CHAPTER

2

Mechanics of futures markets

LEARNING OBJECTIVES

1 To familiarise with the mechanics of the Australian futures markets
2 To understand the main features of a futures contract
3 To understand the relationship between futures and spot prices as the delivery date for a futures contract is approached
4 To understand the operation of margins under the ASX rules
5 To understand the risks involved in over-the-counter contracts
6 To understand newspaper quotes relating to futures contracts
7 To understand the types of traders and types of orders common in Australian futures markets
8 To understand the regulations relating to the US and Australian futures markets
9 To understand the accounting and tax treatment of Australian futures contracts
10 To understand the differences between forward and futures contracts

Introduction

In Chapter 1 we explained that both futures and forward contracts are agreements to buy or sell an asset at a future time for a certain price. Futures contracts are traded on an organised exchange and the contract terms are standardised by that exchange. By contrast, forward contracts are private agreements between two financial institutions or between a financial institution and one of its clients.

This chapter covers the details of how futures markets work. We examine issues such as the specification of contracts, the operation of margin accounts, the organisation of exchanges, the regulation of markets, the way in which quotes are made and the treatment of futures transactions for accounting and tax purposes. We compare futures contracts with forward contracts and explain the difference between the payoffs realised from them.

2.1 Opening and closing futures positions

LO 1

To familiarise with the mechanics of the Australian futures markets

A futures contract is an agreement to buy or sell an asset for a certain price at a certain time in the future. A contract is usually referred to by its delivery month. Thus an investor could instruct a broker to buy one October oil futures contract. There is a period of time during the delivery month (often the whole month) when delivery can be made. Trading in the contract usually ceases some time during the delivery period. The party with the short position chooses when delivery is made.

The reader may be surprised to learn that the vast majority of the futures contracts that are initiated do not lead to delivery. The reason is that most investors choose to close out their positions prior to the delivery period specified in the contract. Making or taking delivery under the terms of a futures contract is often inconvenient and in some instances quite expensive. This is true even for a hedger who wants to buy or sell the asset underlying the futures contract. Such a hedger usually prefers to close out the futures position and then buy or sell the asset in the usual way.

Closing a position involves entering into an opposite trade to the original one that opened the position. For example, an investor who buys five July corn futures contracts on 6 May can close out the position on 20 June by selling (i.e. shorting) five July corn futures contracts. An investor who sells (i.e. shorts) five July contracts on 6 May can close out the position on 20 June by buying five July contracts. In each case, the investor's total gain or loss is determined by the change in the futures price between 6 May and 20 June.

Delivery is so unusual that traders sometimes forget how the delivery process works (see Business snapshot 2.1). Nevertheless, we will spend part of this chapter reviewing the delivery arrangements in futures contracts. This is because it is the possibility of final delivery that ties the futures price to the spot price.[1]

1 As mentioned in Chapter 1, the spot price is the price for almost immediate delivery.

LO 2

To understand the main features of a futures contract

2.2 Specification of a futures contract

When developing a new contract, the exchange must specify in some detail the exact nature of the agreement between the two parties. In particular, it must specify the asset, the contract size (exactly how much of the asset will be delivered under one contract), where delivery will be made and when delivery will be made.

Sometimes alternatives are specified for the grade of the asset that will be delivered or for the delivery locations. As a general rule, it is the party with the short position (the party that has agreed to sell the asset) that chooses what will happen when alternatives are specified by the exchange. When the party with the short position is ready to deliver, it files a *notice of intention to deliver* with the exchange. This notice indicates selections it has made with respect to the grade of asset that will be delivered and the delivery location.

THE ASSET

When the asset is a commodity, there may be quite a variation in the quality of what is available in the marketplace. When the asset is specified, it is therefore important that the exchange stipulate the grade or grades of the commodity that are acceptable. The Australian Securities Exchange (ASX)[2] has specified the asset in its Australian Sorghum Futures contract as sorghum of Australian origin, with a minimum grade of the Grain Trade Australia (GTA) Sorghum (SOR).

For some commodities a range of grades can be delivered, but the price received depends on the grade chosen. For example, in the ASX Western Australian Wheat Futures, the standard grade is the Commodity Standard Guide (CSG) 104 (Australian Premium White, APW2) 10% protein, as prescribed by the GTA Wheat Standard.[3] The protein range payable is from 10% to 11.4% with the premium paid at 60 cents per 0.1% of protein content.

The financial assets in futures contracts are generally well defined and unambiguous. For example, there is no need to specify the grade of stock indices. There are four standard stock index futures listed on the ASX; namely, the ASX SPI 200™ Index Futures, the S&P/ASX 200 A-REIT Index Futures, the S&P/ASX 200[4] Index Futures and the S&P/ASX 50 Index Futures. The specifications of Treasury notes and bonds on the ASX are also comprehensive. There are seven interest rate futures: the 30-day interbank cash rate futures; the 90-day bank accepted bill futures; the 3-year and 10-year Treasury bond futures; the Australia/US 10-year bond spread futures; and the 3-year and 10-year interest rate swap futures. In the case of Treasury bonds futures, the exchange has a formula for adjusting the price received according to the coupon and maturity date of the bond delivered. This is discussed in Chapter 6.

THE CONTRACT SIZE

The contract size specifies the amount of the asset that has to be delivered under one contract. This is an important decision for the exchange. If the contract size is too large, many investors who wish to hedge relatively small exposures or who wish to take relatively small speculative

2 Prior to 2006, Australia's primary futures exchange was the Sydney Futures Exchange (SFE). Since the merge with the ASX on 7 July 2006, the existing SFE products are now listed and traded on the ASX Trade24.

3 See <www.graintrade.org.au> for more details.

4 The ASX SPI 200™ and the S&P/ASX 200 Index Futures are both written on the underlying S&P/ASX 200 Stock Index. They have different contract specifications and are open for trade at different times of day. The ASX SPI 200™ Index Futures has longer trading hours and is more exposed to international investors. Thus, it is considered as the benchmark derivative product for investors trading and hedging in the Australian equity index market.

Business snapshot 2.1

THE UNANTICIPATED DELIVERY OF A FUTURES CONTRACT

This story (which may well be apocryphal) was told to the US author of this book by a senior executive of a US financial institution. It concerns a new employee of the financial institution who had not previously worked in the financial sector. One of the clients of the financial institution regularly entered into a long futures contract on live cattle for hedging purposes and issued instructions to close out the position on the last day of trading. (Live cattle futures contracts trade on the Chicago Mercantile Exchange and each contract is on 40 000 pounds of cattle.) The new employee was given responsibility for handling the account.

When the time came to close out a contract, the employee noted that the client was long one contract and instructed a trader at the exchange to buy (not sell) one contract. The result of this mistake was that the financial institution ended up with a long position in two live cattle futures contracts. By the time the mistake was spotted, trading in the contract had ceased.

The financial institution (not the client) was responsible for the mistake. As a result it started to look into the details of the delivery arrangements for live cattle futures contracts—something it had never done before. Under the terms of the contract, cattle could be delivered by the party with the short position to a number of different locations in the United States during the delivery month. Because it was long, the financial institution could do nothing but wait for a party with a short position to issue a *notice of intention to deliver* to the exchange and for the exchange to assign that notice to the financial institution.

It eventually received a notice from the exchange and found that it would receive live cattle at a location 2000 miles away the following Tuesday. The new employee was sent to the location to handle things. It turned out that the location had a cattle auction every Tuesday. The party with the short position that was making delivery bought cattle at the auction and then immediately delivered them. Unfortunately the cattle could not be resold until the next cattle auction the following Tuesday. The employee was therefore faced with the problem of making arrangements for the cattle to be housed and fed for a week. This was a great start to a first job in the financial sector!

positions will be unable to use the exchange. On the other hand, if the contract size is too small, trading may be expensive as there is a cost associated with each contract traded.

The correct size for a contract clearly depends on the likely user. Whereas the value of what is delivered under a futures contract on an agricultural product may vary in the range of $40 000 to $50 000, depending on the contract specifications and the price of the underlying commodity itself, it is much higher for some financial futures. For example, the ASX 90-day bank accepted bill futures contract has a face value of AUD 1 000 000, while the ASX SPI 200™ Futures contract is written on a portfolio of shares in the S&P/ASX 200 Index, with the value equal to the index level × AUD 25.

In some cases exchanges have introduced 'mini' contracts to attract smaller investors. For example, the S&P/ASX 200 Index Futures, also known as the Mini 200 Futures, is on 10 times the S&P/ASX 200 Index whereas the regular contract, the **ASX SPI 200™ Index Futures**, is on 25 times the index.

DELIVERY MONTHS

A futures contract is referred to by its delivery month. The exchange must specify the precise period during the month when delivery can be made. For many futures contracts, the delivery period is the whole month.

The delivery months vary from contract to contract and are chosen by the exchange to meet the needs of market participants. For example, the ASX Western Australia Wheat Futures have delivery months, referred to as the 'contract months' in the contract specifications, of January, March, May, July, September and November. At any given time, contracts trade for the closest delivery month and a number of subsequent delivery months. The exchange specifies when trading in a particular month's contract will begin. The exchange also specifies the last day on which trading can take place for a given contract. Trading generally ceases a few days before the last day on which delivery can be made.

