ISMA CENTRE - THE BUSINESS SCHOOL
OF THE FINANCIAL MARKETS

UNIVERSITY OF READING
ENGLAND

IFID Certificate Programme

Rates Trading and Hedging

Futures Trading

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1. Overview

In this module, we explain what financial futures are and we outline how futures exchanges work in terms of:

- Margining procedures
- Settlement procedures

In the other modules in this course we look at specific contracts and how they are used to manage market risk.
If you are new to futures, you may find the Derivatives Instruments PDF and Market Size and Composition PDF a useful starting point.

Learning Objectives

By the end of this module, you will be able to:

1. - Explain the basic terminology of futures and options exchange trading, in particular:
    - Types of order (market order and limit order)
    - Types of trade (basis, block, bundle, cabinet, EFP and pack)
    - Types of margin (initial, maintenance and variation)

2. Definition

A financial futures contract is an agreement to buy or sell, through an organised exchange:

- A standard amount of a specified financial instrument
- For delivery at a specified date in the future
- At a price which is agreed on the trade date

Financial futures are a relatively recent phenomenon, much newer than futures on commodities such as wheat or soya beans which have been traded for more than a century in the US. With commodity futures agricultural producers, eager to protect their income against sharp drops in cash prices during periods of oversupply, are able to fix in advance the price at which future crop deliveries will be made.

Financial futures are very similar to commodity futures. The main difference is that the underlying asset is not some physical commodity but a financial instrument.

Market Users

The main users of financial futures are:

- **Speculators** who use futures to create highly leveraged positions in a financial market
- **Hedgers** who use futures to manage their risk on positions in the underlying financial assets

It is often argued that excessive speculative interest in financial futures contributes to present-day volatility in the markets. The other side of this coin is that without the speculators there would not be sufficient liquidity to allow hedgers to benefit from these instruments in their everyday business.

Only about 1% of all futures contracts typically reach final delivery - the vast majority of positions are closed before then. This reflects the extent to which:

- Speculators outnumber hedgers in these markets
- Futures tend to be used as short term risk management instruments.

3. Trading Procedures

3.1. Futures Exchanges

All futures trades must take place through an organised futures exchange. This is very different from the practice in the over-the-counter (OTC) markets where amounts, delivery dates and prices are negotiable and confidential between the two counterparties.

Direct trading in a futures exchange can only be done by organisations or individuals who are members of that exchange. These parties will either be trading on their own account, or on behalf of third parties who wish to transact. Non-members therefore can trade only through a broker who, as a member of the exchange, will charge a commission for the service.

Trading on the futures exchange is conducted either by open outcry or electronically.

- **Open outcry** involves traders communicating prices and trades by voice or hand-signal in a specified trading area called a pit on the floor of the exchange. In busy times, the trading sessions can get particularly boisterous as traders compete for attention.

- **Electronic trading** forgoes physical pit trading for screen-based trading. Many futures exchanges switched from open outcry to electronic trading in the late 1990's following the success of Frankfurt's Deutsche Terminborse which was able to undercut its rivals on pricing. The Chicago Board of Trade and the Chicago Mercantile Exchange still retain open outcry, although both have developed complimentary electronic trading systems.

Locals: exchange members who trade on one or more exchange pits using their own capital, rather than being employed to trade for a bank or other financial intermediary.

Also known as: **scalpers**, because they tend to trade in and out of positions quickly for just a few ticks in the price.

In order to trade futures someone who is not an exchange member must go through a broker who is a member. The broker in turn calls the floor trader who reports back when the trade has been filled. For a typical trade the whole process would take not more than a couple of minutes.

Each trader filling an order enters the trade details into the exchange's deal matching system. For example, a trader for Alpha Brokers would enter:

Buy / Sell:	Buy
Number of contracts:	10
Delivery month:	SEP
Price:	9542
Counterparty:	Beta Bank

Likewise, the trader for Beta Bank would enter his side of the bargain.

Once the exchange matches the two sides of a trade the Clearing Corporation (CC), which is a limited liability company, steps in the middle and becomes the seller to every buyer and the buyer to every seller. The CC's own position is therefore always flat.

