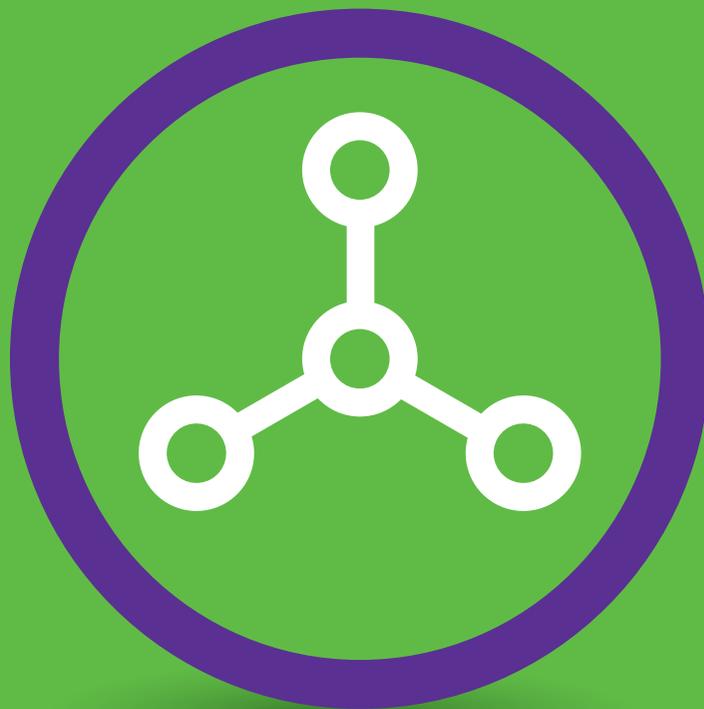


CHAPTER 15

THE FUNCTIONING OF FINANCIAL MARKETS

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LEARNING OUTCOMES

After completing this chapter, you should be able to do the following:

- a** Distinguish between primary and secondary markets;
- b** Explain the role of investment banks in helping issuers raise capital;
- c** Describe primary market transactions, including public offerings, private placements, and right issues;
- d** Explain the roles of trading venues, including exchanges and alternative trading venues;
- e** Identify characteristics of quote-driven, order-driven, and brokered markets;
- f** Compare long, short, and leveraged positions in terms of risk and potential return;
- g** Describe order instructions and types of orders;
- h** Describe clearing and settlement of trades;
- i** Identify types of transaction costs;
- j** Describe market efficiency in terms of operations, information, and allocation.

INTRODUCTION

1

Have you ever bought shares, bonds, or invested money in a mutual fund? If so, you have—whether you realise it or not—been served by financial markets. Many investors use financial markets to implement their investment decisions, as reflected by the trillions of financial market transactions each year.

Investors buy and trade securities that are issued by companies and governments that need to raise capital. Markets in which companies and governments sell their securities to investors are known as **primary markets**. Each type of security has its own primary market. For example, in most countries, there is a primary market for shares issued by companies or bonds issued by the sovereign (national) government.

Investors also trade securities, such as shares and bonds, as well as contracts, such as futures and options. These trades take place in **secondary markets**. When trading securities and contracts in secondary markets, investors often obtain assistance from trading services providers, such as brokers and dealers. These specialists perform a variety of tasks, which were described in the Structure of the Investment Industry chapter.

Well-functioning financial markets are important for economic welfare. Investment industry participants must understand how financial markets work; this understanding will help them appreciate how the industry connects those who need money with those who have savings and are willing to invest their savings. In this chapter, you will learn how primary and secondary markets operate, how investors and traders are served by these markets, and what characterises well-functioning financial markets.

PRIMARY SECURITY MARKETS

2

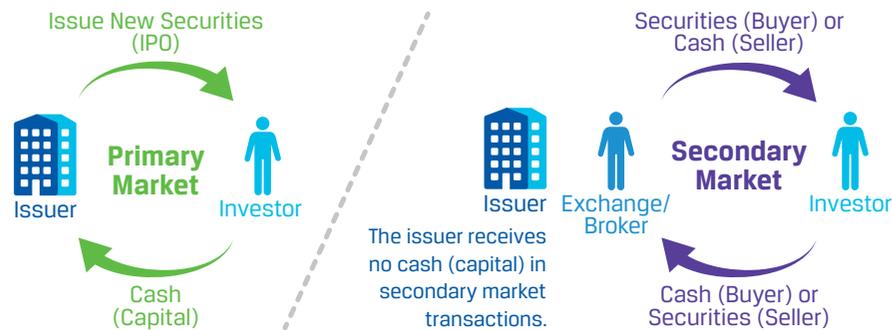
Secondary markets are the main focus of this chapter because most investors buy and sell securities via secondary markets. So, most of the investment industry is focused on secondary markets. But, first, we discuss primary markets, which are the markets in which issuers sell their securities to investors. In other words, primary markets are where securities first become available to all investors. **Issuers** are typically companies and governments; selling securities to investors in exchange for cash is a way for these companies and governments to raise money. The main primary market transactions are public offerings, private placements, and rights offerings.

2.1 Public Offerings

As discussed in the Equity Securities chapter, a company that sells securities to the public for the first time makes an initial public offering (IPO), sometimes also called a placing or placement. Practitioners say that the company is “going public”. The shares

offered consist of new shares issued by the company and may also include shares that the founders and other early investors in the company want to sell. The IPO provides founders and other early investors with a means of converting their investments into cash, a process known as monetising.

The selling of new shares by a publicly traded company subsequent to its IPO is referred to as a secondary, or seasoned, equity offering. Both initial public and seasoned offerings occur in the primary market for a particular type of securities—for instance, the primary market for corporate bonds. Later, if investors buy and sell this type of securities from and to each other, they do so in the secondary market. Note that the issuer only receives additional capital when it issues new securities in the primary market. It will not receive any new capital from the trading of its securities in the secondary market.



Before a public offering, the issuer typically provides detailed information about its business and inherent risks as well as the proposed uses for the money it hopes to raise. This information is offered in the form of a prospectus to potential investors. Most exchanges and their regulators have detailed rules regarding the format and content of a prospectus.

Companies generally contract with investment banks to help them sell their securities to the public. Investment banks play an important role in identifying potential investors and setting the offering price—that is, the price at which the securities are sold. The role played by investment banks is different, however, depending on whether it is an underwritten offering or a best efforts offering.

The most common offering type for initial public and seasoned offerings is an **underwritten offering**. In an underwritten offering, the investment bank acts as an underwriter. In this role, the investment bank buys the securities from the issuer at a price that is negotiated with the issuer, thus guaranteeing that the issuer gets the amount of capital it requires. The securities are then sold at an agreed-on offering price to investors. The objective of the investment bank is not to become a long-term shareholder of the issuer but to be an intermediary between the issuer and the investors for a fee. Finding investors willing to buy the securities is thus an important aspect of an underwritten offering because it reduces the risk that the investment bank is unable to resell all the securities it bought from the issuer.

In a process called book building, the investment bank identifies investors who are willing to buy the securities. These investors are known in the industry as subscribers. The investment bank tries to build a book of orders from clients or other interested buyers to whom they can resell the securities.

In the book building process, the right offering price is particularly important. If there are not enough buyers for all the securities that are for sale, the offering is said to be undersubscribed. If there is more demand than securities for sale, the offering is said to be oversubscribed. In the case of oversubscription, the securities are often allocated by the investment bank to preferred clients or on a *pro rata* basis, by which all investors get a set proportion of the shares they ordered.