DELIVERY ARRANGEMENTS

The place where delivery will be made must be specified by the exchange. This is particularly important for commodities that involve significant transportation costs. In the case of the ASX Western Australian wheat futures contract, the destination sites include Brisbane, Melbourne, Newcastle and Port Kembla.

When alternative delivery locations are specified, the price received by the party with the short position is sometimes adjusted according to the location chosen by that party. The price tends to be higher for delivery locations that are relatively far from the main sources of the commodity.

However, very few of the futures contracts that are entered into lead to delivery of the underlying asset. Most are closed out early. Nevertheless, it is the possibility of eventual delivery that determines the futures price. An understanding of delivery procedures is therefore important.

The period during which delivery can be made is defined by the exchange and varies from contract to contract. The decision on when to deliver is made by the party with the short position, whom we shall refer to as investor A. When investor A decides to deliver, investor A's broker issues a notice of intention to deliver to the exchange clearinghouse. This notice states how many contracts will be delivered and, in the case of commodities, also specifies where delivery will be made and what grade will be delivered. The exchange then chooses a party with a long position to accept delivery.

Suppose that investor B was the party on the other side of investor A's futures contract when it was entered into. It is important to realise that there is no reason to expect that it will be investor B who takes delivery. Investor B may well have closed out his or her position by trading with investor C, investor C may have closed out his or her position by trading with investor D and so on. The usual rule chosen by the exchange is to pass the notice of intention to deliver on to the party with the oldest outstanding long position. Parties with long positions must accept delivery notices. However, if the notices are transferable, long investors have a short period of time, usually half an hour, to find another party with a long position that is prepared to accept the notice from them.

In the case of a commodity, taking delivery usually means accepting a warehouse receipt in return for immediate payment. The party taking delivery is then responsible for all warehousing costs. In the case of livestock futures, there may be costs associated with feeding and looking after the animals (see Business snapshot 2.1). In the case of financial futures, delivery is usually made by wire transfer. For all contracts the price paid is usually the most recent settlement price. If specified by the exchange, this price is adjusted for grade, location of delivery and so on. The whole delivery procedure from the issuance of the notice of intention to deliver to the delivery itself generally takes two to three days.

There are three critical days for a contract. These are the first notice day, the last notice day and the last trading day. The *first notice day* is the first day on which a notice of intention to make delivery can be submitted to the exchange. The *last notice day* is the last such day. The *last trading day* is generally a few days before the last notice day. To avoid the risk of having to take delivery, an investor with a long position should close out his or her contracts prior to the first notice day.

CASH SETTLEMENT

Some financial futures, such as those on stock indices, are settled in cash because it is inconvenient or impossible to deliver the underlying asset. In the case of the futures contract on the S&P/ASX 200, for example, delivering the underlying asset would involve delivering a portfolio of 200 stocks. When a contract is settled in cash, all outstanding contracts are declared closed on a predetermined day. The final settlement price is set equal to the spot price of the underlying asset at either the opening or close of trading on that day. For example, in the S&P/ASX 200 Futures contract trading on the ASX, the predetermined day is the third Thursday of the delivery month and final settlement is at the opening price on the expiry morning.

PRICE QUOTES

The exchange defines how prices will be quoted. For example, the Victorian Wholesale Gas Futures prices on the ASX are quoted in dollars and cents per gigajoules. On the other hand, the ASX quotes the short-term interest rate and bond futures in yield per cent per annum. For quotation purposes, the yield is deducted from an index of 100. For example, a 3-year bonds future with yield of 4.95% is quoted as 95.05.

PRICE LIMITS AND POSITION LIMITS

For most contracts, daily price movement limits are specified by the exchange. If in a day the price moves down from the previous day's close by an amount equal to the daily price limit, the contract is said to be *limit down*. If it moves up by the limit, it is said to be *limit up*. A **limit move** is a move in either direction equal to the daily price limit. Normally, trading ceases for the day once the contract is limit up or limit down. However, in some instances the exchange has the authority to step in and change the limits.

The purpose of daily price limits is to prevent large price movements from occurring because of speculative excesses. However, limits can become an artificial barrier to trading when the price of the underlying commodity is advancing or declining rapidly. Whether price limits are, on balance, good for futures markets is controversial.

Position limits are the maximum number of contracts that a speculator may hold. The purpose of these limits is to prevent speculators from exercising undue influence on the market. Under the ASX trading rules, the position limits are imposed through the Capital Based Position Limits (CBPL), which restricts the initial margin liabilities. This, in turn, effectively limits the maximum number of contracts that an investor may hold. Specifically, a participant's CBPL is specified as 200% of his or her Net Tangible Asset (NTA), where the confirmed NTA figure is provided on a monthly basis to ASX's compliance and surveillance function.[5]

5 For further information, please visit <www.asx.com.au>.

LO 3

To understand the relationship between futures and spot prices as the delivery date for a futures contract is approached

2.3 Convergence of futures price to spot price

As the delivery period for a futures contract is approached, the futures price converges to the spot price of the underlying asset. When the delivery period is reached, the futures price equals, or is very close to, the spot price.

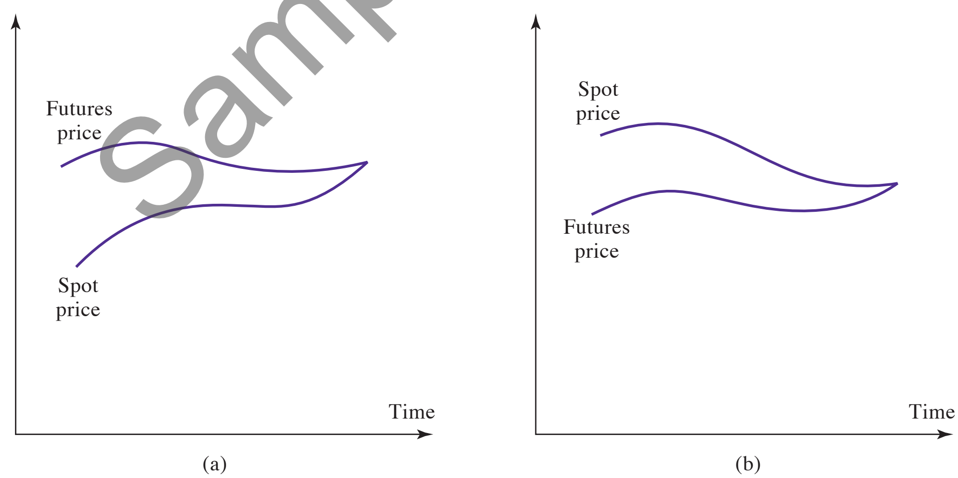
To see why this is so, we first suppose that the futures price is above the spot price during the delivery period. Traders then have a clear arbitrage opportunity:

1 sell (i.e. short) a futures contract
2 buy the asset
3 make delivery.

These steps are certain to lead to a profit equal to the amount by which the futures price exceeds the spot price. As traders exploit this arbitrage opportunity, the futures price will fall. Suppose next that the futures price is below the spot price during the delivery period. Companies interested in acquiring the asset will find it attractive to buy a futures contract and then wait for delivery to be made. As they do so, the futures price will tend to rise.

The result is that the futures price is very close to the spot price during the delivery period. Figure 2.1 illustrates the convergence of the futures price to the spot price. In Figure 2.1(a) the futures price is above the spot price prior to the delivery period and in Figure 2.1(b) the futures price is below the spot price prior to the delivery period. The circumstances under which these two patterns are observed are discussed in Chapter 5.

FIGURE 2.1 **Relationship between futures price and spot price as the delivery month is approached: (a) futures price above spot price; (b) futures price below spot price**



LO 4

To understand the operation of margins under the ASX rules

2.4 The operation of margins

If two investors get in touch with each other directly and agree to trade an asset in the future for a certain price, there are obvious risks. One of the investors may regret the deal and try to back out. Alternatively, the investor simply may not have the financial resources to honour the agreement. One of the key roles of the exchange is to organise trading so that contract defaults are avoided. This is where margins come in.

DAILY SETTLEMENT

To illustrate how margins work, we consider an investor who contacts his or her broker on Wednesday, 20 October 2010 to buy one December 2010 ASX SPI 200™ Futures contract on the ASX. With the futures price quoted at 4669.0 index points, the size of the contract is AUD 116 725, calculated by multiplying the futures quote to the minimum tick value of AUD 25. The broker will require the investor to deposit funds in a *margin account*. The amount that must be deposited at the time the contract is entered into is known as the **initial margin**.[6] The ASX specified this to be AUD 3250[7] per contract. At the end of each trading day, the margin account is adjusted to reflect the investor's gain or loss. This practice is referred to as *daily settlement* or **marking to market**.

Suppose, for example, that by the end of 20 October the futures settlement price has dropped from 4636.0 to 4632.0 index points. The investor has a loss of AUD 100 (= 4.0 × AUD 25). The balance in the margin account would therefore be reduced by AUD 100 to AUD 3150. If ASX SPI 200™ Futures settlement price rose to 4640.0 by the end of the first day, the balance in the margin account would be increased by AUD 100 to AUD 3350. A trade is first settled at the close of the day on which it takes place. It is then settled at the close of trading on each subsequent day.

