, then only small changes in the price of the security will be required to restore equilibrium should a sudden imbalance between buy and sell orders arise. In short, price changes will be continuous in deep markets. In *shallow* markets, on the other hand, the flow demand and supply curves are either discontinuous or highly inelastic (steep). In such markets price changes will be both highly variable and discontinuous (i.e. they will jump around a great deal). Price changes will be smaller in deep markets than in shallow markets. Therefore there is less risk of market makers incurring losses on their inventories as a result of sudden large adverse price movements in deep markets compared with shallow markets. As a result, market-makers' spreads will be lower in deep markets than in shallow markets. A security will be regarded as highly reversible if the market for that security has substantial depth. Figure 1.5 shows a broad, deep market, while Figure 1.6 shows a thin, shallow market.

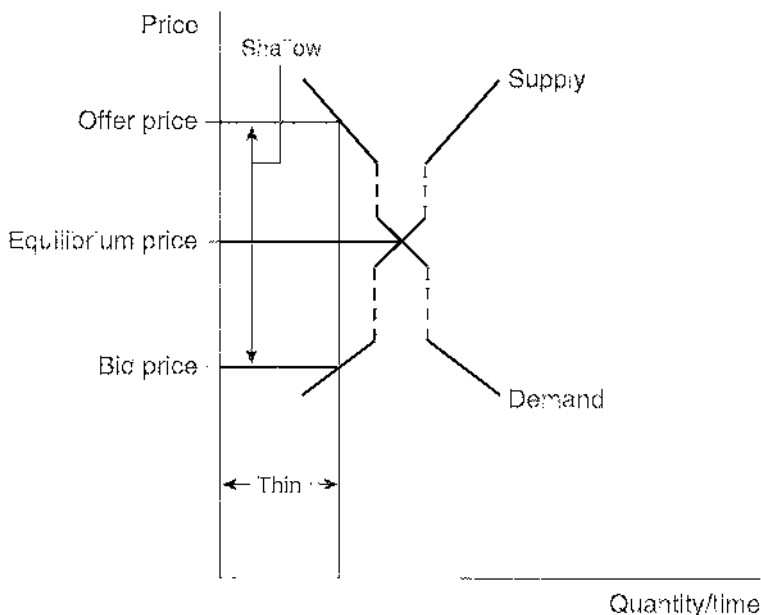
Figure 1.5 A broad, deep market



A market is said to be *resilient* if the flow of buy and sell orders does not dry up whenever the price changes. If price changes do not reduce the flow of orders, then the market-makers will not be faced with an inventory of unsaleable securities, and as a result they will be willing to charge lower spreads.

So we can see that the bid-offer spread will be lower the broader the market, the deeper the market, and the more resilient the market.

But the bid-offer spread will be higher, the larger the ratio of information-motivated investors to liquidity motivated investors. It is clear from Figure 1.4 that the market-maker will always make money if the equilibrium price for the security lies between the bid and offer prices. This is because he buys at below the equilibrium price and sells at above the equilibrium price. Since most liquidity-motivated investors are willing to accept these terms, the market-maker, on average, makes money from liquidity-motivated investors. Similarly, he will on average make money out of badly

**Figure 1.6** A thin, shallow market

informed information-motivated investors. However, he will on average lose money to well-informed information-motivated investors. Such investors will want to buy the security if they believe that the true equilibrium price is above the offer price and will want to sell the security if they believe that the true equilibrium price is below the bid price. They hope that the market will soon adjust so that they can take their profits. So the larger the ratio of information-motivated to liquidity-motivated investors, the bigger the risk of losses to the market-maker and therefore the wider the spread.

The market-maker therefore always has an incentive to ensure that the equilibrium price of the security never lies outside his bid and offer prices. He can do this by having a wide bid-offer spread. But if this is set too wide, he will be uncompetitive and will lose business. An alternative way of protecting himself, especially in a volatile market, is to limit the size of each transaction. Rather than quoting bid and offer prices that are good for up to 10,000 shares, for example, the market-maker's quote might be good only for 1000 shares. Market-makers therefore make a very important contribution towards what is known as *price discovery* or *efficient price formation*. This is the process by which the equilibrium prices of securities become known to investors in general; and it follows because market-makers have every incentive to ensure that the equilibrium price lies within the market bid-offer spread.

### 1.3.2 Financial markets in the UK

We conclude this section with a discussion of the three most important cash securities markets in the UK: the money market, the bond market and the share (or equity) market. The markets in derivative securities (e.g. options and futures) are explained later (see Chapters 8 and 9).

**The money market.** The money market trades money market securities such as Treasury bills and commercial bills. The main components of the money market are the discount market (which trades Treasury bills and commercial bills eligible for rediscount at the Bank of England, the inter-bank market (which trades the temporary surpluses and deficits of the banking system), the certificate of deposit market (which trades certificates of deposit), the local authority market (which trades local authority bills), and the inter-company market (which trades the temporary surpluses and deficits of the company sector). The settlement period for money market securities is one day: this means that the securities must be delivered to the buyer by the seller on the next business day following the transaction. This is known as *cash settlement*. However, it is now also possible to have same-day settlement if required. The settlement process for money market instruments is conducted through the Central Moneymarkets Office (CMO) which was established in 1990.

**The bond market.** The bond market trades UK government and government-guaranteed bonds (or gilts), corporate bonds (debentures and loan stock), foreign bonds and eurobonds. The dealing and settlement procedures differ for different types of bond.

The most important bond market in the UK is the *gilts* or *gilt-edged market*, so-called because originally the bond certificates were edged in gilt. This market began in 1694 when the government of William III raised £1 million to finance a war against France. This event signalled the start of the UK National Debt and also the beginning of the Bank of England, since the financiers who raised the £1 million were, in return, granted a royal charter to set up a bank, which became known as the Bank of England. The Bank of England is the *central bank* of the UK.

Until 1998, the Bank of England had responsibility both for issuing new gilts and for the financial regulation of the gilts market (i.e., ensuring investor protection and the capital adequacy of market-makers). Since 1998, the institutional framework underlying the gilts market has been as follows. The primary (or new issues) market in gilts is controlled by the Debt Management Office (DMO), an executive agency of HM Treasury established in 1998, which acts as the government's agent in managing the *public sector borrowing requirement* (PSBR) (if a borrowing requirement exists) and the *national debt*, as well as actively managing the net cash flows of the government (this activity is called *exchequer cash management*). The Treasury informs the DMO of the size of any borrowing requirement, but the DMO decides on all other aspects of the issue, such as maturity and coupon, taking into account its remit to minimize the cost of financing government borrowing. The DMO is also involved in refinancing the National Debt, i.e., in issuing new gilts to replace maturing gilts.<sup>2</sup> The responsibility for the financial regulation of the gilts market lies with the Financial Services Authority (see section 1.5 below). Dealing in gilts is the responsibility of the London Stock Exchange (LSE), while the clearing and settlement process in the gilts market is conducted through the Gilts Settlements Office (GSO) (see also section 1.4.4 below). Finally, the Bank of England is responsible for keeping the register of gilt owners.<sup>3</sup> The aim is to provide a highly liquid market in government debt securities, with high standards of investor protection and an efficient trading system. We will now examine, in

<sup>2</sup>The DMO is separate from the National Debt Office (NDO), which manages several statutory funds, including the National Loans Fund, the National Insurance Fund and the National Savings Bank. The NDO, along with the Public Works Loan Board (which lends to local authorities), is part of the National Investment and Loans Office (NILO) of the Treasury.

<sup>3</sup>The Bank of England is also responsible for the *open market operations* (i.e., the buying and selling of Treasury bills and eligible commercial bills) needed to maintain interest rates at a level consistent with the government's monetary policy objective of controlling inflation; this is a completely separate activity from that of actively managing the government's net cash flows in order to reduce the government's debt servicing costs, an activity conducted by the DMO. The Bank also manages the government's foreign currency borrowing programme which is used to finance the government's foreign currency reserves.

turn, the primary and secondary markets in gilts; the operational structure of the gilts market in its current form was established at the time of the Big Bang in October 1986 (see section 1.6.1 below).

There are two main methods of issuing gilts in the UK: tender and auction. Most gilts are offered for sale by *tender*. A tender issue will be announced at 3.30pm on a Friday and will take place the following Wednesday or Thursday. Tenders can involve both conventional and index linked gilts and typically will involve a substantial amount of stock (i.e. £750-£1000 million nominal). Any member of the public can submit an application for stock (specifying a price and an amount of stock demanded at that price), although most tender offers will usually end up in the portfolios of large institutional investors such as pension funds and insurance companies. Most tender offers are fully paid, although some are partly paid and so allow investors to spread their payments over time. All tender issues are allocated at a single price (called the *allotment price*): equal to the lowest price at which tenders are accepted (which must be at or above the *minimum tender price* of the offer). All bids submitted at prices above the tender price are allotted in full. Bids submitted at the tender price will be allocated stock on a pro rata basis, until the entire amount of stock is allocated. If at the minimum tender price, not all of the stock available has been allotted, then the DMO retains the unallotted stock as a *tap stock*, to sell into the secondary market as conditions dictate. Some gilts issues are specifically intended to be tap stocks. The gilt is issued in *tranches* (or *tranchettes*, if less than £100 million nominal is issued at a particular time). The existing stock is known as the *parent stock* and the tranche is said to be fully *fungible* with the parent stock. Gilts designed for specialist investors (e.g. low coupon deep-discount gilts designed for higher-rate taxpayers, or index-linked gilts designed for pension funds) are also often issued in tranches. Particularly actively traded bonds (usually a recently issued tranche or tranchette) are known as *runners*.

The second and most recent method of issuing gilts is via *auction*, a system widely used in the US Treasury bond market. The first gilts auction took place on 13 May 1987 and involved £1 billion of 8% Treasury Loan Stock 1992. The DMO announces that an auction will take place some weeks ahead. Details of the issue (size, e.g. £750 million, and maturity, e.g. ten years) are confirmed seven days before the auction. Dealings can take place prior to the auction. (This is known as *when issued* or *grey market* trading.) Irrevocable bids (a maximum of three per applicant) for the stock together with same-day funds must be submitted to the DMO by 10am on the day of the auction. Gilt edged market-makers are expected to bid competitively for the stock (but, unlike in the USA, are not obliged to bid). Successful bidders at an auction (in contrast with successful bidders for a tender issue) are allotted stock at the price that they bid and not at a single allotment price. The difference between the average price and the lowest accepted price is called the *tail*. The DMO is also willing to accept non-competitive bids for amounts between £1,000 and £100,000. These bids will be allotted in full at the average allotment price. Settlement of grey market deals takes place on the day following the auction.

In January 1989, *reverse auctions* were introduced. As a result of the government running a budget surplus at the time, the public sector borrowing requirement (PSBR) turned into the *public sector debt repayment* (PSDR). At first this was achieved by the direct repurchase of gilts from the market. But now it is achieved by reverse auction, whereby the DMO bids directly for the gilts held by institutional investors.

At the centre of the secondary market in gilts is a set of approved *gilt-edged market makers* (GEMMs). The role of GEMMs is to make a market in the full range of gilts. They have an obligation to provide continuous and effective two way prices on demand and in any trading conditions to other member firms of the LSE (i.e. broker-dealers, but excluding other GEMMs) and to outside investors known directly to them. GEMMs can, but are not required to, display their prices on SEAQ

(the *Stock Exchange Automated Quotations* system which is carried by TOPIC, an electronic information transmission service). GEMMs are required to report their position risks to the DMO on a daily basis. The DMO can require GEMMs to reduce their risk exposure or to increase their capital basis. The DMO is also keen to ensure that the gilts market is highly liquid. It helps this process by ensuring that there is a significant issue of bonds at particular maturities, namely 5, 10 and 15 years. Such bonds are known as *benchmark* or *reference* bonds. It does this by issuing new bonds at these maturities or by adding to existing issues. Such bonds are attractive to investors and this is indicated by the fact that they typically trade at higher prices and lower yields than bonds with neighbouring maturities.

GEMMs have exclusive access to *inter-dealer brokers* (IDBs). The role of inter-dealer brokers is to allow GEMMs to unwind long or short positions that arise as a result of their market-making activities and to do this anonymously so that their *book* is not exposed. So, for example, a GEMM that finds that it has an excessive holding of a particular gilt can sell the excess holding to another GEMM which would like to take more of this particular gilt on to its books. It will do this using the services of an IDB, and neither GEMM will be able to identify the counterparty. The IDBs will display anonymously the GEMMs' bids and offers and then seek to match bids with offers. IDBs are not permitted to take positions for their own account; they merely earn commission from the GEMM on whose behalf they are acting. It is vitally important for the liquidity of the market that anonymity is preserved. Therefore IDBs must be established as completely independent entities.

The liquidity of the gilts market was further enhanced by the introduction of a *repurchase* or *repo* market in 1996. A gilt repo or repurchase market enables investors to sell gilts for cash (that is, borrow funds) and then repurchase them at a later date on prearranged terms. The implied rate of interest on the loan is known as the *repo rate* and this is slightly higher than the yield on a Treasury bill of the same term. The most common type of repo is the *overnight repo*; a repo lasting more than one business day is known as a *term repo*. The agreement is fully collateralized since, if the borrowing counterparty fails to repay the loan, the lender is able to retain ownership of the gilts (see also sections 1.4.3 and 5.10). When the gilt repo market started in January 1996, about £100bn of the £230bn of gilts then outstanding were made available for repo trading by being placed by wholesale market participants, such as commercial and investment banks, building societies, insurance companies and pension funds in Central Gilts Office Star accounts. Large banks quote two-way prices on terms extending out to a year. The GEMMs use repos not only to meet their market making obligations, but also in both their matched and mismatched book trading (e.g., a GEMM borrows a gilt in the repo market, in the expectation of a price rise, and when this occurs re-lends it at a more favourable repo rate).

The government expects the introduction of the repo market to lead to a more efficient gilts market with closer links between it and the money markets; it also expects gilt yields to fall as liquidity improves, thereby reducing the cost of servicing the National Debt. As in other money markets, the repo rate has become the benchmark UK interest rate, replacing both the commercial banks' base lending rate and the discount rate on Treasury bills. One consequence of the introduction of the gilts repo market was the ending of the role of *stock exchange money brokers* (SEMBs) in the gilts market. The SEMBs used to provide a link between GEMMs and institutional investors, enabling the former to cover short positions by borrowing stock on a temporary basis from the latter. This role is no longer required since the GEMMs can use the repo market directly and SEMBs have either merged with banks, or have reverted to stand-alone *money brokers*, arranging stock lending agreements in other securities such as equities or currencies.

As in the money market, the settlement period in the gilts market is one day, so that the relevant gilts must be delivered against a sale the following business day. It is this short settlement period that makes IDBs and repurchase agreements so important. However, with the permission of the LSE, it

is possible to have delayed settlement (known as *forward settlement*) of up to 14 days after a trade, so long as both parties agree. This allows, for example, for delays in currency conversion, the transit of requisite documentation or the realization of proceeds from a related sale of a security. Settlement between market-makers and other members of the CGO is made by *book entry transfer* rather than by the physical transfer of gilt certificates. The method used is known as *delivery-versus-payment (DVP)* and involves an automated stock transfer and assured payment service, whereby positive acceptance of the stock by the buyer and a guarantee from the buyer's settlement bank to make payment occur simultaneously. In return, the settlement banks take a floating charge over the stock in case the member defaults. Small investors can buy and sell gilts through the National Savings Stock Register (NSSR) which is administered by the Department of National Savings.

A recent innovation in the gilts market was the introduction of *gilt stripping* in 1991. Gilt stripping involves the separation of a bond into its two constituent components, the coupon payments (also called the *annuity component*) and the par value (also called the *zero coupon component*). These two components are then traded separately, enabling investors to buy just the income component of the gilt, say. Capital gains on gilt strips as well as coupon payments are subject to income tax (for individuals) or corporation tax (for companies), although capital losses can be offset against other taxable income. The introduction of gilt repoining and stripping, by making the gilts market more attractive to investors, should help to reduce government borrowing costs: institutional investors such as pension funds are likely to be the major investors in the zero coupon component of the strip since these match their longer-term liabilities, whilst the annuity component will be most highly valued by those wanting regular income, such as pensioners.

The UK *corporate bond market* trades on the LSE the debentures and loan stocks of UK-based corporations. It is much smaller than the gilts market and relatively much smaller than the corporate bond markets in other financial systems (e.g. the USA) because of the tendency of UK corporations to raise debt finance through the banking system rather than through the markets. Market-makers register to trade in particular bonds. Unlike GEMMs who have to trade in all government bonds, market-makers in this sector do not have to trade in all corporate bonds outstanding. As a result many corporate bonds are not very liquid. The settlement system used is the same as that used for domestic equities (see below).

The *foreign bond market* (both governmental and corporate) operates in a very similar way to the UK corporate bond market. For example, the Kingdom of Sweden might issue a bond in sterling, and it will be traded just like the sterling bond of a UK company.

The *eurobond market* is rather different from the markets considered above. Eurobonds are bonds whose capital and interest payments are generally denominated in a currency different from that of the country in which the bond is issued; the issuer can be of any nationality. The eurobond market was established in the early 1960s in response to what was regarded as over-regulation in domestic bond markets, especially that in the USA. It remains a largely unregulated market, with transactions between participants being a question of honour, there being no arbitration procedure in the event of dispute. The eurobond market in the UK has the status of a Designated Investment Exchange (see below) and is organized by the International Securities Market Association (ISMA), comprising international banks and brokers.

Some eurobonds are quoted on the official stock exchanges in London, Zurich and Luxembourg. However, eurobonds do not have to be listed on an official exchange, and most trading in eurobonds is conducted over-the-counter by telephone between market makers (mainly international banks and especially the lead managers involved in the original issue) and brokers acting on behalf of investors.

Market-makers' price quotes are carried by Reuters and other electronic information services. Settlement and delivery take place three calendar days following the dealing date, although by mutual agreement it is possible to have *urgent settlement* which is two business days following the dealing date. Clearing is usually done through systems known as *Cedel* (based in Luxembourg) and *Euroclear* (based in Brussels).