In the case of undersubscription, the investment bank will be left with unsold securities, which not only commits capital for longer than expected but is also risky. If after the public offering, the price of the securities falls below the offering price, the investment bank may face a loss. So, investment banks have a conflict of interest with respect to the offering price in underwritten offerings. As agents for the issuers, they should price the issue to raise the most money for the issuer. But as underwriters, they have strong incentives to choose a lower price because it reduces the risk of the offering being undersubscribed. Underwriters can also allocate these essentially “underpriced” securities to benefit their clients, a process that indirectly benefits the investment bank.

First-time issuers may accept lower offering prices because they are concerned about the possibility of the issue being undersubscribed. Many believe that an undersubscribed IPO conveys unfavourable information about a company’s prospects at a time when the company is most vulnerable to public opinion about its future. The issuer may fear that an undersubscribed IPO will reduce the benefits of going public, such as the opportunity to raise capital in subsequent offerings and the positive publicity associated with a successful IPO.

In an IPO, the underwriter usually promises to ensure that the secondary market for the securities will be liquid. If necessary, the underwriter provides price support for a limited period of time, typically about a month. During that time, if the price of the securities falls below a certain threshold, the underwriter will buy securities to stop or limit the price fall. Providing price support is costly to investment banks, and it is another factor that motivates them to choose a lower offering price so that the security’s price in the secondary market rises immediately following the IPO. However, price support does not guarantee that the security’s price will not fall. For example, the price of Facebook’s shares declined substantially in the weeks that followed the company’s IPO in 2012, despite price support from the underwriters.

Pricing is less challenging in a seasoned offering because the issuer’s securities already trade in the secondary market. Thus, it is easier to identify an appropriate price for the offering. The fees charged for a seasoned offering are lower than for an initial public offering because there is less risk.

A single investment bank may not have the distribution network, capital, or risk appetite to organise a large offering, so large offerings are often organised by a syndicate that includes several investment banks. The syndicate helps the investment bank that leads the offering (known as the lead underwriter) to build the book of orders. The issuer pays the investment banks an underwriting fee for all these services.

In a **best efforts offering**, the investment bank acts only as a broker and does not assume the risk associated with buying the securities. If the offering is undersubscribed, the issuer will sell fewer securities and may not be able to raise as much capital as it had planned.

Exhibit 1 summarises the roles of those involved in a public offering.

Exhibit 1 Roles of Those Involved in a Public Offering

Participant	Role
Issuer	Makes new shares or shares held by the founders and other early investors available for sale to the public. Provides detailed information about its business and inherent risks as well as the proposed uses for the funds.
Investment bank	Identifies investors who are willing to buy the securities and helps sell the securities to the public. Underwritten offering Buys the securities from the issuer at a price that is negotiated with the issuer and then resells them to investors at the offering price. This effectively guarantees that the issuer gets the amount of capital it expects. In an initial public offering, it also promises to ensure that the secondary market for the securities will be liquid and to provide price support for a limited period of time. Best effort offering Only acts as a broker of the offered securities and does not assume the risk associated with buying the securities.
Syndicate	Helps the lead underwriter build the book of orders.

Companies sometimes sell new issues of seasoned securities directly to the public over time via shelf registrations. In a **shelf registration**, the company provides the same detailed information that it would for a regular public offering. However, in contrast to a seasoned offering in which all the shares are sold in a single transaction, a shelf registration allows the company to sell the shares directly to investors over a longer period of time. Shelf registrations provide companies with flexibility on the timing of raising capital, and they can alleviate the downward pricing pressures often associated with large secondary offerings.

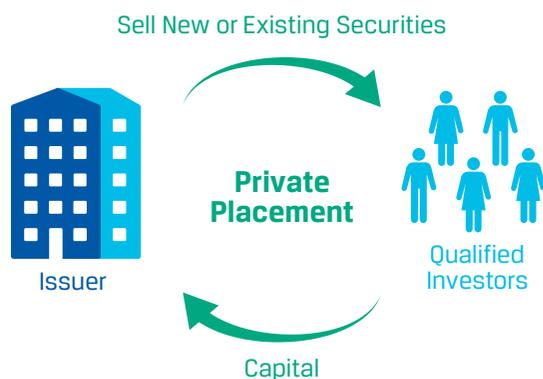
2.2 Private Placements

Companies sometimes issue their securities to select investors via private placements. In a **private placement**, companies sell securities directly to a small group of investors, usually with the assistance of an investment bank that helps identify potential investors and set the price of the securities.

Investors in private placements are expected to have sufficient knowledge and experience to recognise the risks that they assume, so most countries require less disclosure for private placements than for public offerings. Thus, private placements allow quicker access to capital with less regulatory oversight and lower cost of regulatory compliance than public offerings.

Issuers can raise money in the primary markets at a lower cost when their securities can be traded in liquid secondary markets. Investors value liquidity because they may need to sell their securities quickly to raise cash. So investors will pay less for securities that are difficult or costly to sell (illiquid) than for those that are easy to sell (liquid). Because securities offered in a private placement do not trade in a secondary

market like securities offered in a public offering, investors are willing to pay less for the former than for the latter. In other words, investors generally require higher returns for securities issued via private placements than for the same securities issued via public offerings.



2.3 Rights Offerings

Companies can also raise capital and issue new shares via rights offerings. In a rights offering, a company allows existing shareholders to buy shares at a fixed price (called the exercise price) in proportion to their holdings. The rights that existing shareholders receive are often known as pre-emptive rights because existing shareholders have the right of first refusal on any new equity offerings. Without such rights, the issuing company's management could dilute (reduce) the ownership interests of existing investors.

Because rights do not need to be exercised, they are options—one of the types of derivative instruments presented in the Derivatives chapter. The exercise price of the rights is typically set below the current market price of the shares so that buying shares by exercising the rights is immediately profitable—that is, an existing shareholder can pay the exercise price and get shares that can immediately be sold at a higher market price for a profit. Accordingly, most rights are exercised.

Existing shareholders who do not want to exercise their rights will be “diluted”—that is, their proportional ownership will decrease because they will hold the same number of shares in a company that now has more shares outstanding. By selling their rights to others who will exercise them, they receive compensation for the decrease in their proportional ownership. Shareholders generally dislike rights offerings because they must provide additional capital to avoid dilution or sell their rights and experience dilution of ownership.

2.4 Other Primary Market Transactions

The national governments of financially strong countries generally issue their debt securities in public auctions. These governments may also sell securities to dealers, who then resell them to their clients. Smaller and less financially secure national governments often contract with investment banks to help them sell their securities.

3 TRADING VENUES

So far in this chapter, we have described how primary markets operate; the rest of the chapter focuses on secondary markets and how they help investors buy and sell securities. In secondary markets, securities trade among investors, and there is thus a need for a trading venue—either physical or electronic—where orders can be placed and trading among investors can occur. **Orders** are instructions that investors who want to trade give trading service providers, such as brokers and dealers, who are discussed in the Structure of the Investment Industry chapter.

This section discusses exchanges and alternative trading venues and then compares them.

3.1 Exchanges

Securities exchanges, or exchanges, are where traders can meet to arrange their trades. Historically, brokers and dealers met on an exchange floor to negotiate trades. Increasingly, exchanges now arrange trades based on orders that brokers and dealers submit to them electronically. These exchanges essentially act as brokers, blurring the distinction between exchanges and brokers.