Note that daily settlement is not merely an arrangement between broker and client. When there is a decrease in the futures price so that the margin account of an investor with a long position is reduced by AUD 100, the investor's broker has to pay the exchange AUD 100 and the exchange passes the money on to the broker of an investor with a short position. Similarly, when there is an increase in the futures price, brokers for parties with short positions pay money to the exchange and brokers for parties with long positions receive money from the exchange. Later we will examine in more detail the mechanism by which this happens.

The investor is entitled to withdraw any balance in the margin account in excess of the initial margin. To ensure that the balance in the margin account never becomes negative, a **maintenance margin**, which is lower than or equal to the initial margin, is set. On the ASX, the exchange requires that the trader maintains an amount equal to their initial margin through their broker. If the balance in the margin account falls below the maintenance margin, the investor receives a margin call and is expected to top up the margin account to the initial margin level the next day. The extra funds deposited are known as a **variation margin**. If the investor does not provide the variation margin, the broker closes out the position. In the case considered above, closing out the position would involve neutralising the existing contract by selling a December 2010 ASX SPI 200™ Futures contract.

Table 2.1 illustrates the operation of the margin account for one possible sequence of futures prices in the case of the investor considered earlier. The maintenance margin equates to the initial margin at AUD 3250. At the end of 20 October, the balance in the margin account falls AUD 100 below the maintenance margin level. This drop triggers a margin call from the broker

6 According to the ASX, the benchmark initial margin levels are computed based on 'long term historical data and are set as to cover ASX Clear (Futures) from daily price movements with a confidence factor of 99%'. Other factors considered may include recent price volatility, market liquidity, historical and implied volatility divergence, underlying market and futures price divergence and potential unexpected price movements caused by market participants.

7 This is effective from 14 October 2010.

for an additional AUD 100. Table 2.1 assumes that the investor does in fact provide this margin by the close of trading on 21 October. On 21 October, the balance in the margin account again falls below the maintenance margin level and a margin call for AUD 50 is sent out. The investor provides this margin by the close of trading on 22 October. On 27 October the investor decides to close out the position by selling one futures contract. The futures price on that day is 4643.0 points and the investor has a cumulative gain of AUD 175. Note that the investor has excess margin on 22, 25, 26 and 27 October. Table 2.1 assumes that the excess is not withdrawn.

TABLE 2.1 **Operation of margins for a long position in the ASX SPI 200™ Index Futures contract.** The initial margin is $3250 per contract. The contract is entered into on 20 October 2010 at 4636.0 index points and closed out on 27 October 2010 at 4643.0 index points. The numbers in the second column, except the first and the last, represent the futures prices at the close of trading

DAY	FUTURES PRICE (INDEX POINT)	DAILY GAIN (LOSS) (AUD)	CUMULATIVE GAIN (LOSS) (AUD)	MARGIN ACCOUNT BALANCE (AUD)	MARGIN CALL (AUD)
	4636.0			3 250	
20 OCTOBER	4632.0	(100)	(100)	3 150	100
21 OCTOBER	4630.0	(50)	(150)	3 200	50
22 OCTOBER	4649.0	475	325	3 725	
25 OCTOBER	4719.0	1 750	2 075	5 475	
26 OCTOBER	4689.0	(750)	1 325	4 725	
27 OCTOBER	4643.0	(1 150)	175	3 575	

Source: Based in part on data from *Australian Financial Review*.

FURTHER DETAILS

Many brokers allow an investor to earn interest on the balance in a margin account. The balance in the account does not, therefore, represent a true cost, providing the interest rate is competitive with what could be earned elsewhere. To satisfy the initial margin requirements (but not subsequent margin calls), an investor can sometimes deposit securities with the broker. In the US, Treasury bills are usually accepted in lieu of cash at about 90% of their face value. Shares are also sometimes accepted in lieu of cash—but at about 50% of their market value. In Australia, investors may deposit initial margins by means of non-AUD cash deposits and selective foreign and AUD securities, but subject to a foreign exchange and/or security valuation 'haircut'.[8]

Whereas a forward contract is settled at the end of its life, a futures contract is settled daily. At the end of each day, the investor's gain (loss) is added to (subtracted from) the margin account, bringing the value of the contract back to zero. A futures contract is in effect closed out and rewritten at a new price each day.

Minimum levels for initial and maintenance margins are set by the exchange. Individual brokers may require greater margins from their clients than those specified by the exchange. However, they cannot require lower margins than those specified by the exchange. Margin

8 The 'haircut' refers to the percentage discount applied to the market value of securities during collateral valuation. The ASX specifies these values; further details can be obtained from <www.asx.com.au>.

levels are determined by the variability of the price of the underlying asset. The higher this variability, the higher the margin levels. The maintenance margin is usually about 75% of the initial margin.

Margin requirements may depend on the objectives of the trader. A bona fide hedger, such as a company that produces the commodity on which the futures contract is written, is often subject to lower margin requirements than a speculator. The reason is that there is deemed to be less risk of default. Day trades and spread transactions often give rise to lower margin requirements than do hedge transactions. In a **day trade** the trader announces to the broker an intent to close out the position in the same day. In a **spread transaction** the trader simultaneously buys (i.e. takes a long position in) a contract on an asset for one maturity month and sells (i.e. takes a short position in) a contract on the same asset for another maturity month.

Note that margin requirements are the same on short futures positions as they are on long futures positions. It is just as easy to take a short futures position as it is to take a long one. The spot market does not have this symmetry. Taking a long position in the spot market involves buying the asset for immediate delivery and presents no problems. Taking a short position involves selling an asset that you do not own. This is a more complex transaction that may or may not be possible in a particular market. It is discussed further in Chapter 5.

THE CLEARINGHOUSE AND CLEARING MARGINS

A **clearinghouse** acts as an intermediary in futures transactions. It guarantees the performance of the parties to each transaction. The clearinghouse has a number of members, who must post funds with the exchange. Brokers who are not members themselves must channel their business through a member. The main task of the clearinghouse is to keep track of all the transactions that take place during a day so that it can calculate the net position of each of its members.

Just as an investor is required to maintain a margin account with a broker, the broker is required to maintain margin with a clearinghouse member and the clearinghouse member is required to maintain a margin account with the clearinghouse. The latter is known as a **clearing margin**. The margin accounts for clearinghouse members are adjusted for gains and losses at the end of each trading day in the same way as are the margin accounts of investors. However, in the case of the clearinghouse member, there is an original margin, but no maintenance margin. Every day the account balance for each contract must be maintained at an amount equal to the original margin times the number of contracts outstanding. Thus, depending on transactions during the day and price movements, the clearinghouse member may have to add funds to its margin account at the end of the day. Alternatively, it may find it can remove funds from the account at this time. Brokers who are not clearinghouse members must maintain a margin account with a clearinghouse member.

In determining clearing margins, the exchange clearinghouse calculates the number of contracts outstanding on either a gross or a net basis. When the gross basis is used, the number of contracts equals the sum of long and short positions; when the net basis is used, these are offset against each other. Suppose a clearinghouse member has two clients: one with a long position in 20 contracts, the other with a short position in 15 contracts. Gross margining would calculate the clearing margin on the basis of 35 contracts; net margining would calculate the clearing margin on the basis of 5 contracts. Most exchanges currently use net margining.

CREDIT RISK

The whole purpose of the margining system is to ensure that funds are available to pay traders when they make a profit. Overall the system has been very successful. Traders entering into contracts at major exchanges have always had their contracts honoured. Futures markets were tested on 19 October 1987, when the S&P 500 Index declined by over 20% and traders with long positions in S&P 500 Futures found they had negative margin balances. Traders who did not meet margin calls were closed out but still owed their brokers money. Some did not pay and as a result some brokers went bankrupt because, without their clients' money, they were unable to meet margin calls on contracts they entered into on behalf of their clients. However, the exchanges had sufficient funds to ensure that everyone who had a short futures position on the S&P 500 got paid off.

LO 5

To understand the risks involved in over-the-counter contracts

2.5 OTC markets

Credit risk has traditionally been a feature of the over-the-counter markets. There is always a chance that the party on the other side of an over-the-counter trade will default. It is interesting that, in an attempt to reduce credit risk, the over-the-counter market has adopted some of the procedures used by exchanges.

COLLATERALISATION

Collateralisation is one way in which participants in the OTC market reduce credit risk. Consider two companies, A and B, that have entered into an over-the-counter contract. A collateralisation agreement would typically require them to value the contract each day. If, from one day to the next, the value of the contract to company A increases, company B is required to pay cash (or other collateral) equal to this increase to company A. But if the value of the contract to company A decreases, company A is required to pay cash equal to the decrease to company B. Interest is paid on outstanding cash balances.

Collateralisation significantly reduces the credit risk in over-the-counter contracts. Collateralisation agreements were used by a hedge fund, Long-Term Capital Management (LTCM), in the 1990s. They allowed LTCM to be highly levered. The contracts did provide credit risk protection, but, as described in Business snapshot 2.2, the high leverage left the hedge fund vulnerable to other risks.

