Investment Operations Certificate

Exchange-Traded Derivatives

Edition 19, June 2013

This learning manual relates to syllabus version 11.0 and will cover examinations from 31 August 2013 to 31 December 2014.
Welcome to the Chartered Institute for Securities & Investment’s Exchange-Traded Derivatives study material.

This learning manual has been written to prepare you for the Chartered Institute for Securities & Investment’s Exchange-Traded Derivatives examination.

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A learning map, which contains the full syllabus, appears at the end of this workbook. The syllabus can also be viewed at cisi.org and is also available by contacting our Customer Support Centre on +44 20 7645 0777. Please note that the examination is based upon the syllabus. Candidates are reminded to check the Candidate Update area of the website (cisi.org/candidateupdate) on a regular basis for updates that could affect their examination as a result of industry change.

The questions contained in this workbook are designed as an aid to revision of different areas of the syllabus and to help you consolidate your learning chapter by chapter.

Learning manual: 19.1 (June 2013)
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With best wishes for your studies.

Ruth Martin, Managing Director
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It is estimated that this workbook will require approximately 70 hours of study time.
CHAPTER ONE

THE HISTORY AND DEVELOPMENT OF DERIVATIVES MARKETS

I. INTRODUCTION
1. INTRODUCTION

Today’s futures and options markets are global and list contracts based on a wide range of products, from currencies to commodities, interest rates, shares, indices and even the weather.

This vast array of products would seem unbelievable to the farmers and merchants of the mid-west of the United States of America, who first started trading futures contracts, in a form similar to today, in the mid-1800s.

The development of futures markets can be traced back to the Middle Ages and revolved around the supply and demand from farmers and merchants. The early contracts were for delivery of grains, such as oats, corn and wheat.

1.1 THE FIRST FUTURES AND OPTIONS MARKETS

LEARNING OBJECTIVES

1.1.1 Know what attracted hedgers and speculators to early futures markets and the detractions of the early options markets

1.1.2 Know how liquidity contributed to the development of the futures market

Imagine the difficulty that a farmer faced back in the mid-1800s. What was the true price of grain? What would happen if the price was so low that it did not cover the overheads? Similarly, consider the merchants who needed to buy grain to turn into products for onward sale. How much would the grain cost? Would they have to put up the price of the products and risk losing business?

Sometimes the farmer and the merchant would agree a price for the grain in advance, but then one or other party might fail to honour the agreement when they found a better price somewhere else.

At harvest time, there were chaotic scenes in the main centres of the agricultural mid-west, like Chicago, as hundreds of farmers brought their grain in by cart. This in turn congested the streets and waterways, as they went from merchant to merchant seeking the best price.

Both the farmers and the merchants had large amounts of risk and that sometimes proved disastrous for them. What they needed was a way to better organise the buying and selling of grain and a way to mitigate some of the risks.

In 1848, the Chicago Board of Trade (CBOT) was established as a centralised market to standardise the size, quality and delivery date of trading in grain into a contract. This standardisation enabled contracts to be readily traded. Thus, the forerunner of today’s markets was born, and farmers or merchants who wanted to hedge against price fluctuations, caused by poor or bumper harvests, bought and sold contracts for delivery in the future with traders or market makers who were willing to make a different price for buying and selling. Speculators wishing to gamble on the price going up or down, without actually buying or selling the physical grains themselves, were also attracted to the market. It is no surprise that these contracts were called futures contracts, because although the terms like how much grain, what type of grain and importantly the price, were agreed today, delivery would actually take place at some agreed future date.
Farmers and merchants had now fixed or locked in the price of the grain for delivery at a later date and so price certainty rather than price risk prevailed.

1.1.1 Liquidity

As a result of this activity amongst different participants at the CBOT, liquidity in the contracts was created. Liquidity means that there are always people in the market who are willing to buy or sell at given prices, therefore making it possible to trade at any time. For example, the trader was able, if he wanted, to lay off the risk he had assumed from buying (or selling) with the farmers or merchants (hedgers), by selling (or buying) with the speculators. The trader’s profit was the difference between buying and selling the contracts.

<table>
<thead>
<tr>
<th>Date</th>
<th>Exchange</th>
<th>Current Status (2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1872</td>
<td>New York Mercantile Exchange (NYMEX)</td>
<td>CME Group</td>
</tr>
<tr>
<td>1874</td>
<td>Chicago Produce Exchange</td>
<td>CME Group</td>
</tr>
<tr>
<td>1877</td>
<td>London Metal Exchange (LME)</td>
<td>HKEX</td>
</tr>
<tr>
<td>1898</td>
<td>Chicago Mercantile Exchange (CME)</td>
<td>CME Group</td>
</tr>
<tr>
<td>1973</td>
<td>Chicago Board Options Exchange (CBOE)</td>
<td>CBOE</td>
</tr>
<tr>
<td>1976</td>
<td>Australian Options Market</td>
<td>ASX</td>
</tr>
<tr>
<td>1978</td>
<td>London Traded Option Market (LTOM)</td>
<td>New York Stock Exchange (NYSE)</td>
</tr>
<tr>
<td></td>
<td>European Options Exchange (Amsterdam)</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>London International Financial Futures Exchange</td>
<td>NYSE</td>
</tr>
<tr>
<td></td>
<td>(LIFFE)</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>Eurex</td>
<td>Deutsche Börse</td>
</tr>
<tr>
<td>2000</td>
<td>Intercontinental Exchange (ICE)</td>
<td></td>
</tr>
</tbody>
</table>
In 1919, the CME was reorganised to allow futures trading. Futures on a variety of commodities have since come to the exchange, including pork bellies, hogs and cattle, as well as contracts based on currencies and interest rate contracts, such as the eurodollar.

Like futures, the use of options, another derivative, can be traced back to the 18th century and in certain forms as far back as the Middle Ages. In the 18th century options were traded in both Europe and the United States, but due to widespread corrupt practices the market gained a poor reputation.

These early forms of option contracts were agreed between the buyer and seller and had only two possible outcomes. The option was delivered (i.e., the underlying product changed hands at the agreed price), or it expired without the buyer taking up his option to exercise the contract for delivery. In other words, there was no trading of the option positions, and in the early days, no guarantee that the seller would honour his obligation to deliver the product if the buyer exercised his option.

In April 1973, the CBOT proposed a new exchange, the Chicago Board Options Exchange (CBOE), which would trade stock options in a standardised form and on a recognised market, where performance of the option contract on exercise was guaranteed. This was the birth of traded options.

Option markets have since grown both in the US and globally. Like futures markets, they cover a wide range of products, including options on futures. Although options have been trading for a shorter time than futures, they are nevertheless extremely popular with both hedgers and speculators alike.

Numerous other financial futures, options (and options on futures) exchanges followed during the next thirty years. See Section 1.2.2 for a list of exchanges.

### 1.2 DEVELOPMENT OF THE MARKETS

#### LEARNING OBJECTIVES

1.2.1 Understand the difference between commodity, energy and financial products

1.2.2 Know why the volume of products traded has changed and why the use of derivatives is increasing (including market directives, electronic trading)

1.2.3 Know the reasons for and the factors affecting the trend towards consolidation of exchanges

1.2.4 Know the importance of links between derivative and stock exchanges, using Eurex and NYSE Liffe as examples, in terms of: cost; management of risk; ease of access

#### 1.2.1 Commodity, Energy and Financial Derivatives Markets

Prior to the 1970s virtually all activity in derivatives related to commodities, particularly agricultural products and metals. Volumes gradually increased simply because the production and use of commodities grew and so did the need to hedge the risks.

However in the early 1970s, the financial markets started to look at how contracts like futures and options might be utilised.
In 1972, the International Monetary Market (IMM) was formed as a division of the CME. Its purpose was to enable trading in futures contracts based on foreign currencies. But why was there a need to think about using derivatives?

From the end of World War Two until the early 1970s, there was a very stable economic environment in the US, helped by the Bretton Woods Agreement, which kept interest rates within a narrow range. However, when the US dollar was devalued, partly as a consequence of the funding of the Vietnam War and a heavy domestic spending programme, this economic stability was replaced by uncertainty and fluctuation in interest rates. Europe and Japan had also recovered from the economic strain brought about by post-war rebuilding and, with their economies growing, the US dollar came under severe pressure.

The need to be able to hedge, or to protect, against the risk associated with volatile currencies and interest rates became critical for many businesses and industries. It was for this reason that financial futures and options contracts were created, and as similar risk affects business around the world, exchanges have opened in every major and many emerging financial centres.

The market collapse in 2008 and subsequent recession in many economies has once again illustrated the importance of derivatives markets in enabling the management of risk through hedging.

Also from the 1970s onwards the price of energy became a very major factor for industry. This meant that the risks in exploration, production, and commercial use of energy became more pronounced as volatility occurred in areas like the crude oil price and natural gas prices, the latter for instance affected by severe weather in the Gulf of Mexico, which could affect production and thus supply to the US. Once again derivatives provided a solution in the form of futures, options and forward contracts in these products.

Although commodity, energy and financial derivative products are used for very similar strategies such as hedging, commodity and energy derivatives are more likely to involve the physical exchange of the underlying if the contract goes to delivery, whereas many financial derivatives are cash settled, for example, index futures. Notable exceptions are stock options and bond futures, which are mainly physical delivery.

Another difference between commodity and financial derivatives is the maturities, with commodities being closely linked to production and harvest cycles.

1.2.2 Development of Exchanges and Growth of Volumes

With the growth of exchanges came the growth in trading volume and gradually commodity derivatives were overtaken, in terms of the share of trading volume, by the many new financial derivatives that were being successfully launched. Commodity and energy products were increasing in volume, but the sheer number and popularity of financial derivatives ensured that by the start of 2000, bond, interest rate and equity index products dominated the volume tables.

The easiest way to explore the way in which markets and products have developed globally is to look at the series of tables provided by the Futures Industry Association (FIA). These are also available at futuresindustry.org. In these tables, note the change in volume of some markets, but also note the variety of exchanges and products in the tables.
### Top 30 Derivatives Exchanges

Ranked by number of contracts traded and/or cleared

<table>
<thead>
<tr>
<th>Rank</th>
<th>Exchange</th>
<th>Jan–Dec 2012 Volume</th>
<th>Annual % Change</th>
<th>Dec 2012 Open Interest</th>
<th>Annual % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CME Group</td>
<td>2,890,036,506</td>
<td>−14.7%</td>
<td>69,940,737</td>
<td>−10.7%</td>
</tr>
<tr>
<td>2</td>
<td>Eurex*</td>
<td>2,291,465,606</td>
<td>−18.8%</td>
<td>79,088,999</td>
<td>−14.1%</td>
</tr>
<tr>
<td>3</td>
<td>National Stock Exchange of India</td>
<td>2,010,493,487</td>
<td>−8.6%</td>
<td>7,786,961</td>
<td>31.5%</td>
</tr>
<tr>
<td>4</td>
<td>NYSE Euronext*</td>
<td>1,951,376,420</td>
<td>−14.5%</td>
<td>46,795,803</td>
<td>−8.2%</td>
</tr>
<tr>
<td>5</td>
<td>Korea Exchange</td>
<td>1,835,617,727</td>
<td>−53.3%</td>
<td>2,553,351</td>
<td>−27.6%</td>
</tr>
<tr>
<td>6</td>
<td>BM&amp;FBovespa</td>
<td>1,635,957,604</td>
<td>9.0%</td>
<td>63,739,705</td>
<td>23.0%</td>
</tr>
<tr>
<td>7</td>
<td>CBOE Holdings*</td>
<td>1,134,316,703</td>
<td>−6.8%</td>
<td>16,312,240</td>
<td>12.7%</td>
</tr>
<tr>
<td>8</td>
<td>Nasdaq OMX*</td>
<td>1,115,529,138</td>
<td>−13.9%</td>
<td>6,770,453</td>
<td>2.5%</td>
</tr>
<tr>
<td>9</td>
<td>Moscow Exchange</td>
<td>1,061,835,904</td>
<td>−3.4%</td>
<td>3,797,729</td>
<td>18.1%</td>
</tr>
<tr>
<td>10</td>
<td>Multi Commodity Exchange of India</td>
<td>959,613,240</td>
<td>−19.8%</td>
<td>2,364,256</td>
<td>44.5%</td>
</tr>
<tr>
<td>11</td>
<td>Dalian Commodity Exchange</td>
<td>633,042,976</td>
<td>119.0%</td>
<td>2,265,275</td>
<td>43.3%</td>
</tr>
<tr>
<td>12</td>
<td>IntercontinentalExchange**</td>
<td>473,895,526</td>
<td>24.4%</td>
<td>73,128,103</td>
<td>982.8%</td>
</tr>
<tr>
<td>13</td>
<td>Shanghai Futures Exchange</td>
<td>365,329,379</td>
<td>18.5%</td>
<td>1,242,174</td>
<td>16.1%</td>
</tr>
<tr>
<td>14</td>
<td>Zhengzhou Commodity Exchange</td>
<td>347,091,533</td>
<td>−14.6%</td>
<td>1,142,206</td>
<td>22.1%</td>
</tr>
<tr>
<td>15</td>
<td>ASX Group</td>
<td>259,966,030</td>
<td>15.4%</td>
<td>16,073,167</td>
<td>21.0%</td>
</tr>
<tr>
<td>16</td>
<td>BSE</td>
<td>243,757,257</td>
<td>7879.5%</td>
<td>68,370</td>
<td>51.3%</td>
</tr>
<tr>
<td>17</td>
<td>TMX Group*</td>
<td>209,352,769</td>
<td>3.8%</td>
<td>4,231,977</td>
<td>−2.9%</td>
</tr>
<tr>
<td>18</td>
<td>Osaka Securities Exchange</td>
<td>205,130,168</td>
<td>5.6%</td>
<td>4,382,878</td>
<td>50.1%</td>
</tr>
<tr>
<td>19</td>
<td>London Metal Exchange</td>
<td>159,719,781</td>
<td>9.0%</td>
<td>1,892,457</td>
<td>−9.3%</td>
</tr>
<tr>
<td>20</td>
<td>JSE South Africa</td>
<td>158,996,880</td>
<td>−4.3%</td>
<td>13,465,018</td>
<td>4.4%</td>
</tr>
<tr>
<td>21</td>
<td>Taiwan Futures Exchange</td>
<td>156,731,912</td>
<td>−14.4%</td>
<td>238,981</td>
<td>323.3%</td>
</tr>
<tr>
<td>22</td>
<td>BATS Exchange*</td>
<td>130,624,660</td>
<td>−11.9%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>23</td>
<td>Hong Kong Exchanges and Clearing</td>
<td>119,802,638</td>
<td>−14.7%</td>
<td>5,317,952</td>
<td>−10.4%</td>
</tr>
<tr>
<td>24</td>
<td>China Financial Futures Exchange</td>
<td>105,061,825</td>
<td>108.4%</td>
<td>110,386</td>
<td>127.9%</td>
</tr>
<tr>
<td>25</td>
<td>Singapore Exchange</td>
<td>80,548,318</td>
<td>11.4%</td>
<td>2,555,953</td>
<td>108.5%</td>
</tr>
<tr>
<td>26</td>
<td>London Stock Exchange Group</td>
<td>68,584,760</td>
<td>−20.5%</td>
<td>7,790,121</td>
<td>−15.8%</td>
</tr>
<tr>
<td>27</td>
<td>Tel-Aviv Stock Exchange</td>
<td>67,179,795</td>
<td>−32.1%</td>
<td>7,790,121</td>
<td>−15.8%</td>
</tr>
<tr>
<td>28</td>
<td>MEFF</td>
<td>67,176,529</td>
<td>−0.6%</td>
<td>10,195,290</td>
<td>−9.7%</td>
</tr>
<tr>
<td>29</td>
<td>Tokyo Financial Exchange</td>
<td>66,925,893</td>
<td>−53.8%</td>
<td>983,014</td>
<td>−27.1%</td>
</tr>
<tr>
<td>30</td>
<td>Turkish Derivatives Exchange</td>
<td>62,474,464</td>
<td>−15.9%</td>
<td>274,556</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