The main distinction between exchanges and brokers is their regulatory operations. Most exchanges regulate their members' actions when trading on the exchange and sometimes also away from the exchange. Brokers generally regulate trading only in their brokerage systems.

Many exchanges also regulate the issuers that list on the exchange, generally requiring timely financial reporting and disclosure. Financial analysts use this information to value the securities traded on the exchange. Without such information, valuing securities would be difficult and market prices might not reflect the fundamental values of the securities. Recall from the Structure of the Investment Industry chapter that a security's fundamental value is the value that would be placed on it by investors if they had a complete understanding of the security's investment characteristics. When market prices do not reflect fundamental values, well-informed participants can profit from less-informed participants. To avoid losses, less-informed participants withdraw from the market, which is detrimental not only to the investment industry but also to the wider economy.

Exchanges also attempt to ensure that companies are run for the benefit of all shareholders and not to promote the interests of controlling shareholders who lack significant economic stakes in the company. For example, some exchanges prohibit companies from concentrating voting rights in the hands of a few shareholders who do not own a proportionate share of the company's equity.

Exchanges derive their regulatory authority from their national or regional governments or through voluntary agreements by their members and their issuers. In most countries, regulators created by the national government oversee exchanges. Most countries also have regulators that impose financial disclosure standards on public issuers.

Exchanges charge fees for their services. They may charge the buyer, the seller, or both parties a transaction fee, which is essentially a commission for facilitating trades. Transaction fees and other transaction costs are further discussed in Section 8.

3.2 Alternative Trading Venues

Not all secondary market trading takes place on an exchange. There are a number of alternative trading venues that are owned and operated by broker/dealers, exchanges, banks, and private companies. These venues can take many different forms and be called by many different names. In the United States, such venues are generally referred to as alternative trading systems, whereas in Europe, they are commonly called multilateral trading facilities.

Many alternative trading venues permit only certain traders or types of traders to use their trading systems, and each of them has its own rules. Most alternative trading venues allow institutional traders to trade directly with each other without the intermediation of dealers or brokers, which makes them lower-cost trading venues.

Some alternative trading venues operate electronic (computerised) trading systems that are similar to those operated by exchanges. Others operate innovative trading systems that suggest trades to their clients based on information that clients share with them or that they obtain through research into their clients' preferences.

One type of alternative trading venue is a **crossing network**, which is an electronic trading system that matches buyers and sellers who are willing to trade at prices obtained from exchanges or other alternative trading venues. Crossing networks are popular with investors who want to trade large blocks of securities without risking moving the price of those securities by submitting an order to an exchange.

Some alternative trading venues are known as **dark pools** because of their lack of transparency. Dark pools do not display orders from clients to other market participants. Large institutional investors may transact in dark pools because market prices often move to their disadvantage when other traders know about their large orders.

3.3 Comparison of Trading Venues

Most secondary market trading globally is now done via electronic trading systems. Traders submit orders to the trading venues electronically. Computers then arrange trades continuously, based on specific trading rules. Trading rules, which stipulate how to match buyers and sellers, vary depending on the trading venue.

Electronic trading systems have greatly decreased the costs of arranging trades. The lower costs of trading have increased trading volumes, and investors now use many investment strategies that were previously too expensive to implement.

An important distinction between exchanges and alternative trading venues is the regulatory authority that exchanges exert over users of their trading systems. Alternative trading venues only control the conduct of subscribers who use their trading systems. Another distinction among trading venues is related to trade transparency. A market is said to be pre-trade transparent if the trading venue publishes real-time data about

quotes and orders. Quotes are prices at which dealers are prepared to buy and sell securities and are discussed in Section 6. Markets are said to be post-trade transparent if the trading venue publishes trade prices and sizes soon after trades occur.

To respond to regulatory requirements, all trading venues offer post-trade transparency, although the speed at which it happens varies among trading venues. Exchanges are pre-trade transparent, but many alternative trading venues are not. Many investors value transparency because it allows them to better manage their trading, understand market prices, and estimate their transaction costs. In contrast, dealers often prefer to trade in opaque markets because, as frequent traders, they have an informational advantage over those who trade less frequently.

4 TRADING IN SECONDARY MARKETS

Trading in secondary markets is the successful outcome of searches in which buyers look for sellers and sellers look for buyers. A critical key to success is liquidity because when markets are liquid, the costs of finding a suitable counterparty to trade with are low.

Secondary markets are organised either as call markets or as continuous trading markets. In a **call market**, participants can arrange trades only when the market is called, which is usually once a day. In contrast, in a **continuous trading market**, participants can arrange and execute trades any time the market is open. Most markets, including alternative trading venues, are continuous.

Buyers can easily find sellers and vice versa in call markets because all traders interested in trading (or orders representing their interests) are present at the same time and place. Trading venues that are call markets have the potential to be very liquid when they are called, but they are completely illiquid between calls. In contrast, traders can arrange and execute their trades at any time in continuous trading markets.

There are three main types of market structures for trading: quote-driven, order-driven, and brokered markets.

4.1 Quote-Driven Markets

Quote-driven markets, also called dealer markets or price-driven markets, are markets in which investors trade with dealers. These markets take their name from the fact that investors trade with dealers at the prices quoted by the dealers. Almost all bonds and currencies, and most spot commodities (commodities for immediate delivery), trade in quote-driven markets.

Quote-driven markets are often referred to as **over-the-counter (OTC) markets** because securities were once literally traded over a counter in the dealer's office. Now most trades in OTC markets are conducted electronically, by telephone, or sometimes via instant messaging systems.

4.2 Order-Driven Markets

In contrast to most bonds, currencies, and spot commodities that trade in quote-driven markets, many shares, futures contracts, and most standard options contracts trade on exchanges and alternative trading venues that use order-driven trading systems. **Order-driven markets** arrange trades using rules to match buy orders with sell orders. Orders typically specify the quantity the traders want to buy or sell. The order may also contain price specifications, such as the maximum price that the trader will pay when buying or the minimum price the trader will accept when selling.

Because rules match buyers and sellers, trades are often arranged among complete strangers. Order-driven markets thus must have settlement systems to ensure that buyers and sellers settle their security trades and perform on their contract trades. Otherwise, dishonest traders would not settle their obligations if a change in market conditions made settlement unprofitable.

4.3 Brokered Markets

Another type of market structure is the **brokered market**, in which brokers arrange trades among their clients. Brokers organise markets for assets that are unique and thus of interest as potential investments to only a limited number of investors. Examples of such assets include very large blocks of securities or real estate. Generally, these assets are infrequently traded and expensive to carry in inventory. Because dealers are often unable or unwilling to hold a very large block of securities or real estate in inventory, they will not make markets in them; that is, they will not stand ready to buy or sell these assets if nobody else does. Thus, organising order-driven markets for these assets does not make sense because too few traders would submit orders to them.

Brokers who are organising markets in unique assets try to know everyone who might now or in the future be willing to trade such assets. These brokers spend most of their time on the telephone and in meetings building their client networks.

POSITIONS

5

A **position** refers to the quantity of an asset or security that a person or institution owns or owes. An investment portfolio usually consists of many positions.