Besides the gilt repo market, London has bond repo markets in the major European currencies, in particular the Deutschmark and the euro. A number of factors have encouraged this development, in particular, the rapid growth in new issues of bonds by a number of governments and the introduction of standardized documentation, namely, the PSA/ISMA Global Master Repurchase Agreement. Confidence in the security of repos has been enhanced by the introduction of the *tri-party repo*, where a repo bank manages a standard two-party agreement by ensuring adequate collateral, daily marking to market and the payment of margin (see chapter 8). In addition, regulations make it unprofitable to undertake repos in many of the domestic European markets. For example, most Deutschmark repos are booked in London because of minimum reserve requirements set by the Bundesbank which require any liability (including repos) taken from either a non-bank customer or a foreign bank by a German bank to be secured by a non-interest bearing deposit at the Bundesbank. To avoid this penalty, Germany banks trade repos in London through their London subsidiaries.

**The share market.** In the UK, the principal body responsible for the *domestic equity market* is the London Stock Exchange which oversees the Listed Securities Market and the Alternative Investment Market. Outside the direct control of the Stock Exchange is the over-the-counter (OTC) share market, the venture capital market and a number of screen-based electronic trading systems.

The *Listed Securities Market* is the main market of the LSE. It began in 1773. The idea of owning shares in a joint-stock company goes back to the seventeenth century, when companies such as 'The Myserie and Companie of the Merchant Adventurers for the Discoverie of Regions, Dominions, Islands and Places unknowne' (later shortened to the Muscovy Company) began trading. Merchants would take shares in a particular venture and divide up the company and the profits at the end of the voyage. Soon it was realized that it was not necessary to break up the company after each venture as long as the original investors could get their money back by selling their shares to new investors. An informal market in shares was established in the coffee houses around the Royal Exchange in London. In 1773 one of them, New Jonathan's, became 'the Stock Exchange' and was the first building in the world to carry this name.

The primary market in listed securities is controlled by the LSE. Only *public limited companies* (i.e. companies with 'PLC' after their name, having a minimum share capital of £50,000, at least two directors and a trading certificate issued by the Registrar of Companies) can apply for listing. *Private limited companies* (i.e. companies with 'Limited' or 'Ltd' after their name) cannot be listed on the listed market. *Listed securities* are the securities (i.e. shares and bonds) of listed companies that have been admitted to the *Official List* of the LSE and whose prices are quoted on the LSE via SEAQ.

The requirements for listing are contained in the LSE's Yellow Book (officially, *The Admission of Securities for Listing*). The main conditions that have to be met are as follows. The minimum market value of an initial listing in shares is £700,000, while that in bonds is £200,000, although in practice, as a result of transaction costs, it is unusual to find firms being listed on the main market with a market capitalization below £10 million. The firm must have at least a three-year trading record (with accounts properly filed at Companies House). At least 25 per cent of the shares must be available for the public to acquire, and the shares must be freely transferable. The company must pay an initial fee to the LSE

based on the size of the issue and then an annual fee based on market capitalization. Directors of the company have a continuing obligation to provide for the disclosure of information which is necessary both to protect the investor and to maintain an orderly market.

The issuing company will have to appoint a member firm of the LSE to act as its sponsor. The sponsor will typically be a large investment bank, which will then be responsible for all matters concerning listing, including the publication of the *prospectus* detailing the nature of the firm, its activities and directors, and the announcement of the issue in the national press. In particular, the sponsor must ensure that the board of directors of the company has the expertise necessary to run a listed company or must decide whether the board needs to be augmented by the appointment of non-executive directors.

Once approval for listing has been given, the company has to decide on the method of issue. The most common method is an *offer for subscription* for the securities of a company, made by or on behalf of the company direct to the public. The issue will generally be underwritten by an investment bank or insurance company. The offer for subscription can be either at a fixed price or by tender. In the case of a fixed-price offer, the company sets the price and investors apply for shares at that price. If the offer is oversubscribed, the company has to scale down applications. If the offer is undersubscribed, the underwriter has to buy from the company the unallotted shares. With a tender offer, investors are required to state both the number of shares that they wish to buy and the price that they are prepared to pay, subject to a minimum tender price specified by the company. When the applications have been received, the company determines an allotment price and issues shares at the allotment price to investors who applied for shares at or above this price.

There are other issue methods, but they are generally used when a company wishes to increase the number of shares issued, rather than as the method of initial issue. These include: (1) *offers for sale* (either at a fixed price or by tender) where an issuing house buys the whole issue and then offers it for sale to the general public; (2) *placings* or *selective marketings* to specific investors (the LSE usually only gives approval for these when significant public demand for the securities is not expected; in the case of initial listing, no more than £15 million worth of shares can be issued by selective marketing); (3) *introductions* (requiring only an abridged announcement in the national press; these are another concessionary method of issue, suitable when the existing shares of the company are widely held and hence already very marketable, or when the shares are already listed on another stock exchange); (4) *rights issues* (offers to existing shareholders to subscribe for new shares in proportion to their existing holdings, thereby recognizing the pre-emptive rights of shareholders as laid down in the Companies Act 1985; made in the form of a *renounceable letter* that can be sold if the shareholder does not wish to exercise his rights); and (5) *open offers* (also offers to existing shareholders to subscribe for shares although not necessarily in proportion to their existing shareholdings, and not in renounceable form). A final method of issuing shares is known as a *capitalization issue* (also known as a *scrip* or *bonus issue*). This is simply the issue of new shares to current shareholders in proportion to their existing holdings because the company wishes to make a transfer from the retained earnings account to the capital account. The shares are issued free of charge and so no new money is raised.

The share prices of Britain's companies are collected together in share price indices of various kinds. The most important of these is the *FTSE 100 Index* which is an index of the share prices of Britain's largest 100 companies by market capitalisation and which is compiled by the *Financial Times*, the Institute and the Faculty of Actuaries, and the LSE; it covers about 74 per cent by value of all UK shares. The *FTSE 250* is an index of the share prices of the next largest 250 companies by capitalisation below the constituent companies of the FTSE 100 Index; it covers about 18 per cent by value of all UK shares. The *FTSE 350 Index* combines the constituents of the FTSE 100 and FTSE 250 indices, and covers 92 per cent of the total stock market by value. The *FTSE Small Cap Index* is an

index of the share prices of 450 small companies, and covers 6 per cent of the stock market by value. The *FTSE Fledgling Index* deals with very small companies with market capitalizations below £50m and covers 1.5 per cent of the market. The *FT-A All Share Index* covers 800 shares prices from large and small companies across the economy.

The secondary market in listed shares is conducted using one of two different trading systems: an electronic order-book system and a more traditional market-making system. We will consider each of these systems in turn.

Since October 1997, the shares of the largest companies operating in the UK (namely those comprising the FTSE 100 index as well as companies on the FTSE reserve list which, for example, contains companies for which LIFFE offers traded options) have been traded using an *order-book* (or *order-driven*) system called *SETS* (the *Stock Exchange Electronic Trading Service*) which automatically matches orders placed electronically by potential buyers and sellers. The motivation for this innovation was increased competition from other exchanges in Europe and elsewhere which were offering greater efficiency, greater transparency and lower costs, by automating the execution of trades, publishing immediately the transaction prices and by narrowing the spread between buy and sell prices. Greater transparency is achieved because there is no opportunity for *iceberg orders*, i.e. limit orders which disclose only part of the order the investor wishes to trade. It also gives investors greater choice by allowing them to trade immediately at the best available price or by placing an order on the book so as to influence the way in which the price changes.

The electronic order book is available for public inspection, but only member firms of the LSE can directly input buy or sell orders. An investor who wishes to trade contacts their broker by telephone and stipulates the number of shares and the price at which they are willing to either buy or sell. The broker enters the details in the order book and these will be displayed anonymously on the order book screen. The order book works by automatically matching buy and sell orders at the same price and then executing the orders to create trades.

To illustrate, an order book screen might look like this for a particular share:

<i>BUY</i>		<i>SELL</i>	
<i>Volume</i>	<i>Price</i>	<i>Price</i>	<i>Volume</i>
10000	235	237	8000
11000	234	238	10000
9500	232	241	4500

If another investor now wished to sell 4,000 shares at 238p, the 'sell volume' at this price would rise from 10,000 shares to 14,000 shares. If the investor wishes to sell immediately at the best possible price, he could do so at 235p and the 'buy volume' at 235p would fall to 6,000. Once an order has been executed, the trade is reported to the exchange which then informs the two member firms involved. Only the two member firms get to know each other's identity; this information is not reported to the market as a whole and, similarly, the identities of the two principals to the trade remain anonymous.

Large block trades (those greater than eight times NMS, see below) operate on the basis of a *worked principal agreement* (WPA) (also known less formally as an *upstairs trading facility*), whereby 80 per cent of a trade can be unwound before details of the trade are published.

The order book is open from 9:00 to 16:30. Between 8:30 and 9:00, there is an 'orientation' period, during which orders can be added or removed in readiness for the market opening. Between 16:30 and 17:00, there is a 'housekeeping' period, allowing unexecuted orders to be removed if investors wish.

All prices reported (including current, opening, closing, high and low) are based on the relevant transaction prices rather than on the more traditional mid prices (between the bid and offer prices). In fact, conventional bid and offer prices do not exist with an order book system, since there are no market maker quotes. The spread is simply the difference between the lowest price for a sell order and the highest price for a buy order at any one time. The opening price is either the price at which the first trade takes place or the *uncrossing price*, the price chosen by the exchange which allows as many of the orders left from the previous day to execute. The official closing price is the last trade price before the 16:30 close. In a volatile market, if the price of a share changes during the day by more than 10 per cent of its opening price, the order book will be suspended for 10 minutes.

The *market-making* (or *quote-driven*) system is conducted through SEAQ. Market-makers in listed securities are obliged to make firm bid and offer prices in the shares that they are registered to make a market in. They must display on SEAQ firm two-way prices in not less than a minimum specified quantity of shares, known as a *minimum quote size*, as laid down by the LSE. (The minimum quote size in a particular share is equal to the normal market size for that share as explained below.) The highest quoted bid price and the lowest quoted offer price are displayed in the *yellow strip* on SEAQ. Once a trade has taken place, it must be reported immediately to the exchange. In return for these obligations, registered market-makers are accorded certain privileges. For example, only registered market makers can input prices into SEAQ. In addition, market-makers are allowed to hold short positions in the shares in which they are registered. They do this by borrowing shares from authorized lending institutions using the services of money brokers. Inter-dealer brokers (IDBs) also exist in the equity market to help market-makers unwind their positions.

Since 1991, listed shares quoted on SEAQ have been classified according to *normal market size* (NMS) bands. There are twelve bands ranging from 500 to 200,000, where each band size indicates the average number of institutional-sized trades (defined as a deal of 10,000 shares) made in that share during the previous year. The twelve NMS bands are shown in Table 1.1.

**Table 1.1** The NMS bands

<i>NMS band</i>	<i>Range of institutional-sized trades per year</i>	<i>Number of SEAQ shares</i>
500	0 – 667	960
1,000	668 – 1,333	321
2,000	1,334 – 2,400	214
3,000	2,401 – 3,750	159
4,000	3,751 – 6,667	158
5,000	6,668 – 12,000	135
10,000	12,001 – 18,000	61
25,000	18,001 – 33,000	74
50,000	33,001 – 60,000	53
75,000	60,001 – 93,000	12
100,000	93,001 – 160,000	9
200,000	more than 160,000	2
		2,158

The average number of institutional-sized trades (of 10,000 shares) in a particular share is calculated as follows:

$$\frac{\text{Value of turnover in previous 12 months}}{\text{Closing mid-price on last day of quarter} \times 10,000}$$

As an example, consider Abbey National ordinary 10p shares. Suppose that the value of the turnover in these shares during the previous 12 months was £1,071.36m and that the closing mid-price was £2.31. Then the average number of institutional-sized trades during the previous 12 months was:

$$\frac{1,071,360,000}{2.31 \cdot 10,000} = 46,379.$$

Since this is in the range 33,001 to 60,000, the NMS band for Abbey National shares is 50,000.

The NMS bands are important for a number of reasons. Most significantly, the NMS band indicates the degree of liquidity of the share: the higher the band, the greater the liquidity. Second, the bands indicate the minimum quote size for a particular share. Third, the bands are used for *trade reporting* purposes. All shares in NMS bands 2,000 and above have immediate trade publication (i.e. within 3 minutes) on SEAQ for all trades up to six times the size of the NMS band (this is known as the *maximum publication level* (MPL)). Trades between 6 and 75 times the size of the NMS band have to be reported with a maximum delay of 60 minutes. *Block trades* greater than 75 times NMS have to be reported after three days or once 90 per cent of the trade has been offset (whichever is sooner). There is no trade publication on SEAQ for bargains of value below £1,000 or for shares in bands 500 and 1,000. These are fairly illiquid shares and the publication of trades in these shares appears the next business day in the Stock Exchange's *Daily Official List*. However all trades that do not involve market-makers assuming risk (e.g. agency cross trades between brokers and riskless principal trades including those between market makers) are published immediately on SEAQ. Similarly, the trades in shares of companies subject to a takeover bid are published immediately.

Once a share has moved to SETS, it will remain there. But international experience indicates that order book systems work best with very liquid shares. The LSE does not believe that SETS would be suitable for shares outside the FTSE350 index. So the quote-driven system using SEAQ will remain in place for such shares.

Listed shares (and also corporate bonds) are cleared and settled using the LSE's CREST electronic (i.e. paperless or 'dematerialized') settlement system (see also section 1.4.4 below). CREST began operating in July 1996 and replaced the exchange's 200-year old, fortnightly, paper-based account settlement system known as TALISMAN. CREST operates a *rolling settlement* system known as T+5 whereby settlement (the exchange of cash for share certificates) takes place five business days after the transaction date (e.g. on the next Monday for a trade taking place on a Monday etc.). The tight five-day schedule for delivering share certificates means that an increasing number of active investors hold their certificates in a *nominee account*, although this is at the price of transferring nominal (although not beneficial) ownership of the shares to the company operating the nominee account (typically a broker). Only one copy of the annual report is sent to the broker running the nominal account, unless investors become *designated nominees* in which case additional copies of the annual report are sent to brokers who then pass them on to these investors. There has also been an increased use of deposit accounts held with brokers (and linked to a nominee account), together with an increased use of margin accounts (see Section 1.4.2 below). An alternative to nominee accounts is *sponsored membership* of CREST. This enables shareholders to retain their names on the company register and to receive annual reports

and accounts, invitations to annual meetings and other shareholder information and benefits (such as discounts when buying company products), directly from the company. The shareholder is sponsored by an intermediary (typically a broker or a solicitor) who can charge for this service. There is a nominee company compensation scheme, but this does not cover sponsored membership. Eventually the T+5 rolling settlement system will be reduced to T+3.

The *Alternative Investment Market* (AIM) was established by the LSE in June 1995 to trade the shares of companies that are not suitable for a listing on the listed market. These include *small-cap companies* (young, fast-growing companies with currently low stock market capitalizations), management buy outs and buy-ins, companies with shares that are closely-held (i.e. companies owned by a few people, typically members of the same family, whose shares are traded only infrequently) and Enterprise Investment Scheme companies. AIM also trades the bonds of such companies as well as the shares and bonds of foreign companies not incorporated in the UK. AIM replaced the Unlisted Securities Market or Second Market (which operated between 1980 and 1996), the Third Market (which operated between 1987 and 1990), and an earlier LSE market known as the section 4.2 market.

Any company wishing for an AIM listing needs to find an approved sponsor called a *nominated adviser*, one of whose responsibilities is to ensure that the company's prospectus complies with the *public offers of securities* (POS) regulations. AIM is regulated by the LSE's Supervision and Surveillance Department, but the nominated adviser is responsible for ensuring that AIM companies meet all the regulatory standards. For example, the prospectus must provide details of the company, the directors' business background, substantial shareholdings, relevant financial results and a risk warning. But there is no requirement for any minimum percentage of the share capital to be made publicly available, nor is a minimum trading period required. Continuing obligations will be similar to those for companies with a full listing. For example, interim figures and audited accounts plus any price-sensitive information must be disclosed to the LSE. The exchange will assess the performance of nominated advisers and their registration can be withdrawn if they have behaved in a way that impairs the 'integrity and reputation of AIM'. On the other hand, if a nominated adviser resigns, the company's shares will be suspended until it gets another one; if it fails to find a new adviser within a month, its trading facilities will be cancelled. There are some important tax advantages available to AIM companies that are not available to listed market companies. For example, there is income tax relief for losses made on subscribed shares, capital gains tax gift and reinvestment relief, and 100 per cent business property relief from inheritance tax if more than one quarter of a company's equity is inherited (50 per cent relief if less than one quarter is inherited).

AIM uses a trading system called SEATS PLUS (the *Stock Exchange Alternative Trading Service*) to deal with the problem of illiquidity in small company shares. Prior to this, if at least two market-makers could not be found to make competitive prices in a particular share, investors had to use a *bulletin board*, a system of order book trading between brokers conducted on a *matched bargain basis*. This meant that an investor could not sell his shareholding until another investor was willing to buy it: there was no market-maker who was willing to take the risk of buying the shares from the first investor and wait until the second investor came along to buy the shares from him. A bulletin board system clearly indicates the lack of liquidity in what are called *thinly-traded shares*. SEATS PLUS is a screen based trading system that allows a single market-maker to trade in such shares. The market-maker quotes bid and offer prices and the broker who wishes to deal in a particular share has to indicate to the market maker whether he is a potential buyer or a potential seller and has to give the market-maker first refusal on the deal (in contrast, brokers using SEAQ do not have to indicate whether they are buyers or sellers). If the market-maker decides to go ahead with the deal, it is executed at the quoted bid or offer price. The size of the deal has to be reported immediately, but information concerning the

price only has to be reported on a five day rolling settlement basis. If a second market-maker chose to trade in the share, then the share would be transferred to the SEAQ trading system. The bulletin board will be retained for a small number of around 100 companies whose shares are so tightly held that few ever change hands or for new companies wanting to use the status of a public quotation to enhance their prospects of raising funds. The LSE hopes that SEATS PLUS, by improving the liquidity of the shares of small companies, will make small company shares more attractive to institutional investors who invest almost exclusively in the shares of the top 350 companies. Nevertheless, spreads tend to be much wider on AIM than on the main market. They can vary between 2 per cent and 20 per cent compared with about 5 per cent for small companies quoted on the main market.