* Open interest for these exchanges does not include options traded in the US and cleared by OCC.
** Includes OTC products converted to futures on 15 October.
### Global Futures and Options Volume by Category
Based on the number of contracts trade and/or cleared at 84 exchanges worldwide.

<table>
<thead>
<tr>
<th>Category</th>
<th>Jan–Dec 2011</th>
<th>Jan–Dec 2012</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Equity</td>
<td>7,062,567,141</td>
<td>6,467,944,406</td>
<td>–8.4%</td>
</tr>
<tr>
<td>Equity Index</td>
<td>8,462,371,741</td>
<td>6,048,262,461</td>
<td>–28.5%</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>3,491,200,684</td>
<td>2,933,255,540</td>
<td>–16.0%</td>
</tr>
<tr>
<td>Currency</td>
<td>3,147,046,787</td>
<td>2,434,238,493</td>
<td>–22.7%</td>
</tr>
<tr>
<td>Agricultural</td>
<td>996,837,283</td>
<td>1,270,531,588</td>
<td>27.5%</td>
</tr>
<tr>
<td>Energy</td>
<td>814,774,756</td>
<td>905,856,150</td>
<td>11.2%</td>
</tr>
<tr>
<td>Non-Precious Metals</td>
<td>435,113,003</td>
<td>554,253,069</td>
<td>27.4%</td>
</tr>
<tr>
<td>Precious Metals</td>
<td>342,057,656</td>
<td>319*,267,659</td>
<td>–6.7%</td>
</tr>
<tr>
<td>Other</td>
<td>229,713,692</td>
<td>236,778,479</td>
<td>3.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24,981,682,743</strong></td>
<td><strong>21,170,387,845</strong></td>
<td><strong>–15.8%</strong></td>
</tr>
</tbody>
</table>

**Note:** Other includes contracts based on commodity indices, credit, fertilizers, housing, inflation, lumber, plastics and weather.

#### Global Futures and Options Volume by Category
- Individual Equities 30.50%
- Foreign Currency 11.30%
- Interest Rate 13.90%
- Other 1.10%
- Agricultural Commodities 6.00%
- Energy 4.30%
- Metals 4.10%
- Equity Indices 28.60%

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**Exchange-Traded Derivatives**

CISI (Chartered Institute of Securities & Investment)
Global Futures and Options Volume by Region
Based on the number of contracts trade and/or cleared at 84 exchanges worldwide.

<table>
<thead>
<tr>
<th>Region</th>
<th>Jan–Dec 2011</th>
<th>Jan–Dec 2012</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>9,825,035,798</td>
<td>7,525,104,448</td>
<td>−23.4%</td>
</tr>
<tr>
<td>North America</td>
<td>8,185,544,285</td>
<td>7,207,682,122</td>
<td>−11.9%</td>
</tr>
<tr>
<td>Europe</td>
<td>5,017,134,049</td>
<td>4,388,879,712</td>
<td>−12.5%</td>
</tr>
<tr>
<td>Latin America</td>
<td>1,603,203,726</td>
<td>1,730,633,144</td>
<td>7.9%</td>
</tr>
<tr>
<td>Other</td>
<td>350,764,885</td>
<td>318,088,419</td>
<td>−9.3%</td>
</tr>
<tr>
<td>Total</td>
<td>24,981,682,743</td>
<td>21,170,387,845</td>
<td>−15.3%</td>
</tr>
</tbody>
</table>

Note: Location of exchanges is determined by country of registration. ‘Other’ consists of exchanges in Dubai, Israel, South Africa and Turkey.

Source: Futures Industry Association – Futures Industry March 2013 (Records Volume)
### Top 20 Futures and Options Contracts

#### Interest Rate Futures and Options Contracts

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eurodollar Futures, CME</td>
<td>1,000,000 USD</td>
<td>564,086,746</td>
<td>426,438,437</td>
<td>−24.4%</td>
</tr>
<tr>
<td>2</td>
<td>One-Day Inter-Bank Deposit Futures, BM&amp;F</td>
<td>100,000 Real</td>
<td>320,821,062</td>
<td>340,800,485</td>
<td>6.2%</td>
</tr>
<tr>
<td>3</td>
<td>10-Year Treasury Note Futures, CBOT</td>
<td>100,000 USD</td>
<td>317,402,598</td>
<td>264,997,089</td>
<td>−16.5%</td>
</tr>
<tr>
<td>4</td>
<td>Euro-Bund Futures, Eurex</td>
<td>100,000 Euro</td>
<td>236,188,831</td>
<td>184,338,704</td>
<td>−22.0%</td>
</tr>
<tr>
<td>5</td>
<td>3–Month Euribor Futures, Liffe UK</td>
<td>1,000,000 Euro</td>
<td>241,950,875</td>
<td>178,762,097</td>
<td>−26.1%</td>
</tr>
<tr>
<td>6</td>
<td>5–Year Treasury Note Futures, CBOT</td>
<td>100,000 USD</td>
<td>170,563,052</td>
<td>133,342,429</td>
<td>−21.8%</td>
</tr>
<tr>
<td>7</td>
<td>3–Month Sterling Futures, Liffe</td>
<td>500,000 GBP</td>
<td>115,586,702</td>
<td>114,915,025</td>
<td>−0.6%</td>
</tr>
<tr>
<td>8</td>
<td>IDI Options, BM&amp;F</td>
<td>1 Real x IDI Index</td>
<td>95,790,772</td>
<td>107,961,438</td>
<td>12.7%</td>
</tr>
<tr>
<td>9</td>
<td>Euro-Bobl Futures, Eurex</td>
<td>100,000 Euro</td>
<td>142,309,151</td>
<td>107,645,238</td>
<td>−24.4%</td>
</tr>
<tr>
<td>10</td>
<td>Euro-Schatz Futures, Eurex</td>
<td>100,000 Euro</td>
<td>165,798,952</td>
<td>93,840,656</td>
<td>−43.4%</td>
</tr>
<tr>
<td>11</td>
<td>30-Year Treasury Bond Futures, CBOT</td>
<td>100,000 USD</td>
<td>92,338,638</td>
<td>91,745,232</td>
<td>−0.6%</td>
</tr>
<tr>
<td>12</td>
<td>Eurodollar Mid-Curve Options on Futures, CME</td>
<td>1,000,000 USD</td>
<td>92,429,741</td>
<td>91,189,258</td>
<td>−1.3%</td>
</tr>
<tr>
<td>13</td>
<td>3-Month Euribor Futures, Liffe UK</td>
<td>1,000,000 Euro</td>
<td>126,535,338</td>
<td>70,671,111</td>
<td>−44.1%</td>
</tr>
<tr>
<td>14</td>
<td>10-Year Treasury Note Options on Futures, CBOT</td>
<td>100,000 USD</td>
<td>50,797,081</td>
<td>56,070,376</td>
<td>10.4%</td>
</tr>
<tr>
<td>15</td>
<td>2-Year Treasury Note Futures, CBOT</td>
<td>200,000 USD</td>
<td>72,178,803</td>
<td>55,108,651</td>
<td>−23.6%</td>
</tr>
<tr>
<td>16</td>
<td>Eurodollar Options on Futures, CME</td>
<td>1,000,000 USD</td>
<td>100,855,181</td>
<td>48,279,896</td>
<td>−52.1%</td>
</tr>
<tr>
<td>17</td>
<td>3-Year Treasury Bond Futures, ASX 24</td>
<td>100,000 AUD</td>
<td>41,662,349</td>
<td>44,003,411</td>
<td>5.6%</td>
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<tr>
<td>18</td>
<td>Euro-Bund Options on Futures, Eurex</td>
<td>100,000 Euro</td>
<td>38,154,098</td>
<td>39,924,387</td>
<td>4.6%</td>
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<tr>
<td>19</td>
<td>Long Gilt Futures, Liffe UK</td>
<td>100,000 GBP</td>
<td>34,362,932</td>
<td>37,777,306</td>
<td>9.9%</td>
</tr>
<tr>
<td>20</td>
<td>3-Year Treasury Bond Futures, KRX</td>
<td>100 million KRW</td>
<td>34,140,210</td>
<td>29,728,075</td>
<td>−12.9%</td>
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</table>
### Equity Index Futures and Options Contracts

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Kospi 200 Options, KRX*</td>
<td>500,000 Korean won</td>
<td>3,671,662,258</td>
<td>1,575,394,249</td>
<td>−57.1%</td>
</tr>
<tr>
<td>2</td>
<td>S&amp;P CNX Nifty Options, NSE India</td>
<td>50 Indian rupees</td>
<td>868,684,582</td>
<td>8063,086,926</td>
<td>−7.6%</td>
</tr>
<tr>
<td>3</td>
<td>SPDR S&amp;P 500 ETF Options**</td>
<td>N/A</td>
<td>729,478,419</td>
<td>585,945,819</td>
<td>−19.7%</td>
</tr>
<tr>
<td>4</td>
<td>E-mini S&amp;P 500 Futures, CME</td>
<td>50 US dollars</td>
<td>620,368,790</td>
<td>474,278,939</td>
<td>−23.7%</td>
</tr>
<tr>
<td>5</td>
<td>RTS Futures, Moscow Exchange</td>
<td>2 US dollars</td>
<td>377,845,640</td>
<td>321,031,540</td>
<td>−15.0%</td>
</tr>
<tr>
<td>6</td>
<td>Euro Stoxx 50 Futures, Eurex</td>
<td>10 euros</td>
<td>408,860,002</td>
<td>315,179,597</td>
<td>−22.9%</td>
</tr>
<tr>
<td>7</td>
<td>Euro Stoxx 50 Options, Eurex</td>
<td>10 euros</td>
<td>369,241,952</td>
<td>280,610,954</td>
<td>−24.0%</td>
</tr>
<tr>
<td>8</td>
<td>S&amp;P 500 Options, CBOE</td>
<td>100 US dollars</td>
<td>197,509,449</td>
<td>174,457,138</td>
<td>−11.7%</td>
</tr>
<tr>
<td>9</td>
<td>Sensex Options, BSE</td>
<td>15 Indian rupees</td>
<td>383,543</td>
<td>148,314,519</td>
<td>38569.6%</td>
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<tr>
<td>10</td>
<td>Nikkei 225 Mini Futures, OSE</td>
<td>100 yen</td>
<td>117,905,210</td>
<td>130,443,680</td>
<td>10.6%</td>
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<tr>
<td>11</td>
<td>iShares Russell 2000 ETF Options**</td>
<td>N/A</td>
<td>167,040,702</td>
<td>124,525,874</td>
<td>−25.5%</td>
</tr>
<tr>
<td>12</td>
<td>Powershares QQQ ETF Options**</td>
<td>N/A</td>
<td>137,923,379</td>
<td>113,719,614</td>
<td>−17.5%</td>
</tr>
<tr>
<td>13</td>
<td>VIX Options, CBOE</td>
<td>100 US dollars</td>
<td>97,988,9510</td>
<td>110,739,796</td>
<td>13.0%</td>
</tr>
<tr>
<td>14</td>
<td>Taiex Options, Taifex</td>
<td>50 New Taiwan dollars</td>
<td>125,767,624</td>
<td>108,458,103</td>
<td>−13.8%</td>
</tr>
<tr>
<td>15</td>
<td>CSI 300 Futures, CFFEX</td>
<td>300 Chinese RMB</td>
<td>50,411,860</td>
<td>105,061,825</td>
<td>108.4%</td>
</tr>
<tr>
<td>16</td>
<td>BSE 100 Options, BSE***</td>
<td>50 Indian rupees</td>
<td>N/A</td>
<td>86,243,943</td>
<td>N/A</td>
</tr>
<tr>
<td>17</td>
<td>S&amp;P CNX Nifty Futures, NSE India</td>
<td>50 Indian rupees</td>
<td>123,144,880</td>
<td>80,061,861</td>
<td>−35.0%</td>
</tr>
<tr>
<td>18</td>
<td>iShares MSCI Emerging Markets Index*</td>
<td>N/A</td>
<td>70,577,232</td>
<td>64,284,148</td>
<td>−8.9%</td>
</tr>
<tr>
<td>19</td>
<td>E-mini Nasdaq 100 Futures, CME</td>
<td>20 US dollars</td>
<td>75,165,277</td>
<td>63,530,758</td>
<td>−15.5%</td>
</tr>
<tr>
<td>20</td>
<td>Kospi 200 Futures, KRX</td>
<td>500,000 Korean won</td>
<td>87,274,461</td>
<td>62,274,461</td>
<td>−28.5%</td>
</tr>
</tbody>
</table>

*Multiplier changed from 100,000 won for series listed from March onwards.