Investors are said to have **long positions** when they own assets or securities. Examples of long positions include ownership of shares, bonds, currencies, commodities, or real assets. Long positions increase in value when prices rise. In contrast, positions that increase in value when prices fall are called **short positions**. To take short positions, investors must sell assets or securities that they do not own, a process that involves borrowing the assets or securities, selling them, and repurchasing them later to return them to their owner. Section 5.1 describes this short-selling process more thoroughly, and Section 5.2 discusses leveraged positions.

5.1 Short Positions

Short sellers construct short positions in securities to take advantage of a fall in the price of the securities. They must first borrow securities from investors with long positions. These investors who lend their securities become **security lenders**. Short sellers then sell the borrowed securities to other traders. They close (exit) their positions by repurchasing the securities and returning them to the security lenders. If the price of the securities falls, the short sellers profit because they repurchase the securities at lower prices than the prices at which they sold them. But if the price of securities rises, short sellers will lose money. When short sellers repurchase the securities, they are said to cover their positions.

The potential gains in a long position generally are unlimited. For example, the share prices of successful companies can increase many times over. But the potential losses in a long position are limited to 100%—a complete loss of the initial investment—unless the position is financed by borrowings (debt). We will discuss leveraged positions in the next section.

The potential gains and losses in a short position are mirror images of the potential losses and gains in a long position. In other words, the potential gains in a short position are limited to 100%, but the potential losses are unlimited. The unlimited potential losses make short positions potentially highly risky.

Although security lenders may believe that they still own the securities they lend, this is not the case during the period of the loan. Instead, security lenders own promises made by the short sellers to return the securities. These promises are recorded in security lending agreements. These agreements specify that the short sellers will pay the security lenders all dividends or interest that they otherwise would have received had they not loaned their securities. These payments are called payments in lieu of dividends or of interest.

Security lending is subject to the risk that one of the parties to the contract will fail to honour their obligation, a risk called counterparty risk. To limit counterparty risk, security lenders require that short sellers leave the proceeds of the short sale on deposit with them as collateral for the loan. Collateral refers to assets that a borrower pledges to the lender. Security lenders run the risk that short sellers will fail to return the securities if their price rises. Thus, short sellers must provide additional collateral to secure the loan following an increase in the price of the securities. In contrast, short sellers run the risk that security lenders will fail to return the collateral if the price of the securities falls, so security lenders must return some of the collateral following a decrease in the price of the securities.

5.2 Leveraged Positions

In many markets, investors can buy securities on margin—that is, by borrowing some of the purchase price. When investors borrow to buy securities, they are said to leverage (or lever) their positions. A highly leveraged (or levered) position is one in which the amount of debt is large relative to the equity that supports it.

Buying securities on margin increases the potential gains or losses for a given amount of equity in a position because the buyer can buy more securities using borrowed money. The use of leverage allows buyers to earn greater profits when prices rise. But, equally, a buyer who has leveraged a position suffers greater losses when prices fall. Buying securities on margin thus increases the risk of investing in the securities.

Investors usually borrow the money from their brokers. The borrowed money is called a margin loan, hence the reference to buying on margin. The maximum amount an investor can borrow is often set by the government, the trading venue, or another trading services provider, such as a clearing house. In practice, though, a broker may only be prepared to lend an investor less than that maximum amount, particularly if the broker wants to limit its exposure to a certain investor. The loan does not have a set repayment schedule and must be repaid on demand. As with any loan, the borrower must pay interest on the borrowed money.

The leverage ratio is the ratio of a position's value to the value of the equity in it. It is a useful measure because it indicates the effect of the return on the equity investment, as illustrated in Example 1.

EXAMPLE 1

Leverage Ratio of a Position

Assume that an investor bought £250,000 of Toyota's shares on margin. She contributed £100,000 of her own money and borrowed £150,000 from her broker. The investor's equity represents 40% of the value of the position:

$$£100,000/£250,000 = 40\%.$$

The leverage ratio is 2.5:

$$£250,000/£100,000 = 2.5.$$

A leverage ratio of 2.5 means that if Toyota's share price rises by 10%, the investor will experience a 25% return on the equity investment in her leveraged position:

$$2.5 \times 10\% = 25\%.$$

To check this return, the price of the share is now £275,000. The investor has a £25,000 profit on a £100,000 investment or a 25% return.

But if Toyota's share price falls by 10%, the return on the equity investment will be -25%. That is, a loss of 25%, or 2.5 times the loss on a debt-free position.

This example shows that by buying shares on margin with a leverage ratio of 2.5, the investor magnifies the return, both positive and negative, on her equity investment by 2.5. These calculations do not count interest on the margin loan and commission payments, both of which lower realised returns.

Some investors, including hedge funds and investment banks, get into trouble when they use leverage. In an attempt to obtain greater profits by borrowing to increase their positions, they often underestimate the risks to which they are exposed. If prices move against their positions, their losses can put them into financial distress or, in extreme cases, bankruptcy.

6

ORDERS

When investors want to trade a security, they issue an order that will be directed to a chosen trading venue. All orders specify what security to trade, whether to buy or sell, and how much should be bought or sold. In addition, most orders have other instructions attached to them, including order execution, exposure, and time-in-force instructions, discussed in Sections 6.1, 6.2, and 6.3, respectively.

In quote-driven markets, the prices at which dealers are willing to buy from investors or other dealers are called **bid prices**, and the prices at which they are willing to sell are called **ask prices** (or **offer prices**). The ask prices are invariably higher than the bid prices.

Dealers may also indicate the quantities that they will trade at their bid and ask prices. These quantities are called bid sizes for bids and ask sizes for offers. Depending on the trading venue, these quotation sizes may or may not be exposed to other traders or dealers in that market.

Dealers are said to quote a market when they expose their bids and offers. They often quote both bid and ask prices, in which case they quote a two-sided market. The highest bid in the market is the best bid and the lowest ask in the market is the best ask. The difference between the best bid and the best offer is the **market bid–ask spread**. The market bid–ask spread is generally smaller than dealers' bid–ask spreads (it can never be more) because dealers often quote better prices on one side of the market than on the other. Accordingly, the bids and asks that are the best bid and best ask in the market often come from different dealers.

6.1 Order Execution Instructions

Order execution instructions indicate how to fill an order. Market and limit orders are the most common execution instructions.

- A **market order** instructs the broker or trading venue to obtain the best price immediately available when filling the order.
- A **limit order** also instructs the broker or trading venue to obtain the best price immediately available when filling the order, but it also specifies a **limit price**—that is, a ceiling price for a buy order and floor price for a sell order. A trade cannot be arranged at a price higher than the specified limit price when buying or a price lower than the specified limit price when selling.

Market orders generally execute immediately if other traders are willing to take the other side of the trade. The main drawback with market orders is that a market buy order may fill at a high price and a market sell order may fill at a low price. The filling of orders at disadvantageous prices is particularly likely when the order is placed in a market for a thinly traded security or when the order is large relative to normal trading activity in the market.

Buyers and sellers who are concerned about the possibility of trading at unacceptable prices add limit prices to their orders. The main problem with limit orders is that they may not execute. Limit orders do not execute if the limit price on a buy order is too low or if the limit price on a sell order is too high. For example, if an investment manager submits a limit order to buy at €20 and nobody is willing to sell at or below €20, the order will not be filled.

Whether traders use market orders or limit orders when trying to arrange trades depends on whether their main concerns are about price, trading quickly, or failing to trade. On average, limit orders trade at better prices than market orders when they trade, but they often do not trade.