THE CREDIT CRISIS AND THE USE OF CLEARINGHOUSES IN OTC MARKETS

Collateralisation is not always used in over-the-counter contracts. For example, during the period leading up to the credit crisis, the insurance company AIG provided protection to other financial institutions against a huge volume of credit risks. This led to the insurance company's failure and a massive bailout by the US Government. Since AIG had a AAA credit rating at the time the contracts were negotiated, it was not required to post collateral by its counterparties.

A major concern of governments since the credit crisis of 2007 is **systemic risk**. This is the risk that a failure by a large financial institution will lead to failures by other large financial institutions and a collapse of the financial system. The way this can happen is described in Business snapshot 2.3. It was, to a large extent, concerns about systemic risk that led to government bailouts of financial institutions in the United States and Europe in 2008.

Business snapshot 2.2

LONG-TERM CAPITAL MANAGEMENT'S BIG LOSS

Long-Term Capital Management (LTCM), a hedge fund formed in the mid-1990s, always collateralised its transactions. The hedge fund's investment strategy was known as convergence arbitrage. A very simple example of what it might do is the following. It would find two bonds, X and Y, issued by the same company that promised the same payoffs, with X being less liquid (i.e. less actively traded) than Y. The market always places a value on liquidity. As a result, the price of X would be less than the price of Y. LTCM would buy X, short Y and wait, expecting the prices of the two bonds to converge at some future time.

When interest rates increased, the company expected both bonds to move down in price by about the same amount so that the collateral it paid on bond X would be about the same as the collateral it received on bond Y. Similarly, when interest rates decreased LTCM expected both bonds to move up in price by about the same amount so that the collateral it received on bond X would be about the same as the collateral it paid on bond Y. It therefore expected that there would be no significant outflow of funds as a result of its collateralisation agreements.

In August 1998, Russia defaulted on its debt and this led to what is termed a 'flight to quality' in capital markets. One result was that investors valued liquid instruments more highly than usual and the spreads between the prices of the liquid and illiquid instruments in LTCM's portfolio increased dramatically. The prices of the bonds LTCM had bought went down and the prices of those it had shorted increased. It was required to post collateral on both. The company experienced difficulties because it was highly leveraged. Positions had to be closed out and LTCM lost about $4 billion. If the company had been less highly leveraged, it would probably have been able to survive the flight to quality and could have waited for the prices of the liquid and illiquid bonds to move back closer to each other.

Business snapshot 2.3

SYSTEMIC RISK

Systemic risk is the risk that a default by one financial institution will create a 'ripple effect' that leads to defaults by other financial institutions and threatens the stability of the financial system. There are huge numbers of over-the-counter transactions between banks. If Bank A fails, Bank B may take a huge loss on the transactions it has with Bank A. This in turn could lead to Bank B failing. Bank C, that has many outstanding transactions with both Bank A and Bank B, might then take a large loss and experience severe financial difficulties and so on.

The financial system has survived defaults such as Drexel in 1990 and Lehman Brothers in 2008, but regulators continue to be concerned. During the market turmoil of 2007 and 2008, many large financial institutions were bailed out, rather than being allowed to fail, because governments were concerned about systemic risk.

An advantage of the futures market is that, because it entails virtually no credit risk, it is unlikely to be a cause of systemic risk. Not surprisingly, politicians and regulators have looked at ways of making the over-the-counter market more like the futures market. Participants in the over-the-counter market have come under pressure to use clearinghouses for over-the-counter trades in order to reduce systemic risk and create greater transparency. Regulators are particularly anxious to use clearinghouses for credit default swaps (CDSs).[9] This would mean that financial institutions trading CDSs maintain margin with a clearinghouse in the same way that they do with futures contracts. The US clearinghouse ICE Trust (operated by the IntercontinentalExchange) started clearing CDS trades in March 2009. The European clearinghouse Eurex did the same in July 2009. The Australian clearinghouse ASX Clear, in contrast, does not provide clearing services for OTC derivatives. However, it facilitates the settlement and depository business for OTC-traded securities, including bonds, forward rate agreements (FRAs), swaps and bank bills.

One limitation is that clearinghouses can be used only for standard transactions in the over-the-counter market. It is necessary for daily gains and losses to be calculated from market prices in a clear and unambiguous way. Part of the impetus for using clearinghouses for CDSs was the AIG fiasco referred to earlier. However, a clearinghouse would probably not have prevented the need for an AIG bailout because many of AIG's CDS contracts were non-standard. In addition to requiring clearinghouses for standard OTC transactions, regulators are likely to push for financial institutions to hold more capital for non-standard OTC transactions.

2.6 Newspaper quotes

LO 6

To understand newspaper quotes relating to futures contracts

Many newspapers carry futures prices. Table 2.2 shows the 'ASX Futures Options' section of the *Australian Financial Review* of Monday, 25 October 2010. The table reports the trading activity of the financial futures contracts on the previous day (i.e. Friday, 22 October 2010).

The asset underlying the futures contract and how the price is quoted are all shown at the top of each section in Table 2.2. The first futures is the SPI 200 whose underlying asset is the S&P/ASX 200 Index. The contract size is AUD 25 × S&P/ASX 200 and the price quoted reflects the level of the S&P/ASX 200 Index. The maturity month and year of the contract are shown in the first and second columns, respectively.

PRICES

The settlement price as of Thursday, 21 October 2010 is shown in the third column. The first trading price on Friday, 22 October 2010, together with the highest and lowest trading prices, is reported in columns titled First Trade, High and Low, respectively. For example, the December 2010 SPI 200 Index Futures contract, the previous price and first trade price are equal at 4630.0, while the highest trade price was 4657.0 and the lowest trade price was 4626.0 on 22 October 2010.

SETTLEMENT PRICE

The settlement column reports the settlement price. This is the price used for calculating daily gains and losses and margin requirements. It is usually calculated as the price at which the

9 Credit default swaps are derivatives that provide protection against defaults by corporations or countries. They are explained in Chapter 23. The CDS market grew very rapidly from 1999 to 2007.

TABLE 2.2

Financial futures quotes from the *Australian Financial Review*, 25 October 2010 (Columns show month, year, previous price, first trade, high, low, settlement price and change, $value of change, trade volume and previous open position, respectively.)

BENCHMARK FUTURES

		PREV PRICE	FIRST TRADE	HIGH	LOW	SETTLEMENT PRICE	SETTLEMENT CHANGE	$ VALUE OF CHG	VOLUME	PREV O/P
SPI 200 (A$25 × SPI200)										
OCT	10	4626.0	–	–	–	4669.3	+43.3	1082.50	0	1657
NOV	10	4614.0	–	–	–	4633.0	+19.0	475.00	0	751
DEC	10	4630.0	4630.0	4657.0	4626.0	4649.0	+19.0	475.00	16889	213012
JAN	11	–	–	–	–	4651.0	0	0.00	0	0
MAR	11	4624.0	–	–	–	4641.0	+17.0	425.00	10	2059
JUN	11	4648.0	–	–	–	4666.0	+18.0	450.00	0	1025
SEP	11	4639.0	–	–	–	4657.0	+18.0	450.00	975	742
DEC	11	4666.0	–	–	–	4684.0	+18.0	450.00	0	765
NIGHT VOL 4242		DAY VOL 17874		PREVIOUS O/P 220011						
30 DAY INTERBANK CASH RATE (RBA INTERBANK OVERNIGHT CASH)										
OCT	10	95.505	–	–	–	95.505	0	0.00	0	83082
NOV	10	95.415	95.410	95.410	95.405	95.410	−0.005	−12.33	4518	100021
DEC	10	95.370	95.360	95.360	95.355	95.360	−0.010	−24.66	2565	52751
JAN	11	95.350	95.345	95.345	95.340	95.340	−0.010	−24.66	2800	21088
FEB	11	95.285	95.275	95.275	95.275	95.270	−0.015	−36.99	250	5911
MAR	11	95.255	–	–	–	95.245	−0.010	−24.66	0	3218
APR	11	95.240	–	–	–	95.225	−0.015	−36.99	0	1277
MAY	11	95.200	95.180	95.185	95.180	95.180	−0.020	−49.32	500	1710
JUN	11	95.160	–	–	–	95.145	−0.015	−36.99	0	1676
JUL	11	95.115	–	–	–	95.100	−0.015	−36.99	0	967
AUG	11	95.070	–	–	–	95.060	−0.010	−24.66	0	1130
SEP	11	95.050	–	–	–	95.030	−0.020	−49.32	0	350
OCT	11	95.020	–	–	–	95.000	−0.020	−49.32	0	150
NOV	11	94.995	–	–	–	94.975	−0.020	−49.32	0	100
DEC	11	94.970	–	–	–	94.945	−0.025	−61.65	0	21
NIGHT VOL 2415		DAY VOL 10633		PREVIOUS O/P 273452						
90-DAY BANK BILLS (100 MINUS YIELD % P.A.)										
DEC	10	95.060	95.060	95.060	95.040	95.050	−0.010	−24.06	11443	181809
MAR	11	94.950	94.940	94.950	94.930	94.940	−0.010	−24.05	10383	143864
JUN	11	94.830	94.820	94.820	94.800	94.820	−0.010	−24.04	2503	86994
SEP	11	94.750	94.730	94.740	94.720	94.730	−0.020	−48.06	2659	51674
DEC	11	94.670	94.650	94.660	94.640	94.660	−0.010	−24.02	1033	34071
MAR	12	94.640	94.620	94.630	94.590	94.610	−0.030	−72.05	1008	37731
JUN	12	94.610	94.610	94.610	94.570	94.590	−0.020	−48.03	231	24357
SEP	12	94.600	94.550	94.610	94.550	94.580	−0.020	−48.02	345	8858
DEC	12	94.570	–	–	–	94.560	−0.010	−24.01	0	1471
MAR	13	94.570	–	–	–	94.560	−0.010	−24.01	0	1288
JUN	13	94.560	–	–	–	94.540	−0.020	−48.02	0	58
SEP	13	94.570	–	–	–	94.540	−0.030	−72.03	0	5
NIGHT VOL 7044		DAY VOL 29605		PREVIOUS O/P 572180						
3 YEAR BONDS (100 MINUS YIELD % P.A.)										
DEC	10	95.080	95.060	95.060	95.040	95.050	−0.030	−84.18	48744	450997
NIGHT VOL 15198		DAY VOL 48744		PREVIOUS O/P 450997						
3 YEAR INTEREST RATE SWAPS (100 MINUS YIELD % P.A.)										
DEC	10	94.765	–	–	–	94.735	−0.030	−83.99	0	0
NIGHT VOL 0		DAY VOL 0		PREVIOUS O/P 0						
10 YEAR BONDS (100 MINUS YIELD % P.A.)										
DEC	10	94.855	94.835	94.840	94.810	94.830	−0.025	−201.09	18706	346283
NIGHT VOL 7686		DAY VOL 18706		PREVIOUS O/P 346283						
10 YEAR INTEREST RATE SWAPS (100 MINUS YIELD % P.A.)										
DEC	10	94.395	–	–	–	94.370	−0.025	−197.08	0	0
NIGHT VOL 0		DAY VOL 0		PREVIOUS O/P 0						