**Traded on multiple US options exchanges.

***Began trading in August 2012.
### Energy Futures and Options Contracts

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Brent Crude Futures, ICE Futures Europe</td>
<td>1,000 barrels</td>
<td>132,045,563</td>
<td>147,385,858</td>
<td>11.6%</td>
</tr>
<tr>
<td>2</td>
<td>Light Sweet Crude Oil Futures, NYMEX</td>
<td>1,000 barrels</td>
<td>175,036,216</td>
<td>140,531,588</td>
<td>−19.7%</td>
</tr>
<tr>
<td>3</td>
<td>Henry Hub Natural Gas Futures, NYMEX</td>
<td>10,000 MMBTU</td>
<td>76,864,334</td>
<td>94,799,542</td>
<td>23.3%</td>
</tr>
<tr>
<td>4</td>
<td>Gasoil Futures, ICE Futures Europe</td>
<td>100 tonnes</td>
<td>65,774,151</td>
<td>63,503,591</td>
<td>−3.5%</td>
</tr>
<tr>
<td>5</td>
<td>Crude Oil Futures, MCX</td>
<td>100 barrels</td>
<td>54,753,722</td>
<td>57,790,229</td>
<td>5.5%</td>
</tr>
<tr>
<td>6</td>
<td>NY Harbor RBOB Gasoline Futures, NYMEX</td>
<td>42,000 gallons</td>
<td>31,129,256</td>
<td>36,603,841</td>
<td>17.6%</td>
</tr>
<tr>
<td>7</td>
<td>No. 2 Heating Oil Futures, NYMEX</td>
<td>42,000 gallons</td>
<td>31,838,626</td>
<td>36,087,707</td>
<td>13.3%</td>
</tr>
<tr>
<td>8</td>
<td>WTI Crude Futures, ICE Futures Europe</td>
<td>1,000 barrels</td>
<td>51,097,818</td>
<td>33,142,089</td>
<td>−35.1%</td>
</tr>
<tr>
<td>9</td>
<td>Light Sweet Crude Oil Options, NYMEX</td>
<td>1,000 barrels</td>
<td>369,716,805</td>
<td>35,525,624</td>
<td>−11.4%</td>
</tr>
<tr>
<td>10</td>
<td>Natural Gas Futures, MCX</td>
<td>1,250 MMBTU</td>
<td>9,882,133</td>
<td>27,886,670</td>
<td>182.2%</td>
</tr>
<tr>
<td>11</td>
<td>Natural Gas European-Style Options, NYMEX</td>
<td>10,000 MMBTU</td>
<td>23,773,183</td>
<td>24,260,726</td>
<td>2.1%</td>
</tr>
<tr>
<td>12</td>
<td>US Oil Fund ETF Options*</td>
<td>N/A</td>
<td>28,881,647</td>
<td>21,348,808</td>
<td>−26.1%</td>
</tr>
<tr>
<td>13</td>
<td>Henry Hub Natural Gas Swap Futures, NYMEX</td>
<td>2,500 MMBTU</td>
<td>20,825,660</td>
<td>18,156,113</td>
<td>−12.8%</td>
</tr>
<tr>
<td>14</td>
<td>Brent Oil Futures, RTS</td>
<td>10 barrels</td>
<td>18,707,384</td>
<td>11,952,101</td>
<td>−36.1%</td>
</tr>
<tr>
<td>15</td>
<td>Brent Crude Oil Options, ICE Futures Group</td>
<td>1,000 barrels</td>
<td>2,191,733</td>
<td>8,908,862</td>
<td>306.5%</td>
</tr>
<tr>
<td>16</td>
<td>Natural Gas Penultimate Swap Futures, NYMEX</td>
<td>2,500 MMBTU</td>
<td>7,384,147</td>
<td>7,945,695</td>
<td>7.6%</td>
</tr>
<tr>
<td>17</td>
<td>EUA Futures, ICE Futures Europe</td>
<td>1,000 EUAs</td>
<td>5,444,050</td>
<td>6,465,262</td>
<td>18.8%</td>
</tr>
<tr>
<td>18</td>
<td>UK Natural Gas (Monthly) Futures, ICE Futures Europe</td>
<td>1,000 therms/day</td>
<td>2,788,240</td>
<td>3m114,820</td>
<td>11.7%</td>
</tr>
<tr>
<td>19</td>
<td>UK Natural Gas (Seasons) Futures, ICE Futures Europe</td>
<td>1,000 therms/day</td>
<td>2,604,150</td>
<td>3,096,300</td>
<td>18.9%</td>
</tr>
<tr>
<td>20</td>
<td>Crude Oil 1 Month Cal. Spread Options, NYMEX</td>
<td>1,000 barrels</td>
<td>2,886,427</td>
<td>2,873,842</td>
<td>−0.4%</td>
</tr>
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</table>

*Traded on multiple US options exchanges.*
### Agricultural Futures and Options Contracts

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Soy Meal Futures, DCE</td>
<td>10 tonnes</td>
<td>50,170,344</td>
<td>325,876,653</td>
<td>549.5%</td>
</tr>
<tr>
<td>2</td>
<td>White Sugar Futures, ZCE</td>
<td>10 tonnes</td>
<td>128,193,356</td>
<td>148,290,190</td>
<td>15.7%</td>
</tr>
<tr>
<td>3</td>
<td>Rubber Futures, SHFE</td>
<td>5 tons</td>
<td>104,286,399</td>
<td>75,176,266</td>
<td>−27.9%</td>
</tr>
<tr>
<td>4</td>
<td>Corn Futures, CBOT</td>
<td>5,000 bushels</td>
<td>79,004,801</td>
<td>73,184,337</td>
<td>−7.4%</td>
</tr>
<tr>
<td>5</td>
<td>Soy Oil Futures, DCE</td>
<td>10 tonnes</td>
<td>58,012,550</td>
<td>68,858,554</td>
<td>18.7%</td>
</tr>
<tr>
<td>6</td>
<td>Soybean Futures, CBOT</td>
<td>5,000 bushels</td>
<td>45,143,755</td>
<td>52,041,615</td>
<td>15.3%</td>
</tr>
<tr>
<td>7</td>
<td>No. 1 Soybeans Futures, DCE</td>
<td>10 tonnes</td>
<td>25,239,532</td>
<td>45,475,425</td>
<td>80.2%</td>
</tr>
<tr>
<td>8</td>
<td>Palm Oil Futures, DCE</td>
<td>10 tonnes</td>
<td>22,593,961</td>
<td>43,310,013</td>
<td>91.7%</td>
</tr>
<tr>
<td>9</td>
<td>Corn Futures, DCE</td>
<td>5,000 bushels</td>
<td>26,849,738</td>
<td>37,824,356</td>
<td>40.9%</td>
</tr>
<tr>
<td>10</td>
<td>Soybean Oil Futures, CBOT</td>
<td>60,000 pounds</td>
<td>24,156,509</td>
<td>27,627,590</td>
<td>14.4%</td>
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<tr>
<td>11</td>
<td>Wheat Futures, CBOT</td>
<td>5,000 bushels</td>
<td>24,283,331</td>
<td>27,379,406</td>
<td>12.7%</td>
</tr>
<tr>
<td>12</td>
<td>Sugar #11 Futures, ICE Futures US</td>
<td>112,000 pounds</td>
<td>24,629,369</td>
<td>27,126,728</td>
<td>10.1%</td>
</tr>
<tr>
<td>13</td>
<td>Corn Options on Futures, CBOT</td>
<td>5,000 bushels</td>
<td>28,650,380</td>
<td>26,559,756</td>
<td>−7.2%</td>
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<tr>
<td>14</td>
<td>Strong Gluten Wheat Futures, ZCE</td>
<td>10 tonnes</td>
<td>7,909,755</td>
<td>25,796,425</td>
<td>226.1%</td>
</tr>
<tr>
<td>15</td>
<td>Cotton No.1 Futures, ZCE</td>
<td>5 tonnes</td>
<td>139,044,152</td>
<td>21,033,646</td>
<td>−84.9%</td>
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<tr>
<td>16</td>
<td>Soybean Options on Futures, CBOT</td>
<td>5,000 bushels</td>
<td>13,236,367</td>
<td>18,402,208</td>
<td>39.0%</td>
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<tr>
<td>17</td>
<td>Soybean Meal Futures, CBOT</td>
<td>100 short tons</td>
<td>16,920,194</td>
<td>18,187,433</td>
<td>7.5%</td>
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<td>18</td>
<td>Live Cattle Futures, CME</td>
<td>40,000 pounds</td>
<td>13,532,554</td>
<td>13,985,374</td>
<td>3.3%</td>
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<tr>
<td>19</td>
<td>Lean Hogs Futures, CME</td>
<td>40,000 pounds</td>
<td>9,969,961</td>
<td>11,461,892</td>
<td>15.0%</td>
</tr>
<tr>
<td>20</td>
<td>Refined Soya Oil Futures, NCDEX</td>
<td>10 tonnes</td>
<td>5,414,754</td>
<td>8,477,569</td>
<td>56.6%</td>
</tr>
</tbody>
</table>
In the early days of the markets the US was hugely dominant, although markets like the LME also have a long history.

What is striking about the tables above is the growth of markets in places as diverse as China, India and Korea alongside the established or mature centres such as Chicago, Philadelphia, New York, London, Frankfurt, Tokyo, Hong Kong, Singapore and Sydney.
The history and development of derivatives markets

Chapter One

The simultaneous growth in over-the-counter (OTC) derivatives use, and the regulatory changes that have affected the use of derivatives by parties such as investment funds, are other major factors in the growth of on-exchange derivatives.

With OTC positions and exposures there is a need to hedge sometimes. The use of on-exchange products to hedge exposure to these OTC positions, i.e., exposure to floating rates in an interest rate swap, enables hedges to be achieved by using short-term interest rate futures and options. Another example is the growth of contract for differences (CFDs) and the hedging of the exposure by using index futures or stock options. This hedging activity increases the activity in the on-exchange market.

Likewise, regulatory changes such as the Undertakings for Collective Investment in Transferable Securities (UCITS) III Directive and the Markets in Financial Instruments Directive (MiFID) for instance, also helped to increase the use of derivatives, by making the use of products by investment funds easier.

The use of derivatives by hedge funds has also helped to boost the volumes of derivative products traded in both the on-exchange and off-exchange markets.

A further important factor has been the increase in capacity and ease of access to markets that electronic trading systems have created. Electronic trading has also allowed much greater and easier use of strategies that utilise more complex and time-sensitive trades, particularly those that involve multi-product or multi-exchange scenarios, for instance arbitrage trades.

The popularity of alternative investments in funds has seen commodity and energy volumes grow, driven as well by the high volatility in prices.

Finally the financial crisis of 2008, whilst reducing liquidity in many markets, had less impact on derivative markets simply because of the need, as noted in Section 1.2.1, to hedge in a highly volatile and unpredictable environment.

1.2.3 Factors Influencing the Trend towards Consolidation

Whilst the trading volumes and number of products have grown, exchanges and indeed their associated clearing houses have seen a high degree of consolidation.

The consolidation has not been confined to mergers and takeovers involving derivatives exchanges but has in some cases also meant the linking together of derivatives and securities markets (see Section 1.2.4).

One of the most significant consolidations of recent times concerned the creation of the CME Group in the US.

The merger of the CME, CBOT and NYMEX created the world’s largest derivatives exchange and a massively dominant position in the US derivatives market.

In the past other significant consolidation has taken place, for instance:

- The merger of the derivative exchanges in Germany and Switzerland to form Eurex was effected to achieve several advantages: a fully integrated exchange organisation, offering a full range of trading, clearing, settlement, custody, information and infrastructure services streamlined at lowest costs.
The merger of the derivative exchanges in Amsterdam, Brussels and Paris, in response to demand from the market, helped to create Euronext in September 2000. The NYSE LIFFE market also joined this grouping making NYSE Euronext (NYX) a fully integrated, cross-border, European market for equities, bonds, derivatives and commodities. At the time, the political environment favoured consolidation in the European capital markets, partially because of the introduction of the euro.

Euronext then became an acquisition of the NYSE to form the largest stock market in the world. NYSE LIFFE was also created to offer members and their customers access to a huge and diverse range of derivatives.

There is a continuing move towards consolidation in the exchanges and clearing houses servicing the industry. So let us remind ourselves of some of the reasons for this which include:

- increasing competition;
- consolidation in the banking and fund management businesses;
- the increasing sophistication of the market participants;
- regulation;
- threats from developments such as internet trading and non-traditional exchanges.

In fact, the trend towards consolidation continues in 2013 with another very significant proposal that has the IntercontinentalExchange (ICE) looking to acquire NYSE Euronext, subject to regulatory permission.