A **stop order** is an order for which a trader has specified a **stop price**—that is, a price that triggers the conversion of a stop order into a market order. For a sell order, the trader's order may not be filled until a trade occurs at or below the stop price. After that trade, the order becomes a market order. If the market price subsequently rises above the sell order's stop price before the order trades, the order remains valid. For a buy order, the trader's order becomes a market order only after a trade occurs at or above the stop price.

Traders who want to protect their long positions often use stop orders that trigger market sell orders if prices are falling with the hope of stopping losses on positions that they have established. These stop orders are often called stop-loss orders.

Some order execution instructions specify conditions on size. For example, all-or-nothing orders can trade only if their entire sizes can be traded. Traders can likewise specify minimum fill sizes.

6.2 Order Exposure Instructions

Order exposure instructions indicate whether, how, and sometimes, by whom an order should be seen. **Hidden orders** are only seen by the brokers or trading venues that receive them and cannot be seen by other traders until the orders can be filled.

Note that there is nothing wrong or unethical about hiding an order. Traders with large orders use hidden orders when they are afraid that other investors might trade against them if they knew that a large order was in the market. In particular, large buyers fear that they will scare sellers away if their orders are seen. Sellers generally do not want to be the first to trade with large buyers because large buyers often push prices up.

Large buyers are also concerned that other buyers will be able to trade before them by buying first to profit from any increase in price necessary to fill their large orders. This increases the costs of filling large orders by taking buying opportunities away from the large traders. Large sellers likewise fear that buyers will shy away from their exposed orders and that other sellers will trade before them.

6.3 Order Time-in-Force Instructions

Time-in-force instructions indicate when an order can be filled. The most common time-in-force instructions are

- immediate or cancel orders, which can be executed only on immediate receipt by the broker or trading venue;
- day orders, which can be executed only on the day they are submitted and are cancelled at the end of that day;
- good-until-cancelled orders, which can be executed until they are cancelled; some brokers or trading venues may set a maximum numbers of days before the order is automatically cancelled.

7

CLEARING AND SETTLEMENT

Brokers and trading venues, especially those that arrange trades among strangers, generally need intermediaries to help traders clear and settle orders that have been filled.

7.1 Clearing

The most important clearing activity is **confirmation**, which is performed by clearing houses. Before a trade can be settled, the buyer and seller must confirm that they traded and the exact terms of their trade. Confirmation generally takes place on the day of the trade and is necessary only for manually arranged trades. For electronic trades, confirmation is done automatically.

To ensure that their members settle their trades, clearing houses require that members have adequate capital and post margins. **Margins** are cash or securities that are pledged as collateral. Clearing houses also limit the aggregate net quantities (that is, buy minus sell) that their members can settle. In addition, they monitor their members to ensure that these members do not arrange trades that they cannot settle.

This system generally ensures that traders settle their trades. The brokers and dealers guarantee settlement of the trades they arrange for their individual and institutional clients. The clearing members guarantee settlement of the trades that their clearing clients present to them, and clearing houses guarantee settlement of all trades presented to them by their clearing members. If a clearing member fails to settle a trade, the clearing house settles the trade using its own capital or capital pledged by the other members of the clearing house.

The ability to settle trades reliably is important because it allows strangers to confidently contract with each other without worrying about counterparty risk. A secure clearing system thus greatly increases liquidity because it vastly expands the number of counterparties with whom a trader can confidently arrange a trade.

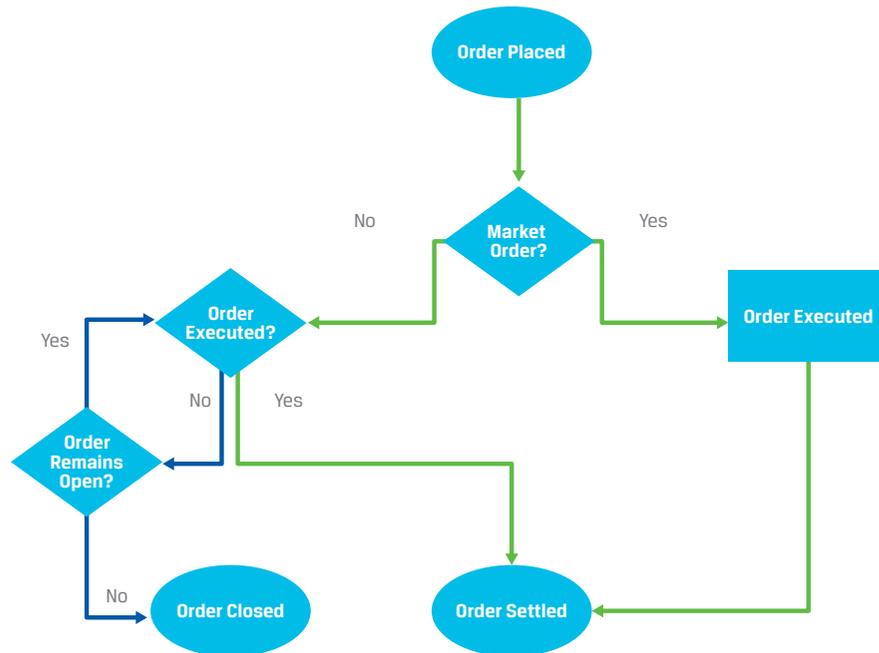
7.2 Settlement

Following confirmation, settlement may occur in real time (instantaneously) or it may take up to three trading days. The settlement cycle refers to the timing of the procedures used to settle trades and differs across markets. For example, in most countries, stocks and bonds settle three trading days after negotiating a trade. The seller must deliver the security to the clearing house and the buyer must deliver cash. The settlement agent then makes the exchange in a process called delivery versus payment. This process eliminates the losses that would occur if one party settles and the other does not.

Many markets have reduced the length of their settlement cycles to reduce what is often referred to as settlement risk, a form of counterparty risk in which one of the parties fails to honour their obligation between the time a trade is negotiated and the time the trade is settled—for instance, as a result of bankruptcy. The fewer unsettled trades outstanding, the less damage occurs when a trader fails to settle. Also, the shorter the settlement period, the fewer extreme price changes can occur before final settlement.

Once a trade is settled, the settlement agent reports the trade to the issuing company's **transfer agent**, which maintains a registry of who owns the company's securities. Most transfer agents are banks or trust companies, but sometimes companies keep their own records and act as their own transfer agents. Companies need to maintain databases about their security holders so they know who is entitled to any interest and dividend payments, who can vote in corporate elections, and to whom various corporate communications should be sent.

Exhibit 2 shows the life of a trade from order to settlement/closure. An order for a trade is placed by one party. For the trade to execute and settle, another party has to be willing to take the other side of the trade. Throughout the life of a trade, various people within the firm receiving the order will be involved. These include people taking the order, executing the order, and accounting for the order/trade.