Benefits of the Clearing Corporation

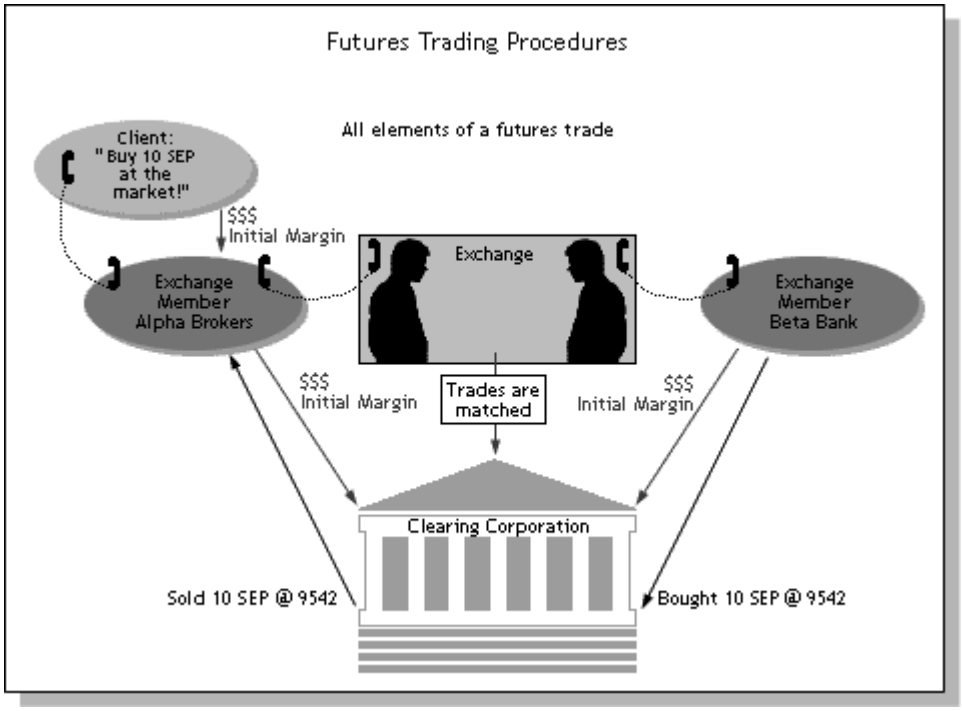
- Since the counterparty to a futures trade is always the same - the CC - futures positions become **fungible**. If I buy 10 SEP contracts and then sell 10 SEP contracts, the CC will automatically set off the two trades against each other to leave me with a net flat position (plus a profit or loss). I no longer need to settle each of the contracts at maturity: they have in fact ceased to exist.

- The CC is a well-capitalised institution typically owned by a consortium of corporate exchange members or its central bank. So for a trader the credit risk on a futures position is negligible.

3.2. Initial Margin

Initial margin is an amount of capital that the trader deposits with the exchange when opening a position.

The CC guarantees the performance of all trades by calling on both sides to the trade to place an initial margin deposit as soon the positions are opened. The initial margin is designed to cover any trading losses which could be potentially incurred by either side of a trade over a 24-hour period. For each futures product the initial margin set by the exchange depends on the volatility of that market and may be altered from time to time. The procedure for initiating a futures trade is summarised in the picture below:



3.3. Variation Margin

Daily variation margin is the cash sum that the trader will pay out to, or receive from, the exchange every day depending on whether market prices have moved against them or in their favour.

At the end of each trading session all open futures positions are **marked to market** against the exchange's Settlement Price, which is the official closing price for that futures contract. Any losses sustained are debited from the trader's margin account, and conversely any profits are credited to the margin account. The sums credited to or debited from the trader's account as a result of changes in market prices are variation margin.

Mark to Market
The process whereby a position is revalued at the current market price and any profit or loss on the position is paid up (**realised**) in full. In effect each futures position is 'closed' and reopened at the current market price. A futures contract may therefore be viewed as a sequence of one-day contracts on a forward rate.

A trader whose margin account balance falls below the required margin level receives a margin call for additional cash. If the margin call is not met immediately the trader's position will be either closed out or pared down.

Example
Trade margining calculation.

Contract: LIFFE Bund Futures
Contract Size: EUR 100,000 nominal of Bunds with 8.5 - 10.5 years to maturity
Price quoted in: Percentage of face value
Minimum price tick: 0.01%
Tick value: 0.01/100 x 100,000 = EUR 10.00
Initial margin: EUR 2,500 per contract

The table below summarises the profit / loss on the client's trade outlined on the previous pages, as well as the daily cashflows moving to and from his margin account:

Date	Position	Profit/loss	Cashflow Out ( ) / In +	Balance Margin A/c
3 August	Buy 10 SEPs @ 9542	0.00	Initial margin: 2,500 x 10 = **(25,000)**	25,000 CR
	Settlement price: 9510	(9510 - 9542) x 10 x 10 = **(3,200)**		21,800 CR
			Variation margin: **(3,200)**	25,000 CR
4 August	Settlement price: 9520	(9520 - 9510) x 10 x 10 = **1,000**		26,000 CR
			Variation margin: **1,000**	25,000 CR
5 August	Sell 6 SEPs @ 9535	(9535 - 9520) x 10 x 6 = **900**		25,900 CR
	Settlement price: 9538	(9538 - 9520) x 10 x 4 = **720**		26,620 CR
			Variation margin: 900 + 720 = 1,620 Initial margin: 6 x 2,500 = **15,000**	10,000 CR
6 August	Sell 4 SEPs @ 9525	(9525 - 9538) x 10 x 4 = **(520)**		9,480 CR
			Margin back: **9,480**	0 CR
Net (3 to 6 August):		**(1,100)**	**(1,100)**	

Notes

- The initial margin is typically very small in relation to the contract size - in this example only 2.5%. This makes the futures a highly leveraged product: at EUR 10 a tick, a 250-tick move in the futures price could either double your money or wipe out your entire capital! The margin requirement for spread trades is even smaller.

- The initial margin is designed to ensure that the Clearing Corporation has sufficient funds in normal markets to pay out variation margins. If the futures price changes very rapidly during a trading session the exchange has the right to stop trading and call for additional margins.

- Initial margin may be paid in cash or acceptable money market securities, such as Treasury bills or CDs, so interest is not lost on the capital deposited. Variation margins must be met in cash.

- In this example we always kept the margin account to the minimum level required to support the position. In practice you would keep extra funds on your margin account to avoid having to deal with margin calls too often.

- In addition to initial margin, some exchanges (or futures brokers) specify a minimum **maintenance margin**, where variation margin is not called as soon as the initial margin level has been breached, but only when the lower maintenance margin level has been reached. At that time a call is made for sufficient funds to get the trader back to the initial margin level. The idea is to avoid having to make lots of small margin calls.

4. Settlement

Delivery settlement procedures are outlined in detail in the other modules of this course. Here is a summary of the main types of settlement mechanisms.

Physical Settlement

Physically settled futures contracts must be closed at maturity by delivering the underlying securities. For example in the case of bond futures, the exchange specifies the list of securities which are deliverable against any contract (**deliverable grades**).

Cash Settlement

For many financial futures physical settlement may be either prohibitively expensive or unnecessary, so the contracts are **cash-settled**.

Example - Index Futures
It would be impractical to make physical delivery against stock index futures such as the S&P 500. Instead these contracts are cash settled at the Exchange Delivery Settlement Price (EDSP), which is an average of the cash S&P 500 index quoted during the last few trading hours of the contract.

On the last trading day any futures positions still open are closed by marking to market against the EDSP and any balances left on the margin accounts are remitted back to the traders. In terms of profit/loss calculation, the last trading day is like any other trading day except that there are no more variation margin calls because the contract ceases to exist.

Example - Eurocurrency Futures
Some futures contracts which could in practice be physically settled are nowadays cash settled against a recognised market index. For example, the three month Eurocurrency futures, which originally required delivery of a cash deposit for the contract amount with a designated bank, is now settled by marking to market any open positions against the EDSP, which is an average of the cash 3 month LIBOR quoted by banks at 11:00 AM London time on the morning of the last trading day.

On the last trading day of a cash-settled contract the futures and the cash market prices are one and the same.

The convergence between cash and futures prices on the futures expiry date establishes an arbitrage link between the two markets before expiry.

5. Exercise

Below is the specification of the Bund futures contract traded at EUREX:

Name:	EUREX Bund Futures
Unit of trading	EUR 100,000 of a notional Bund with a 6% coupon and maturity of 8½ - 10½ years
Delivery months	March, June, September, December
Delivery day	Tenth calendar day of delivery month
Last Trading day	Two business days prior to Delivery Day
Quotation	Percentage of face value, to 2 decimal places
Minimum price movement (Tick size)	0.01%
Tick value	0.01% x 100,000 = EUR 10.00
Initial Margin	EUR 2,500 per contract

Question 1

a) Complete the trading blotter below showing your daily profit/loss and cash flows, and the totals for the whole campaign. By the end of each day the balance on your margin account should have the minimum required to run the position. Enter your answer in each box below and validate.

Date	Position	Profit/Loss	Cashflow Out - /In +	Balance Margin A/c
1 June	BUY 10 SEPs @ 102.38		Initial margin:	
	Settlement price: 102.10			
			Variation margin:	
2 June	Settlement price: 102.23			
			Variation margin:	
3 June	SELL to close 10 SEPs @ 102.45			
			Margin back:	
Net (1 to 3 June):				