### 1.2.4 The Importance of Links between Derivatives and Stock Exchanges

Both exchanges and clearing houses have been involved in the process of consolidation, driven in part by the threat posed by internet trading and, also as a result of the link between transactions and strategies, which often means that securities and derivatives are both used. Clearly the market users want ease of access to the market and efficiency in the settlement of transactions. The ability to have securities and derivatives traded and cleared through a linked process has the benefits of cost savings, and risk management and creates the environment for enhanced straight-through processing (STP).

The London Clearing House (LCH) and Clearnet, for instance, merged to form LCH.Clearnet Group, which had exchanges including NYSE Euronext, the LME and the London Stock Exchange (LSE) as its customers. However exchanges have also looked carefully at the merits of running the clearing process themselves. This is explained more in Chapter 6.

The increasing use of central counterparty (CCP) clearing in securities, for example, LCH.Clearnet, providing the CCP facility for equities traded on the LSE means that systems and clearing processes and procedures, such as margin and collateral, should be more easily harmonised across products and markets.

In a further development, early in 2011 the LSE announced its intention to acquire LCH.Clearnet. The recommended offer was accepted by some 70% of shareholders and the completion of the transaction that will see the London Stock Exchange Group (LSEG) plc own 60% of LCH.Clearnet took place in 2012.
The History and Development of Derivatives Markets

Chapter One

The History and Development of Derivatives Markets

Exchange-Traded Derivatives

NYSE Euronext and the German derivatives market, Eurex, both trade securities and derivatives alongside each other, offering ease of access, harmonisation of process and centralisation of risk management.

Most of these exchanges have shareholders. Therefore they have the additional pressures of having to satisfy their shareholders. The capital markets operate in highly competitive, rapidly-changing and technology-driven environments. Being commercial organisations, with a broad base of products and services, sharpens their competitiveness and, in theory, leads to benefits for members, clients and shareholders.

As noted earlier in this section, today many exchanges are exploring or have taken over the clearing process, mainly for financial reasons. These include ICE, which has created ICE Clear and which, as stated in Section 1.2.3, is seeking to acquire NYSE Euronext.

1.3 OVERVIEW OF EXCHANGE-TRADED AND OVER-THE-COUNTER (OTC) MARKETS

LEARNING OBJECTIVES

1.3.1 Know the reasons for standardising contracts

1.3.2 Know the similarities and differences between exchange-traded derivatives and OTC traded products: method of valuation, pricing and margining; settlement methods

The derivatives industry is made up of both on-exchange and off-exchange products.

Off-exchange or OTC products are often very similar to those traded on exchanges in terms of their design for strategies, like hedging. This is certainly true of forwards (similar to futures) and options.

Exchange-traded and OTC derivative markets are very different, in that one is an organised market and the other is predominantly a negotiated market. On-exchange transactions take place in contracts or lots that have a contract specification (the terms of the transaction) set by the exchange, whilst the OTC transactions are under terms agreed between the two parties. Similar products are traded in both markets, ie, options, but also there are very specific products that are traded only in the OTC market such as interest rate swaps (IRSs).

The exchange-traded market is often used by traders in OTC products to hedge exposures. For instance, a trader in an interest rate swap, who has agreed to pay a floating rate of interest in return for receiving a fixed rate of interest, has an exposure to a rise in interest rates. If the floating rate rises above the fixed rate that the trader will receive, he will make a loss. To hedge this, the trader could use interest-rate futures contracts. The profit on the position in the futures contract will offset any loss on the swap.

The principal difference in using on- and off-exchange products, as we have already noted above, is one of standardised versus bespoke, or tailored, products.
There are issues to consider in the choice of product such as:

- duration of the hedge;
- liquidity (size of the market) is generally good on-exchange but may be more restricted off-exchange by the counterparty risk issues;
- risk (clearing house guarantee versus counterparty risk);
- secondary market (ability to trade out of a position and remove the obligation).

The flexibility of OTC products and the benefits of exchange-traded, standardised and guaranteed products provide users of the markets with an ample choice of hedging and speculative tools that will suit almost all strategies, risk appetites and durations.

In the aftermath of the financial markets crisis and banking problems in 2008–09, the authorities have looked increasingly at using the clearing process associated with on-exchange derivatives to manage the exposure risks of the OTC derivatives market.

### 1.3.1 Development of Standardised Contracts

The impact of standardised contracts should not be underestimated. Prior to the establishment of the CBOT, all derivative-type products were traded in what we now call the OTC market.

By standardising the terms of the futures contract, not only was a tradeable instrument created, but characteristics were also created that would distinguish an exchange-traded contract from one that was traded OTC.

Most important was the determination of what is called the underlying asset, on which the futures or option contract is based. This was defined by the exchange on which the contract would be traded so there could be no argument about what was to be delivered.

The terms of the standardisation were such that a contract specification was established for each product and instrument. This has a series of set parameters covering important issues such as:

- the size of the contract or how much of the underlying asset each contract represented;
- the maturity or delivery date of the contract;
- the grade or quality of the underlying asset that could be delivered;
- the way in which the derivative contract would have its price quoted;
- the amount and value of the minimum price movement, known as the tick size and value;
- whether the contract was available as a call and/or put (options);
- the hours of trading on the exchange; and
- for options contracts:
  - the way in which the strike or exercise prices would be established (sometimes referred to as the graduation or gap between the strike prices);
  - whether calls and puts are available;
  - the option style relating to when the option can be exercised.

In addition to the above, there will also be clear instructions for the delivery process, particularly for commodities and physically deliverable financial futures and options (including stock options).
Essentially the standardisation of a derivative into a contract that can be traded creates an instrument that:

- can be bought or sold and held until delivery;
- can be bought or sold and subsequently closed out by doing an opposite trade;
- has pre-defined terms relating to maturity;
- can be used to hedge the underlying;
- can be used instead of, or in conjunction with, the underlying asset in many strategies covering hedging and speculation.

Due to corporate action contract adjustments some equity options series may have a non-standard contract size.

With standardised contracts available farmers and merchants could now hedge against the risks they faced.

**Contract Specifications**

Below are three example contract specifications taken from the NYSE Liffe and Eurex exchanges. Note the differences between the index future, bond future and option contract specifications.

**NYSE Liffe FTSE 100 Index Future**

**Contract size**
Valued at £10 per index point (eg, value £65,000 at 6500.0).

**Delivery months**
March, June, September, December (nearest three available for trading).

**Last trading day**
10:30 (London time) – third Friday in delivery month. (In the event of the third Friday not being a business day, the last trading day shall normally be the last business day preceding the third Friday.)

**Delivery day**
First business day after the expiry date.

**Quotation**
Index points (eg, 6500.0)

**Minimum price movement**
0.5

**Tick size and value**
£5.00

**LIFFE CONNECT™ Trading hours**
08:00 – 17:30 (London time)

**Minimum block trade threshold**
See block trade facility – contract minimum size thresholds.
Contract standard
Cash settlement based on the exchange delivery settlement price.

Exchange Delivery Settlement Price (EDSP)
The EDSP is based on the average values of the FTSE 100 Index every 15 seconds between (and including) 10:10 and 10:30 (London time) on the last trading day. Of the 81 measured values, the highest 12 and lowest 12 will be discarded and the remaining 57 will be averaged to calculate the EDSP. Where necessary, the calculation will be rounded to the nearest half index point.

Source: NYSE Liffe

Eurex Eurobund Contract Specification

Contract Standard
A notional long-term debt instrument issued by the German Federal Government with a term of 8½ to 10½ years and an interest rate of 6%.

Contract Size
€100,000

Settlement
A delivery obligation arising out of a short position in a Euro-Bund Futures contract may only be satisfied by the delivery of specific debt securities – namely, German Federal Bonds (Bundesanleihen) with a remaining term upon delivery of 8½ to 10½ years. The debt securities must have a minimum issue amount of €20 billion.

Quotation
In a percentage of the par value, carried out two decimal places.

Minimum Price Movement
0.01%, representing a value of €10.

Delivery Day
The 10th calendar day of the respective delivery month, if this day is an exchange trading day; otherwise, the immediately following exchange trading day.

Delivery Months
The three successive months within the cycle March, June, September and December.

Notification
Clearing members with open short positions must notify Eurex which debt instruments they will deliver, with such notification being given by the end of the post-trading period on the last trading day in the delivery month of the futures contract.

Last Trading Day
Two exchange trading days prior to the delivery day of the relevant delivery month. Trading in the contract for this delivery month ceases at 12:30 Central European Time (CET).
Daily Settlement Price
The volume-weighted average price of the five last trades of the day, providing that they are not older than 15 minutes – or, if more than five trades have occurred during the final minute of trading, then the volume-weighted average price of all trades that occurred during that period. If such price determination is not possible, or should the calculated price not reflect actual market conditions, Eurex will determine the settlement price.

Final Settlement Price
The volume-weighted average price of the last ten trades, providing that they are not older than 30 minutes – or, if more than ten trades have occurred during the final minute of trading, then the volume-weighted average price of all trades that occurred during that period – is used to determine the final settlement price. The final settlement price is determined at 12:30 CET on the last trading day.

Trading Hours
8:00 until 19:00 CET.

Source: Eurex

Individual Equity Option Contracts

Unit of trading
One option normally equals rights over 100 or 1000 shares (shown in relevant exchange’s contract specifications), and which is often determined by the value of the underlying share.

Expiry months

January Cycle (J): means the three nearest expiry months from January, April, July, October cycle.

February Cycle (F): means the three nearest expiry months from February, May, August, November cycle.

March Cycle (M): means the three nearest expiry months from March, June, September, December cycle.

Exercise
Exercise by 17:20 on any business day, extended to 18:00 (London time) for all series on a last trading day.

Last trading day
16:30 (London time) – third Wednesday in expiry month.

Settlement day
Settlement day is four business days following the day of exercise/last trading day.

Quotation
Pence/share

Minimum price movement
0.5 pence/share
Tick size and value
Normally £0.50 or £5.00 depending on the underlying share.

LIFFE CONNECT™ Trading hours
08:00 – 16:30 (London time)

Contract standard
Delivery will be 100 or 1000 shares (depending on the underlying share). This number may be amended by the exchange following a corporate action.

Option premium
Is payable in full by the buyer on the business day following a transaction.

Exercise price and exercise price intervals
The interval between the exercise prices is set according to a fixed scale determined by the exchange.

Introduction of new exercise prices
Additional exercise prices will be introduced after the underlying share price has exceeded the second highest, or fallen below the second lowest, available exercise price.

Source: NYSE Liffe

### 1.3.2 Comparison of On- and Off-Exchange Derivatives

The following table shows the comparison between on- and off-exchange derivatives.

<table>
<thead>
<tr>
<th>On-Exchange</th>
<th>Off-Exchange</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardised terms established by the exchange which creates contracts.</td>
<td>Bilateral negotiated terms between counterparties.</td>
<td>OTC derivatives can be tailored into a transaction that meets specific conditions.</td>
</tr>
<tr>
<td>Price established by trades carried out by members on the exchange under the rules and regulations of the exchange. Positions can be opened and closed with the market.</td>
<td>Price determined by several factors which can include credit rating of counterparty and exposure limits. May be difficult or impossible to trade out of positions unless it is with the initial counterparty (ie, there may be no secondary market).</td>
<td>The pricing and valuation of OTC products can be considerably more difficult and time consuming than on-exchange products, where prices are easily obtained. Closing an OTC position is not as straightforward as it is on the exchange-traded secondary market.</td>
</tr>
<tr>
<td>Changes to regulation since 2008 have seen some OTC products being traded on electronic systems which has been driven by the Dodd-Frank Act and European Market Infrastructure Regulation (EMIR).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: NYSE Liffe
End-of-day price published by the exchange and used for valuation purposes. | No formal source of end-of-day price, valuation may require pricing models.
---|---
Clearing house manages the settlement and delivery of transactions in members’ accounts and acts as a guarantor of the settlement and delivery of the trades and positions by becoming the counterparty through a process called novation. | Settlement and other trade details contained in agreements (usually the International Swaps and Derivatives Association (ISDA) master agreement including confirmation) signed by the counterparties. Changes to regulation since 2008 have seen some OTC products being centrally cleared via a CCP. Trades may also be recorded at a trade repository. Historically, some OTC products traded between clearing house members have previously been cleared and settled where the clearing house offers that facility, otherwise settlement is directly the responsibility of the two counterparties. An example would be LCH.Clearnet’s Swapclear.
---|---
Manages risks, including default by a member, through various processes, including margin calls. | Unless cleared centrally, there is a counterparty risk between the two parties. The stronger party may require collateral from the other party.
---|---
Delivery of contracts are under the terms in the contract specification. | Delivery terms are defined by the counterparties.
---|---
Liquidity is often very good. | Liquidity can be restricted by lack of willing counterparties or credit issues.
---|---
Disputes are resolved by the exchange. | Agreements detail dispute arrangements.