Exhibit 2 A Trade from Order to Settlement/Closure*


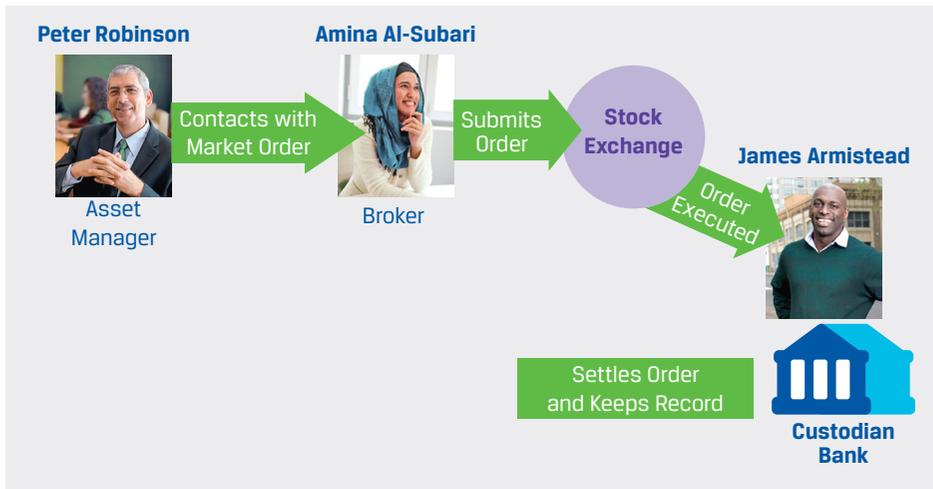
* This assumes the order is one for which the trade is approved. For example, the order's magnitude is within approved limits for the trader. Generally, market orders will be executed. The exceptions occur when there are liquidity issues.

A BASIC TRADE INVOLVING PARTICIPANTS INTRODUCED IN THE INVESTMENT INDUSTRY: A TOP-DOWN VIEW CHAPTER

Peter Robinson, an asset manager for Aus Ltd., wants to buy 1 million shares in a company that is listed on a stock exchange in the Middle East.

He contacts Amina Al-Subari, a broker at Middle East Corp, which is based in Dubai. She submits the Aus Ltd. market order to the local stock exchange.

The order is filled and financial settlement takes place. A record of the transaction is then sent to James Armistead, who works for Big Bank Financial Services, a custodian bank. It provides safekeeping of assets, such as the shares purchased by Aus Ltd. Big Bank Financial Services keeps a record of the security and the price paid, and this record is available—usually online—so that Aus Ltd. Can prove it owns the shares and can include them in its accounts.



TRANSACTION COSTS

8

Trading is expensive. The costs associated with trading are called **transaction costs** and include two components: explicit costs and implicit costs.

8.1 Explicit Trading Costs

Explicit trading costs represent the direct costs associated with trading. Brokerage commissions are the largest explicit trading cost. Other costs include fees paid to trading venues and financial transaction taxes, such as the stamp duty in the United Kingdom, Hong Kong SAR, and Singapore.

Most market participants employ brokers to trade on their behalf. They pay their brokers commissions for arranging their trades. The commissions are usually a fixed percentage of the principal value of the transaction or a fixed price per share, bond, or contract.

The commissions compensate brokers for the resources they use to fill orders. Brokers must maintain order routing systems, market data systems, accounting systems, exchange memberships, office space, and personnel to manage the trading process. These are all fixed costs. Brokers also pay variable costs, such as exchange, regulatory, and clearing fees, on behalf of their clients. Traders who do not trade through brokers pay the fixed and variable costs of trading themselves.

8.2 Implicit Trading Costs

Implicit trading costs are the indirect costs associated with trading. These costs result from the following:

- bid–ask spreads

- price impact
- opportunity costs

8.2.1 Bid-Ask Spread

Many investors assess a market's liquidity by looking at the difference between bid and ask prices, called **bid-ask spreads**. Recall that bid prices are the prices at which dealers are willing to buy and ask prices are the prices at which dealers are willing to sell. So bid-ask spreads represent the compensation dealers expect for taking the risk of buying and selling securities. Bid-ask spreads tend to be wider in opaque markets because finding the best available price is harder for dealers in such markets. Transparency reduces bid-ask spreads, which benefits investors.

8.2.2 Price Impact

Traders who want to trade quickly tend to purchase at higher prices than the prices at which they sell. The difference comes from the price concessions that they offer to encourage other traders to trade with them. For large trades, impatient buyers generally must raise prices to encourage other traders to sell to them. Likewise, impatient sellers of large trades must lower prices to encourage other traders to purchase from them. These price concessions, called price impact, or market impact, often occur as large-trade buyers push prices up and large-trade sellers push them down. For large institutional investors, the price impact of trading large orders generally is the biggest component of their transaction costs.

8.2.3 Opportunity Costs

Traders who are willing to wait until other traders want to trade with them generally incur lower transaction costs on their trades. In particular, by using limit orders instead of market orders, they can buy at the bid price or sell at the ask price. But these traders risk that they will not trade when the market is moving away from their orders. They lose the opportunity to profit if their buy orders fail to execute when prices are rising, and they lose the opportunity to avoid losses if their sell orders fail to execute when prices are falling. The costs of not trading are called opportunity costs.

8.3 Minimising Transaction Costs

Traders choose their order submission strategies to minimise their transaction costs. Efficient traders ultimately are more successful than those who do not trade well. They buy at lower prices, sell at higher prices, and less often fail to trade when they want to.

Market participants use various techniques to reduce their transaction costs. They employ skilful brokers, use electronic algorithms to manage their trading, or as mentioned before, use hidden orders or dark pools so other market participants cannot see their orders and exploit them.

Most brokers and large institutional traders conduct transaction cost analyses of their trades to measure the costs of their trading and to determine which trading strategies work best for them. In particular, these studies help large institutional investors better understand how their order submission strategies affect the trade-off between transaction costs and opportunity costs.

EFFICIENT FINANCIAL MARKETS

9

As described in the previous section, low transaction costs are an important characteristic of well-functioning financial markets because they benefit everyone who needs to trade. Low transaction costs contribute to making financial markets efficient. Financial market efficiency increases investor confidence, which ultimately lowers the costs that companies pay to raise capital.

The following are the three types of efficiency that ultimately contribute to efficient financial markets:

- Operational efficiency. **Operationally efficient markets** have low transaction costs and they can absorb large orders without substantial price impacts. The most operationally efficient markets tend to be those in which many people are interested in trading the same securities in the same trading venue.
- Informational efficiency. **Informationally efficient prices** reflect all available information about fundamental values. They are crucial to an economy's welfare because informationally efficient prices help ensure that the resources available to the economy, such as labour, capital, materials, and ideas, are used wisely.
- Allocational efficiency. **Allocationally efficient economies** are economies that put resources to use where they are most valuable. Economies that misallocate their resources tend to waste resources and consequently are often relatively poor.

SUMMARY

Financial markets that function efficiently benefit all investors by keeping transaction costs low and allowing investors to trade financial instruments easily.

Some important points to remember about financial markets include the following:

- Issuers sell their securities and raise capital in primary markets. The securities then trade in secondary markets among investors.