Source: Fairfax, AFR Review, 25 October 2010.

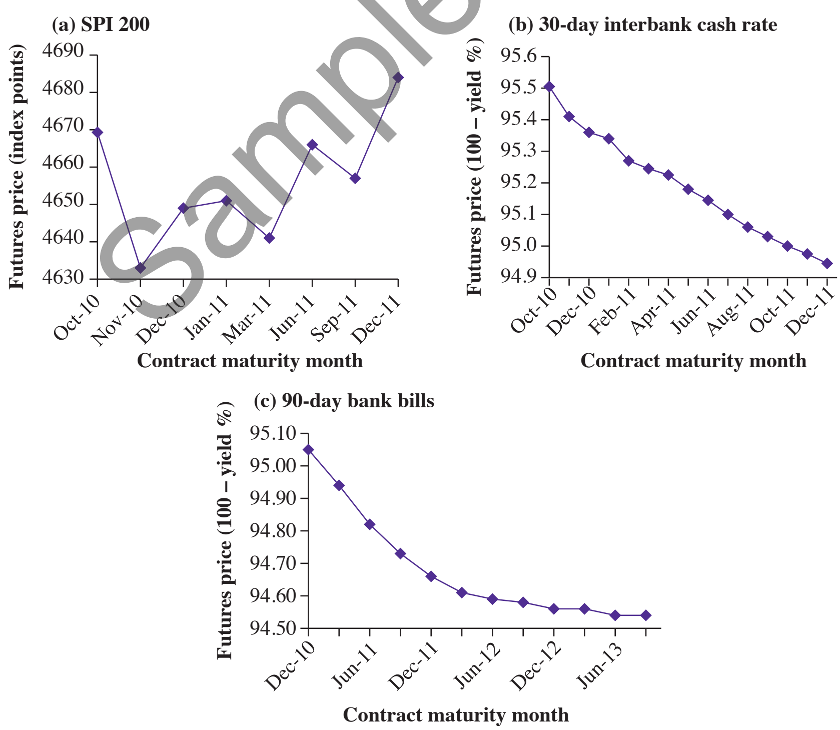
contract traded immediately before the bell signalling the end of trading for the day. The eighth number is the change in the settlement price from the previous day. For the December 2010 SPI 200 Index Futures contract, the settlement price was 4649.0 on 22 October 2010, up 19 index points from the previous day.

In the case of the December 2010 SPI 200 Index Futures, an investor with a long position in one contract would find his or her margin account balance increased by AUD 475 (i.e. AUD 25 × 19 index points) on 22 October 2010. Similarly, an investor with a short position in one contract would find that the margin balance decreased by AUD 475 on this date. Such gain/loss for a long position holder is reported in the column titled '$ Value of Chg'.

VOLUME AND OPEN POSITION

The trade volume and the **open position**[10] for each contract are reported in the last two columns. This is the total number of contracts traded and the number of contracts outstanding, respectively. The open position/open interest is the number of long positions or, equivalently, the number of short positions. The open position for December 2010 SPI 200 Index Futures is shown as 213 012 contracts, while 16 889 contracts were traded on 22 October 2010. Note that the open position for the November 2010 contract is much lower because most traders who held long or short positions in that contract have already closed out.

FIGURE 2.2 **Settlement futures price as a function of contract maturity on 22 October 2010, for: (a) SPI 200, (b) 30-day interbank cash rate, and (c) 90-day bank bills**



10 Also known as open interest.

PATTERNS OF FUTURES PRICES

Futures prices can show a number of different patterns. The case where settlement prices increase with the maturity of the contract is known as a **normal market**. Conversely, a market where futures prices decline with maturity is known as an **inverted market**. In Figure 2.2, the futures on both the 30-day interbank cash rate and the 90-day bank bills have settlement yield to maturity that are increasing with contract maturity, as illustrated by decreasing future prices (100 – yield %). This is an example of an inverted market.

Futures prices can show a mixture of normal and inverted markets. An example is provided by SPI 200 on 22 October 2010. As shown in Figure 2.2, futures prices are at first a decreasing function of maturity. Data from the *Australian Financial Review* shows that the decrease continues for maturity months out to March 2011. The futures price then increases for maturity months until the end of 2011.

2.7 Types of trader and types of order

LO 7

To understand the type of traders and types of orders common in Australian futures markets

There are two main types of trader executing trades: **futures commission merchants** (FCMs) and **locals**. FCMs are following the instructions of their clients and charge a commission for doing so; locals are trading on their own account.

Individuals taking positions, whether locals or the clients of FCMs, can be categorised as hedgers, speculators or arbitrageurs, as discussed in Chapter 1. Speculators can be classified as scalpers, day traders or position traders. **Scalpers** are watching for very short-term trends and attempt to profit from small changes in the contract price. They usually hold their positions for only a few minutes. *Day traders* hold their positions for less than one trading day. They are unwilling to take the risk that adverse news will occur overnight. *Position traders* hold their positions for much longer periods of time. They hope to make significant profits from major movements in the markets.

ORDERS

The simplest type of order placed with a broker is a *market order*. It is a request that a trade be carried out immediately at the best price available in the market. However, there are many other types of orders. We will consider those that are more commonly used.

A **limit order** specifies a particular price. The order can be executed only at this price or at one more favourable to the investor. Thus, if the limit price is $30 for an investor wanting to buy, the order will be executed only at a price of $30 or less. There is, of course, no guarantee that the order will be executed at all, because the limit price may never be reached.

A *stop order* or *stop-loss order* also specifies a particular price. The order is executed at the best available price once a bid or offer is made at that particular price or a less favourable price. Suppose a stop order to sell at $30 is issued when the market price is $35. It becomes an order to sell when and if the price falls to $30. In effect, a stop order becomes a market order as soon as the specified price has been hit. The purpose of a stop order is usually to close out a position if unfavourable price movements take place. It limits the loss that can be incurred.

A *stop–limit order* is a combination of a stop order and a limit order. The order becomes a limit order as soon as a bid or offer is made at a price equal to or less favourable than the stop price. Two prices must be specified in a stop–limit order: the stop price and the limit price. Suppose that, at the time the market price is $35, a stop–limit order to buy is issued with a stop price of $40 and a limit price of $41. As soon as there is a bid or offer at $40, the stop–limit becomes a limit order at $41. If the stop price and the limit price are the same, the order is sometimes called a *stop-and-limit order*.

A *market-if-touched order* (MIT) is executed at the best available price after a trade occurs at a specified price or at a price more favourable than the specified price. In effect, an MIT becomes a market order once the specified price has been hit. An MIT is also known as a *board order*. Consider an investor who has a long position in a futures contract and is issuing instructions that would lead to closing out the contract. A stop order is designed to place a limit on the loss that can occur in the event of unfavourable price movements. By contrast, a market-if-touched order is designed to ensure that profits are taken if sufficiently favourable price movements occur.

A *discretionary order* or *market-not-held order* is traded as a market order except that execution may be delayed at the broker's discretion in an attempt to get a better price.