### 1.3.3 Impact of the Dodd–Frank Act

The Dodd-Frank Act has resulted in changes to the way in which OTC derivatives are regulated and these changes include the requirement for the industry to meet the following objective:

**CREATING TRANSPARENCY AND ACCOUNTABILITY FOR DERIVATIVES – Bringing Transparency and Accountability to the Derivatives Market**

The changes move some aspects of the OTC market into the exchange-traded derivatives (ETD) space, such as central clearing of some types of OTC derivatives.
The specific impact of the Act covers the following areas:

- **Closes regulatory gaps** – provides the Securities and Exchange Commission (SEC) and Commodities Futures Trading Commission (CFTC) with authority to regulate OTC derivatives, so that irresponsible practices and excessive risk-taking can no longer escape regulatory oversight.
- **Central clearing and exchange or trading system** – required for derivatives that can be cleared and provides a role for both regulators and clearing houses to determine which contracts should be cleared.
- **Market transparency** – requires data collection and publication through clearing houses or swap repositories to improve market transparency and provide regulators with important tools for monitoring and responding to risks.
- **Financial safeguards** – added to system by ensuring dealers and major swap participants have adequate financial resources to meet responsibilities. Provides regulators with the authority to impose capital and margin requirements on swap dealers and major swap participants, not end users.
- **Higher standard of conduct** – establishes a code of conduct for all registered swap dealers and major swap participants when advising a swap entity. When acting as counterparties to a pension fund, endowment fund, or state or local government, dealers are required to have a reasonable basis to believe that the fund or governmental entity has an independent representative advising them.
## END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. On what was the first futures contract traded on a market in the US based?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>a. Oil</td>
<td></td>
</tr>
<tr>
<td>b. Cattle</td>
<td></td>
</tr>
<tr>
<td>c. Grain</td>
<td></td>
</tr>
<tr>
<td>d. Gold</td>
<td></td>
</tr>
<tr>
<td>2. What prompted the formation of the Chicago Board Options Exchange?</td>
<td>Section 1.1.1</td>
</tr>
<tr>
<td>3. What was the name of the original exchange that led to the formation of the Chicago Mercantile Exchange?</td>
<td>Section 1.1.1</td>
</tr>
<tr>
<td>4. Which London exchange was established as long ago as 1877?</td>
<td>Section 1.1.1</td>
</tr>
<tr>
<td>5. On what exchange was the first financial futures contract traded?</td>
<td>Section 1.2.1</td>
</tr>
<tr>
<td>6. What is contributing to the increase in derivatives volumes?</td>
<td>Section 1.2.2</td>
</tr>
<tr>
<td>7. What are examples of the top derivatives exchanges in the world?</td>
<td>Section 1.2.2</td>
</tr>
<tr>
<td>8. Which global region had the highest traded volume of listed derivatives in 2011?</td>
<td>Section 1.2.2</td>
</tr>
<tr>
<td>9. What major development has occurred between three large US exchanges?</td>
<td>Section 1.2.3</td>
</tr>
<tr>
<td>10. A major possible takeover involving two US exchanges could happen in 2013; which exchanges are involved?</td>
<td>Section 1.2.3</td>
</tr>
<tr>
<td>11. In the derivatives industry, what kind of organisation is LCH.Clearnet and what is its role?</td>
<td>Section 1.2.4</td>
</tr>
<tr>
<td>12. What impact did the market crash of 2008 have on the derivatives industry?</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>13. How are contracts standardised?</td>
<td>Section 1.3.1</td>
</tr>
<tr>
<td>14. Describe the differences between on-exchange and OTC derivatives.</td>
<td>Section 1.3.2</td>
</tr>
<tr>
<td>15. What has been the impact of the Dodd-Frank legislation?</td>
<td>Section 1.3.3</td>
</tr>
</tbody>
</table>
CHAPTER TWO

AN INTRODUCTION TO FUTURES

1. CHARACTERISTICS OF FUTURES 29
2. BASIC PRINCIPLES OF PRICING AND USING FUTURES 39

This syllabus area will provide approximately 4 of the 50 examination questions
1. CHARACTERISTICS OF FUTURES

1.1 DEFINITION OF A FUTURE

LEARNING OBJECTIVES

2.1.1 Know the definition of a futures contract: size; tick size and value; currency; delivery period; method of settlement

A futures contract is a legally binding agreement to buy or sell a specified amount of an asset, at a certain time in the future, for a price that is agreed today. The buyer enters into an obligation to buy, and the seller is obliged to sell, on a specific date. Exchange-traded futures are standardised in terms of size, quantity, grade and time, so that each contract traded on the exchange has the same specification. This allows for a secondary market to exist where a futures contract that is purchased can be sold to someone else.

Futures are, in effect, substitutes or synthetic versions of the underlying asset from which they derive their value.

For example, an investment manager wanting to get exposure to the equity market could buy the shares in the index in the equity market or buy index futures, which also gives the portfolio an exposure to the market.

Not surprisingly traders and investors have discovered that there are numerous strategies and reasons for using and not using derivatives, and these are explored further in Chapter 4.

Important components of futures contracts are the contract size, tick size and value, currency of the contract, delivery period and method of settlement. Each of these is detailed in contract specifications published by the relevant exchange on which the future is traded. These are covered in more detail in Section 1.2.

1.2 PRODUCTS AND SETTLEMENT PROCESS

LEARNING OBJECTIVES

2.1.2 Understand the underlying products and settlement process for the following: equity index futures; equity futures; interest rate futures; currency futures; government bond futures; commodities (metals/softs/agricultural); energy (oil/gas/power/emissions)

The standardisation of a future is referred to as a lot or contract; hence we have futures and options contracts.

What is the Underlying?

If the underlying asset on which the future is based is not known at the outset it would be almost impossible for anyone to use futures logically and safely. The following example shows why.
EXAMPLE

A buyer enters into a futures contract to buy a car. The car futures contract carries with it an obligation to buy a car at a fixed cost of £12,000 with delivery taking place in, say, June.

However, the description of the car type has not been included in the contract. The buyer does not know whether he may take delivery of a Porsche, or whether he may receive a Robin Reliant, in exchange for his £12,000 payment.

Therefore, it is very important that the legal specification of the contract is determined at the outset. Prospective clients will want to know exactly what the quantity, quality and delivery date of the contract will be.

Delivery Date

The delivery or prompt date of futures contracts is fixed. As each delivery date passes, a new delivery date is introduced. Some contracts list several years of delivery dates simultaneously.

Long and Short Positions

Futures can be bought to represent a long position and sold to represent a short position. This means that a person does not have to already hold a futures position to sell a future. The ability effectively to go short of the market is useful for many users of the products as, for example, they may not be allowed to sell the underlying asset without already owning it.

It also allows a position to be taken that will profit from a fall in the price. If a future is sold and the price of the underlying asset falls in price, the futures price will also fall. The seller of the future can now buy a future at a lower price. He now holds both a long position and a short position.

EXAMPLE

20 April
Dealer sells 100 futures @ 50 (short position of 100 contracts)

25 April
Dealer buys 100 futures @ 40 (long position of 100 contracts)

Position at close of business 25 April:
Long 100 contracts purchased @ 40
Short 100 contracts sold @ 50
Profit 100 contracts x 10 (50 – 40)

The position will be netted or closed out so that the profit is now realised and the position is flat.
Open Futures Positions

Futures positions can be held gross. This means that both long and short positions can be held in the same contract, creating a flat exposure, as one side is equal and opposite to the other side. A broker, for instance, may have long positions for some clients and short positions for others, held together in an omnibus account.

Delivery

Important note: Futures contracts can go to physical delivery of the underlying asset, or can be settled by a cash amount being paid by the buyer to the seller instead of delivering the underlying asset. The contract specification published by the exchange will state how the contract is settled but examples are bond futures that are physically settled and index futures which are cash settled.

There are many different categories of futures contracts available for trading and it is important to examine each one to understand the characteristics.

- **Financial futures contracts** – financial futures is a generic term used to describe futures contracts based on financial instruments, eg, currencies, debt instruments (such as government bonds) short-term interest rates and financial indices.
- **Interest rate futures** – these take a debt instrument, such as a government bond or a Treasury note, as the underlying product and require the delivery of a bond or bill to fulfil the contract. This category also covers short-term interest rate futures, which show the trend in interest rate movements over a one- or three-month period. These contracts are settled in cash and are often referred to as short-term interest rate (STIR) contracts.
- **Major bond and interest rate futures contracts** are traded on Eurex, NYSE Liffe and the CME Group. Examples of the products traded include:
  - Euro-Bund (Eurex);
  - Euro-Bobl (Eurex);
  - Euro-Schatz (Eurex);
  - Ten-year Treasury notes (CME);
  - Three-year Treasury notes (CME);
  - 30-year US Treasury bonds (CME);
  - Eurodollar (CME);
  - Three-month Euro (Euribor) (NYSE Liffe);
  - Three-month Sterling (NYSE Liffe).

Most major financial centres have markets with bond and interest rate products. These include Japan (Tokyo Financial Exchange (TFX)), Australia (Sydney Futures Exchange (SFE)) and Singapore (Singapore Exchange (SGX)).

- **Currency futures** – these are contracts calling for delivery of a specific amount of a currency at a specified future date, in return for a given amount of another currency. The main markets for trading currency futures are the CME and Bolsa de Mercadorias & Futuros (Brazilian Mercantile Futures Exchange (BM&F)). The main products on the CME are against the US dollar and include:
  - Euro foreign exchange (FX);
  - Japanese Yen;
  - Canadian Dollar;
  - Swiss Franc;
  - British Pound;
• Mexican Peso;
• Norwegian Krone;
• Swedish Krone;
• Russian Ruble;
• South African Rand;
• Australian Dollar;
• New Zealand Dollar;
• CME Dollar Index;
• Cross Rates.

• **Equity futures:**
  - **Equity index futures** – these are based on the value of an underlying stock index such as the FTSE 100 in the UK, the S&P 500 index in the US and the Nikkei 225 and 300 in Japan. Delivery is fulfilled by the payment or receipt of cash against the EDSP.
  - **Equity futures** – these are based on individual shares. In most cases delivery is fulfilled by the payment or receipt of cash against the EDSP. Physically delivered stock futures are available in some markets.

• **Commodities** – commodity futures are generally used by participants that are involved in the physical commodity market. When financial institutions are allowed to use commodity derivatives, careful controls must be in place, because of the implications of physical delivery. Accidentally entering the delivery process for a cash instrument is one thing, but to accidentally enter the delivery process for barrels of oil is quite another. Therefore, clearing members do not automatically allow their clients to trade commodity futures, even if they are existing clients of financial derivatives. These commodities comprise three main categories:
  - **Agricultural** – these are futures on agricultural products, such as wheat, barley and potatoes and also on soft or perishable commodities, such as sugar, coffee and cocoa. Delivery dates of these products revolve around harvest times. They are normally physically delivered contracts that call for a certain weight and grade of agricultural product to fulfil the contract; in the case of those commodities that are easily perishable, delivery must be carefully managed.
  - **Metals** – these are futures on precious metals such as gold, platinum, and silver, and also on base metals such as lead, copper, tin, aluminium and zinc. They are physically deliverable contracts of certain grades and quantities of each metal. Note: metals are sometimes referred to as 'hard commodities'.
  - **Energy** – these are futures and options on energy products such as heating oil, gas oil and Brent crude oil and more recently electricity supply.
## Examples of Leading Commodity Contracts

### Agricultural Futures and Options Contracts

<table>
<thead>
<tr>
<th>Rank</th>
<th>Contract</th>
<th>Contract Size</th>
<th>2010</th>
<th>2011</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No.1 Cotton Futures, ZCE</td>
<td>5 tonnes</td>
<td>86,955,310</td>
<td>139,044,152</td>
<td>59.9%</td>
</tr>
<tr>
<td>2</td>
<td>White Sugar Futures, ZCE</td>
<td>10 tonnes</td>
<td>305,303,131</td>
<td>128,193,356</td>
<td>−58.0%</td>
</tr>
<tr>
<td>3</td>
<td>Rubber Futures, SHFE</td>
<td>5 tons</td>
<td>167,414,912</td>
<td>104,286,399</td>
<td>−37.7%</td>
</tr>
<tr>
<td>4</td>
<td>Corn Futures, CBOT</td>
<td>5,000 bushels</td>
<td>69,841,420</td>
<td>79,004,801</td>
<td>13.1%</td>
</tr>
<tr>
<td>5</td>
<td>Soy Oil Futures, DCE</td>
<td>10 tonnes</td>
<td>91,406,238</td>
<td>58,012,550</td>
<td>−36.5%</td>
</tr>
<tr>
<td>6</td>
<td>Soy Meal Futures, DCE</td>
<td>10 tonnes</td>
<td>125,581,888</td>
<td>50,170,334</td>
<td>−60.0%</td>
</tr>
<tr>
<td>7</td>
<td>Soybean Futures, CBOT</td>
<td>5,000 bushels</td>
<td>36,933,960</td>
<td>45,143,755</td>
<td>22.2%</td>
</tr>
<tr>
<td>8</td>
<td>Corn Options on Futures, CBOT</td>
<td>5,000 bushels</td>
<td>20,810,260</td>
<td>28,650,380</td>
<td>37.7%</td>
</tr>
<tr>
<td>9</td>
<td>Corn Futures, DCE</td>
<td>10 tonnes</td>
<td>35,999,573</td>
<td>26,849,738</td>
<td>−25.4%</td>
</tr>
<tr>
<td>10</td>
<td>No. 1 Soybeans Futures, DCE</td>
<td>10 tonnes</td>
<td>37,393,600</td>
<td>25,239,532</td>
<td>−32.5%</td>
</tr>
<tr>
<td>11</td>
<td>Sugar #11 Futures, ICE Futures US</td>
<td>50 long tons</td>
<td>29,052,539</td>
<td>24,629,369</td>
<td>−15.2%</td>
</tr>
<tr>
<td>12</td>
<td>Wheat Futures, CBOT</td>
<td>5,000 bushels</td>
<td>23,090,255</td>
<td>24,283,331</td>
<td>5.2%</td>
</tr>
<tr>
<td>13</td>
<td>Soybean Oil Futures, CBOT</td>
<td>60,000 pounds</td>
<td>20,791,164</td>
<td>24,156,509</td>
<td>16.2%</td>
</tr>
<tr>
<td>14</td>
<td>Palm Oil Futures, DCE</td>
<td>10 tonnes</td>
<td>41,799,813</td>
<td>22,593,961</td>
<td>−45.9%</td>
</tr>
<tr>
<td>15</td>
<td>Soybean Meal Futures, CBOT</td>
<td>100 short tons</td>
<td>14,052,845</td>
<td>16,920,194</td>
<td>20.4%</td>
</tr>
<tr>
<td>16</td>
<td>Live Cattle Futures, CME</td>
<td>40,000 pounds</td>
<td>11,332,739</td>
<td>13,532,554</td>
<td>19.4%</td>
</tr>
<tr>
<td>17</td>
<td>Soybean Options on Futures, CBOT</td>
<td>5,000 bushels</td>
<td>10,046,345</td>
<td>13,236,367</td>
<td>31.8%</td>
</tr>
<tr>
<td>18</td>
<td>Lean Hogs Futures, CME</td>
<td>40,000 pounds</td>
<td>8,076,535</td>
<td>9,969,961</td>
<td>23.4%</td>
</tr>
<tr>
<td>19</td>
<td>Guar Seed Futures, NCDEX</td>
<td>10 tonnes</td>
<td>10,937,797</td>
<td>8,998,515</td>
<td>−17.7%</td>
</tr>
<tr>
<td>20</td>
<td>Strong Gluten Wheat Futures, ZCE</td>
<td>10 tonnes</td>
<td>5,804,642</td>
<td>7,909,755</td>
<td>36.3%</td>
</tr>
</tbody>
</table>

### Explanation of Terms

In Chapter 1 we looked at some contract specifications. As we are focusing on futures contracts in this chapter it is sensible to recap on what some of the terms contained in those contract specifications were and how they relate to the trading and settlement processes associated with using futures.