There are a number of other markets trading domestic equities that are not operated by the LSE.

The *OTC (over-the-counter) market* (which began in 1971) is for new companies which do not have a sufficiently long track record to warrant listing on one of the LSE's markets. Most business is carried out by telephone buyers and sellers on a commission basis, although some act as market makers by directly buying from and selling to investors.

The *venture capital market* (which began to take off in the mid 1970s) provides development or redevelopment capital for unquoted speculative companies which have extremely high risks attached to them but from which higher returns are expected. A venture capital investment is generally illiquid and is realizable only when the company is sold or begins to have its shares traded on the OTC market or one of the LSE markets. The entire investment can be lost if the company fails, as frequently happens. The venture capital market has been used for start-up or greenfield investments, expansion by high growth companies, refinancing, rescue of unprofitable companies through capital injection, and management buy-outs. The most common features of a venture capital investment are: that the investment is through equity participation or with an option to convert to equity; it is of medium term (five to ten years); and there is generally active involvement by the investor with the management of the company.

Recently a number of electronic trading systems have been developed and these compete directly with the LSE in the trading of domestic securities. The most important is *Tradepoint Financial Networks PLC* (or simply Tradepoint) which began operating in 1995 and provides a screen-based, order-matching market in domestic securities for banks and institutional investors, thereby saving on market-makers' spreads. Tradepoint uses Windows software and users such as fund managers and stockbrokers enter the shares they wish to buy or sell together with the volume and price at which they wish to deal. If there are other orders outstanding at that price, the new order is aggregated with those and takes a place at the back of the queue. The user's screen will signal the order in the 'my bids' or 'my offers' column. When a counterparty comes in willing to deal at the price displayed, the trade takes place automatically and the screen records this at the top. If the counterparty wishes to buy fewer shares than the total number on offer, the order goes to the first seller in the queue at that price. If the counterparty wishes to buy more shares than the total on offer, the unfilled part of the order remains on the screen and will be executed as soon as any new shares are offered for sale at that price. Users who change their bid and offer prices during the day have to go to the back of the queue. All orders that are not executed by the end of the business day are cancelled. There is continuous matching of buy and sell orders in liquid shares, but Tradepoint holds periodic auctions for less liquid shares. The trades are settled via the London Clearing House (which also settles deals on the derivatives exchanges in London), but Tradepoint has also been designed to use the LSE's CREST settlement system. Other examples are *Instinet*, a subsidiary of Reuters, which also operates an order matching market in a limited number of shares via a bulletin board, *Ofex* which was developed by market maker JP Jenkins, and *ESI (Electronic Share Information)* which uses the Internet, thereby enabling investors to deal

in shares using their home computers, with the deals channelled through Charles Schwab (formerly Share-Link), an execution-only broker and member firm of the LSE. ESI supplies current bid and offer prices, the last trade price and the volume of shares changing hands.

*International equities* are the shares issued and traded in the domestic markets of overseas countries. They are purchased and sold using the services of local dealers and brokers. As an alternative to directly accessing the various domestic markets overseas, large investors wishing to invest internationally can use the *international equity market* (IEM) in blue-chip shares. The first genuine example of an international placing of a British company's equity was 25 million shares of Britoil in July 1985. Before that, in November 1984, 90 million British Telecom shares were sold in Switzerland as part of the Swiss tranche of the initial public offering, but this was really part of a placing exercise in different domestic overseas markets.

Having begun in 1983, the international equity market is exactly twenty years younger than the eurobond market and shares many of its characteristics. In particular, the same investment banks that are involved in the eurobond market are using similar resources and techniques to issue and distribute equities. They are involved in the underwriting and placing of the primary issue of equity as well as acting as brokers and even market-makers in the secondary market.

The key advantage of an organized international equity market to international investors is ease and speed of communications. Information concerning shares in companies in different countries can be communicated to international investors much more rapidly using the centralized resources of the investment banks than by using local brokers alone.

One advantage to corporations of an international issue compared with a conventional domestic issue is the saving on costs. By circumventing the need for roadshows, pathfinder prospectuses, stock exchange listing fees and meetings with fund managers and investment analysts in different cities, substantial savings can be made. In addition, there can be time savings in the selling period of up to two months compared with the traditional approach. Another advantage is the access to funds that are not available when the issue is confined to domestic investors. Also, by using international equity issues, companies can bypass some of the restrictive rules and regulations (e.g. with regard to disclosure requirements) of domestic stock exchanges and regulatory authorities.

One of the main constraints on the development of the international secondary market for equities is the absence of an efficient clearing and settlement system. The time taken to settle transactions between different financial centres during the initial phase of the international equity market has been excessive. A similar problem affected the eurobond market in the 1960s. The solution was the introduction of the two clearing systems, Euroclear and Cedel. The same solution has been introduced by both of these systems for international equities, mostly in bearer-form although in some countries (e.g. Sweden) only registered-form equity can be traded. In total, more than 600 equities worldwide have a significant international market.

Another feature of the international equity market is the consequential foreign exchange transactions. An international investor may purchase, say, 10,000 ICI shares in London in sterling and resell half of them in Frankfurt in Deutschmarks and the other half in New York in dollars. Euroclear and Cedel offer such international investors the opportunity of dealing in different markets in a single base currency.

In a further attempt to head off another innovation outside its control, the LSE introduced in 1986 *SEAQ International* (or *SEAQ I*) a price quotations system used by more than forty market-makers for trading international equities. Within the European time zone, *SEAQ International* provides real time

dealing prices for all the main international regions. For example, it covers the 'Big Board' stocks listed on the New York Stock Exchange, such as AT&T, Coca Cola, Exxon, General Motors and IBM, and allows investors to execute orders six hours before the New York Market opens. It also covers the markets in Australia, Canada, Hong Kong, Japan, Scandinavia, South Africa and other emerging markets, with most of the shares quoted in domestic currencies.

SEAQ-I ceased trading European equities in January 1996 because of increasing competition from continental stock exchanges which modernized their rules and their operating systems in an attempt to win back trade in their own domestic shares from London, e.g. they are now more willing to engage in block trades. In October 1995, NatWest Securities, one of the UK's leading market makers, announced that it intended to conduct more of its business on continental exchanges than on SEAQ-I: 'Although London remains the most active trading centre in the world for European equities, we believe our clients can benefit significantly from the growing sophistication and transparency of local dealing systems in Europe ... where we are finding greater efficiency in both cost and execution.' Under EU rules, which came into effect in January 1996, NatWest Securities has applied for *remote membership* of the exchanges in Paris, Madrid and Frankfurt. In 1997, the *FTSE Eurotop 300* index of the shares of Europe's largest 300 companies was launched.

In 1989, the *London Securities and Derivatives Exchange* (or OMLX, an acronym that reflects its original name of Options Market London) began to trade the securities and derivatives of certain Swedish and German companies and equity indices. In 1996, EASDAQ (the *European Association of Securities Dealers Automated Quotations*) began to trade the shares of European smaller companies.

In 1996, all the quote-driven electronic trading systems operated by the LSE, namely SEAQ, SEATS PLUS and SEAQ I, were integrated into a single trading platform called SEQUENCE, with the aim of executing transactions more rapidly and cheaply. The *London Market Information Link*, introduced in 1994, has reduced the waiting time for information by 15 seconds.

The shares of UK corporations are also traded in overseas markets. For example, in the USA they are traded in the form of *American depository receipts* (ADRs). The UK shares are held by the UK branches of US banks which issue ADRs against them. The ADRs are then traded on the major markets or the OTC market. The original shares do not have to be listed on the relevant US market. ADRs are negotiable bearer securities which are denominated in US dollars. The holders of ADRs are entitled to receive dividends which are payable in US dollars by the custodian bank, subject to a withholding tax of 15 per cent. The holders of ADRs also have voting rights and can request the underlying shares at any time. The attractiveness of ADRs lies in the fact that they are bearer securities and so the holder avoids having to register as the beneficial owner of the UK shares. ADRs are now being replaced by GDRs (*global depository receipts*). Depository receipts in London are traded on SEAQ I.

## 1.4 Trading arrangements

In this section, we consider some of the trading arrangements that are common to organized financial markets. This covers such issues as the kinds of orders received by brokers, the kinds of accounts kept by investors, and the kinds of stock borrowing agreements made by investors. We also examine the clearing and settlement of trades, as well as official intervention in markets.

### 1.4.1 Types of order

There are various types of order that an investor can give to his broker:

- 1 *Market (or at best) order.* The most common type of order is the market order, which is an instruction to buy or sell a particular security immediately at the best possible price (i.e. to buy at the lowest offer price available and sell at the highest bid price).
- 2 *Stop order.* This is an instruction to buy or sell a particular security as soon as the price passes a particular level. A *buy stop order* for 1000 shares at £2.50 is an instruction to purchase 1000 shares as soon as the share price rises above £2.50. There is no guarantee that the trade will take place at £2.50 and it might be that the order is executed at £2.52. Similarly, a *sell stop order* (also called a *stop-loss order*) on the same terms might be executed at £2.47 rather than £2.50.
- 3 *Limit order.* This is an instruction to buy or sell a particular security only up to a stated limit price. If the limit price is exceeded, the order will not be executed. For example, a *buy limit order* for 1000 shares at £2.50 is an instruction to purchase 1000 shares if the price is at or below £2.50. The order will not be executed if, by the time it reaches the market, the share price has risen above £2.50.
- 4 *Stop limit order.* This is a combination of the last two orders. For example, the instruction to 'sell 1000 shares at £2.50 stop, £2.47 limit' will be executed if the share price falls below £2.50 but does not fall below £2.47.
- 5 *Day order.* This is an order (of the type 2, 3 or 4) that is cancelled if it is not executed on the day the instruction is received.
- 6 *Open order (or Good-till-cancelled order).* This is an order that remains in effect until it is either executed or cancelled.
- 7 *Fill-or-kill order.* This is an order that is cancelled if it cannot be executed immediately.
- 8 *Round lot order.* This is an order to buy or sell a security in the standard trading unit for a given stock exchange. For example, on the LSE a round lot for shares is 1000 shares. Similarly, a single LSE share option is for 1000 shares.
- 9 *Odd lot order.* This is any order for other than a round lot.

### 1.4.2 Types of account

There are two main types of account that an investor can keep with his broker:

- 1 *Cash account.* This is the most common type of account kept by an investor with his broker. It is exactly like a standard bank account: deposits (in the form of cash and revenue from the sale of securities) must exceed withdrawals (in the form of cash and security purchases).
- 2 *Margin account.* A margin account is like a bank account with an overdraft limit. It allows investors to buy securities with credit supplied by the broker. The securities are kept with the broker as collateral. The broker charges interest on this loan, at a rate that is related to current money market interest rates. Trading on margin is a means of leverage or gearing that magnifies the percentage gain or loss from a given change in security prices.

The following example illustrates how a margin account works. Suppose initially that an investor buys 1000 shares at £2.00 for cash and sells them after a year for £2.50. His initial cash outflow is £2000 and his cash inflow after a year is £2500. The return on his investment is:

$$\begin{aligned}\text{Rate of return} &= \frac{\text{Net cash inflow}}{\text{Initial cash outflow}} \\ &= \frac{£2500 - £2000}{£2000} = 25\%.\end{aligned}$$

Now suppose instead that the investor purchased the shares on margin subject to an *initial margin* requirement of, say, 75 per cent. This means that he has to put up 75 per cent of the cash himself but can borrow the other 25 per cent at, say, 10 per cent. His initial cash outflow is therefore only £1500 although the shares still cost £2000 to buy. At the end of the year, he again sells the shares for £2500 but the net cash inflow is reduced by the £50 interest he has to pay to the broker. The rate of return on investment is:

$$\begin{aligned}\text{Rate of return} &= \frac{\text{Net cash inflow}}{\text{Initial cash outflow}} \\ &= \frac{£2500 - £2000 - £50}{£1500} = 30\%.\end{aligned}$$

So with margining, the rate of return has been magnified from 25 to 30 per cent.

Suppose, however, that the share price had fallen to £1.50 rather than risen to £2.50. The value of the shares at the end of the year would have been £1500, a loss of £500. The cash investor would have made a loss of 25 per cent (i.e.  $[\£1500 - \£2000]/\£2000$ ). But the marginal investor, who still has to pay interest on the borrowed funds, would have made a loss of 37 per cent (i.e.  $[\£1500 - \£2000 - \£50]/\£1500$ ). So with margining, the rate of loss has been magnified from 25 to 37 per cent.

Even worse, the marginal investor suffering adverse price movements may also be faced with a *margin call*. This will occur when the *percentage margin* falls below the *maintenance margin* level, which is set at, say, 70 per cent. Initially the percentage margin was 75 per cent (equal to the initial margin):

$$\begin{aligned}\text{Initial percentage margin} &= \frac{\text{Initial value of investor's equity}}{\text{Initial value of investor's equity} + \text{Value of loan}} \\ &= \frac{£1500}{£1500 + £500} = 75\%.\end{aligned}$$

If the maintenance margin is 70 per cent, then the value of the investor's equity (and the value of the shares) can fall by £333 before a margin call is made, since:

$$\begin{aligned}\text{Value of investor's equity at time of margin call} &= \frac{0.7(\text{Value of loan})}{i - 0.7} \\ &= 2.33 \cdot (\£500) = \£1167,\end{aligned}$$

and the initial value of the investor's equity was £1500 ( $\£333 = \£1500 - \£1167$ ). Now a fall in the value of the shares by £333 is equivalent to a fall of 17 per cent (i.e.  $\£333/\£2000$ ). But by the year end, the value of the shares had fallen by 25 per cent or £500. In order to meet the maintenance margin, the investor would have had to deposit a total of £167 (i.e.  $\£500 - \£333$ ) with the broker by the end of the year. However, the effect of the margin call is to reduce the loss from 37 to 33 per cent (i.e.  $[\£1500 - \£2000 - \£50]/[\£1500 + \£167]$ ). The procedure of paying maintenance margin is known as *marking to market*.

### 1.4.3 Stock borrowing agreements

Trading on margin is equivalent to borrowing cash. But there are other trading arrangements that are equivalent to borrowing securities. The most important ones are *short sale agreements* and *repurchase agreements*.

**Short sale agreements.** If an investor expects security prices to rise, he undertakes a marginal purchase of securities. However, if he believes security prices are going to fall, he makes a *short sale*. Short selling involves the sale of a security that is not currently owned by the seller. Initially, the security is borrowed from the short-seller's broker (e.g. from an inventory of securities held as collateral for the margined purchases of other investors) and delivered to the buyer. But at the end of the agreement with the broker, the security has to be repaid to the broker. This is achieved by the short-seller buying the security in the open market and handing it over to the broker.

It follows from this arrangement that the short-seller gains if the security price falls and loses if the security price rises. There is no limit to the potential loss from a short sale, because the security's price can increase without limit. (It can only ever fall to zero.) This makes short selling a very risky activity. It can also be risky for the lender of the security because the short-seller can default on his obligations and not repay the loan. The broker as security lender can protect himself from default through the requirement of the short-seller to make both initial margin and maintenance margin payments. For example, 50 per cent of the proceeds of the short sale may have to be deposited as initial margin. If the security price subsequently rises, maintenance margin payments have to be made. On the other hand, if the security price subsequently falls, cash can be withdrawn by the short-seller. In other words, the margin account is marked to market.

It is difficult if not impossible to provide a sensible way of calculating the rate of return on a short sale. This is because the short seller does not have to put up any capital to support the transaction. Strictly speaking, therefore, the rate of return on a short sale is always plus or minus infinity. However, many people base the rate of return on the value of the initial proceeds, as the following example illustrates.

Suppose that 1000 shares are sold short for £2.00 each. This raises £2000. At the end of the year the shares are standing at £1.50, so that the short seller has to pay only £1500 for the 1000 shares he has to return to the broker. Suppose also that the £2000 raised could be invested at 10 per cent, generating £200 over the year. However, the short-seller will have to pay the dividend (called a *manufactured dividend*) on the shares borrowed which we take to be payable at 8 per cent, costing £160. The total gain from the transaction is £540 (i.e. £2000 - £1500 + £200 - £160). The rate of return is:

$$\begin{aligned} \text{Rate of return} &= \frac{\text{Net cash inflow}}{\text{Proceeds from short sale}} \\ &= \frac{£540}{£2000} = 27\%. \end{aligned}$$

If instead the share price had risen to £2.50, then the total loss from the transaction is £460 (i.e. £2000 - £2500 + £200 - £160). This implies a rate of return of:

$$\begin{aligned} \text{Rate of return} &= \frac{\text{Net cash inflow}}{\text{Proceeds from short sale}} \\ &= \frac{-£460}{£2000} = -23\%. \end{aligned}$$

Finally, it is important to note that for most investors there are limits to the extent that they can engage in short selling. These are designed to protect the market from a downward slide in prices that substantial short selling activity could generate. The fewest restrictions on short selling are those faced by market-makers themselves.

**Repurchase agreements.** A *repurchase agreement* (or *repo*) is also an arrangement for borrowing securities but, unlike a short sale, the payments under the transaction are determined at the beginning of the deal. The buyer of a repo buys the security for a fixed term on the understanding that the seller of the repo will repurchase the security at the end of the term at a price that is either set at the beginning of the agreement or determined according to an agreed formula.