Some orders specify time conditions. Unless otherwise stated, an order is a day order and expires at the end of the trading day. A *time-of-day order* specifies a particular period of time during the day when the order can be executed. An *open order* or a *good-till-cancelled order* is in effect until executed or until the end of trading in the particular contract. A *fill-or-kill order*, as its name implies, must be executed immediately on receipt or not at all.

In addition to the above-mentioned orders, the ASX introduced a range of new order types on its platform in June 2010. Namely, they are centre point order, centre point crossing, undisclosed order and iceberg order. A more detailed technical description of these order types can be found on the ASX website: <www.asx.com.au/asxtrade>.

2.8 Regulation

LO 8

To understand the regulations relating to the US and Australian futures markets

Futures markets in the United States are currently regulated federally by the Commodity Futures Trading Commission (CFTC; <www.cftc.gov>), which was established in 1974. This body is responsible for licensing futures exchanges and approving contracts. All new contracts and changes to existing contracts must be approved by the CFTC. To be approved, the contract must have some useful economic purpose. Usually this means that it must serve the needs of hedgers as well as speculators.

The CFTC looks after the public interest. It is responsible for ensuring that prices are communicated to the public and that futures traders report their outstanding positions if they are above certain levels. The CFTC also licenses all individuals who offer their services to the public in futures trading. The backgrounds of these individuals are investigated and there are minimum capital requirements. The CFTC deals with complaints brought by the public and ensures that disciplinary action is taken against individuals when appropriate. It has the authority to force exchanges to take disciplinary action against members who are in violation of exchange rules.

With the formation of the National Futures Association (NFA; <www.nfa.futures.org>) in 1982, some of the responsibilities of the CFTC were shifted to the futures industry itself. The NFA is an organisation of individuals who participate in the futures industry. Its objective is to prevent fraud and to ensure that the market operates in the best interests of the general public. It is authorised to monitor trading and take disciplinary action when appropriate. The agency has set up an efficient system for arbitrating disputes between individuals and its members.

From time to time other bodies such as the Securities and Exchange Commission (SEC; <www.sec.gov>), the Federal Reserve Board (<www.federalreserve.gov>) and the US Treasury Department (<www.treas.gov>) have claimed jurisdictional rights over some aspects of futures trading. These bodies are concerned with the effects of futures trading on the spot markets for securities such as stocks, Treasury bills and Treasury bonds. The SEC currently has an effective veto over the approval of new stock or bond index futures contracts. However, the basic responsibility for all futures and options on futures rests with the CFTC.

The Australian futures market was regulated by the Australian Securities Exchange (ASX) prior to August 2010. The supervision of trading on Australian domestic licensed markets and participants has since been transferred to the Australian Securities and Investments Commission (ASIC), which is Australia's corporate, markets and financial services regulator (<www.asic.gov.au>). ASIC now governs integrity rules in the ASX, the ASX 24 (formerly the Sydney Futures Exchange[11]), as well as other OTC derivative dealings and licensing for settlement and clearing facilities.

However, the ASX still maintains a division called the ASX Compliance, which maintains the ASX's oversight obligations as a market and clearing and settlement facility operator (<www.asxgroup.com.au/asx-compliance.htm>). The ASX Compliance is responsible for oversight and enforcement of operating rules of the ASX markets and clearing settlement facilities, which are comprised of: ASX Listing Rules, ASX Operating Rules, ASX Clear Operating Rules, ASX Settlement Operating Rules, ASX 24 Operating Rules, ASX Clear (Futures) Operating Rules, ASX Enforcement and Appeals Rulebook and Austraclear Regulations.

TRADING IRREGULARITIES

Most of the time futures markets operate efficiently and in the public interest. However, from time to time trading irregularities do come to light. One type of trading irregularity occurs when an investor group tries to 'corner the market.'[12] The investor group takes a huge long futures position and also tries to exercise some control over the supply of the underlying commodity. As the maturity of the futures contracts is approached, the investor group does not close out its position, so that the number of outstanding futures contracts may exceed the amount of the commodity available for delivery. The holders of short positions realise that they will find it difficult to deliver and become desperate to close out their positions. The result is a large rise in both futures and spot prices. Regulators usually deal with this type of abuse of the market by increasing margin requirements or imposing stricter position limits or prohibiting trades that increase a speculator's open position or requiring market participants to close out their positions.

Other types of trading irregularities can involve the traders on the floor of the exchange. These received some publicity early in 1989 when it was announced that the FBI had carried out a two-year investigation, using undercover agents, of trading on the Chicago Board of Trade and the Chicago Mercantile Exchange. The investigation was initiated because of complaints filed by a large agricultural concern. The alleged offences included overcharging customers, not paying customers the full proceeds of sales, and traders using their knowledge of customer orders to trade first for themselves. (The latter is known as *front running*.)

11 The Sydney Futures Exchange (SFE) merged with the Australian Stock Exchange in July 2006. The ASX Group brand was formally introduced in August 2010 and it has become one of the world's top 10 exchange groups, as measured by market capitalisation.

12 Possibly the best-known example of this involves the activities of the Hunt brothers in the silver market in 1979–80. Between the middle of 1979 and the beginning of 1980, their activities led to a price rise from $6 per ounce to $50 per ounce.

LO 9

To understand the accounting and tax treatment of Australian futures contracts

2.9 Accounting and tax

The full details of the accounting and tax treatment of futures contracts are beyond the scope of this book. A trader who wants detailed information on this should consult experts. In this section we provide some general background information.

ACCOUNTING

Accounting standards require changes in the market value of a futures contract to be recognised when they occur unless the contract qualifies as a hedge. If the contract does qualify as a hedge, then gains or losses are generally recognised for accounting purposes in the same period in which the gains or losses from the item being hedged are recognised. In such circumstances, the details of such hedging strategies must be disclosed. The treatment is referred to as *hedge accounting*.

Example 2.1 considers an Australian company with a June year end. In May 2011 it buys an October 2011 greasy wool futures contract and closes out the position at the end of August 2011. Suppose that the futures prices are 950 cents per kilogram clean weight when the contract is entered into, 956 cents per kilogram clean weight at the end of June 2011 and 958 cents per kilogram clean weight when the contract is closed out. The contract is for the delivery of 2500 kilograms clean weight. If the contract does not qualify as a hedge, the gains for accounting purposes are:

$$2500 \times (9.56 - 9.50) = \$150$$

in the 2010/2011 financial year and:

$$2500 \times (9.58 - 9.56) = \$50$$

in the 2011/2012 financial year. If the company is hedging the purchase of 2500 kilograms clean weight of greasy wool in August 2011 so that the contract qualifies for hedge accounting, the entire gain of $200 is realised in the 2011/2012 financial year for accounting purposes.

The treatment of hedging gains and losses is sensible. If the company is hedging the purchase of 2500 kilograms clean weight of greasy wool in August 2011, the effect of the futures contract is to ensure that the price paid is close to 950 cents per kilogram clean weight. The accounting treatment reflects that this price is paid in the 2011/2012 financial year.

EXAMPLE 2.1

Accounting treatment of a futures transaction

An Australian company buys a 2500 kilograms clean weight October 2011 greasy wool contract in May 2011 for 950 cents per kilogram clean weight and closes out the position in August 2011 for 958 cents per kilogram clean weight. The price of October 2011 greasy wool on 30 June 2011, the company's year end, is 956 cents per kilogram clean weight.

If the contract is not a hedge, the treatment of these transactions leads to:

Accounting profit in 2010/2011 = 2500 × 6 cents = $150.

Accounting profit in 2011/2012 = 2500 × 2 cents = $50.

If the contract is hedging a purchase of wool in 2011, the result is:

Accounting profit in 2010/2011 = $0.

Accounting profit in 2011/2012 = 2500 × 8 cents = $200.

The Australian Accounting Standards Board (AASB) issued Statement No. 139 (AASB 139), Financial Instruments: Recognition and Measurement. AASB 139 applies to all types of derivatives (including futures, forwards, swaps and options).[13] It requires all derivatives to be included on the balance sheet at fair value. It also gives companies far less latitude than previously in using hedge accounting. For hedge accounting to be used, the hedging instrument must be highly effective in offsetting exposures, and an assessment is done on an ongoing basis. The AASB increases disclosure requirements for the use of derivative instruments, through AASB 7, Financial Instruments: Disclosures; and AASB 132, Financial Instruments: Presentation, offers the guidelines for classification of derivative instruments for accounting purposes. The latest issues of AASB 7, 132 and 139 are in agreement with their International Accounting Standards Board counterparts.

TAX

As in the United States, the two key issues of the Australian tax rules are the nature of a taxable gain or loss and the timing of the recognition of the gain or loss. Gains or losses are either classified as capital gains/losses or as part of ordinary income.

For an American corporate taxpayer, capital gains are taxed at the same rate as ordinary income and the ability to deduct losses is restricted. Capital losses are deductible only to the extent of capital gains. A corporation may carry back a capital loss for three years and carry it forward for up to five years. For an American non-corporate taxpayer, short-term capital gains are taxed at the same rate as ordinary income, but long-term capital gains are taxed at a lower rate than ordinary income. (Long-term capital gains are gains from the sale of a capital asset held for longer than one year; short-term capital gains are the gains from the sale of a capital asset held one year or less.) The Taxpayer Relief Act of 1997 widened the rate differential between ordinary income and long-term capital gains. For an American non-corporate taxpayer, capital losses are deductible to the extent of capital gains plus ordinary income up to $3000 and can be carried forward indefinitely.