- **Unit of trading** – the specified type and amount of the underlying product which makes up the basis of contract.
• **Delivery month** – the month when the contract will be finally settled by physical tender or the payment/receipt of cash against the EDSP.

• **First notice day** – the first day of the delivery month that the seller can notify the exchange of their intention to go to delivery and the details of the delivery. After this date, holders of long futures positions may be forced to take delivery at any time.

• **Last trading day** – the last day on which futures positions can be traded before delivery must take place.

• **Last notice day** – on this day any remaining futures positions which are open must go to delivery.

• **Delivery day** – the final day when futures contracts are settled by receipt or tender of the physical underlying product or exchange of cash.

• **Quotation** – the way in which the price of the contract is expressed.

• **Minimum price movement** – the minimum amount that the contract price can move.

• **Tick size and value** – the monetary value of the minimum price movement.

• **Trading hours** – the normal hours during which trading takes place, all quoted in the local time of the exchange unless otherwise stated.

### Examples of Futures Products

#### Index Products

<table>
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<tr>
<th>Example trade</th>
<th>Buy 25 NYSE Liffe FTSE 100 June futures @ 6812.0</th>
</tr>
</thead>
</table>

In this example let us assume it is early April. The transaction shown is a purchase of 25 contracts of the FTSE 100 index future listed on NYSE Liffe maturing in June at an index level of 6812. If the index is currently trading at 6800 then the buyer is anticipating that (1) sometime before June or (2) at maturity of the contract in June, the index will or has risen above the 6812 level and a profit will be made from either (1) selling the 25 contracts, or (2) receiving cash at the delivery settlement price.

#### Commodity Products

There are many types of commodities on which there are futures contracts. As was seen in Chapter 1, the use of commodity derivatives products is mainly by participants in the commodities themselves. Let us look at an example of such use.
EXAMPLE – A POTATO FARMER AND HIS USE OF POTATO FUTURES

In March, at the beginning of the season, the farmer must purchase the seeds to plant his potato crop and will tend his crop during the coming months until harvest time. He has no idea at that time how the season will turn out but his livelihood depends on the profits that he can make from growing his potatoes. He looks to the futures market to hedge or protect the value of his potato crop.

The farmer has two fields with an estimated yield of 375 tonnes in each field. He has fixed overheads of £5,000 to produce the potatoes, and expects to sell them at around £10 to £12 per tonne.

In order to protect his crop against a fall in prices, and to ensure that his overheads are covered, the farmer enters into a futures bargain. He sells 25 contracts (20 tonnes per contract = 500 tonnes) at £10 per tonne for delivery in October.

This will cover the £5,000 fixed costs, as he is guaranteed to sell 500 tonnes at £10 per tonne in October. He also has his estimated additional 250 tonnes to sell at the prevailing market price, on which he will hope to make a profit.

At harvest time, in October, the farmer’s crop is poor and potatoes are in short supply. He has managed to produce only 520 tonnes from his crop. However, the market price of potatoes, given the shortage, is £16 per tonne.

The farmer must fulfil his futures contract obligation by selling 500 tonnes at £10 per tonne but he sells his additional 20 tonnes at £16 per tonne.

Sell 500 tonnes @ £10 per tonne = £5,000 cr
Sell 20 tonnes @ £16 per tonne = £320 cr
Gross return after £5,320 cr

If the farmer had not entered into any futures transaction he would have been able to sell his total crop of 520 tonnes at the market price of £16 per tonne, thus realising a profit of £8,320.

Using the futures to hedge protected the value of his crop and gave him a profit as well, but some of the possible profit was forgone in order to get the protection by the hedge.

Let us look at what happened if the crop had been successful and the farmer was able to produce 900 tonnes of potatoes.

Because of the good crop and plentiful supply, the market price of potatoes has fallen to £7 per tonne. He fulfils his obligations in the futures market.

Sell 500 tonnes @ £10 per tonne = £5,000 cr
Sell 400 tonnes @ £7 per tonne = £2,800 cr
Gross return of hedge £7,800 cr

If the farmer had not entered into any futures transaction he would have been able to sell his total crop of 900 tonnes at the market price of £7 per tonne, thus realising a return of £6,300. Using futures not only protected his revenue from the crop, but in this example also gave him a better profit than would have occurred without entering into the protective hedge trade.
Because agricultural and soft commodities are perishable and have a limited life, the delivery process must be carefully fulfilled. Delivery issues include warehousing, transportation and product standardisation requirements.

Commodity futures contract specifications are more intricate than financial futures because they must take into account the quality and grade of the product, and where it can be stored and delivered to or from.

An example is the NYSE-Liffe Robusta coffee futures (Number 409) where the quality of the coffee to be delivered must be as follows:

Class 1 Robusta Coffee deliverable at contract price. Other qualities deliverable at set premiums and discounts. The full details of the other qualities deliverable can be found at: http://globalderivatives.nyse.com/en/commodities/nyse-liffe.

Source: https://globalderivatives.nyse.com/contract/content/29040/contract-specification.

The contract size is ten tonnes of Robusta coffee per contract and the ten available delivery months are taken from January, March, May, July, September and November. The contract is priced in US dollars with a tick value of $1 per tonne.

Agricultural and soft commodities are finite in terms of availability. There can be large fluctuations in the quality of products due to forces of nature such as drought, flood and fire. To ensure that the product delivered is of the correct quality, as defined in the contract, there is a vetting procedure. If there is a problem with delivery, arbitration is sought. This may be via a trade association or an independent source appointed by the exchange.

The delivery months of agricultural and soft commodities are not as standardised as other futures contracts as they have to account for factors such as harvesting, shipments and transportation.

During the delivery period, the clearing organisation may demand higher margins (referred to as spot month margins) in order to force traders who do not wish to go to delivery to close their positions.

Here is an example of an agricultural contract traded on the CBOT:

**CME Soybean Future**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract size</td>
<td>5,000 bushels</td>
</tr>
<tr>
<td>Tick size</td>
<td>¼ cent per bushel ($12.50 per contract)</td>
</tr>
<tr>
<td>Contract months</td>
<td>Jan, March, May, Jul, Aug, Sept, Nov</td>
</tr>
<tr>
<td>Last trading day</td>
<td>The business day prior to the 15th calendar day of the contract month</td>
</tr>
<tr>
<td>Last delivery day</td>
<td>Second business day following the last trading day of the delivery month</td>
</tr>
<tr>
<td>Deliverable grades</td>
<td>No. 2 yellow at par, No. 1 yellow at 6 cents per bushel over contract price and No. 3 yellow at 6 cents per bushel under contract price</td>
</tr>
</tbody>
</table>

The details of the Daily Grains and Final Soybean Settlement can be found in the Appendix 14.

Source: CME Group
Some commodities are traded as forwards. Forwards are very similar to futures contracts as they are an agreement to buy or sell an asset at a certain time in the future for a certain price. However, futures contracts are revalued daily by a mark-to-market process, the value of which is then due for settlement daily. Forwards may not be marked-to-market daily, or, if they are, then the resulting profits are not paid out until maturity and any losses must be paid to the exchange clearing house. Forwards are therefore settled only on the delivery date. They can be traded both on-exchange and off-exchange. The LME lists forward contracts.

<table>
<thead>
<tr>
<th>Example trade</th>
<th>Sell 65 LME Grade A copper three months buyer @ 1611</th>
</tr>
</thead>
</table>

A metals business believes they will have a surplus of 1625 tonnes of copper at a future date and they also expect the price of copper to fall in the meantime, so they sell 65 forward contracts.

In this example the forward contract is an agreement to sell 65 contracts which represent 1625 tonnes (25 tonnes per contract) of Grade A copper at a price of 1611. If the price of copper is currently 1640 then the seller is anticipating that sometime (1) before the delivery date or (2) at delivery, the price will fall below 1611 and a profit will be made from (1) buying back the 65 contracts at a lower price if they do not have surplus copper or now have a need for it or (2) selling physical copper at 1611 which is higher than the market price at the time.

**Basic Settlement Features**

Futures contracts are margined transactions, or put another way, the full value of the underlying asset as represented by the futures contract is not settled on purchase or sale.

Instead, a mark-to-market process of revaluing the futures position against the official market closing price generates a daily settlement of the resultant profit or loss.

This latter process is most frequently referred to as variation margin and this is explained fully in Section 2 of Chapter 7.

The principle behind variation margin is that risk of default by a member of the clearing house is reduced significantly if any losses made on a day are settled the next day.

Speculators and investors alike can gain an exposure to the underlying asset by using futures far more cheaply than by buying the asset itself. For instance, if a speculator wants to purchase some equities in the belief that the UK stock market will rise significantly in the next three months, he is faced with finding sufficient funds from some source to purchase the equities and settle the transaction three days later in full.

Alternatively, as the futures contract does not settle for the full value it represents, the speculator can purchase an exposure to the market through the futures contract. If they are right and the market rises, they receive the profit on a daily basis through the variation margin process. Although they do not pay the full value of the contract, they do pay a deposit, known as initial margin, which is a fraction of the full value of the contract. This deposit is returnable.
However, should the market fall, although the speculator did not need to pay the full value of the shares, they will nevertheless have to find the funds to meet the losses on a daily basis for as long as the position is open.

So futures contracts, because of their margin rather than full settlement, offer a cheaper way to gain an exposure to the asset, but generate a daily settlement of profits and losses.

In return for the benefit of settling only the movement in price rather than the full value, the clearing house does need to have a deposit or initial margin amount given to it for each open position. This amount is a percentage of the value of the contract designed to cover the largest reasonable move in price of the future. It can be settled using cash or non-cash collateral and still makes the use of futures cheaper than operating in the equivalent underlying asset.

We must also remember that futures contracts are obligations to go to delivery of the underlying asset and whilst only a small percentage of contracts remain open and are taken to delivery it is nevertheless an important settlement process when it does occur. Chapter 8 covers delivery in detail but it is important to recognise that open positions will go to delivery if left open during the delivery period.

Settlement of futures can be summarised as:

• settlement on a margin basis rather than full value of the underlying represented by the future;
• mark-to-market process called variation margin generates a daily settlement;
• a deposit or initial margin amount is given to the clearing house whilst a position is open;
• a futures contract is a legally binding obligation to go to delivery and all contracts open on maturity or at the commencement of the delivery period will go to delivery of the asset or for cash settlement; and
• commodity futures will carry such costs as warehousing and transport.

Now let us look at another important derivatives market, emission rights.

1.3 EMISSIONS TRADING

Emissions trading has become an important sector of the markets and the European Energy Exchange (EEX) trades contracts based on emissions. This is a technical users’ market and, whilst futures contracts are traded, they are different in specification and delivery from other futures contracts. Comprehensive details can be found in Appendix 12.
2. BASIC PRINCIPLES OF PRICING AND USING FUTURES

The price of a futures contract will include an amount that reflects the value of time.

It is important to understand this relationship to the price, because time erodes and therefore so does the value of time in the price. As we shall see later in this and the next chapter, various futures and options strategies can be used to achieve an investment objective. However, the price of the future to be used will be a key factor in the decision, as futures and options have a fair value and can trade at a premium or discount to that fair value.

2.1 FAIR VALUE

LEARNING OBJECTIVES

2.2.1 Understand how futures are priced and what fair value is

Fair value is the value a derivative should be priced at given different factors. Those factors include the:

- time to maturity of the derivative;
- fact that only a fraction of the value of the underlying is required to be paid to enter into the contract; and
- volatility of the underlying asset.

This is sometimes referred to as the cost of carry.

Suppose it is April and a fund manager wants to buy the stocks that make up the FTSE 100 index.

The index stands at 6000 and the manager wants to buy approximately £60,000 of the stocks in their weighting in the index. At the moment the £60,000 is on deposit earning interest.

The fund manager looks at the June FTSE 100 index future traded on NYSE Liffe and sees that the size of the contract is £10 x the index point and it is trading at 6045. The fund manager decides that using futures which are worth approximately what he wants to invest might be a good idea, but wants to know if the futures price of 6045 is cheap or expensive.

The fund manager uses a formula to work this out:

\[
\text{Spot index level} + \text{spot index level} \times \text{the three-month interest rate} - \text{the expected dividend income over the next three months/days to maturity of the future.}
\]

Assume the following figures:

\[
6000 + (6000 \times (6\% - 3.5\%) \times 90/365) = \\
6000 + (6000 \times 0.025 \times 90/365) = \\
6000 + 36.98 = 6036.98
\]
where 6% is the three-month interest rate and 3.5% is the expected dividend yield on the FTSE 100 stocks over the next three months (90 days) to expiry of the future.

Thus the fair value of the future today is:

\[ 6000 + 36.98 = 6036.98 \]

Therefore the fund manager is paying a premium of eight points over fair value for the future if he decides to buy it.

The future is trading at a premium because of supply and demand in the market. It could therefore also trade at a discount to its fair value.