- Investment banks play an important role in helping issuers raise capital. In a public offering, they help the issuer identify potential investors and set the offering price for the securities.
- In underwritten offerings, the investment bank guarantees the sale of the securities at the offering price negotiated with the issuer. In contrast, in a best efforts offering, the investment bank acts only as a broker and does not take the risk of having to buy securities.
- A shelf registration allows a company to sell shares directly to investors over a long period of time rather than in a single transaction.
- Other ways to issue securities in the primary markets are through private placements or rights offerings. In a private placement, companies sell securities directly to a small group of investors, usually with the assistance of an investment bank. In a rights offering, companies give existing shareholders the right to buy shares in proportion to their holdings at a price that is typically set below the current market price of the shares, thus making the exercise of the rights immediately profitable.
- Liquid secondary markets reduce the costs of raising capital because investors value the ability to sell their securities quickly to raise cash.
- Secondary markets require a trading venue—either physical or electronic—where trading among investors can take place. Most secondary market trading globally is now done via electronic trading systems.
- Exchanges are the most common type of trading venue, but alternative trading venues, which have their own rules, have gained in popularity. The two main distinctions between exchanges and alternative trading venues are that exchanges typically have regulatory authority and more trade transparency than alternative trading venues.
- Markets vary in how trades are arranged. In quote-driven markets, investors trade with dealers at the prices quoted by the dealers. Order-driven markets arrange trades using rules to match buy orders with sell orders. In brokered markets, which are usually markets for assets that are unique, brokers arrange trades among their clients.
- A position is the quantity of an asset or security that a person or institution owns or owes. Investors have long positions when they own assets or securities. Long positions benefit when prices rise. In contrast, positions that benefit when prices fall are short positions, which involve borrowing assets, selling them, and repurchasing them later to return to their owner.
- When investors borrow some of the purchase price to buy securities, they are said to buy securities on margin and leverage their positions. Leveraged positions expose investors to more risk and higher potential gains and losses than otherwise identical debt-free positions.
- Orders are instructions to trade. They always specify what security to trade, whether to buy or sell, and how much should be bought or sold. They usually provide several other instructions as well, such as execution instructions about

how to fill an order; exposure instructions about whether, how, and by whom an order should be seen; and time-in-force instructions about when an order can be filled.

- Market orders are instructions to obtain the best price immediately available when filling the order. They generally execute immediately but can be filled at disadvantageous prices. A limit order specifies a limit price—a ceiling price for a buy order and a floor price for a sell order. They generally execute at better prices, but they may not execute if the limit price on a buy order is too low or if the limit price on a sell order is too high.
- Stop orders specify stop prices; the order is filled when a trade occurs at or above the stop price for a buy order and at or below the stop price for a sell order. Traders often use stop orders to stop losses on their long positions.
- Intermediaries help traders clear and settle orders that have been filled. The most important clearing activity is confirmation, which is performed by clearing houses. Settlement follows confirmation; at settlement, the seller must deliver the security to the clearing house and the buyer must deliver cash.
- The costs associated with trading are called transaction costs and include two components: explicit costs and implicit costs. Brokerage commissions are the largest explicit trading cost. Implicit trading costs result from bid–ask spreads, price impact, and opportunity costs. Traders usually choose order submission strategies that minimise transaction costs.
- Well-functioning financial markets are operationally, informationally, and allocationally efficient. Operationally efficient markets have low transaction costs. Informationally efficient markets have prices that reflect all available information about fundamental values. Allocationally efficient economies put resources to use where they are most valuable.

CHAPTER REVIEW QUESTIONS

- 1 A company sells new shares to the public in the:
 - A call market.
 - B primary market.
 - C secondary market.
- 2 The market where an investor sells shares of a publicly traded company she bought in an initial public offering (IPO) three years ago is known as the:
 - A primary market.
 - B secondary market.
 - C private placement.
- 3 Compared with a regular public offering, in a shelf registration, a company:
 - A sells the shares in a single transaction.
 - B faces lower public disclosure requirements.
 - C can sell shares over a longer period of time.
- 4 An investment bank is exposed to the greatest risk with:
 - A a rights offering.
 - B a best efforts offering.
 - C an underwritten offering.
- 5 The proportional ownership of shareholders who fail to exercise their options under a rights offering will:
 - A decrease.
 - B remain the same.
 - C increase.
- 6 Relative to public offerings, private placements provide:
 - A slower access to capital and less regulatory oversight.
 - B quicker access to capital and less regulatory oversight.
 - C quicker access to capital and higher regulatory compliance costs.

- 7 Compared with exchanges, alternative trading systems:
- A may be less transparent.
 - B require the use of brokers.
 - C exercise regulatory authority over their subscribers.
- 8 Dealers arrange all trades in:
- A a brokered market.
 - B a quote-driven market.
 - C an order-driven market.
- 9 Stock exchanges *most likely* use trading systems that are:
- A price-driven.
 - B order-driven.
 - C quote-driven.
- 10 Unique assets, such as real estate, are *most likely* traded in:
- A a dealer market.
 - B a brokered market.
 - C an order-driven market.
- 11 An investor's loss is limited to the amount of the initial investment in a:
- A long position
 - B short position
 - C leveraged position
- 12 An investor takes a short position in a security by:
- A buying the security.
 - B lending the security to another trader.
 - C borrowing the security and then selling it to another trader.
- 13 If the price of a security falls, the loss experienced by an investor who bought the security on margin relative to the loss experienced by an investor who did not use leverage will *most likely* be:
- A lower.
 - B higher.
 - C the same.

- 14 Which of the following orders will *most likely* be executed immediately?
- A Stop order
 - B Limit order
 - C Market order
- 15 From the investor's perspective, the main drawback to using a limit order to buy shares is that it may:
- A not execute.
 - B execute immediately.
 - C execute at an unacceptable price.
- 16 Which activity is a clearing activity?
- A Exchanging cash for securities
 - B Confirming the terms of the trade
 - C Reporting the trade to the company's transfer agent
- 17 Which of the following statements about the settlement cycle is correct?
- A The settlement cycle is the same across markets.
 - B A long settlement cycle reduces counterparty risk.
 - C The settlement cycle refers to the timing of the procedures used to settle trades.
- 18 The price concessions that occur as large-trade buyers push prices up and large-trade sellers push prices down are called:
- A price impact.
 - B bid–ask spreads.
 - C opportunity costs.
- 19 The costs associated with orders failing to execute are *best* described as:
- A opportunity costs.
 - B price impact costs.
 - C brokerage commissions.
- 20 Markets that can absorb large orders without substantial price impacts are classified as:
- A operationally efficient.
 - B allocationally efficient.
 - C informationally efficient.

- 21** An economy that uses resources where they are most valuable can be described as being:
- A** operationally efficient.
 - B** allocationally efficient.
 - C** informationally efficient.

ANSWERS

- 1** B is correct. Primary markets are the markets in which issuers sell their securities to investors. If the company is selling shares in a public market for the first time, it is an initial public offering (IPO). If the company has previously sold shares in a public market, the sale of new shares is a seasoned offering. A is incorrect because a call market is where participants can arrange trades only once per day and is not the sale of newly issued shares to the public. C is incorrect because secondary markets are the markets in which securities trade between investors.
- 2** B is correct. The investor will sell the shares to another investor, and trading of securities between investors takes place in the secondary market. A is incorrect because the purchase of the shares in the IPO three years ago took place in the primary market—that is, the market in which the company sold shares to investors for the first time. C is incorrect because a private placement is a primary market transaction in which a company sells shares to a small group of qualified investors.
- 3** C is correct. A shelf registration allows a company to sell the shares directly into the secondary market over time when it needs additional capital. A shelf registration gives a company more flexibility with the timing of selling the shares. A is incorrect because in a shelf registration, unlike in a regular public offering, a company that issues shares does not have to sell the shares in a single transaction. The sale of additional shares can be timed over several months or even years. B is incorrect because in a shelf registration, the company makes the same public disclosures that it would for a regular offering. Companies face lower public disclosure requirements when they issue shares via a private placement.
- 4** C is correct. In an underwritten offering, the investment bank buys the securities from the issuer at an offering price that is negotiated with the issuer. The objective of the investment bank is to set a price at which it can sell all of the securities and not become a long-term shareholder. If all the shares are not sold, the investment bank risks its own capital in the residual shareholding. A is incorrect because a rights offering allows existing shareholders to buy shares at a fixed price and does not involve the investment bank's capital. B is incorrect because with a best efforts offering, the investment bank acts only as a broker and thus does not expose its own capital to buy the securities.
- 5** A is correct. The proportional ownership of existing shareholders who do not exercise their option in a rights offering will decrease. They will hold the same number of shares of the company but the total number of shares outstanding has increased.
- 6** B is correct. Private placements allow for quicker access to capital with less regulatory oversight and lower cost of regulatory compliance than public offerings. A is incorrect because access to capital is quicker. C is incorrect because the cost of regulatory compliance is lower.