We can consider an example of an overnight repo. The buyer of a repo agrees to buy a government bond overnight. The seller agrees to repurchase the bond the following day at a price that includes overnight interest rates. The seller gets the use of cash for one day (i.e. borrows cash against the bond as collateral) and the buyer invests cash overnight in the government bond (i.e. effectively borrows the bond). The opposite transaction to a repo is a *reverse* (or a *reverse repo* or even a *resale*).

Suppose that the seller of the repo is a GEMM who has just agreed to buy £5 million of a government bond but does not have the funds to pay for it, while the buyer of the repo is an investor with surplus cash who wishes to earn the overnight *repo rate* of 8 per cent, say. The interest received by the repo buyer is calculated as follows:

$$\begin{aligned} \text{Interest} &= \text{Principal} \times \text{Repo rate} \times \frac{\text{Repo term}}{365} \\ &= 5,000,000 \cdot 0.08 \cdot \frac{1}{365} = \text{£}1095.89. \end{aligned}$$

This interest is paid indirectly as follows. The repo seller sells the bonds on one day for £4,998,904.11 (i.e. £5,000,000 – £1,095.89) and buys them back the next day for £5,000,000.

Repos are attractive for two main reasons. First, bond holders can generate extra yield by repoing out their bonds to dealers for short periods. Second, investors with surplus cash can undertake very secure collateralised investments when they lend dealers cash against bonds. The repo market began in the US in the 1980s as a means for investment banks to finance both their long bond positions and to cover their short positions by respectively lending and borrowing bonds. Since 1992, a common international repo contract has been traded. As we saw above, the Bank of England began a repo market in gilts in 1996 (this is explained in more detail in section 5.11).

#### 1.4.4 Clearing and settlement of trades

An important aspect of the secondary market is the clearing and settlement of trades between sellers and buyers of securities. These are sometimes called *back office* functions to contrast with the *front office* activities of trading and sales.

*Clearing* covers all the activities prior to settlement such as trade comparison and matching, trade netting, securities messages and numbering, and securities lending. The first part of the clearing process is trade comparison and matching which involves confirmation between the counterparties that a deal has been done and that the details of the deal have been agreed on both sides. The next step is the netting of trades. During the course of a trading day an investor might sell 100 shares in a particular

company and later that day buy back 80 shares in the same company; at the end of the day only 20 shares would have to be delivered since only 20 shares net have been sold. Security messaging and numbering involves informing the relevant clearing system that a transaction in an identified security is about to take place, that delivery or receipt of securities has taken place, or that such a transaction has been cancelled. This is particularly important for international securities transactions (say involving Cedel or Euroclear) where two different countries' clearing systems will be involved (and possibly a third country's as well if the securities involved are domiciled in a third country). Related to this is the correct identification of the shares and bonds being sold. UK securities used to have identification names listed in the UK Stock Exchange Daily Official List (SEDOL). But these have been replaced by an ISIN (International Security Identification Number) operated by ANNA (Association of National Numbering Agencies). The final aspect of clearing is securities lending which occurs at the point where settlement is about to take place and there are either insufficient or surplus securities available (this could be due to human error or a deliberate strategy by a market maker). At this point securities may have to be borrowed to complete the deal, while surplus securities might be lent or reposed.

*Settlement* deals with the actual transfer of ownership of securities in exchange for cash and the confirmation that this has taken place and as the saying goes 'if it does not settle, it is not a trade'. There are risks even at this stage because it is possible for one of the counterparties to go bankrupt just after receiving securities but before delivering cash. This is known as *settlement risk* and becomes an increasing possibility as real-time settlement systems are introduced. In the case of gilts, the settlement of repos is facilitated by a system offered by the Gilts Settlements Office known as *delivery by value* (DBV). Registered members of the GSO wishing to borrow money against gilt collateral can have stock in their GSO account automatically pledged overnight against an assured payment from the lender's bank. The gilts are returned to the account the next business day and the money is automatically returned to the bank. The stock lender usually requires collateral in the form of DBVs (i.e. gilts in the GSO) or certificates of deposit. He also requires a fee for the loan as well as any income payments that become due on the stock lent.

### 1.4.5 Official intervention in markets

Occasionally the authorities intervene in the operation of financial markets, especially when they believe that the actions of speculators have created a disorderly market. There are many examples of *official intervention* in the gilt-edged, money and foreign exchange markets. For example, in the gilts market, the government aims to maximize investors' desires to hold gilt-edged stock in the long run. This objective is more likely to be achieved if there are not sudden falls in gilt prices from one day to the next. The Bank of England therefore sometimes buys gilts from market-makers in a falling market in order to smooth out price falls. It also sells gilts onto the market to smooth out sharp price rises caused by the activities of short-term speculators who are likely to sell out suddenly, causing a collapse in gilt prices. However, it is possible for the actions of the authorities to be counter-productive, i.e. to be destabilizing rather than stabilizing. This is because of the activities of speculators who attempt to exploit the predictable behaviour of the authorities.

In a rising market, speculators will be tempted to join the bandwagon and make their short term profits, while always being prepared to sell out at the first piece of bad news. Such selling when it occurs depresses prices and shakes the confidence of long-term investors who might then be tempted to sell stock themselves. Similarly in a falling market, speculators will wish to make profits by taking short positions but must always be ready to cover their short positions at the first sign of good news. There will generally be more speculative activity if speculators are confident that the authorities will

act to smooth out price reversals, because this helps to prevent speculators getting their fingers burned. So the price smoothing activities of the authorities might counter-productively encourage speculation.

It is arguable that it would be better if there was no official intervention and if markets were left alone to stabilize themselves. This could be achieved through the *technical adjustments* of market-makers. For example in a rapidly rising market, market-makers are likely to find themselves short of stock to deliver against sales that they have made. They sometimes respond to this by sharply marking prices down. This has the effect of shaking out speculators who have long positions and who fear further price falls. The market-makers are therefore able to get the stock they need. But another effect is to help stabilize the market, because, once price rises resume, they do so in a more stable market with fewer speculators, and hence in a market that is more resistant to any further bad news. But the risk to market-makers is that the fall in prices not only does not frighten off speculators, it actually encourages long-term investors to buy more securities. Market makers have to make a careful assessment about how the situation will develop and they will not implement a technical adjustment until they feel that speculators' holdings are substantial.

Technical adjustments also occur in falling markets. Institutional investors tend not to buy long-term securities in falling markets. Instead they will save up surplus funds until prices begin to rise again. However if large numbers of institutional investors all begin to buy securities at the same time then this can create a disorderly market. Market-makers attempt to prevent demand piling up in this way by initiating a series of sharp upward technical adjustments in prices to encourage institutional investors to buy.

It has been argued that to reduce the impact of speculators, the authorities should do the opposite of what they actually do at this time. Rather than sell gilts when the market stops falling, the Bank should execute a *bear squeeze* against speculators by buying gilts. If speculators waited until this stage before closing their short positions, they would find not only that they had difficulty in acquiring the stock to do so but that what stock was available was available only at high prices. In order to avoid being squeezed speculators would have to close their short positions before prices stopped falling and this would help to stabilize the market.

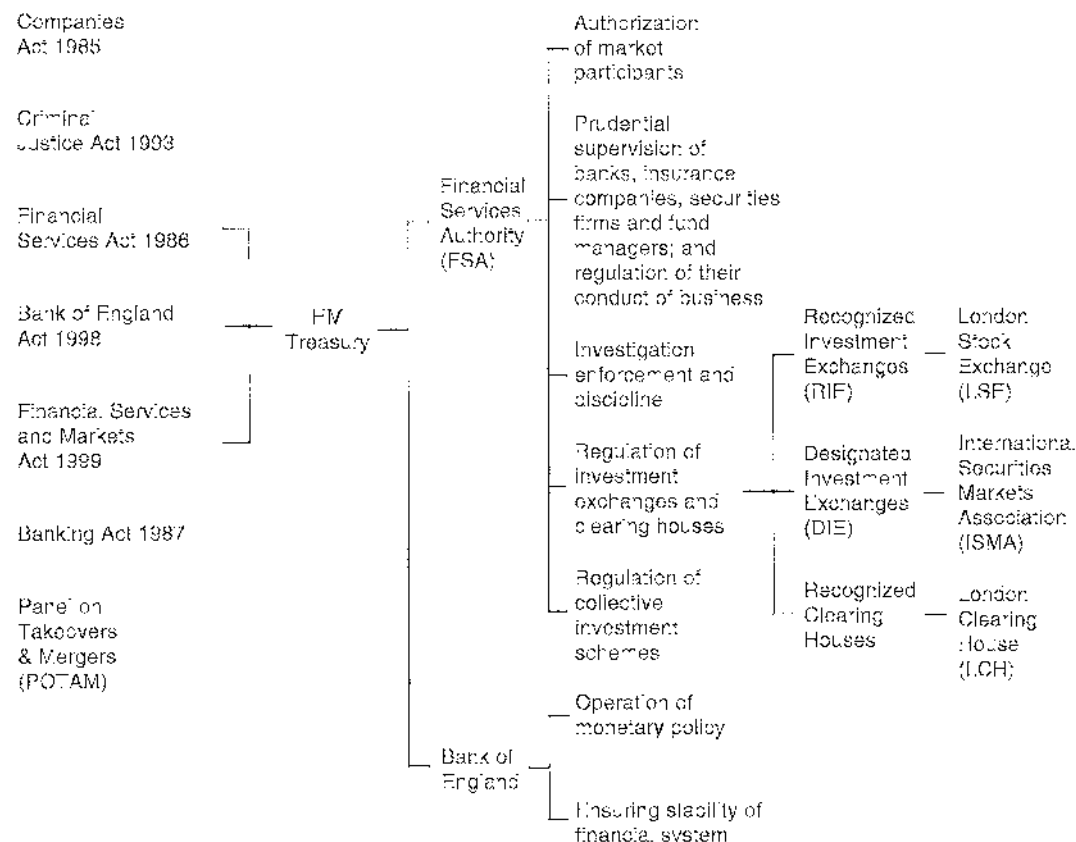
Depending on how it is implemented, official intervention can therefore be either stabilizing or destabilizing.

## 1.5 Regulation

In this section,<sup>4</sup> we examine the set of regulations that confront the financial system. Everyone who operates in a financial system (in particular, financial intermediaries and market-makers) faces a particular regulatory environment. This environment can differ from one financial system to another. We will examine the set of regulations operating in the UK.

Figure 1.7 shows the hierarchical structure of regulatory control in the UK. The *Financial Services Act 1986*, the *Bank of England Act 1998*, and the *Financial Services and Markets Act 1999* are the key to the whole system of regulatory control. These Acts give overall responsibility for regulating the financial system to HM Treasury, although there are other organizations engaged in regulation which do not report directly to the Treasury. An example is the *Panel on Takeovers and Mergers*. This is a non-statutory body established by the City itself. It operates two sets of rules: the *City*

<sup>4</sup>This section draws heavily on *Financial Services Authority: An Outline* (1997).

**Figure 1.7** Regulatory control of the UK financial system

*Code on Takeovers and Mergers*, and the *Rules on Substantial Acquisition of Shares*. While the rules are non-statutory, they generally work because rule-breakers can be *cold-shouldered* by everyone else operating in the City.

The Treasury has overall responsibility for the institutional structure of regulation and for the legislation that governs it. However, it has delegated operational matters to the *Financial Services Authority* (FSA) and the *Bank of England*.

The FSA has five statutory objectives:

- 1 To sustain confidence in the UK financial sector and markets.
- 2 To protect consumers by ensuring that firms are competent and financially sound and to give their customers confidence in their integrity, while recognizing consumers' own responsibility for their financial decisions.
- 3 To promote improvement in public understanding of the benefits and risks associated with financial products.

- 4 To monitor, detect and prevent financial crime.
- 5 To pursue these objectives in a way which:
  - a) is efficient and economic and ensures that costs and restrictions on firms are proportionate to the benefits of regulation;
  - b) facilitates innovation in financial services;
  - c) takes account of the international nature of financial regulation and financial services businesses.

The FSA has three principal aims:

- 1 *To protect consumers of financial services.* The FSA will:
  - a) set, promote, monitor and enforce high standards of integrity, financial soundness, fair dealing and competence for those it regulates, in order to protect and secure fair treatment for investors, depositors and policyholders;
  - b) aim to ensure that consumers receive clear and adequate information about services, products and risks;
  - c) acknowledge customers' responsibility for their own decisions, while aiming to ensure that they are not exposed to risks that they should not reasonably be expected to assume.
- 2 *To promote clean and orderly markets.* The FSA will:
  - a) promote fairness, transparency and orderly conduct in financial markets, looking in the first instance to the markets and market participants to set and enforce high standards in this area;
  - b) take action where such standards are inadequate or are ineffectively enforced.
- 3 *To maintain confidence in the financial system.* The FSA will:
  - a) set, promote, monitor and enforce high standards of financial soundness and probity for financial services businesses, in order to contribute to the soundness of the financial system as a whole and to promote consumers' and financial institutions' confidence in its strength and integrity;
  - b) aim to ensure, in co-operation with the Bank of England, that the failure of individual financial institutions does not undermine the overall stability and soundness of the financial system.

The FSA will pursue these aims and objectives in an efficient way and will seek to ensure that the costs of regulation are proportionate to the benefits. To achieve this, the FSA exercises the following functions:

#### 1 *The authorization of market participants*

*Authorized persons* must meet specified standards of integrity, financial soundness and competence in order to operate in the financial services industry. Authorized persons have to demonstrate through examinations and other means that they are *fit and proper* persons to engage in

investment business. One way of achieving this is to pass the examination for *securities representative* set by the Securities Institute. It is a criminal offence to carry on investment business without being either authorized or exempted. *Exempted persons* do not require authorization to carry on investment business and include the Bank of England, recognized investment exchanges and recognized clearing houses. Persons carrying on investment business without being authorized or exempted can be fined or imprisoned; any contracts that they make cannot be enforced but can be enforced against them if the investor wishes; and a restitution order can be made against them so that they can be obliged to return any profits that they make or meet any losses caused by investors.

In recent years, the City has begun to emphasize the importance of professional training. The FSA has established the Securities Industry Diploma through the Securities Institute, and the Society of Financial Advisers requires its members to pass examinations set by the Chartered Insurance Institute. It is also possible to become an associate of the Institute of Investment Management and Research (IIMR) by obtaining the Institute's Investment Management Certificate.

## 2. *The prudential supervision of banks, life companies, securities firms and fund managers, and regulation of their conduct of business*

The FSA is responsible for implementing a co-ordinated supervisory programme for every bank, life company, securities firm and fund manager. This involves an understanding, in respect of each such organization, of: its business strategy; its management capabilities and policies; its systems and controls; the adequacy of its resources, both human and financial; and the economic environment in which it operates, in the UK and overseas.

The FSA also makes rules governing the carrying on of investment business. These cover:

- a) *the conduct of business*: an investment adviser (e.g. a broker or an investment bank) must *know his client*, give him the *best advice* for his circumstances, ensure *best execution* (buying and selling for the client on the best terms available), ensure the client understands any *risk* involved in a proposed transaction, *disclose* any interest his company may have in the transaction, inform the client of the size of any fee or commission from arranging the transaction, keep good records, and establish barriers to passing on information gained in confidence (the so-called Chinese Walls rule);
- b) *unsolicited calls*: for example, the selling of investment products following an unsolicited call (i.e. *cold calling*) is closely regulated and customers are permitted to cancel some types of deals after unsolicited calls;
- c) *clients' money*: for example, a client's money must be kept in a separate account from that of the firm acting for the client.

The rules are collected together in a *rule book* which is given to every member of staff when they join a company. The rule book provides for an *arbitration procedure* in the case of customer complaints and a *compensation scheme* to compensate depositors, investors and policyholders in the event of default or fraud. The FSA monitors financial service companies by means of *compliance visits* to ensure that they comply with the rules. Firms appoint *compliance officers* to ensure their actions are compatible with the rules. The rule book allows for the disciplining and expulsion of members who break the rules.

## 3 *Investigation, enforcement and discipline*

In order to exercise effectively its regulatory authority, the FSA needs to have powers of investigation, enforcement and discipline over the individuals, firms and markets that it regulates.

Under the Banking Act 1987 it also has intervention powers in relation to the banking system. This means that it has powers to prevent unauthorized investment business and illegal deposit-taking.

There is increasing use of both information technology and international co-operation in the investigation process. For example, in 1993, the Surveillance Department of the LSE introduced a computer system to help identify cases of illegal share dealings. It is called IMAS, the *Integrated Monitoring and Surveillance System*, and uses different sources of electronic financial information to detect unusual market situations (known as *alerts*), such as unusually large transactions, sharp price changes, unorthodox price quotes by market-makers or apparent breaches of the rules on the reporting of transactions. Graphs showing the transactions made by different brokers on behalf of clients can be superimposed on charts depicting prices and volumes, enabling investigators to pick out suspicious trades within a few minutes of them occurring. The US equivalent is called *Stockwatch*. About 1,000 unusual share price movements are examined daily. There is also increasing cooperation with regulators in other countries, via the *International Organization of Securities Commissions* (IOSCO) and *Inter-Market Surveillance*. Inter-Market Surveillance is an international group of exchanges and regulators which has agreed to pool information. This is because of the increasing number of suspicious trades that are made by shell companies in offshore financial centres such as Jersey and the Cayman Islands.

There have been other measures to tighten up the regulatory control of the financial markets. For example, in 1994, the *Market Conduct Regulators Group* was established to ensure that regulators operate in a coherent manner and become more effective in detecting financial market abuses. Its aim is to offer 'explicit standards of market integrity and investor protection'. The argument is that a unified system of surveillance is needed for all markets where UK equities, say, are traded (including derivative markets), so that abuse can be detected and punished.

#### 4 *The regulation of investment exchanges and clearing houses*

A *recognized investment exchange* (RIE) is one that is recognized as being engaged in the dealing or arrangement of deals in authorized UK securities. The main RIEs of the UK are: the London Stock Exchange, Tradepoint, the London International Financial Futures and Options Exchange (LIFFE), and the London Securities and Derivatives Exchange (OMLX).