The concept of value is an important part of the derivatives market. On expiry, the underlying asset’s price and the futures price must be the same because there are no time, dividend or interest streams to take into account.

Futures contracts trade at premiums and discounts to their fair value, and in volatile conditions the futures price can fluctuate quickly between a premium and a discount to fair value.

The price of the future and the underlying converge as the future moves towards maturity.

### 2.2 PRICE FACTORS

**LEARNING OBJECTIVES**

2.2.2 Understand the use of price factors in relation to bond futures

Price factors are used in fair value calculations for futures contracts such as bond futures where the underlying asset is a notional bond rather than an actual bond or where there are several bonds with different coupons deliverable against the contract.

This list of deliverable bonds is decided by the exchange which will also compute and publish the price factor for each bond.

If the bond has a coupon the same as that of the notional bond in the futures contract specification the price factor will be one.

**EXAMPLE**

An NYSE Liffe long gilt future has a unit of trading of £100,000 of a notional government bond with a 6% coupon.

If an investor is trying to hedge £100,000 of a government bond that has a 6% coupon, they will require a position of one futures contract.

The price factors convert other coupons to that of the futures contract.

A copy of a NYSE Liffe price factor list is contained in Appendix 9.
2.3 RELATIONSHIP BETWEEN FUTURES AND UNDERLYING ASSETS

LEARNING OBJECTIVES

2.2.3 Understand the relationship between futures and underlying assets and time

Derivatives derive their value from the underlying asset on which they are based. They are instruments in their own right, but they will respond to change in the underlying assets at various times.

We have seen in Section 1.2 how the price of an index futures contract is calculated by reference to the level of the index itself, plus recognition of time, interest rates and dividend yield. The price of the future in the market will also be subject to supply and demand, just as in any other market. This supply and demand is related to and creates volatility. The volatility may be in the futures market or the underlying market or both.

For example, if the price of coffee rises sharply in the market because there is an expectation of a poor crop, then the futures price will rise as well, and may, if there are significant buyers of futures, rise further and faster than the price of coffee in the spot market. The futures market may react to the expectations sooner than the spot market as hedgers seek to protect against a higher price when they need to take delivery of the coffee.

In the financial markets, dealers unsure of whether the shares in the index will rise or fall, may prefer to take an initial position in index futures rather than buying the shares. The stock market, therefore, might move only fractionally in thin trading whilst the traders in futures push the index futures price higher in active trading.

The price of futures and the underlying asset constantly move in response to buyers and sellers. As they do so, the difference between the fair value of the future and its actual price changes, sometimes being at a premium to, or higher than, the fair value; and sometimes being at a discount to, or cheaper than, its fair value. This enables arbitrageurs to operate and take advantage of the anomalies between the spot market price of the asset, fair value and futures market prices.

Dealers and investors in futures contracts must always be aware of the change in price of the underlying asset and, therefore, the change in fair value. This is particularly important to fund managers as the use of futures purchased at a heavy premium to fair value may be more expensive than buying the stocks.

We know that time plays an important part in the price of the future and so does the impact of changes to the underlying asset. For instance, a stock being delisted or promoted to the index will potentially change the share price significantly, and if there were a share future (or indeed an option) on the stock, then there will be movement in the price of the future.

Changes to dividends or interest rates will impact on those elements of the fair value calculation.

We can surmise from this that, although the underlying and the future are separate instruments, they are nevertheless very closely linked throughout the life of the future.
On maturity of the future, of course, the underlying asset and the future will be the same price because the elements of time and volatility no longer have an impact on the price and so parity occurs.

One final point to note in terms of the relationship between the underlying and the futures price is that, for many futures contracts, there is no restriction on how many contracts can be open at any point in time. It is quite conceivable, therefore, that as a futures contract moves towards maturity, there may be concerns about whether there is sufficient underlying asset available to meet the potential futures deliveries.

If that happens we can get what is called a 'market squeeze', when prices of both the futures and underlying asset are forced artificially high, as speculators who have short positions are caught between closing the futures at huge premiums to the fair value, or buying the asset to satisfy delivery at equally inflated prices.

In many cases the clearing house will seek to manage this problem through calling special margins and this spot month margin is explained in Chapters 6 and 7.


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<thead>
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<th>Answer Reference</th>
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<td>2. What are interest rate futures?</td>
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<td>3. What kind of futures contract is the Eurodollar?</td>
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<td>4. What is the characteristic of an equity index future?</td>
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<td>5. What are examples of non-precious metals?</td>
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<td>6. What is the unit of trading in a contract specification?</td>
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<td>7. What is last notice day?</td>
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<td>example of a futures contract that goes to physical delivery and one</td>
<td></td>
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<td>that is cash settled?</td>
<td></td>
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<td>9. What does the expression underlying refer to?</td>
<td>Section 1.2</td>
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<td>10. Futures allow investors to gain an exposure to the underlying asset</td>
<td>Section 1.3</td>
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<td>in a cheaper way. What is the reason for this?</td>
<td></td>
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<td>11. Which trading centre operates a spot market on which EU emission</td>
<td>Section 1.2</td>
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<td>allowances are traded?</td>
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<td></td>
</tr>
<tr>
<td>14. What are the terms used to describe the futures market when it is</td>
<td>Section 2.1</td>
</tr>
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<td>trading: a. higher than fair value; and b. lower than fair value?</td>
<td></td>
</tr>
<tr>
<td>15. What are price factors?</td>
<td>Section 2.2</td>
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<td>16. On many markets there is no restriction on the number of futures</td>
<td>Section 2.3</td>
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<tr>
<td>contracts in existence – true or false?</td>
<td></td>
</tr>
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CHAPTER THREE

AN INTRODUCTION TO OPTIONS

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2. BASIC PRINCIPLES OF PRICING OPTIONS 58

This syllabus area will provide approximately 4 of the 50 examination questions
1. CHARACTERISTICS OF OPTIONS

1.1 DEFINITION OF AN OPTION CONTRACT

LEARNING OBJECTIVES

3.1.1 Know the definition of an options contract: call or put; writer/granter or holder/taker; size; tick size and value; strike price; exercise styles and expiry dates; methods of settlement

An option is (in the case of the buyer) the right, but not the obligation, to take (call) or make (put) delivery of the underlying product, and (in the case of the seller) the obligation to make or take delivery of the underlying product. In return for this right and obligation, the buyer pays a premium to the seller, which the seller retains, whether or not the option contract is exercised by the buyer.

Options like futures can be used to gain exposure, to hedge and also to speculate. In addition they can be used to generate income.

However, a futures contract is very similar to the underlying in the sense that if we thought the price of something, for instance, a share, was going to rise we could buy the shares or buy a share future. Both give us the same exposure, ie, they will rise or fall in price based on market assessments of the company’s performance and profitability.

Options however are different.

Options are divided into call options that give the buyer the right to take delivery (buy) of the shares and put options that give the buyer the right to make delivery (sell) the shares.

So, if we think the price of a share is going to rise we could actually:

1. Buy the shares.
2. Buy a futures contract on the shares.
3. Buy a call option on the shares.

Conversely, if we think the shares are going to fall in price we could:

1. Sell the shares.
2. Sell a futures contract on the shares.
3. Buy a put option on the shares.

We buy the put option because we buy the right to make delivery (sell) the shares.

Why would we use an option instead of a future?

The answer is that options offer us an alternative way of getting the exposure to the underlying that we want.
If we buy an option, we pay the seller a fee called a premium that secures the right to do something at a fixed price. This is called an exercise of strike price. An option gives the buyer a right and not an obligation; there will be no further payment required, unless we decide to exercise our right.

However, if we buy the futures contract we must either sell it to close the position or go to delivery. We have what is called a contingent liability; as we will go to delivery or we will have to trade out of the position.

**EXAMPLE**

Suppose investor A buys a BP call option for delivery of BP shares at 500p with a maturity in September and pays a premium of say 20p per share, and investor B buys a futures contract with maturity in September on BP shares and pays a price of 500p.

BP shares fall to 300p.

The call option giving investor A the right to take delivery of the shares at 500p is not worth anything because why would the investor exercise their right and pay 500p for the shares when they could buy them on the stock market for 300p? The 20p per share premium amount that investor A has paid to the seller of the option is lost but that is the end of it.

However, investor B purchased the futures contract and must now either sell the future in the market at 300p or take delivery of the shares. Either way, investor B loses 200p.

Both gave the investors the chance to benefit from an upward movement, but the option contract restricted the potential loss to the amount of the premium.

We will look at more ways in which options can be used later in this chapter and elsewhere in the book, but the important thing about options is to remember that there are calls and puts and that options give the buyer the right to do something and the seller, therefore, has an obligation but the buyer must make a payment to the seller to secure that right.

The illustration below shows the premium flow and the flow of the underlying if the option is exercised. Note the various terms that can be used for buyers and sellers of options.
Note also that option contracts represent an amount of the underlying and this amount is set by the exchange and is included in the contract specifications issued by the exchange.

**Example of an Option Trade**

| Example trade | Buy 100 Eurex Daimler June 70 call options @ 14 |

In the example above, the buyer has purchased the right to buy (call) 10,000 shares (100 shares per contract) of Daimler at any time until expiry in June at a price of €70. For this right the buyer must pay €14 premium per contract. If the price of Daimler shares is currently €69 then the buyer expects that the price will rise towards or above €70 some time (1) before June or (2) at expiry in June and a profit will be made from either (1) selling the option at a higher premium or (2) exercising the rights and buying the underlying shares at a price which is less than the market price.

When exercising the option the buyer will make a profit when the share price exceeds €84, ie, the combined value of the premium and strike price.

If the price of the Daimler shares does not move to 70 or above then the buyer does not have to take any action and the contract is deemed to expire worthless, or be abandoned.

**Basic Settlement Features of Options**

Option contracts trade on margin and premium, or, put another way, the full value of the underlying asset, as represented by the options contract, is not settled on purchase or sale of the option.

Assume we decide to buy 250 contracts at a price of 11p.

The amount of money that must be paid for a premium paid option is calculated in the following way:

\[
\text{(Number of contracts)} \times \text{(underlying contract size)} \times \text{(premium price)}/100
\]

The underlying size of the contract is needed for the calculation. In this example let us say, it is 1,000 shares as determined by the exchange:

\[
\frac{250 \text{ contracts} \times 1,000 \text{ shares} \times 11\text{p}}{100} = £27,500
\]

This amount will be required by the broker from the client on trade day +1 (T+1), because the clearing organisation of the exchange concerned will require this amount from the member that did the trade on T+1. The seller of this option in the market will receive the £27,500 on T+1.
If premium or traded options are sold in the market, then, in addition to the receipt of premium, the client must cover an amount of initial margin with the clearing member, using either cash or collateral. This initial margin requirement is refundable upon the closing of the contract, by buying back the option in the market. Options on futures will have an initial margin requirement for both the bought and sold positions.

Options on futures have the characteristics of a premium option as described above, but they are treated like futures. Premium is not exchanged like options as they are marked-to-market, which means that the profit or loss on each contract is settled every day. The underlying product is either a long or short futures contract.

**Settlement of options can be summarised as:**

- settlement on a margin and premium basis, rather than full value of the underlying represented by the option;
- a deposit or initial margin amount is given to the clearing house whilst a short option position is open;
- a long option contract is a right but not an obligation to go to delivery and all long contracts open at expiry will either be exercised by the holder or left to expire; the term often used is ‘option is abandoned’;
- mark-to-market process called variation margin generates a daily settlement for options on futures.

The clearing and settlement of futures and options is covered again in detail in Chapter 8.

**Exercise Styles and Expiry Dates**

Options have exercise styles and expiry dates.

The styles that we find in the exchange-traded environment are American and European.

- **European-style** options are exercisable only on the expiry date;
- **American-style** options can be exercised on any business day up to the expiry date.

One way to identify the difference between the styles is to look at the price for the option. An American-style option with greater choice of when to exercise will cost more than the restricted European-style.

Expiry dates are published by the exchange on which the option is listed.
1.2 OPTION PRODUCTS

LEARNING OBJECTIVES

3.1.2 Understand the underlying products and method of exercise for the following: equity index options; equity options; interest rate options; currency options; government bond options; commodity options (metals/softs/agricultural); energy options (oil/gas/power/emissions)

Options on Futures

These have the characteristics of an option as described in Section 1.1, but they are treated like futures. Premium is not exchanged, as they are marked to market, which means that the profit or loss on each contract is settled every day. The underlying product is either a long or short futures contract.

Example trade

Sell 50 ICE futures gas oil April 12,500 call options @ 1,180

In the example above, the seller has sold the rights to buy a gas oil future at 12,500. If the price of the gas oil future is currently 12,900 then the seller of the option believes that at sometime (1) before April or (2) at expiry in April the price of the future will fall and that a profit will be made from buying the 50 contracts at a lower premium to close the position, or retaining the premium if the future falls below 12,500 and the option price goes to zero.

<table>
<thead>
<tr>
<th>Futures Price</th>
<th>Option Strike</th>
<th>Option Price</th>
<th>Combined Strike/Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,900 at time of option trade</td>
<td>12,500</td>
<td>1,180</td>
<td>13,680</td>
</tr>
<tr>
<td>Price falls to 12,500</td>
<td></td>
<td>780 (option bought back at profit of 400)</td>
<td></td>
</tr>
<tr>
<td>Price falls to 11,500 on expiry</td>
<td></td>
<td>Zero (option seller retains the 1,180 premium)</td>
<td></td>
</tr>
<tr>
<td>Price rises to 14,000 on expiry</td>
<td></td>
<td>1,500 (option can be bought back at a loss of 320)</td>
<td></td>
</tr>
</tbody>
</table>

Equity Options

These are contracts based on individual equities or shares. On exercise of the option the specified amount of shares is exchanged between the buyer and the seller through the clearing organisation. Some exchanges list short-term and long-term options. The Daimler example used in Section 1.1 is an example of an equity option.