- 7** A is correct. Alternative trading systems may be less transparent than exchanges. Many alternative trading systems are known as dark pools because of a lack of transparency; they do not display the orders that their clients send to them. Large investment managers especially like these systems because market prices often move to their disadvantage when other traders know about their large orders. B is incorrect because alternative trading systems do not require the use of brokers. Most of them allow institutional traders to trade directly with each other without the intermediation of dealers or brokers, which makes them lower-cost trading venues. C is incorrect because alternative trading systems are trading venues that function like exchanges but do not exercise regulatory authority over their subscribers whereas exchanges do.
- 8** B is correct. Quote-driven markets (also called dealer markets), price-driven markets, or over-the-counter markets are markets in which investors trade with dealers at the price quoted by the dealers. A is incorrect because brokered markets are markets in which brokers arrange trades between their clients. Assets traded in brokered markets are usually unique and of interest to only a limited number of people or institutions; they are also infrequently traded and expensive to carry in inventory. C is incorrect because order-driven markets are markets in which a broker, an exchange, or an alternative trading system arranges trades using rules to match buy orders and sell orders.
- 9** B is correct. Many shares trade on exchanges that use order-driven trading systems. Order-driven markets arrange trades by using rules to match buy orders with sell orders. A and C are incorrect because price-driven and quote-driven markets are the same thing; they are also called over-the-counter markets. They are markets in which investors trade with dealers at the prices quoted by the dealers. Almost all bonds and currencies and most commodities for immediate delivery (spot commodities) trade in price-driven/quote-driven markets.
- 10** B is correct. Unique assets, such as real estate, are likely to be traded in a brokered market. Brokers organise markets for assets that are unique and thus of interest to only a limited number of buyers and sellers. Successful brokers spend most of their time building their client networks. A is incorrect because dealer markets are markets in which investors trade with dealers at the prices quoted by the dealers. Dealers are not likely to make markets in real estate because real estate is infrequently traded and expensive to carry in inventory. C is incorrect because unique assets, such as real estate, are not likely to be traded in order-driven markets because too few traders would participate.
- 11** A is correct. Investors have long positions when they own assets or securities, such as stocks, bonds, currencies, commodities, or real assets. The potential gain in a long position generally is unlimited. But the potential loss on a long position is limited to no more than 100%—a complete loss of the initial investment—for a long position with no associated liabilities (debt). B is incorrect because the potential gains and losses in a short position are mirror images of the potential losses and gains in a long position. Thus, the potential gain on a short position is limited to no more than 100%, but the potential loss is unlimited. C is incorrect because a leveraged position involves buying securities on margin—that is, by borrowing some of the purchase price. Buying securities on margin increases the potential gains or losses for a given amount of equity in a position because the buyer can buy more securities on margin than otherwise.

The buyer thus earns greater profits when prices rise. But the buyer suffers greater losses when prices fall—losses that potentially could exceed the amount of the initial investment.

- 12** C is correct. Investors take short positions when they sell securities that they do not own, a process that involves borrowing securities, selling them, and repurchasing them later to return them to their owner. If the security falls in price, the investor profits because she can repurchase the security at a lower price than the price at which she sold it. If the security rises in price, she loses. A is incorrect because if the investor buys the security, she takes a long, not short, position in the security. B is incorrect because if the investor lends the security to another trader, she becomes the security lender.
- 13** B is correct. Buying securities on margin is risky, because leverage (debt) magnifies gains and losses. Thus, if the price of a security falls, the loss experienced by an investor who bought the security on margin (leveraged position) will be higher than the loss experienced by an investor who did not use leverage (debt-free position).
- 14** C is correct. A market order instructs the broker or exchange to obtain the best price immediately available when filling an order. B is incorrect because a limit order also instructs the broker or exchange to obtain the best price immediately available, but it sets conditions on price. The price to be paid on a purchase cannot be higher than the specified limit price, or the price to be accepted on a sale cannot be lower than the specified limit price. Thus, the order may not execute. A is incorrect because a stop order is an order for which the trader has specified a stop condition. The order may not be filled until the stop condition has been satisfied.
- 15** A is correct. The main drawback with a limit order is that it may not execute. Limit orders do not execute if the limit price on a buy order is too low or if the limit price on a sell order is too high. B is incorrect because a limit order will only execute immediately if the limit price matches the bid or ask price of other traders. C is incorrect because by placing a limit order, the investor ensures that the buy order is executed at an acceptable price.
- 16** B is correct. The most important clearing activity is confirming the terms of the trade. A and C are incorrect because exchanging cash for securities and reporting the trade to the company's transfer agent are activities that occur after clearing activities and are settlement activities.
- 17** C is correct. The settlement cycle refers to the timing of the procedures used to settle trades. Settlement may occur in real time (instantaneously), or it may take up to three trading days. A is incorrect because settlement cycles vary across markets. B is incorrect because a short, not long, settlement cycle reduces counterparty risk.
- 18** A is correct. Price impact is the price concessions that occur as large-trade buyers push prices up and large-trade sellers push prices down. B is incorrect because the bid–ask spread is the difference between the bid price and the ask price and is not the price concession associated with large-trade buys or sells. C is incorrect because opportunity costs are the costs of not trading and not the price concessions associated with large-trade buys and sells.

- 19** A is correct. The costs associated with orders failing to execute are called opportunity costs. Traders lose the opportunity to profit if their buy orders fail to execute when prices are rising, and they lose the opportunity to avoid losses if their sell orders fail to execute when prices are falling. Thus, opportunity costs represent the costs of not trading. B and C are incorrect because price impact costs and brokerage commissions are only incurred if orders execute—that is, if trading happens. Price impact costs are price concessions that often occur over time as large-trade buyers push prices up and large-trade sellers push them down in multiple transactions. For large institutions, the price impact of trading large orders generally is the biggest component of their transaction costs. Brokerage commissions are the commissions that market participants pay their brokers to arrange their trades. These commissions usually are a fixed percentage of the principal value of the transaction or a fixed price per security or contract.
- 20** A is correct. Operationally efficient markets have relatively low transaction costs, and they can absorb large orders without substantial price impacts. B is incorrect because allocationally efficient is used to describe economies that use resources where they are most valuable. C is incorrect because informationally efficient markets are markets in which prices reflect all available information about fundamental values.
- 21** B is correct. Allocationally efficient economies are economies that use resources where they are most valuable. A is incorrect because markets in which trades are easy to arrange and have low transaction costs are operationally efficient. C is incorrect because informationally efficient prices reflect all available information about fundamental values. Informationally efficient prices are crucial to an economy's welfare because they help ensure that the resources available to the economy, such as labour, capital, material, and ideas, are used wisely.