A *designated investment exchange* (DIE) is one that is engaged in the dealing or arrangement of deals in international securities but without being subject to UK regulation. An example of a DIE is the International Securities Market Association (ISMA), which organizes a market in international bonds (mainly eurobonds) from London.

A *recognized clearing house* (RCH) is one that is recognized as being engaged in the business of the clearing and settlement of deals in authorized UK securities, in other words in the transfer of ownership of securities between counterparties. The largest clearing house in the UK is the *London Clearing House* (LCH) which clears trades on the London International Financial Futures and Options Exchange, the London Metal Exchange, the International Petroleum Exchange and Tradepoint. The next largest is the *Exchange Clearing House* (ECHO) which clears (via multilateral netting) foreign exchange trades between banks.

The FSA supervises the above exchanges and clearing houses as well as the over-the-counter market.

#### 5 *Regulation of collective investment schemes*

The FSA will regulate collective investment schemes (i.e., unit trusts, investment trusts and

open-ended investment companies). In particular, the FSA will authorize and recognize new schemes and approve changes to existing schemes.

The Bank of England has been given responsibility for the operation of monetary policy and for ensuring the stability of the financial system as a whole. This involves:

- 1 The stability of the monetary system. The Bank monitors this, as part of its monetary policy functions. It acts daily in the markets, to deal with day to day fluctuations in liquidity (see section 1.4.5 above).
- 2 The financial system infrastructure, in particular payments systems at home and abroad. As the bankers' bank, the Bank stands at the heart of the system. The Bank advises the Chancellor on any major problem inherent in the payments systems. The Bank is also closely involved in developing and improving the infrastructure, and strengthening the system to help reduce systemic risks.
- 3 The broad overview of the system as a whole. The Bank is responsible for monetary stability, and, through its involvement in the payments system, it may be the first to identify potential problems. The Bank advises on the implications for financial stability of developments in the domestic and international markets and payments systems; and it assesses the impact on monetary conditions of events in the financial sector.
- 4 Being able, in exceptional circumstances, to undertake official financial operations, in order to limit the risk of problems in or affecting particular institutions spreading to other parts of the financial system.
- 5 The efficiency and effectiveness of the financial sector, with particular regard to international competitiveness.

The FSA and the Bank of England also share certain responsibilities for regulation. For example, they are both represented on the Basle Supervisors' Committee and the European Central Bank Banking Supervisors' Sub-Committee. They have also agreed the following charing of domestic market committees:

- 1 Sterling Markets Joint Standing Committee: the FSA;
- 2 Foreign Exchange Joint Standing Committee: the Bank;
- 3 Derivatives Joint Standing Committee: the FSA;
- 4 Stocklending and Repo Committee: the Bank.

On an historical note, the Financial Services Authority was created in 1997 and replaced the Securities and Investments Board (SIB) which was established by the Financial Services Act 1986. As a result of the Bank of England Act 1998, responsibility for supervising banks, listed money market institutions and related clearing houses was transferred from the Supervision and Surveillance Division of the Bank of England to the FSA. The Bank of England retained responsibility for the operation of monetary policy and for ensuring financial stability. As a result of the Financial Services and Markets Act 1999, the FSA acquired the regulatory and registration functions of:

Building Societies Commission (BSC)	Building societies
Friendly Societies Commission (FSC)	Friendly societies
Insurance Directorate (ID) of the Department of Trade and Industry	Insurance
Investment Management Regulatory Organisation (IMRO)	Investment management
Personal Investment Authority (PIA)	Retail investment business
Registry of Friendly Societies (RFS)	Credit unions' supervision (and the registration and public records of building societies, friendly societies, industrial and provident societies and other mutual societies)
Securities and Futures Authority (SFA)	Securities and derivatives business
Securities and Investments Board (SIB)	Investment business (including responsibility for supervising exchanges and clearing houses)
Recognized Professional Bodies (RPBs)	Accountants, solicitors and actuaries for example.

The analysis so far has dealt with the regulation of market participants. But there are also regulations covering the behaviour of end-users of the financial system. These are specified in the Companies Act 1985 and the Criminal Justice Act 1993.

The *Companies Act 1985* specifies the obligations that various people have in disclosing their interests in the shares of companies. This is particularly important in the case of takeover bids. For example, directors must disclose to their company all share dealings in their company within five days. Similarly, shareholders with more than 5 per cent of total shareholdings must disclose to the company any transaction involving 1 percentage point or more shareholdings within five days, while shareholders with more than 15 per cent of total shareholdings must report any transaction involving 1

percentage point or more shareholdings within one day. (The latter case is governed by the Rules on Substantial Acquisition of Shares of the Panel on Takeovers and Mergers.)

The *Criminal Justice Act 1993* prohibits the use of confidential inside information. An *insider* is a person *knowingly connected with a company* (e.g. a director of, employee of or an adviser to the company). Such a person may have access to *specific unpublished price-sensitive information* (SUPSI) (e.g. about the possibility of a takeover bid). It is a criminal offence for an insider to deal in securities on a *regulated market* or through a *professional intermediary* on the basis of SUPSI, or for an *unconnected person* to deal in securities on the basis of SUPSI acquired from an insider with both the insider and unconnected person culpable (unless the unconnected person acquired that information in his capacity as a market maker), or even for inside information to be disclosed to an unconnected person, other than in the usual performance of employment. The Act covers dealings in shares, bonds and derivatives of these, such as futures and options, but excludes inside information about the state of the economy in general. The maximum penalty for insider dealing is seven years' imprisonment or an unlimited fine or both. Responsibility for policy on insider dealing and market manipulation lies with the Treasury. Responsibility for the statutory investigation of alleged insider dealing and market manipulation lies with the FSA, while responsibility for prosecution lies with the Serious Fraud Office and the Crown Prosecution Service.

## 1.6 The financial system in a temporal context

In this final section of the chapter we will place the UK financial system in a temporal context. In particular, we will discuss the recent past and examine prospects for the near future.

### 1.6.1 The recent past: the Big Bang of October 1986

On Monday 27 October 1986, the City of London experienced what has become known as the *Big Bang*. It represented just one part of the biggest revolution taking place in the UK financial system in more than two centuries. The Big Bang itself had two dimensions: a regulatory dimension and a technological dimension. Both were intended to unleash a wave of competition and therefore to increase choice in a way that has not been known hitherto.

For the previous two hundred years the Stock Exchange in London had operated along the lines of a cosy though honourable gentleman's club. It had been owned by its own members, and in order to avoid too much competition it operated a system of minimum fixed brokerage commissions on all stock transactions. But to protect the investor, it also operated as a single-capacity system, whereby the activities of the stockjobbers (the principals or dealers who make a market in each stock) and the stockbrokers (the agents who act in the best interests of the client by buying from or selling to the jobber offering the best prices) were kept entirely separate, thereby avoiding any potential conflict of interest. Under the new deregulated environment following the Big Bang, it was possible for the LSE to be owned by non-member firms. So, for example, Barclays Bank took over a member firm (the stockbroker de Zoete and Bevan) and a stockjobber (Wedd Durlacher) to create the new investment bank Barclays de Zoete Wedd (or BZW). Out went the system of fixed commissions: since Big Bang all commissions have been fully negotiable. Finally, the single-capacity system has been replaced by a dual-capacity system in which firms can act both as agents and principals, i.e. broker-dealers: they can therefore deal in a particular stock as well as advising clients to trade in the same stock.

The technological dimension to the Big Bang was the new method by which the LSE dealt in stocks. Before 27 October trading took place on the floor of the exchange, and brokers would physically approach the jobbers to find the best prices for their clients. The jobbers would quote two prices, a bid price and an offer price, and the difference (or spread) would be the jobbers' reward for making a market. In turn, the broker would charge the client a commission which depended on the size of the transaction. Since 27 October 1986 the trading system has been computerized. The market-makers announce their bid and offer prices through SEAQ and these prices are transmitted to the brokers through TOPIC. The brokers simply sit in their offices in front of their TOPIC screens and select the best prices for their clients.

The Big Bang was just one part of the financial revolution taking place in the UK. Again, there were two main dimensions to the changes taking place outside the LSE.

First, the structure of all British financial institutions has been changing rapidly. This is due partly to the government's wish to increase competition and choice and partly to technology. For example, in the 1980s there was a huge increase in competition between banks and building societies (the latter traditionally lending money solely for the purpose of house purchase). This increased competition was formalized in the Building Societies Act 1986. The banks became involved in lending for house purchase and also in estate agency work. Now building societies are able to offer current accounts, make unsecured loans, engage in estate agency work and conveyancing, sell unit trusts and personal pension plans, and raise funds through the wholesale money markets. Similarly, insurance companies began to give advice on a wider range of financial products such as mortgages and pensions. The major financial institutions were beginning to provide a common set of financial services and the differences between them were disappearing. Technological developments have also had an important influence on these changes. Indeed, it is arguable that it is technological developments that have made the changes possible. The rate of technological progress is such that we could soon be entering the *cashless society*. If the use of EFTPOS (electronic funds transfer at point of sale) becomes widespread, then cash could be rendered unnecessary.

Second, the government decided to increase the degree of investor protection through the Financial Services Act 1986. It was the failure in 1983 of Norton Warburg, a licensed dealer in securities, that led to the Gower Report recommending a new system of investor protection based on the principle of self-regulation rather than government control. The aim was to cover all investment products and services (e.g. life assurance services and commodities) and not just those traded on the LSE.

The London Big Bang is only one of a number of Big Bangs that have taken place in the world's financial centres in recent years, beginning with New York in May 1975. The Japanese Big Bang took place in April 1998. So why did the Big Bang take place in London in 1986?

One of the most important underlying causes of all the Big Bangs has been the *internationalization of finance* following the dramatic changes in the world economy since the beginning of the 1970s. After the ending of the Bretton Woods agreement on fixed exchange rates in 1971, the world has seen a huge increase in exchange rate variability. This led to the introduction of a new range of exchange rate hedging instruments, such as options, futures and swaps. Similarly, since the oil price shock of 1973, there has been a huge increase in interest rate variability which has resulted in a new range of interest rate hedging instruments, again mainly options, futures and swaps. The Third World debt crisis (which began with Mexico nearly defaulting on its debt service payments in August 1982) dramatically changed the way in which the major banks operate their balance sheets. With the development of the unregulated eurobond markets, big borrowers have been bypassing the banking system and going directly to the international markets to raise capital. This has resulted in a movement away from syndicated bank lending (which had become relatively unprofitable and, in the light of the debt crisis, had

weakened banks' balance sheets) towards the earnings of commission fee income from selling corporate debt on the eurobond markets using a new range of securitized instruments such as NIFs (note issuance facilities) and RUFs (revolving underwriting facilities). This has led to the *securitization* of parts of the banks' balance sheets, thus making them much more liquid. Another aspect of the internationalization of finance has been the relaxation of exchange controls, which has permitted institutional investors such as pension funds and insurance companies to invest up to a quarter of their portfolios across national frontiers. There has also been a movement of banks across national boundaries. For example, there are about 500 foreign banks in London, 260 in New York and 80 in Tokyo. A parochial and inward-looking stock exchange could not hope to survive in a world of such rapid change.

Another cause of the Big Bang was the loss of business to US and Japanese securities houses. London broking firms had been losing market share in both UK and overseas markets because the London firms were too small and LSE commissions were too large relative to those on the New York Stock Exchange (NYSE). British shares had been trading on the NYSE in the form of ADRs with lower transaction costs than in London; so London was losing market share even in British stock traded on the LSE.

Third, there has been the development of risk products such as options, futures, swaps and over-the-counter securities, which have traded outside the LSE. So the LSE was losing market share to other domestic markets.

Finally, the development of computer technology has made possible international dealing in securities 24 hours a day between Tokyo, London and New York. When the London market opens, the trading books are handed over by Tokyo, and when the New York market opens they are handed over by London. The net result is the interdependence (or *globalization*) of the world's three major financial centres, although the move towards globalization was slowed down as a result of the crash in October 1987.

The explanation for the Big Bang occurring in London is now clear. The capital base of the old member firms of the LSE was far too small to compete effectively on the world stage. This explains the change in the LSE membership rules to allow UK and foreign banks to purchase member firms. The abolition of fixed minimum commissions was necessary to prevent the LSE losing any more market share to other domestic and the international markets. The brokerage commissions are now set by negotiation and must be competitive with New York, Tokyo and, increasingly, financial centres on the European continent. With the ending of minimum commissions, the single-capacity separation of stockbroker and stockjobber was no longer feasible and had to be replaced by the dual-capacity system of combined dealers and brokers. With the potential conflicts of interest that might arise in the new dual-capacity world, a new system of investor protection was necessary, with a new set of supervisory bodies with powers to inflict penalties if the rules were not observed. Finally, with the huge increase in the number of competing players in the market-place, the old system of posting up bid and offer prices on the floor of the Stock Exchange was no longer feasible, and a new system of publishing prices on the SEAQ system became necessary.

## 1.6.2 The near future

**The consequences of the Big Bang.** Before examining the prospects for the UK financial system in the near future, and in particular the likely consequences of the Big Bang, it is interesting to examine what happened on the NYSE when it had its Big Bang in May 1975. Between 1975 and 1980, commission rates fell by 50 per cent on large transactions; the volume of trading activity taking place

outside the NYSE in the Third Market (which is not subject to NYSE rules) fell sharply; there was a substantial increase in concentration among broker-dealers as the number of firms engaged in the market-place fell from 422 to 389 and the share of business of the top 25 firms rose from 53 to 61 per cent; there was an increase in *discount broking* (that is, a straight broking service without any investment advice); and because of the reduction in commissions, there was an increase in trading volume on the NYSE leading to an increase in profitability and employment.

The few years after the Big Bang in London were extremely challenging ones both for the individual players and for the system as a whole.

In terms of the individual players, it was likely that the problems would be more acute for the new British investment banks than for the foreign ones. The British investment banks were cobbled together in a few months in 1986 from three completely separate entities: merchant banks, stockbrokers and stockjobbers. Historically, there had been enormous cultural differences between these three groups. The stockjobbers, for example, were akin to street traders, used to making instant decisions. The merchant bankers, on the other hand, were the aristocrats of the City, used to spending three hours over lunch and taking much time and much discussion in committee before making decisions. Then suddenly these different groups were thrown together in the same organization and given very little time to integrate properly.

The London capital market has now become extremely competitive and the British investment banks did not have much experience at market-making in very competitive conditions. For example, the London gilts market initially became considerably more competitive than the US Treasury bond market. In London there were initially 27 market makers, whereas in the USA there are 37 market makers serving a market ten times larger. There was clear excess capacity in the gilts market and the number of market-makers fell to below 20. It is also questionable whether the UK firms have a sufficiently large capital base to support risk-taking in all market conditions. The UK investment house Mercury Asset Management had a market capitalization of \$0.9 billion in 1986, but Salomon Brothers, the US investment house, had a market capitalization of \$5.6 billion and the Japanese company, Nomura, the world's largest investment bank, had a market capitalization of \$27.8 billion. The UK banks have been dwarfed by these overseas giants invading their hitherto sacred territory. MAM was eventually bought out by Merrill Lynch in 1997.

Take, for example, Salomon Brothers, the largest and most profitable underwriter of new bond and equity issues in New York. Following Big Bang, it was trading skill that replaced fixed commissions as the key to success and profitability in the City of London. And Salomons brought its hustling Wall Street methods to London in order to win over market share. Immediately, they flexed their muscles by arranging the first *bought deal* in the UK. In mid October 1986 they raised £30 million for the Granada takeover of Lasky by buying-in the entire stock and selling it out again to institutional clients within two hours for a profit of £200,000 (and in less time than a traditional City lunch!). On an average day in New York in 1986, Salomons would trade \$18 billion of stock and might end a day's trading with more than \$40 billion of stock on its own book. Salomons is a world leader in market skills: they are extremely price-competitive and will take on huge blocks of stock for only tiny margins; half their profits come from trading on their own account; they are very innovative, and are continually designing new types of corporate bonds (for example, in late 1986 they issued a bond for Eastman Kodak which was denominated in Australian dollars but was convertible to US dollars); and they are experienced at 24-hours-a-day trading. An even bigger giant is Nomura, which has grown to be the world's largest financial institution as a result of the insatiable desire of the Japanese to save. Nomura is Number One in Japan and intends to become Number One in the world by expanding at the rate of 40 per cent per year.

With rivals of this kind entering the London markets, the British dealing and broking firms were justifiably feeling very nervous. Their degree of nervousness was doubled when they heard that big institutional investors such as the Prudential Insurance Company intended to use the brokers and dealers offering the best deals, regardless of past loyalties. With this kind of post-Big Bang environment in the City, it is felt that the smaller broker will not be able to compete in market-making, agency broking or the international markets. Unless they are able to tap the private client market or the smaller independent fund management groups, they are not likely to survive.

However, not all the overseas banks which came to London during the 1980s were successful. For example, Citibank bought up UK brokers Scringecour Kemp Gee and Vickers da Costa and formed the investment bank Citicorp Scringecour Vickers. Immediately there were cultural conflicts between the US owners and British brokers. In addition, Citibank made the disastrous purchase of the old Billingsgate fish market building on the banks of the Thames. The architect Richard Rogers was commissioned to spend millions of pounds converting the building into a trading floor for CSV. When the work was completed, the basement cold storage system (which has been used for the previous 200 years to keep the market's fish frozen) was switched off and, as the ice melted, the whole building, which in effect was built on a huge block of ice, began to sink into the Thames. Despite millions more pounds being spent to rectify this problem, CSV was never able to use the building and had to be located elsewhere. More disasters followed and in 1990 CSV closed with net losses to Citibank of £330m. Similarly, the US bank Security Pacific bought UK brokers Hoare Govett in 1982 and formed Security Pacific Hoare Govett. Again there were cultural conflicts and in 1987 the bank lost millions of pounds underwriting the British Petroleum privatisation issue which came to the market just after the October stock market crash. In 1990, SPHG was closed with a net loss to Security Pacific of £200m.