Generally, positions in futures contracts are treated as if they are closed out on the last day of the tax year. For the US non-corporate taxpayer this gives rise to capital gains and losses. These are treated as if they are 60% long term and 40% short term without regard to the holding period. This is referred to as the '60/40' rule. An American non-corporate taxpayer may elect to carry back for three years any net losses from the 60/40 rule to offset any gains recognised under the rule in the previous three years.

Hedging transactions are exempt from this rule. The definition of a hedge transaction for tax purposes is different from that for accounting purposes. The tax regulations define a hedging transaction as a transaction entered into in the normal course of business primarily for one of the following reasons:

1 to reduce the risk of price changes or currency fluctuations with respect to property that is held or to be held by the taxpayer for the purposes of producing ordinary income
2 to reduce the risk of price or interest rate changes or currency fluctuations with respect to borrowings made by the taxpayer.

A hedging transaction must be clearly identified in the company's records as a hedge. Gains or losses from hedging transactions are treated as ordinary income. The timing of the recognition

13 Previously, the attraction of derivatives in some situations was that they were 'off-balance-sheet' items.

of gains or losses from hedging transactions generally matches the timing of the recognition of income or expense associated with the transaction being hedged.

Similarly, in Australia, gains from the sale of assets may be classified as either ordinary income or capital gains (losses), depending on the nature of the transaction. That is, if the sale forms part of the taxpayer's ordinary course of business, it will be classified as ordinary income. Otherwise, the proceeds will be subject to capital gains tax provisions.

Where the proceeds are deemed to be ordinary income, it will be subject to the taxpayer's income tax rate. For an individual, the rate will depend on their income tax bracket. For a company, the rate will be the company rate.

If the proceeds are deemed to be capital gains, it will still be included in the taxpayer's assessable income, under subsection 102-5(1) of the Income Tax Assessment Act 1997 (ITAA 1997). Capital losses are deductible only to the extent of capital gains. Subsection 102-15(3) of the ITAA 1997 states that a net capital loss can be carried forward to a later income year to the extent that it cannot be applied in an income year. Although the Act does not explicitly state a time limit for carrying forward capital losses, for a company to be able to do so, the following requirements must be met:

1. The same people had majority ownership of the company in the period from the start of the capital loss year to the end of the capital gain year, and
2. No person controlled the company's voting power at any time during the capital gain year who did not also control it during the whole of the capital loss year. Or the company has carried on the same business and commenced no additional business or new transactions.

These tests correspond to the continuity of ownership test and the same business test which apply in relation to the carry forward of prior year revenue losses by companies. No such tests exist for individuals.[14]

LO 10

To understand the differences between forward and futures contracts

2.10 Forward versus futures contracts

As explained in Chapter 1, forward contracts are similar to futures contracts in that they are agreements to buy or sell an asset at a certain time in the future for a certain price. Whereas futures contracts are traded on an exchange, forward contracts are traded in the over-the-counter market. They are typically entered into by two financial institutions or by a financial institution and one of its clients.

One of the parties to a forward contract assumes a **long position** and agrees to buy the asset on a certain specified date for a certain price. The other party assumes a **short position** and agrees to sell the asset on the same date for the same price. Forward contracts do not have to conform to the standards of a particular exchange. The contract delivery date can be any date mutually convenient to the two parties. Usually, in forward contracts a single delivery date is specified, whereas in futures contracts there is a range of possible delivery dates.

Unlike futures contracts, forward contracts are not settled daily. The two parties contract to settle up on the specified delivery date. Whereas most futures contracts are closed out prior to delivery, most forward contracts do lead to delivery of the physical asset or to final settlement in cash. Table 2.3 summarises the main differences between forward and futures contracts.

14 Refer to the Income Tax Assessment Act 1997 (ITAA 1997) for further details on specific treatments of capital gains/losses such as discount rates, indexation and capital gains tax exemptions.

TABLE 2.3

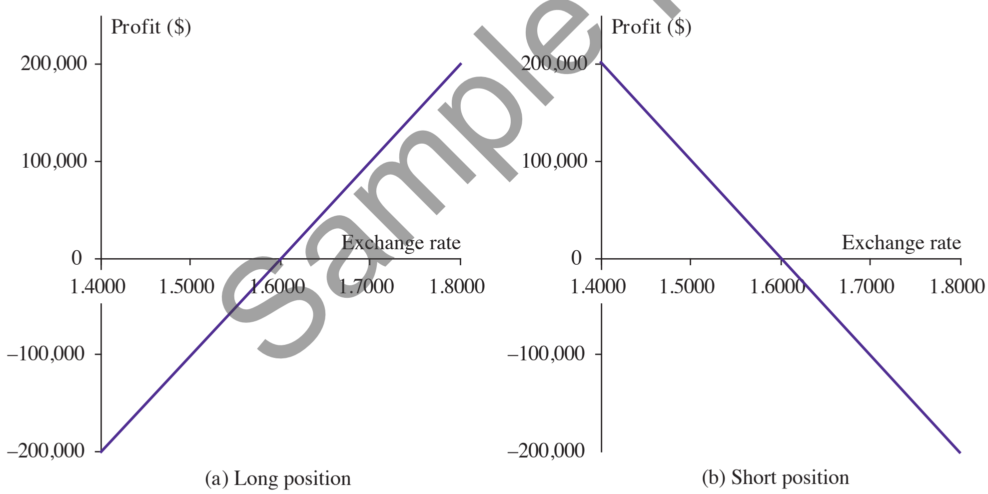
Comparison of forward and futures contracts

FORWARD	FUTURES
PRIVATE CONTRACT BETWEEN TWO PARTIES	TRADED ON AN EXCHANGE
NOT STANDARDISED	STANDARDISED CONTRACT
USUALLY ONE SPECIFIED DELIVERY DATE	RANGE OF DELIVERY DATES
SETTLED AT END OF CONTRACT	SETTLED DAILY
DELIVERY OR FINAL CASH SETTLEMENT USUALLY TAKES PLACE	CONTRACT IS USUALLY CLOSED OUT PRIOR TO MATURITY
SOME CREDIT RISK	VIRTUALLY NO CREDIT RISK

PROFITS FROM FORWARD AND FUTURES CONTRACTS

Suppose that the sterling exchange rate for a 90-day forward contract is 1.6000 USD per GBP and that this rate is also the futures price for a contract that will be delivered in exactly 90 days. Under the forward contract, the whole gain or loss is realised at the end of the life of the contract. Under the futures contract, the gain or loss is realised day by day because of the daily settlement procedures. Figure 2.3 shows the net profit as a function of the exchange rate for 90-day long and short forward or futures positions on £1 million.

Profit from: (a) long, and (b) short forward or futures position on £1 million FIGURE 2.3



Example 2.2 considers the situation where investor A is short AUD 1 million in a 90-day forward contract and investor B is short AUD 1 million in 90-day futures contracts. (Each futures contract traded on the Chicago Mercantile Exchange (CME) is for the purchase or sale of AUD 100 000, so investor B has purchased a total of 10 contracts.) Assume that the spot exchange rate in 90 days proves to be USD 0.9800 per AUD. Investor A makes a loss of USD 10 000 on the 90th day. Investor B makes the same loss—but spread out over the 90-day period. On some days investor B may realise a loss, whereas on other days he or she makes a gain. However, in total, when losses are netted against gains, there is a loss of USD 10 000 over the 90-day period.

EXAMPLE 2.2

Futures versus forwards

Investor A takes a short position in a 90-day forward contract on AUD 1 million. The forward price is USD 0.9700 per AUD. Investor B takes a short position in 90-day futures contracts on AUD 1 million. The futures price is also USD 0.9700 per AUD. At the end of the 90 days, the exchange rate proves to be 0.9800.

The result of this is that investors A and B each make a total loss equal to:

$$(0.9800 - 0.9700) \times 1\,000\,000 = \text{USD } 10\,000$$

Investor A's loss is made entirely on the 90th day. Investor B's loss is realised day by day over the 90-day period. On some days investor B may realise a loss, whereas on other days he or she will realise a gain.

FOREIGN EXCHANGE QUOTES

Both forward and futures contracts trade actively on foreign currencies. However, there is sometimes a difference in the way exchange rates are quoted in the two markets. Futures prices are always quoted as the number of US dollars per unit of the foreign currency or as the number of US cents per unit of the foreign currency. Forward prices are always quoted in the same way as spot prices. This means that, for the British pound, the euro, the Australian dollar and the New Zealand dollar, the forward quotes show the number of US dollars per unit of the foreign currency and are directly comparable with futures quotes. For other major currencies, forward quotes show the number of units of the foreign currency per US dollar (USD). Consider the Canadian dollar (CAD). A futures price quote of 0.8500 USD per CAD corresponds to a forward price quote of 1.1765 CAD per USD (1.1765 = 1/0.8500).