It was not only US banks which made disastrous acquisitions in London. Some British companies also made mistakes. For example, merchant bank Morgan Grenfell wished to expand into equity broking, so it purchased Pember and Boyle and formed Morgan Grenfell Securities. But Pember and Boyle were gilts brokers and had no expertise in equity broking and the whole enterprise failed with Morgan Grenfell Securities closing down in December 1988 with net losses of £90m. Morgan Grenfell was later taken over by Deutsche Bank. In fact, European investment banks have on the whole been much more successful in their acquisitions of UK merchant banks than have US investment banks. The year 1995 saw the effective end of the independent British merchant bank. One of the oldest British banks, Baring, was taken over by the Dutch group ING (International Netherlands Group), after its Singapore subsidiary lost £800m on Nikkei futures contracts. Warburgs was bought out by Swiss Bank Corporation and Kleinwort Benson was purchased by Dresdner Bank.

There are also problems for the system as a whole. One of the most important questions raised is over the effectiveness of the system of investor protection. What occurred in 1986 was a deregulation of financial markets but an increased supervision of players. But the supervision was in the form of self-regulation, and self-regulation works best with homogeneous groups of people with common objectives and restrictions on entry to maintain standards. If it is not possible to restrict entry, then self-regulation will not be effective. In addition, if competition keeps profits margins small, then there is an increased risk of fraud. This is exactly what happened in the early 1980s in the Lloyds of London reinsurance market, another self-regulated market. Unless the policing of the deregulated market place is adequate, the potential conflicts of interest that result from dual-capacity trading will turn into real conflicts of interest and fraud will result. The system of self-regulation was also highly fragmented without clear lines of responsibility. The effects of this were shown most clearly by the personal pensions mis-selling scandal in the late 1980s and early 1990s which the system of investor protection through decentralized self-regulation failed to prevent. This scandal was the primary reason behind

the introduction of an integrated system of financial regulation beginning with the establishment of the Financial Services Authority in 1997.

Another problem for the system is the new computer technology that is needed to run it. So much of the dealing and settlement is now done using computers that if the computer systems crash and there is a failure to deliver either stock or payments, the costs could be enormous. To illustrate the problem, in November 1985 the Bank of New York's computer broke down for two days and so much money was drawn out of the bank that it had to borrow \$22 billion from the Federal Reserve. The interest cost of this two day loan was almost \$8 million. There was a similar failure of Super-DOT, the computerized Designated Order Turnaround list-processing system, which automatically executes small orders on the NYSE, on Black Monday, 19 October 1987. The problems that the Stock Exchange itself had during the first few days of post-Big Bang trading, with the TOPIC service failing intermittently, shows that similar problems with the computer technology could arise in the UK. So while computer technology has been the most important single factor in the rapid expansion of the financial system both domestically and globally, there always remains the danger of systems crashes.

What are the likely long-term effects of the Big Bang? For the City of London itself, the long-term effects are likely to be similar to those that arose in New York after its Big Bang, namely a reduction in commissions and spreads on large trades and an increase in the volume of activity; there will also be an increase in concentration as competition reduces the numbers of both brokers and dealers. For large institutional investors and large corporate borrowers, the Big Bang is likely to be regarded as a success. The increase in competition in trading the stock of large companies is likely to benefit both groups. The reduction in commissions and spreads will help to lower the cost of raising capital for large companies, and the increase in liquidity will help large investors switch their portfolios more easily. These groups are also sufficiently large and influential in the market place that they do not require a system of investor protection. But small- and medium-sized firms or small investors may not fare so well. This is because the increase in competition in market-making and broking is not uniform across all companies' stocks. Smaller company stocks have actually been less well traded after Big Bang than before. This in turn will tend to raise the cost of capital to these firms and make their stock less liquid in the market-place and therefore less attractive to investors. Small investors have found that they have to pay more for broking services since the broking firms were more interested in competing for large investors. Also, the smaller investor may be more in need of investor protection than before.

The Big Bang was one large step towards reducing restrictive practices in the LSE. But many restrictive practices still remain and will increasingly be challenged either by the authorities or by competitive rivals such as Tradepoint. For example, in the mid-1990s the Office of Fair Trading issued two reports (*Trade Publication Rules of the London Stock Exchange*, November 1994, and *Rules of the London Stock Exchange relating to Market Making*, March 1995) that argued that, despite the changes since Big Bang, market making on the LSE remained uncompetitive. This was because the current system was *quote driven* with market makers having exclusive use of SEAQ to post the prices at which they are willing to trade and also having exclusive access to the prices quoted by inter-dealer brokers. Furthermore, market makers were able to delay the reporting of large blocks of shares and the prices at which such deals were done by 90 minutes. The OFT reports regarded these as excessive privileges for market makers.

The reports noted that only one other major market in the world (namely NASDAQ, the *National Association of Securities Dealers Automated Quotations*, in the US) was quote driven. All the other major markets (including those in New York, Tokyo and continental Europe) are *order-driven*. This means that customers post buy and sell orders for securities in the *public order book* and the exchange matches buy and sell orders for a share at the same price without the need for a market maker as

such. It is considerably more expensive to deal using quote-driven systems compared with order-driven systems. For example, in 1995 the average bid-offer spread for the most popular shares traded in London was 1.4 per cent, while on the New York Stock Exchange and the Paris Bourse, it was only 0.32 per cent and 0.30 per cent respectively. Associated with an order driven trading system is a *post-trade reporting system* in the form of a *last trade tape* or *ticker tape* which shows the transaction prices at which the last trade took place. Investors therefore know the actual price of the last trade which contrasts with a quote-driven trading system where investors know the indicative bid and offer prices at which the next trade might take place. With the order-driven system, investors can either place a market order to be executed at the last trade price or place a limit order which will be executed if the limit price is reached. Of particular concern are the shares of small companies which are difficult to trade using a quote-driven system. Proponents argue that order-matching is the only way to generate *liquidity* in the shares of small companies.

The delayed reporting of block trades by 90 minutes was criticized because it reduces the *transparency* of the market in terms of promoting *efficient price formation* and in ensuring that investors are treated fairly and equitably. This is because delayed publication might give an unfair advantage to both market makers and the institutions that place the trades at the expense of less well-informed market participants. Market makers argue that they need the time to break up a block of shares into smaller packages which can then be unloaded on to the market. If they do not have this breathing space, they argue, they might be left with unsaleable stock which increases the risk to market making and may eventually lead to a reduction in liquidity if market makers are, as a consequence, driven out of the industry. But small-scale investors who buy these small packages of shares might regret having bought them had they known that a block trade had just occurred. This is because they might have inferred that the reason the block trade was taking place was because the seller was aware of some adverse news concerning the company. So there appears to be a trade off between transparency and liquidity: greater transparency may well come at the cost of reduced liquidity.

Also during the early 1990s, there were rumours about market abuses, many of them taking place outside the direct control of the LSE. For example, much of the market manipulation and insider dealing in company shares was believed to be taking place through ADRs. One notable illustration of this was the share dealings carried out by Robert Maxwell prior to his death in 1991, most of which took place via ADRs. Similarly, the Guinness share support operation at the time of its takeover of Distillers was conducted using ADRs. Another type of market abuse involves short selling. Unscrupulous investors attempted to use short selling as a mechanism for driving down the issue price of shares in Wellcome and the third British Telecom privatization offer.

The Securities and Investments Board or SIB (the chief UK financial services regulator between 1986 and its replacement by the Financial Services Authority in 1997) responded to all these criticisms and complaints, as well as to the development of competitive rivals to the LSE, by issuing a set of proposals concerning market maker privileges and obligations on the LSE (*Regulation of the United Kingdom Equity Markets*, June 1995). The SIB argued that 'the primary objective of regulation of the UK equity markets is to enable investors to use these markets with confidence. Regulation seeks to achieve this by providing investors with an appropriate level of protection in the form of fair and clean markets, but without being so burdensome as to reduce the overall volume of trading... Investors will generally have confidence in the market process if they believe they can: deal satisfactorily, at an acceptable cost, in a market that is fair and is not misled, manipulated or abused; and rely on the integrity of the trading process overall, and in particular on the operation of trading and settlement systems' (p.15). This regulatory objective, the SIB argued, should be implemented via a number of guiding principles, such as: *market freedom*, investor protection should not impede market evolution

and competition; and *cost-effectiveness*, by supporting the integrity of the trading process, regulation should minimize the cost to investors when things go wrong, and by increasing the confidence of investors, regulation should reduce the cost of raising new capital. The SIB argued that success in achieving these objectives can be measured in three main ways: *fairness* in terms of market users having *equitable access to trading opportunities* on the basis of having *sufficient information* and with the *opportunity to exercise choice* in the light of their differing preferences and priorities, in terms of, say, immediate execution as against execution at acceptable prices; *freedom from abuse* in the sense that market users have confidence that the markets that they trade in are 'clean'; and *efficient price formation* which is vital for determining the fair value of securities and for achieving best execution for clients. In turn, efficient price formation relies on the transparency of dealings and the free flow of information.

In the light of these objectives, the SIB and the LSE negotiated a new deal which came into effect at the beginning of 1996 and which makes trades much more transparent. Trades up to six times normal market size and all trades between market makers have their details published immediately (i.e. within three minutes). Details of trades between six and 75 times normal market size have to be published within 60 minutes (rather than 90 minutes as formerly). The disclosure of block trades larger than this can be delayed for up to three days or until the market-maker has unwound 90 per cent of the position. The SIB estimated that under the new rules 75 per cent of trades by value are disclosed immediately and a further 20 per cent of trades by value are disclosed within one hour.

The LSE's order-driven share dealing system called SETS began in October 1997. But there was substantial opposition to this development from market-makers who would lose the privileges they enjoyed under the traditional quote-driven system (such as delays in reporting details and avoidance of stamp duty). Indeed their hostility was such that they forced the resignation of the LSE's chief executive in January 1996. However, there was equal support for the move from the Institutional Fund Managers Association, representing institutional investors such as pension and insurance fund managers, who would benefit from lower dealing costs and greater liquidity. They had threatened to move their business away from London to other European centres operating order-driven systems, pointing out that SEAQ-I was now defunct in European stocks. There was also support from the Association of Private Client Stockbrokers and Investment Managers.

Another practice that developed after Big Bang is the *soft commission arrangement* or *softing*. This is an arrangement whereby stockbrokers offer research and information services to institutional clients in return for guaranteed business to trade in securities. Since brokers do not charge explicitly for these services, the subsequent payment for them is said to be in *soft money*. The practice started because the increase in competition following Big Bang drove commissions down to the levels charged by the most cost-efficient brokers. After this, brokers could only compete on service not on price. But investment banks with both broking and market-making arms could use their economies of scale to offer better softing deals than independent brokers. This is because the broking arm of the bank could cover their costs through a cross-subsidy from the market-making arm. They could negotiate keener prices (higher sale prices and lower purchase prices) than was available to outside brokers who were forced to deal at the official prices quoted by the market maker on SEAQ. By keeping the difference between the official and negotiated prices, the broking arm could pay for the services that the independent broker could not afford to provide. The independent brokers argued that this was unfair competition and complained to the SIB. The SIB published a report in 1991 (*Soft Commissions — Recent Developments*) which recognized the problem but stated that it was impossible to prevent this happening. The integrated investment banks were only taking advantage of their greater economies of scale. But the long-run outcome is likely to be reduced numbers of independent brokers as they become absorbed by the large investment banks.

**Developments in Europe.** Within a European context, two important factors are affecting or are about to affect the UK financial system in a substantial way. These are the creation of the *European Financial Area* (EFA) and the introduction of *Economic and Monetary Union* (EMU) within the European Union (EU).

The European Financial Area formally came into effect on 1 January 1993 with the intention of establishing an integrated European financial system. This was part of the process of creating the *single European market* in goods and services by the end of 1992, a process that in the UK context was sanctioned by the 1986 *Single European Act*. The objective was to remove all barriers to entry in the provision of goods and services between member states of the EU, and, in the particular context of financial services, the liberalization of capital movements between member states and a common regulatory framework for financial services. By 1 July 1990, all capital controls had been removed by all member states.

Banking was one of the first financial service industries to begin the process of harmonization within the EU. The First Banking Directive of 1977 established minimum legal requirements for the authorization of credit institutions in member states. The Second Banking Directive which came into force in 1993 established minimum prudential standards to enable a credit institution authorized in one member state to offer core banking services in other member states under a single licence or *passport*. Core banking services include: deposit taking; lending (e.g. consumer credit, mortgage finance, trade finance); financial leasing; money transmission services; credit cards and travellers' cheques; guarantees and commitments; trading in money market instruments, foreign exchange, financial futures and options, and securities; participation in share issues; corporate finance advice; money broking; portfolio management and advice; and custodial services. A similar process occurred with insurance. Under a series of *Life Insurance Directives* (beginning in 1979) and *Non-life Insurance Directives* (beginning in 1973) insurance companies headquartered within the EU can, under the single passport scheme, offer services anywhere in the EU.

In 1996, the European Union's *Investment Services Directive* (ISD) and *Capital Adequacy Directive* (CAD) came into force. The objective behind these directives was to create a single market in financial services across Europe and to provide a passport for non-bank financial firms wanting to offer services in other member states. Home country authorization became a sufficient criterion for being able to operate cross-border, given, in addition, the acquisition of the passport. However, this greater freedom to operate cross-border was tempered by the simultaneous implementation of stringent capital adequacy requirements. Minimum levels of *initial capital*, in three tiers, were defined for firms wishing to trade under the provisions of these directives. Firms authorized to act as principals and to take positions on their own account were required to have initial capital of 730,000 ECUs (about £600,000) and also to hold additional capital equal to three months' fixed overhead costs. Firms acting as an agent or a fund manager and holding clients' money or securities were required to have initial capital of 125,000 ECUs (about £100,000). Firms acting as agents but are not authorised to hold clients' money were exempted from the initial capital requirement unless they deal in derivatives, such as options and warrants, in which case they were required to maintain 50,000 ECUs (about £40,000). However, the British government negotiated certain exemptions which resulted in 90 per cent of British independent financial advisers not having to meet the initial capital requirements of the CAD. Nevertheless, the British government has imposed its own minimum capital requirement of £10,000 irrespective of the size of the firm, as a means of cutting down on fraud.

The initial capital requirements have been criticized on the grounds that they are likely to reduce rather than enhance competition. Some have even argued that capital adequacy requirements for investment advisors who act only as agents are completely unnecessary; rather capital requirements are

needed only for those organisations, such as banks, insurance companies and market makers, that act as principals, taking positions on their own account. There was a danger of over regulation for a number of reasons. While large well-established companies can easily meet the capital requirements, dynamic new firms might be prevented from entering the industry. All firms have to meet the new requirements even if they do not intend to operate cross-border. Furthermore, business might shift to less regulated centres outside Europe. On top of this, banks had licences to do business throughout Europe, three years prior to the introduction of the passport and this has given them a head start over investment businesses.

The move towards mutual recognition began before 1996. For example, in October 1989, UCITS (or *undertakings for collective investments in transferable securities*) were introduced on an EU-wide basis. UCITS are unit trusts that are eligible for marketing and selling between member states. UCITS must be 90 per cent invested in transferable securities, such as shares and bonds, and they cannot invest directly in property, precious metals or options. They are limited to a 5 per cent investment in any single security, and 10 per cent in futures contracts. UCITS can invest through any recognized stock exchange in the world and they pay dividends gross to all investors. They can be bought and sold in any EU country that has introduced regulations that are compatible with the EU directive on investor protection. UCITS are subject to the marketing rules of the country in which they are being sold, not the country of origin. But they are not covered by any compensation scheme, even when sold in the UK.

There is no comparable EU directive on futures and options funds and developments have taken place on a piecemeal basis. In the UK, the Financial Services (Regulated Schemes) Regulations came into effect in 1991. These permitted managed futures and options funds to be marketed to the general public as authorized unit trust schemes. There are two types: *futures and options funds* (FOFs) and *geared futures and options funds* (GFOFs). FOFs are permitted to invest in transferable securities, derivatives (exchange-traded futures and options and certain over-the-counter options), cash, units in certain collective investment schemes, gold (up to 10 per cent of the value of the fund) and forward transactions in currencies or gold; investment in derivatives must be fully covered by the assets of the scheme (including permitted borrowing up to 10 per cent of the value of the assets). GFOFs can invest in the same assets as FOFs but in addition are allowed to invest up to 20 per cent of their assets in initial outlay (i.e. initial margin payments and premiums paid on options and warrants) and are not required to maintain sufficient assets to cover their full exposure; in other words, they are permitted to gear-up their investment exposure, but they are not permitted to cover this through borrowing.

The proposals for Economic and Monetary Union were contained in the *Delors Report* of June 1989 and form another aspect of the movement towards European integration. The Delors Reports envisaged a three-stage plan for EMU.

*Stage 1*, which began on 1 July 1990, further consolidated moves towards the single European market. It involved:

- 1 The complete removal of physical, technical and fiscal barriers;
- 2 The strengthening of competition policy and the reduction of state subsidies to industry;
- 3 The reform of structural funds, which offer regional aid, and the doubling of their resources;
- 4 Closer co-ordination of economic and monetary policies;
- 5 The deregulation of financial markets;

6 All EU currencies joining the *exchange rate mechanism* (ERM) of the *European Monetary System* (EMS).

The EMS began operating in March 1979. It has four components. The first component is the *exchange rate mechanism*. The ERM requires each participant to maintain its currency within specific bands around a central rate of exchange against other currencies in the mechanism. The band limits are changed periodically and have varied from 2.25 per cent on either side of the central rates to 15 per cent. Central banks are obliged to maintain their currencies within these limits. They can do so either by changing interest rates or by intervening in the foreign exchange markets when their currencies reach the band limits. If market pressures become too great and the policies required to retain exchange rates within band limits become unsustainable, then a realignment of central rates may be required. This is likely to occur if a member state runs a substantial trade surplus or deficit, or if there are widely differing inflation rates between member states. There were eleven central rate realignments between March 1979 and January 1987. Of the twelve member states of the EU at the beginning of Stage 1 of EMU, nine were members of the ERM (Germany, France, Italy, the Netherlands, Denmark, Belgium, Luxembourg, Ireland and Spain) and three were not (the UK, Greece and Portugal).

The UK joined the ERM on 8 October 1990 with a central rate of 2.95 DM per £ and with band limits of 6 per cent on either side of the central rate. The other currencies in the ERM had band limits of only 2.25 per cent, with the exception of the peseta which shared sterling's 6 per cent range. The Portuguese escudo joined the ERM in April 1992.

The second component of the EMS is the *European Currency Unit* (ECU). The ECU is calculated with reference to fixed quantities (or a basket) of EU currencies. The quantities are reset periodically. In September 1989, the ECU was reset to contain:

3.301	Belgian francs	0.008552	Irish pounds
0.1976	Danish krone	15.18	Italian lire
0.6242	Deutschmark	0.13	Luxembourg francs
0.2198	Dutch guilder	1.393	Portuguese escudos
1.332	French francs	0.08784	Pound's sterling
1.44	Greek drachmas	6.885	Spanish pesetas

The market value of the ECU is therefore equal to the weighted sum of the market values of the twelve EU currencies. The ECU is used in all official EU transactions, and is increasingly being used in transactions between large corporations within the EU. In October 1988, the UK government introduced Treasury bills denominated in ECUs.

The third component of the EMS is the *European Monetary Co-operation Fund* (EMCF). The EMCF is run by the governors of all the central banks in the EU. Its purpose is to create a fund of 'official' ECUs that can be used in transactions between the central banks, such as the settling of debts arising from operating the ERM. The EMCF operates by issuing ECUs to central banks in exchange for deposits from them equal to 20 per cent of their gold and dollar reserves. The reserves remain with the central banks who retain any interest earned on them.

The final component of the EMS is the *Very Short-term Financing Facility*. This allows funds to be borrowed by one central bank in the currency of another central bank to finance an intervention under the ERM. The funds have to be repaid after a short period.

Stage 2 of the Delors plan is a transition stage. It established a *European System of Central Banks* (ESCB) through the mechanism of a *European Monetary Institute* (EMI) which would begin to take

decisions on a common monetary policy, independent of political control. At this stage, central banks would begin pooling their reserves.

*Stage 3* involves a move to irrevocably fixed exchange rates, binding constraints on national budgets, and the EU acting as a single entity in international policy measures. The EMI would take over responsibility for the formulation and implementation of monetary policy. The EMI would also determine currency market interventions in respect of non-EU currencies and manage all official reserves. Finally a single EU currency (to be called the *euro*) would be established and the EMI would be replaced by a single *European Central Bank* (ECB).

The Delors Report was not accepted in full by all EU member states. All that was agreed was the starting date for Stage 1, namely 1 July 1990, and the condition that Stage 2 would not start until Stage 1 had been fully implemented. Nevertheless the report did establish a provisional timetable for the three stages: Stage 1 was to be completed by 31 December 1993, Stage 2 was scheduled to last between 1 January 1994 and 31 December 1996, and Stage 3 was scheduled to last between 1 January 1997 and 1 January 1999. Stage 2 did begin with the establishment of the EMI, but the other aspects of Stage 2, a common monetary policy and the pooling of reserves, did not materialize by the provisional completion date of 31 December 1996.

The most notable critic of the report has been the UK government. While not ruling out the principle of economic and monetary union as a long term objective, the UK government preferred an evolutionary and less bureaucratic approach, one that respected both parliamentary accountability and the diversity of member states. The government argued that Stage 1 involved profound changes that had to be implemented and analyzed before further developments took place. This was especially important, given the likely increase in membership of the EU following the revolutions in Eastern Europe in 1989.

The UK government accepted most of Stage 1 of the Delors Report because it promoted a single market with free movement of people, goods, services and capital, and equal access to capital and financial services for all citizens and companies. But the government wanted Stage 1 to be followed by a system: that increased the influence of markets and competition; that promoted price stability through a system of competing currencies, with citizens preferring to transact in the more stable currencies; that kept national control over economic policy making; and that involved no major constitutional changes. Stages 2 and 3 of the Delors plan involved the establishment of a new layer of bureaucratic institutions and laid down rigid rules that were potentially anti-competitive. For example, there was no guarantee that the European Central Bank would deliver successful counter inflationary policies. The Delors plan for regional aid involved compensating poorer EU member states for moving towards EMU. The government felt that this form of intervention was inefficient. It preferred the use of market forces to enable countries with lower costs to prosper under the single market. The UK government's position was that it would begin to participate in EMU and, in particular, in the ERM, when the UK inflation rate had been reduced to EU levels, when there was full capital liberalization in the EU, and when adequate progress had been made towards completing the single market.

The UK government's concerns about both the form and speed of implementation of EMU were not shared by other member states. In 1991 the Delors Report was formalized in the Maastricht Treaty. The Maastricht Treaty leads to the following:

- 1 Single currency by 1999 for EU member states meeting a set of convergence criteria (the UK opted out of this).
- 2 Independent European Central Bank to manage the single currency.

- 3 Gradual convergence of EU economies, especially in respect of interest and exchange rates, government expenditure and national debt in the run up to the single currency.
- 4 A Stability Pact to ensure convergence is maintained after the single currency is introduced; this will place severe limitations on the fiscal policies of national governments adopting the euro.
- 5 Cohesion Fund established by the richer countries to help the poorer ones (Spain, Portugal, Greece and Ireland) improve their economies.
- 6 More social legislation (known as the Social Chapter) governing the work-place (the UK opted out of this initially, although the Social Chapter was accepted by the newly elected Labour Government in 1997).
- 7 Greater inter governmental cooperation in foreign policy and defence, but individual member states will retain power of veto in foreign affairs except in narrow fields of non military action; a common defence policy and a joint army are ultimate objectives.
- 8 Greater inter-governmental cooperation in justice, crime and immigration affairs.
- 9 European citizenship, with full voting rights in country of residence.
- 10 Emphasis on 'subsidiarity', with decision-making at national level except in areas where EU-wide decisions can be justified.
- 11 New EU powers in environmental and consumer protection and setting up cross-border transport, energy and telecommunications networks in culture, education and training, and research.
- 12 European Parliament given greater powers to confirm the appointment of the President of the Commission, to amend or veto legislation, audit EU expenditure and investigate maladministration.

The *convergence criteria* specified in the Maastricht Treaty for membership of the single European currency by 1 January 1999 are as follows. Each member state must satisfy the following conditions:

- 1 Average inflation rate less than 1.5 per cent above the average of the lowest three member states during the preceding year.
- 2 Exchange rate within the narrow band of the ERM ( $\pm 2.25$  per cent) for two years.
- 3 Average long term interest rate less than 2 per cent above the average of the lowest three member states during the preceding year.
- 4 Budget deficit (PSBR) less than 3 per cent of GDP.
- 5 National debt less than 60 per cent of GDP.
- 6 Have passed legislation guaranteeing the political independence of the central bank.

Even if the five financial criteria are satisfied, a member state could not participate in the single European currency unless its central bank was politically independent and that legislation had been passed to ensure this.

The European Central Bank, which came into effect in 1998, has four main characteristics:

- 1 Its principal objective is the maintenance of price stability; however this has been defined, not as zero inflation, but as an inflation rate in any member state no higher than 1.5 per cent above the average of the lowest three member states (the central bank is also able to support the general economic policies and objectives of the EU, but without prejudice to the objective of price stability).
- 2 It is independent of political interference.
- 3 It has full responsibility for monetary policy across Europe.
- 4 It has powers to ensure that governments do not finance their budget deficits by printing money (i.e. that budget deficits are not monetized, since this tends to be inflationary).

The preference amongst the majority of member states to move towards full monetary union sooner rather than later was influenced by the recognition that the EMS was not likely to be sustainable in the long run as a result of the liberalization of capital controls within the EU after July 1990. With complete freedom of capital movements (i.e. perfect capital mobility), it is not possible for countries to maintain interest rate differentials in order to support their currencies; and exchange rate realignments are not readily permitted in the ERM. Until July 1990, countries that maintained capital controls were able to support their currencies by restricting capital outflows. With no controls, countries that had higher inflation rates than other ERM countries would find it difficult to devalue (since ERM rules do not allow this), and therefore would lose competitiveness. They would tend to experience persistent trade deficits compared with other ERM members. These trade imbalances would have put considerable pressure on countries to revert back to the early pattern of the EMS, when realignments within the ERM were fairly frequent.

The argument therefore was that, since capital controls had been removed, the EMS would come under increasing strain if inflation differentials persisted. Given that most countries did not want to leave the ERM, since this might damage the credibility of their counter-inflationary policies, further monetary integration was seen as the only option. Full monetary integration, where all countries agreed to have a single currency, by definition, implies irrevocably-fixed exchange rates, so, by design, there could be no realignments. In other words, monetary union would have the same effect as occurs in a single country with different regions all using the same currency (such as the USA). Monetary union of this form also implies a single monetary policy for all countries conducted by a single central bank.

A further impetus for EMU came from the single market in goods and services. Since the end of 1992, all trade barriers have been removed and workers and companies can now move freely between member states. Associated with these trends towards freedom of movement for factors of production (mainly labour and capital), it was argued by many member states that the existence of national currencies imposed unnecessary costs on transactions in Europe. It has been estimated that the cost of transacting in multiple currencies amounts to 4 per cent of Europe's GDP per year. So it would be much cheaper to conduct transactions in a common medium of exchange, i.e. in a single European currency.

The pressure for choosing the fast track towards EMU was further increased, at least in continental Europe, by the crises that occurred in the ERM in 1992 and 1993.

For nearly five years from January 1987 to September 1992 there were no realignments of exchange rates within the ERM. Many commentators regarded this period as evidence that, after a somewhat turbulent beginning, the EMS was able finally to offer its members a stable regime of fixed exchange rates. However, in September 1992 there was a crisis in the ERM involving speculative attacks on

sterling, the Italian lira, the Spanish peseta, the Portuguese escudo, the Irish punt and the French franc. The crisis resulted in:

- 1 Sterling's and the lira's membership of the ERM being suspended.
- 2 The peseta being devalued within the ERM.
- 3 Spain, Portugal and Ireland reintroducing exchange controls.
- 4 The attack on the franc being defeated only as a consequence of massive support from the German central bank (the Bundesbank).

The UK had for nearly four years been in the deepest recession since the 1930s. Despite this, the Conservative government, in power since 1979, won an historic fourth consecutive victory in a General Election in April 1992. However, the group most affected by the recession was its own electoral supporters. These were the businesses and home-owners who were being hurt by high borrowing costs necessitated by the UK having to match the high real interest rates that Germany required to attract the funds needed to finance the costs of German reunification. The government had used up most of its goodwill in persuading the electorate that a Conservative victory at the election would reinforce the credibility of the government's counter-inflation policy and, as a result, the financial markets would reward the UK with lower nominal and hence real interest rates.

However, the lowering of interest rates did not arrive in the aftermath of the Conservative election victory. There was only further, gloomy news confirming more bankruptcies, more home repossession, more redundancies, and a bigger current account deficit. All this pointed to a deepening of the recession rather than to recovery. Every sign indicated that if the government could not cut interest rates at home to encourage investment and hence boost domestic demand, then it would have desperately liked to reduce the exchange rate to boost export demand. This was despite protestations to the contrary. However, membership of the ERM prevented sterling from falling below 2.7780 DM per £ (the 6 per cent limit below the central parity of 2.95 DM per £).

It was well established that the UK had entered the ERM in October 1990 at too high an exchange rate against the Deutschmark. During the spring and autumn of 1990, John Major, then Chancellor of the Exchequer, had talked up the value of sterling from 2.70 DM to 2.95 DM per £ with promises of ERM membership, while keeping interest rates at 15 per cent. When sterling joined at a central rate of 2.95 DM per £ on 8 October 1990, interest rates were cut to 14 per cent, with expectations of further falls as the counter-inflationary disciplines of the ERM came into effect.

But the other members of the ERM had not been consulted either about the UK's intention to join or about the entry rate. The Germans certainly thought that the central rate was too high, making UK exports uncompetitive. They had also just embarked on the process of German reunification, following the collapse of the Soviet empire in Eastern Europe. The high costs of financing this were going to keep German interest rates high and were correspondingly going to keep UK interest rates high, whatever the need for lower interest rates in the UK.

In the event, sterling traded above the central rate for only five weeks of its 23 month membership of the ERM. The government was boxed in with very little room for manoeuvre. With sterling almost always trading below its central parity, nominal interest rates could not be cut as frequently as the government wished. Nominal interest rates were however reduced from 14 per cent to 10 per cent between October 1990 and June 1992. But the UK inflation rate had fallen at a faster rate during this

period, so the real interest rate was actually rising during this period and there was no sign that the recession was ending.

The catalyst to the September crisis was the Danish rejection of the Maastricht Treaty in a referendum on 2 June 1992. The train leading to European monetary and political union was derailed, if only temporarily, by what was regarded as an inner-core member of the ERM. The train was gradually put back on the tracks over the summer as the Maastricht Treaty was ratified by other member states, but its speed was not as great as before.

It was becoming clear over the summer that the Italian government budget deficit was out of control and that, as a result, Italy would find it increasingly difficult to maintain its exchange rate parity within the ERM. Also, over the summer, the financial markets came to the view that the UK recession was so deep that the government would not raise interest rates whatever happened to the value of sterling.

As sterling began to slide, the Prime Minister, the Chancellor, and the Governor of the Bank of England, as well as the EU finance ministers, all attempted to talk back up the value of sterling. But the markets began to sense that there was no clout behind the rhetoric, especially when sterling fell below the 75 per cent divergence indicator, the point at which intervention to defend the exchange rate is mandatory, and the Bank still did not intervene. The Bank believed that investors would not sell sterling as it approached its ERM floor because they knew that it was 'impossible' for sterling to fall below the floor.

But the markets became convinced that the government would not take the only measure that was necessary to lift sterling off the floor, namely raise interest rates. Even a £7.25bn loan, announced on 3 September, was designed to defend sterling without having to trigger a rise in interest rates.

The speculators also knew that they had up to £600bn of 'hot money' to sell short against sterling and the Chancellor had only £7.25bn to defend it. In addition, the government did not begin the defence of the pound until, in the words of the City commentator, 'it was on the goal-line'.

The attack came on 16 September 1992 (a date which has gone down in UK financial history as 'Black Wednesday'), three days after Italy had devalued within the ERM, and so three days after the markets had realized that the move to an 'irrevocable fixed exchange rate' had been put slightly in question! Currency dealers, acting on behalf of their clients, began selling massive quantities of sterling and the Bank of England was forced to buy it. They sold short; they sold forward; they did everything to drive down the price of sterling below the ERM floor, knowing that if they succeeded in doing this they could close their positions and make huge profits.

As the Bank's reserves ran out, the Chancellor was forced to raise interest rates. They were raised an unprecedented two times during the day from 10 per cent to 12 per cent, and then to 15 per cent. But it was too little and it was too late. Sterling eventually fell by 3.2 per cent against the Deutschmark during the day.

In order to fully protect investors in sterling assets from a fall of this size during a single day, overnight interest rates would have had to have risen to about 1200 per cent (i.e. 3.2 per cent  $\times$  365 days per year). The actual rise in interest rates, as with the £7.25bn loan, was wholly inadequate to protect sterling within the ERM. At 7.30pm on 'Black Wednesday', sterling was forced to make a humiliating withdrawal from the ERM. The Prime Minister was said to be 'devastated'. The total profits made by speculators on this single day were estimated to be at least £1bn.

The government immediately began to blame the Bundesbank and, in particular, its president, Professor Helmut Schlesinger, for helping to undermine sterling's position in the ERM. The government

listed five occasions on which senior officials of the Bundesbank had used language that had undermined sterling and the ERM: on August 25 and 28, and September 10, 15 and 16. For example, on 15 September, news agencies reported sources in the Bundesbank as suggesting that a sterling devaluation could not be ruled out, and on 'Black Wednesday' itself, Schlesinger was quoted as saying that Europe's financial problems were unresolved in spite of Italy's devaluation within the ERM the previous Sunday. Following the Bundesbank's successful intervention on 23 September to save the franc, the government also blamed the Bundesbank for not doing enough to save sterling.

The Bundesbank rejected all these criticisms. Specifically, it denied that it had favoured the franc over sterling, by revealing that it had spent DM 44bn (£17.3bn) defending the pound and the lira, most of it on sterling. The Bundesbank also said that it could not be blamed for anonymous statements and rumours in the markets or for inaccurate reproduction of its statements by news agencies.

At the end of July 1993 there was a second crisis which almost destroyed what remained of the ERM. In June 1993, France foolishly challenged German monetary leadership of the EMS by lowering its key short-term interest rate below that of Germany during an argument with Germany over the conduct of monetary policy shortly after the Balladur government took power in France. Within weeks, the speculators began to attack the French franc in an attempt to drive it out of the ERM just as they had done with sterling ten months before. However, rather than suspend the franc's membership of the ERM, as happened with sterling in September 1992, or change the central rates, as happened eleven times between March 1979 and January 1987, the remaining ERM members decided to widen the band limits to 15 per cent for all currencies in the ERM except for the guilder and the Deutschmark which remained within the 2.25 per cent band (i.e. for the French franc, Belgian franc, peseta, Danish krone, escudo and Irish punt).

From the UK government's viewpoint, an important underlying cause of these crises was the excessive haste to economic and monetary union implied by the timetable laid out in the Delors Report and the Maastricht Treaty. Everything had to be completed by the year 1999. The ERM, which had been conceived as a system of fixed but adjustable exchange rates and which the UK joined to give credibility to its counter-inflation policy, suddenly became the first stage of EMU and, therefore, became a test of commitment to EMU with its requirement for irrevocably fixed exchange rates followed by a single currency. The flexibility of the ERM was immediately taken away. The UK was expected to move rapidly to the narrow  $\pm 2.25$  per cent bands of the mechanism as a prelude to the irrevocable fixing of exchange rates. Any thought of realignment of the ERM was ruled out of order, and any country that did realign would have lost its credibility in the financial markets, however much its domestic economy needed a realignment. Supporters of EMU argued that if a country did devalue, the markets would not believe any assurances it gave that it would not devalue again and hence would demand higher interest rates to protect investors from the risk of further devaluations.