SUMMARY

A very high proportion of the futures contracts that are traded do not lead to the delivery of the underlying asset. This is because traders usually enter into offsetting contracts to close out their positions before the delivery period is reached. However, it is the possibility of final delivery that drives the determination of the futures price. For each futures contract, there is a range of days during which delivery can be made and a well-defined delivery procedure. Some contracts, such as those on stock indices, are settled in cash rather than by delivery of the underlying asset.

The specification of contracts is an important activity for a futures exchange. The two sides to any contract must know what can be delivered, where delivery can take place and when delivery can take place. They also need to know details on the trading hours, how prices will be quoted, maximum daily price movements and so on. In the United States, new contracts must be approved by the Commodity Futures Trading Commission before trading starts. In Australia, ASX Compliance oversees the listing of futures contracts traded on ASX24.

Margins are an important aspect of futures markets. An investor keeps a margin account with his or her broker. The account is adjusted daily to reflect gains or losses and from time to time the broker may require the account to be topped up if adverse price movements have taken place. The broker either must be a clearinghouse member or must maintain a margin account with a clearinghouse member. Each clearinghouse member maintains a margin account with the exchange clearinghouse. The balance in the account is adjusted daily to reflect gains and losses on the business for which the clearinghouse member is responsible.

Information on futures prices is collected in a systematic way at exchanges and relayed within a matter of seconds to investors throughout the world. Many daily newspapers such as the *Wall Street Journal* and the *Australian Financial Review* carry a summary of the previous day's trading.

Forward contracts differ from futures contracts in a number of ways. Forward contracts are private arrangements between two parties, whereas futures contracts are traded on exchanges. There is generally a single delivery date in a forward contract, whereas futures contracts frequently involve a range of such dates. Because they are not traded on exchanges, forward contracts do not need to be standardised. A forward contract is not usually settled until the end of its life and most contracts do in fact lead to delivery of the underlying asset or a cash settlement at this time.

In the next few chapters we will examine in more detail the ways in which forward and futures contracts can be used for hedging. We will also look at how forward and futures prices are determined.

FURTHER READING

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Kawaller, I. G. & Koch, P. D. 2000, 'Meeting the Highly Effective Expectation Criterion for Hedge Accounting', *Journal of Derivatives*, vol. 7, no. 4, Summer, pp. 79–87.

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QUIZ

2.1 Distinguish between the terms open position/open interest and trading volume.

2.2 What is the difference between a *local* and a *commission broker*?

2.3 Suppose that you enter into a short futures contract to sell December fine wool for AUD 15.00 per kilogram on the Australian Securities Exchange. The size of the contract is 2500 kilograms. The initial margin is $4000, equating to the maintenance margin. If the price of the fine wool futures increases to AUD 15.75 per kilogram, what will be the balance of the margin account? Determine the amount of the margin call, if appropriate.

2.4 Suppose that in September 2012 an Australian company takes a long position in a contract on May 2013 crude oil futures. It closes out its position in March 2013. The futures price (per barrel) is $68.30 when it enters into the contract, $70.50 when it closes out the position, and $69.10 at the end of December 2012. One contract is for the delivery of 1000 barrels. What is the company's profit? When is it realised? How is it taxed if it is: (a) a hedger, and (b) a speculator? Assume that the company has a 31 December year end.

2.5 What does a stop order to sell at $2 mean? When might it be used? What does a limit order to sell at $2 mean? When might it be used?

2.6 What is the difference between the operation of the margin accounts administered by a clearinghouse and those administered by a broker?

2.7 What differences exist in the way prices are quoted in the foreign exchange futures market, the foreign exchange spot market and the foreign exchange forward market?

PRACTICE QUESTIONS

(Answers in Solutions manual/Study guide)

CONSOLIDATE

2.8 Explain how margins protect investors against the possibility of default.

2.9 A trader buys two July futures contracts on frozen orange juice. Each contract is for the delivery of 15 000 pounds. The current futures price is 160 cents per pound, the initial margin is $6000 per contract and the maintenance margin is $4500 per contract. What price change would lead to a margin call? Under what circumstances could $2000 be withdrawn from the margin account?

2.10 Explain the difference between a market-if-touched order and a stop order.

2.11 Explain what a stop–limit order to sell at 20.30 with a limit of 20.10 means.

2.12 The forward price on the Swiss franc for delivery in 45 days is quoted as 1.1000. The futures price for a contract that will be delivered in 45 days is 0.9000. Explain these two quotes. Which is more favourable for an investor wanting to sell Swiss francs?

2.13 An Australian wool exporter expects to receive USD 10 million worth of wool in 30 days. The forward price of the Australian dollar for delivery in 30 days is quoted as 1.0150. The futures price for a contract that will be delivered in 30 days is 0.9950. Explain these two quotes. Which is more favourable for the exporter?

2.14 Suppose you call your broker and issue instructions to sell one October greasy wool contract. Describe what happens.

2.15 Identify the three futures contracts in Table 2.2 which have the highest open position/open interest.

DEVELOPMENT

2.16 The party with a short position in a futures contract sometimes has options as to the precise asset that will be delivered, where delivery will take place, when delivery will take place and so on. Do these options increase or decrease the futures price? Explain your reasoning.

2.17 What are the most important aspects of the design of a new futures contract?

2.18 Show that, if the futures price of a commodity is greater than the spot price during the delivery period, then there is an arbitrage opportunity. Does an arbitrage opportunity exist if the futures price is less than the spot price? Explain your answer.

2.19 At the end of one day a clearinghouse member is long 100 contracts and the settlement price is $50 000 per contract. The original margin is $2000 per contract. On the following day the member becomes responsible for clearing an additional 20 long contracts, entered into at a price of $51 000 per contract. The settlement price at the end of this day is $50 200. How much does the member have to add to its margin account with the exchange clearinghouse?

2.20 On 1 July 2012, a US company enters into a forward contract to buy AUD 1 million with US dollars on 1 January 2013. On 1 September 2012, it enters into a forward contract to sell AUD 1 million on 1 January 2013. Describe the profit or loss the company will make in US dollars as a function of the forward exchange rates on 1 July 2012 and 1 September 2012.

2.21 'Speculation in futures markets is pure gambling. It is not in the public interest to allow speculators to trade on a futures exchange.' Discuss this viewpoint.

2.22 'When a futures contract is traded on the floor of the exchange, it may be the case that the open position/open interest increases by one, stays the same, or decreases by one.' Explain this statement.

2.23 Suppose that on 24 October 2011, an Australian company sells three September 2012 wheat futures contracts. It closes out its position on 21 July 2012. The futures price (per tonne) is AUD 305.00 when it enters into the contract, AUD 302.40 when it closes out the position and AUD 303.00 at the end of June 2012. One contract is for the delivery of 200 metric tonnes of wheat. What is the profit? How is it taxed if the company is: (a) a hedger, and (b) a speculator? Assume that the company has a 30 June accounting year end.

EXTENSION

2.24 What do you think would happen if an exchange started trading a contract in which the quality of the underlying asset was incompletely specified?

ASSIGNMENT QUESTIONS

2.25 Trader A enters into futures contracts to buy 1 million euros for 1.3 million Australian dollars in three months. Trader B enters into a forward contract to do the same thing. The exchange rate (Australian dollars per euro) declines sharply during the first two months and then increases for the third month to close at AUD 1.3300. Ignoring daily settlement, what is the total profit of each trader? When the impact of daily settlement is taken into account, which trader has done better?

2.26 Explain what is meant by open position/open interest. Why does the open position/open interest usually decline during the month preceding the delivery month? On a particular day, there are 2000 trades in a particular futures contract. Of the 2000 traders on the long side of the market, 1400 were closing out position and 600 were entering into new positions. Of the 2000 traders on the short side of the market, 1200 were closing out position and 800 were entering into new positions. What is the impact of the day's trading on open position?

2.27 One orange juice futures contract is on 15 000 pounds of frozen concentrate. Suppose that in September 2011 an Australian company sells a March 2013 orange juice futures contract for 120 cents per pound. In December 2011, the futures price is 140 cents; in December 2012, it is 110 cents; and in February 2013, it is closed out at 125 cents. The company has a December year end. What is the company's profit or loss on the contract? How is it realised? What is the accounting and tax treatment of the transaction if the company is classified as: (a) a hedger, and (b) a speculator?

2.28 A company enters into a short futures contract to sell 5000 bushels of wheat for 450 cents per bushel. The initial margin is \$3000 and the maintenance margin is \$2000. What price change would lead to a margin call? Under what circumstances could \$1500 be withdrawn from the margin account?

2.29 Suppose that there are no storage costs for greasy wool and the interest rate for borrowing or lending is 3% per annum. The greasy wool futures contract for December 2012 is quoted at AUD 9.55 per kilogram, while the June 2013 contract is quoted at AUD 9.89 per kilogram. One contract is for delivery of 2500 kilograms. How could you make money by trading the December 2012 and June 2013 greasy wool futures contracts today?

2.30 What position is equivalent to a long forward contract to buy an asset at K on a certain date and a put option to sell it for K on that date?