However, from the viewpoint of most of the other member states of the EU, these crises, far from deterring them, had the effect of renewing their determination to proceed to full monetary union and a single currency at the earliest opportunity. Only with a single currency, backed by the vast resources of the Bundesbank, could the speculators be defeated. In fact, after July 1993, it was not the speculators that worried most supporters of EMU. It was whether Germany could be compensated politically (in terms of being given the political leadership of Europe as well as a permanent seat on the UN Security Council) for giving up the Deutschmark in favour of the euro.

That EMU would come was not in much doubt, although it was clear that not all members of the EU would join at the same time. There was even a timetable for joining laid down in the Maastricht Treaty. By May 1998, the Council of Ministers of Economics and Finance had to determine which countries

satisfied the convergence criteria for admission to the euro, which was scheduled to be introduced on 1 January 1999. National debts had to be redenominated in euros by 1 July 2002. Even countries that did not satisfy the convergence criteria to the letter could still join if they had made sufficient progress towards meeting them, especially those criteria dealing with deficits and debt. The budget deficit to GDP ratio could exceed 3 per cent if it 'has declined substantially and continuously and reached a level that comes close to the reference value' or if 'the excess over the reference level is only exceptional and temporary'. The debt to GDP ratio could exceed 60 per cent if it is 'sufficiently diminishing and approaching the reference value at a satisfactory pace' (quoted from Maastricht Treaty, Articles 109j and 104c respectively). It turned out that 14 out of 15 countries (the exception was Greece) had budget deficits below 3 per cent of GDP, but very few countries had budget deficits below 60 per cent of GDP (and none if their unfunded state pension liabilities were officially included in measures of national debt). Only 11 of the 14 eligible countries opted to adopt the euro in May 1998: Germany, France, Italy, Holland, Belgium, Luxembourg, Spain, Austria, Portugal, Finland and Ireland. The UK, Sweden and Denmark opted to stay out of the first round of membership.

The British government decided that the UK would not adopt the euro as part of the first wave on 1 January 1999. However in October 1997, it set five economic tests for membership of EMU:

- 1 *Cyclical convergence.* Are business cycles and economic structures compatible so we can live comfortably with euro interest rates on a permanent basis?
- 2 *Flexibility.* If problems emerge, is there sufficient flexibility to deal with them?
- 3 *Investment.* Would joining EMU create better conditions for firms making long-term decisions to invest in Britain?
- 4 *Financial services.* What impact would EMU have on the competitive position of the UK's financial services industry, particularly the City's wholesale markets?
- 5 *Employment and growth.* In summary, will joining EMU promote higher growth, stability and a lasting increase in jobs?

These developments in Europe are in one way or another likely to have a dramatic effect on the City of London as the dominant financial centre in the European time zone. If the ERM is a success and if EMU goes ahead with UK participation and is also a success, there will be a big increase in competition in financial services between member states, there will be price (or at least inflation rate) stability, and exchange rate volatility will be a thing of the past. The single market will permit UK firms to market their products in other EU countries, but will also allow non-UK companies to market their products in the UK. For example, UCITS may well prove an attractive alternative to traditional unit trusts, since the management fees are about half those of unit trusts. But it is also possible that local loyalties might remain. The single market is likely to increase corporate finance activities such as mergers and acquisitions. But again the companies involved might prefer to take local advice on the matter. All this suggests a decentralization in the provision of financial services with strong regional financial centres developing.

Different parts of the UK financial system have responded in different ways to the pending increase in competition. In April 1990, the UK and German stock exchanges announced plans for increased co-operation through the *Federation of European Stock Exchanges*; in 1992 the Federation started *Eurolist*, a cross-border price-quotation and dealing system. Also in 1992 the London Traded Options Market (LTOM) and the London International Financial Futures Exchange merged to form the London

International Financial Futures and Options Exchange (LIFFE), following the growing threat from the MATIF in Paris and the DTB in Frankfurt. In 1998, the DTB merged with the Swiss options and futures exchange, SOFPEX, to form *Eurex*. In 1999, LIFFE introduced an automated trading system to compete against the one operating at *Eurex*.

However, two aspects of the new regime might actually reduce competition. The first is the capital adequacy requirements which, because of their relatively high fixed capital requirements, are likely to reduce the entry of small firms into the industry. The second is the problem of designing an acceptable investor protection framework that reduces investors' fears of investing in strange, foreign products.

While the UK financial system has been subjected to substantial interest rate and exchange rate volatility for the past 20 years, this might all change. If sterling enters the ERM or is replaced by the euro, many of the financial futures and options contracts currently trading may become obsolete. They will be replaced by new contracts, such as *credit derivatives*, denominated in euros. Further there is the prospect of the loss of monetary independence by the Bank of England. If monetary and fiscal policies are to be controlled by Europe rather than national governments, then the prospect of the ending of the UK gilts market becomes a possibility.

If the UK does not participate in EMU, then the outcome for the City depends on the success of EMU. If EMU turns out to be a bureaucratic nightmare with high costs of compliance, high reserve requirements and other restrictive policies, European banks might move to London and the City's relative importance in Europe might well increase. If EMU works and the euro replaces the currencies of continental Europe, a huge market in euro-denominated securities might develop in Frankfurt, eventually swamping the sterling-denominated markets in London and marginalizing London as a financial centre. Time will tell.

## Appendix: The City Research Project 1991–95

In 1991 the Corporation of London, the local authority responsible for the City of London, initiated a study to examine the City's competitive position in financial services in the light of the European single market which came into effect in 1992. The study, entitled the City Research Project, was conducted by the London Business School.

The aims of the project were to: collect and collate a full range of data pertaining to the City's financial services; describe and analyze the activities in the City and the sources of its competitive advantage; and to initiate a debate about London's future by highlighting possible directions for change. Of particular concern was whether London's predominance as the premier financial centre in the European time zone would survive the competitive pressures from other centres such as Frankfurt, Paris and Amsterdam, and whether there was any risk that the UK's financial sector would go the same way as much of the rest of British industry in the post-war period. The main conclusion of the study are as follows.

Of the world's three major financial centres (London, New York and Tokyo), London is the most important internationally. The other two are much larger, but this is due to the size of their domestic business. London is the global leader in foreign exchange trading, international bank lending to non-residents, marine and aviation insurance, international bond underwriting and trading, cross-border fund management, metals futures trading and shipbroking. The City employs some 150,000 people

and makes a contribution of £10.15bn a year to the UK's GDP. The financial sector of the UK as a whole is responsible for 20 per cent of the UK's GDP. There has also been rapid growth since the beginning of the 1980s, largely as a result of the introduction of new products such as swaps, financial futures, and the underwriting of international equities and commercial paper. London has, however, lost market share in some of the more mature markets such as bank lending and general insurance.

There are several sources of London's competitive advantage. Historically, London has benefited from what is known as first mover advantage. Being Europe's first significant financial centre, London achieved a critical mass in a whole range of activities that other centres were not able to reach. As Stanislas Yassukovich, the Chairman of the Governing Board of the City Research Project, said in the Final Report: 'The sharing of common services, access to pools of skills, speed of dissemination of information and risk are all forces which lead to the clustering of practitioners. Thus externalities are created, such that each firm derives extra benefit from the proximity of other firms. These externalities protect the incumbent producer so that it is possible for no one city to have an inherent advantage over another, but once services have concentrated in one centre, there is no incentive for anyone to leave' (p.x).

Currently, London has four principal competitive advantages: strategic assets, relationship structures, reputation and innovation. Strategic assets include favourable regulatory, tax and legal structures, although it is possible to duplicate these elsewhere. But the most important strategic asset is a large pool of skilled personnel whose competitive advantage is constantly enhanced by the transferable skills acquired as a result of the shared experience of being located in the same city. New financial centres have difficulties in achieving the critical mass necessary for this to happen. Certain ancillary services, such as accounting, actuarial, legal, printing, telecommunications and information, computing and technical support services, are strategic assets which are difficult to introduce at low cost into small centres. Relationship structures, in particular the nature of personal contacts, are important for establishing trust and reducing the likelihood of corrupt practices. These, in turn, help to secure and enhance reputation, and reputation, in turn, helps to attract both new business and the best entrepreneurs and innovators. In this way a virtuous circle develops as innovation helps to preserve the primacy of the first mover.

While these competitive advantages are not easy to replicate elsewhere, there have certainly been challenges to the City's position. The report concludes that London will not face a serious threat from continental financial centres, despite the fact that Paris and Frankfurt have done much to attract business away from London. There are three reasons for this. London's position depends chiefly on the world-wide growth in demand for financial services, rather than on what is happening in the rest of Europe, and this demand depends on global economic growth and the global regulatory framework. Much of the activity in different financial centres is complementary rather than competitive, e.g., the origination of business is best conducted in dispersed financial centres, but the trading of the securities subsequently issued is best conducted in a single financial centre in order to maximize liquidity, so the greater the origination the better it is for the principal trading centre. Competitive threats to London are more likely to come not from monolithic financial centres but from niche centres, e.g. Dublin, Jersey and Luxembourg in offshore fund management, Bermuda in insurance, and Piraeus in shipbroking. The report also dismisses the threat from regional centres such as Hong Kong and Singapore; while the growth in Hong Kong and Singapore as financial centres certainly reflects the increasing economic importance of the Pacific Rim, this does not necessarily imply that they will take business away from London.

However, the Report does conclude that London, while not facing serious external threats, does face a number of significant internal threats to its competitive advantage. These relate to the co-ordination

of policy and to the physical and institutional infrastructure.

The Report argues that policy-making in a number of important areas, such as promotion, education and training, establishing protocols and reacting to crises, is fragmented. For example, promotion is undertaken by the Corporation of London, British Invisibles, London First Centre and the many trade associations. But there is both wasteful duplication and significant gaps: no organisation is responsible for promoting inward investment by financial institutions or increasing the total volume of business in London. The Report calls for improved policy coordination in these areas. In particular, it recommends that there should be mergers between related trade associations and that the merged associations should be made more effective through the employment of full-time professional staff. These associations have an important role in helping to keep the regulatory framework supportive and up to date. The report also criticises the UK's implementation of EU directives which, because of the precise drafting requirements of English law, is less flexible than is the case in other member states. Because EU legislation, once implemented, is difficult to change, this could place severe constraints on the dynamism of London's financial system.

In terms of physical infrastructure, the Report argues that this is a major responsibility of the government. London's roads are heavily congested, its underground system is antiquated and unreliable, the co ordination of transport policy in London is fragmented, long-term investment planning is hampered by short-term expediency over government spending, and the planning process itself is slow and ineffective compared with the rest of Europe. The Report argues that the private sector financing of transport projects in Central London is not really feasible, but that individuals and businesses which are based in the City and will benefit from improved transport will have to finance the expenditure in one way or another. Fare increases will not provide all the required finance, but the report suggests two radical solutions: road pricing could provide both funds and more efficient road use, and a property tax on the businesses in Central London that would benefit most from improvements in the transport system.

Historically, the City of London has had a more international outlook than the other major financial centres, New York and Tokyo, and the institutional infrastructure within which the City operates reflects this: the stable and pragmatic political, regulatory and legal systems have all helped to promote London's international reputation. The location of financial services is very sensitive to the tax and regulatory regimes of different financial centres and to any changes in these regimes. The classic example is the euromarkets which started when the US imposed the Interest Equalisation Tax in the early 1960s. The Report warns that London could lose its competitive advantage either if the tax and regulatory regime in the UK were to be made more onerous or if deregulation in other financial centres continued. The Report suggests some regulatory principles that should be adopted in the UK (p.xxii):

- 1 The purpose of regulation is to alleviate market failures, which are typically connected with a) systemic risk, b) fraud, or c) lack of information. The purpose should not be to protect investors from risks which the market can reasonably assess.
- 2 If the regulatory system is unable to provide investor protection, there should be compensation, but this should always include a deductible to ensure that the investor is subject to the principle of *caveat emptor*.
- 3 The focus of regulation should be primarily on retail markets; wholesale investors should as far as possible be exposed to the principle of *caveat emptor*.
- 4 Where possible, regulation should employ market, rather than administrative solutions to market failure.

5 The efficiency of the regulatory structure is likely to be improved by the Securities and Investments Board focusing as far as possible on standard-setting rather than detailed rule-making. The Report acknowledges that there is a widespread view that the regulatory system in the UK imposes high costs of compliance yet has failed to provide satisfactory investor protection. However there were no direct measures of these costs. The Report provides some measures which indicate that the direct costs of regulating the securities industry are similar to those in the US and France. But the indirect costs of compliance on firms were up to three times the size of the direct costs, so that the total cost of financial service regulation amounted to 3.4 per cent of net operating expenses. The Report argues that it is important that regulation provides 'value-for-money'. These ideas appear to have been taken into account in the design of the Financial Services Authority which replaced the SIB in 1997.

The Report also warns of the dangers of the politicization of regulation within an EU context. There were four main concerns (p.xxiii):

- 1 Harmonization of regulation is likely to result in rules which are less well-suited to individual markets or institutions.
- 2 Harmonization may make regulation more remote from practitioner expertise.
- 3 International agreements are hard to reach, so that there is likely to be reluctance to adapt them as shortcomings are revealed and markets change.
- 4 Regulation becomes politicized, so that rules are the outcome of a bargaining process. One consequence is that financial services shift out of the EU to more hospitable centres.

The Report argues that the UK tax system causes a number of distortions in respect of financial transactions, e.g. the differences between taxable and accounting income, the division between income and capital gains, and the treatment of foreign exchange gains and losses and off-balance sheet items such as options. Rapid financial innovation is likely to lead to tax anomalies, but the Report argues there should be a speedy resolution to these, possibly through the use of outside experts in the tax reform process. Uncertainty over taxation issues places any financial centre at a strong competitive disadvantage. The taxation of personal income is also an important matter, because it affects the remuneration of expatriate staff employed by overseas financial institutions. The Report notes that in recent years, many of the tax reliefs for expatriate staff have been phased out, so that any increase in income tax rates would reduce the attractiveness of overseas institutions locating in London.

Finally, the Report considers the consequences of Economic and Monetary Union within the EU. EMU and the introduction of a single currency would lead to the closing of a number of markets and the expansion of others. Intra-European foreign currency dealing would disappear as would the national money and bond markets. These would be replaced with the market for the euro and the euro-denominated money and bond contracts of the regional governments of the EU. The Report notes that the effect on London would depend on whether the UK joined EMU. If the UK joined, London and the Bank of England might have the same dominant role as New York and the New York Federal Reserve Bank does in the US. If the UK stayed outside EMU and those that joined faced excessive reserve requirements and other restrictive policies, European banks might relocate in London. On the other hand, EMU might succeed and a strong liquid euro money and bond market might develop in Frankfurt. The Report does not predict which of these outcomes will materialise, but it does end by proposing a number of ways in which the Bank of England might harmonise its operating procedures with those of

other central banks and also increase the liquidity of the UK money markets. These include: widening the range of instruments with which the Bank of England deals by replacing outright bill purchases in its money market operations with repurchase agreements, enabling the Bank to lend cash against an extended set of eligible securities, such as government bonds, as collateral; widening the set of institutions with which it deals by establishing an open gilt repo system, thereby eliminating the special privileges of the discount houses (these two proposals were adopted in 1996); paying Treasury receipts into secured accounts with commercial banks rather than the Exchequer accounts at the Bank. The Report notes that current practices have led to recent very high volatility in the overnight interest rate, ranging from 4.5 per cent to 20 per cent. The proposed changes would increase the depth and liquidity of the money market, make money-market shortages more predictable and reduce the volatility of the overnight rate.

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**Exercises**

- 1 Who are the main participants in the financial system?
- 2 What are the main functions of financial intermediaries?
- 3 What are the main types of financial intermediary?
- 4 What are the principal differences between retail and investment banks?
- 5 What are the main ways of classifying securities?
- 6 How would you measure the marketability of a particular security?
- 7 Why are futures and options known as derivative instruments?
- 8 Why is a convertible bond a composite security?
- 9 What is the difference between money markets and capital markets?
- 10 What is the difference between primary and secondary markets?
- 11 What are the main reasons for trading in secondary markets?
- 12 What is the difference between transaction prices and equilibrium prices?
- 13 What is the bid-offer spread? What is the touch?
- 14 What is the role of a market-maker?
- 15 Explain the difference between quote-driven and order-driven trading systems.
- 16 Explain the difference between a broad, deep market and a thin, shallow market?
- 17 What factors are likely to determine the size of the bid offer spread?
- 18 How can a market-maker protect himself in a volatile market?
- 19 Explain the terms 'market order', 'stop order', 'limit order', 'stop limit order'. Give examples.
- 20 What is the difference between a cash account and a margin account? Illustrate using an example.
- 21 What is the difference between a short sale agreement and a repurchase agreement? Illustrate using an example.
- 22 What role do regulations play in a financial system?
- 23 Explain the role of the Financial Services Authority.
- 24 What are conduct of business rules?
- 25 What is the difference between a recognized investment exchange and a designated investment exchange?
- 26 What is specific unpublished price-sensitive information? Why is it important?

- 27 Compare and contrast the different roles played by GEMMs, IDBs and repurchase agreements in the UK gilts market.
- 28 Compare and contrast the different methods of issuing:
  - a) gilts in the UK;
  - b) shares in the UK.
- 29 What is the 'when issued' market?
- 30 Compare and contrast the different markets trading shares in the UK.
- 31 How are international securities traded in the UK?
- 32 What are American depository receipts?
- 33 What was 'Big Bang'? What are the likely consequences of 'Big Bang'?
- 34 How successful will Economic and Monetary Union be within Europe?