On exercise most equity.stock options are physically delivered so the relevant number of shares at the strike price are delivered.
Equity Index

Stock index options are based on an underlying index like the FTSE, S&P or Dow Stoxx. The option can also be based on the futures contract related to the index.

**EXAMPLE**

An example of this is the CBOE S&P index option, which has the S&P index as the underlying, and the CME S&P option, which has the CME S&P future as the underlying.

The options which have the index as the underlying, if exercised, will be settled by a cash amount and not delivery of the constituent shares in the relevant index.

Flex Options

Flexible Exchange (FLEX®) options were launched by the CBOE in 1993. Initially introduced for the trading of index options, FLEX options allowed users the ability to custom-tailor contract terms whilst maintaining the security of an exchange-traded contract.

These contracts are a cross between OTCs and exchange-traded products. The advantage of flex options is that participants can negotiate various parts of the contract specification, such as the expiry date and exercise price.

There are also options available for trading on other categories of underlying assets which were described in Chapter 2.

Interest Rate and Bond Options

Options on bonds and interest rates are contracts that usually have the bond or interest rate future as their underlying. The holder of a call or put will, on exercise, have a long or short position in the relevant bond or interest rate future.

Major bond and interest rate option contracts are traded on Eurex, NYSE Liffe and CME Group.

Examples of the products traded include:

- Euro-Bund (Eurex);
- Euro-Bobl (Eurex);
- Ten-year Treasury notes (CME Group);
- Three-year Treasury notes (CME Group);
- 30-year US Treasury Bond (CME Group);
- Eurodollar (CME Group);
- Three-month Euro (Euribor) (NYSE Liffe);
- Three-month Sterling (NYSE Liffe).
  (As with bond and interest rate futures most financial centres trade options on the products.)
- Commodities.
There are commodity options that are based on the commodity futures contract, for example, the International Petroleum Exchange (IPE) Brent crude options, which are exercisable into Brent crude futures and the LME Grade A copper options, which are based on the copper futures.

**Currency**

The main markets for trading currency options are the CME Group and BM&F (Bolsa de Mercadorias & Futuros). Examples of currencies on the CME Group are pairs based on:

- Offshore Chinese Renminbi;
- Euro FX;
- Japanese Yen;
- Canadian Dollar;
- Swiss Franc;
- British Pound;
- Mexican Peso;
- Norwegian Krone;
- Swedish Krone;
- Russian Ruble;
- South African Rand;
- Australian Dollar;
- New Zealand Dollar;
- CME Dollar Index.

These option contracts are options on futures, e.g., on exercise of a long British pound call option the holder will become long of a British pound futures contract at the strike price. See Appendix 15 for an example contract specification.

On the BM&F, they are the US dollar against Brazilian real. On the BM&F there are both options on the futures contract and cash options, i.e., on exercise of the latter there is a delivery of US dollars at the exchange rate determined by the strike price.

A full list of the futures and options and available currencies can be found at http://www.cmegroup.com/trading/fx/.

### 1.3 EXPLANATION OF TERMS

To understand options it is very important to understand the everyday terms used, so let us look at some of those terms and remind ourselves of what they mean:

- **Premium** – the sum of money paid by the buyer for acquiring the right of the option and received by the seller for incurring the obligation of the option.
- **Call/put** – whether the buyer has the right to take delivery (call) or make delivery (put) of the underlying asset.
- **Exercise price (or strike price)** – the fixed price, per share or unit, at which an option conveys the right to call (purchase) or put (sell) the underlying shares, assets or units.
- **Expiry/delivery month** – the month and date when the right of the holder (buyer) of the long option will expire and the seller will no longer have an obligation. The buyer must have either sold the option or exercised their right by the prescribed time or the option will lapse and be abandoned.
• **Last trading day** – the last day on which options positions can be traded before expiry of the contract.
• **Expiry day** – the last date on which an option holder can exercise their right. After this date an option is deemed to lapse or be abandoned.

The Glossary at the end of this manual contains further definitions of terminology associated with derivatives products.

It is also a good idea to look at some more examples of how options are used.

**EXAMPLE**

An option can be thought of as a deposit, for example on a computer, before having to make the final decision to purchase outright. The buyer may be content to pay the deposit and secure the price which is on offer at the time. However, he may want to have more time to make sure that the package on offer is exactly suitable in terms of specification and price. The computer prices are rumoured to be going up due to shipment problems with supplies and the price of the product could double. The deposit locks in the current price ready for when the buyer wishes to take delivery. If the buyer subsequently decides not to buy the computer then only the deposit is lost. Buying an option on a stock, or product, is akin to a deposit or holding fee. It does not mean that you are forced to buy the package at some time.

Remember, this is only the case when buying options.

**EXAMPLE**

Investor A wishes to purchase BP shares because he believes that the price will soon increase due to the possible discovery of a new oil field. However, the investor does not have the full amount of cash required to purchase the shares, but he would like to participate in any potential profit. The purchase of a call option allows the investor to participate in the price increase, but at only a fraction of the full cost of the shares. The maximum amount that could be lost is the premium paid for the option in the first place.

If the price of BP stock falls, the investor could purchase the ordinary shares at the cheaper price, but would have to offset this against the loss on the option.

• **Time and volatility value** – the amount by which an option’s premium exceeds its intrinsic value. If an option has no intrinsic value, the premium consists entirely of time value.
EXAMPLE

Take an investor who is considering purchasing a BP 550 call option priced at 60p and the stock is currently priced at 575. How much of the 60p premium is intrinsic value (the minimum price the option can be, given the share price and strike price) and how much is related to time and volatility?

<table>
<thead>
<tr>
<th>Option Premium</th>
<th>Intrinsic Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>60p</td>
<td>575p (share price) minus 550 (strike price) = 25p</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time and Volatility Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>60p (premium) minus intrinsic value (25p) = 35p</td>
</tr>
</tbody>
</table>

In the example above, the 550 call option priced at 60p is considered to have 25p intrinsic value and 35p time value. To buy the stock at 575p is 25p less than the current market price, leaving 35p remaining of the 60p premium, which is the value of the time and volatility included in the price of the option.

• Calculating the Cost of the Option

The following has been traded:

+ 250 BP April 650 Call Options at 11p

If you recall, the amount of money which must be paid for an option is calculated in the following way:

\[
\text{(Number of contracts) } \times \text{ (underlying contract size) } \times \text{ (premium price)/100}
\]

The underlying size of the contract is needed for the calculation. In this case, it is 1,000 shares as determined by NYSE Liffe.

\[
\frac{250 \times 1,000 \times 11}{100} = £27,500
\]

We know that this amount will be required by the clearing broker on T+1.

When making an opening purchase the buyer of an option, known as the position holder, is said to be long of the market. When making an opening sale the seller of an option, known as the position writer, is said to be short of the market.

Option positions can be either long or short or both long and short positions can be held gross. Long or short option positions are normally closed out at the time of transacting the opposite position.

For example, NYSE Liffe equity options can be designated as opening or closing bargains as part of the details that are loaded into the trade registration system (TRS) after trading.
1.4 OPTION STYLES (AMERICAN, EUROPEAN, BERMUDAN, ASIAN)

LEARNING OBJECTIVES

3.1.3 Understand the differences between the following styles of option: European; American; Asian

As we know, there are two principal styles of exchange-traded options:

- **American** – the holder of the long position can choose to exercise the position at any time from opening the position until the expiry day.
- **European** – these options can be exercised only on the expiry day.

In addition there are other styles of options, some of which are predominantly found in the OTC derivatives market but which can also now be traded on exchanges, for example the CBOE binary option (see Appendix 11) which has a fixed payout on maturity if the call option is at or above the strike price or at or below the strike price for a put option, but which can also be closed out, like other traded options through an equal and opposite trade.

Other options styles includes barrier options, lookback options and Asian options (see Glossary).

The exercise style for each contract is detailed in the contract specification, as participants need to know which exercise style is applicable to the option which they are trading. On NYSE Liffe, an American-style FTSE 100 index option is listed, as well as a separate European-style FTSE 100 index option.

The **prices at which these options trade** on the exchange will be different.

- **American-style options** tend to be more expensive than European-style because it is more likely that American-style options will be worth exercising during their lifetime.
- **European-style options** may be in-the-money during their lifetime, but it is relevant only if they are in-the-money at the expiry date.

The exercise deadline each day for American-style options will be given in the contract specification. Instructions can be given to the exchange or clearing organisation, as applicable, at any time during the day up to the deadline.

Similarly, the exercise deadline on the expiry day or last trading day is also given. Care must be taken as the deadline on the expiry day may be different from the exercise deadline on non-expiry days.

**Asian options** typically utilise an average price, over, for example, the month leading up to expiry, for determining the underlying asset price on expiry.

An example of an Asian-style option that is traded on an exchange would be an LME-traded average price option (TAPO).

We can see here the contract specification for a Aluminium TAPO.
TAPOs are exchange-cleared contracts, which settle financially based on the average of the daily LME Official Settlement Prices for the relevant month.

**LME Aluminium TAPOs**

<table>
<thead>
<tr>
<th>Contract code</th>
<th>AH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying metal</td>
<td>P1020A high grade primary aluminium</td>
</tr>
<tr>
<td>Lot size</td>
<td>25 tonnes</td>
</tr>
<tr>
<td>Contract months</td>
<td>Monthly out to 63 months</td>
</tr>
<tr>
<td>Underlying contract</td>
<td>LME aluminium futures – the average of the cash prompts for each business day of the contract month</td>
</tr>
<tr>
<td>Price quotation</td>
<td>US dollars per tonne</td>
</tr>
<tr>
<td>Clearable currencies</td>
<td>US dollars</td>
</tr>
<tr>
<td>Option style</td>
<td>Asian</td>
</tr>
<tr>
<td>Trading deadlines</td>
<td>The business day preceding the declaration day of the relevant prompt month:</td>
</tr>
<tr>
<td></td>
<td>• Last trading time – by 18.00</td>
</tr>
<tr>
<td></td>
<td>• Last matching and registration – by 18.15</td>
</tr>
<tr>
<td>Declaration date/time</td>
<td>Automatic declaration of in-the-money TAPOs at 15.00 on the last business day of the contract month</td>
</tr>
<tr>
<td>Minimum price fluctuation (tick size)</td>
<td>$0.01 per tonne</td>
</tr>
<tr>
<td>Strike price interval</td>
<td>$1</td>
</tr>
<tr>
<td>Exercise of option</td>
<td>LCH.Clearnet auto-exercise TAPOs. Exercise will result in two futures contracts, one priced at the strike price and the other priced at the Monthly Average Settlement Price (MASP). The effect is to generate a cash settlement which is settled on the second business day after the declaration day for the TAPO month.</td>
</tr>
<tr>
<td>Settlement type</td>
<td>Financial</td>
</tr>
<tr>
<td>Trading venues</td>
<td>Ring, inter-office telephone and LMEselect (as a hedged option only)</td>
</tr>
</tbody>
</table>

All contracts are subject to LME rules and regulations and LCH.Clearnet SPAN marging.

*Source: London Metal Exchange*

**Bermudan options** typically allow exercise at certain times. They are a cross between European and American-style options. Bermudan options have an early exercise date as well as an expiry date. Before the early exercise date they behave like European options and cannot be exercised. After this date, they assume American-style and can be exercised at any time until expiry.

Asian and Bermudan-style options are mainly utilised in OTC transactions.
1.5 COMPARISON OF FUTURES AND OPTIONS

LEARNING OBJECTIVES

3.1.4 Understand the fundamental differences between futures and options contracts

As we have seen in Section 1.21 of Chapter 2 and this chapter, the fundamental difference between options and futures is found in the definitions. Options give the buyer the right, but not the obligation, to buy or sell the underlying asset, whereas futures have an obligation and the buyer or seller has no choice but to fulfil the contract obligations at the delivery date. In order to avoid the obligations of a futures contract, the contract must be bought or sold to close the position down to zero before the delivery date or period.

2. BASIC PRINCIPLES OF PRICING OPTIONS

LEARNING OBJECTIVES

3.2.1 Understand the fundamental influences on price: underlying price; time to expiry; volatility; interest rates; dividends

Like a future, the price of an option contract will include an amount that reflects the value of time. However, options are quite different from futures when it comes to pricing.

Time, interest rates and dividend considerations will all be part of the pricing equation, but so too will the price of the underlying asset and the exercise price, whether the option is a call or a put, and the associated volatility.

This can be a somewhat complex calculation and so dealers use option pricing models to compute the value of each option series. The movement of price of the option in relation to the movement of price in the underlying asset is known as the delta.

In very simplistic terms, this means that if an option series is in-the-money, the option price will move penny for penny with the underlying asset price, whilst it may take a movement of 5p in the underlying asset price to move the out-of-the-money option price by 1p.

The price of an option (the premium) is dependent on several factors, including supply and demand. The impact of time erosion (theta), the impact of volatility change (vega), the change in the price of the underlying asset (delta) and the speed of that change (gamma) also need to be taken into account. For instance if the price of the underlying moves by, say, 1p, then the premium of the call and put options will change but by different amounts for each series or strike price depending on the delta.
An Introduction to Options

Chapter Three

Exchange-Traded Derivatives

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EXAMPLE

Share price moves from 221p to 222p

<table>
<thead>
<tr>
<th>Strike Price</th>
<th>Delta</th>
<th>Current Premium</th>
<th>New Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>1</td>
<td>28p</td>
<td>29p</td>
</tr>
<tr>
<td>220</td>
<td>0.5</td>
<td>12p</td>
<td>12.5p</td>
</tr>
<tr>
<td>240</td>
<td>0.1</td>
<td>5p</td>
<td>5p</td>
</tr>
</tbody>
</table>

We can see that the premium has changed based on the delta; however, if the value of the time erosion was say 1p then the premiums will be: 28p, 11.5p, 4p.

What has happened is that the rise in the share price and resulting delta changes are offset by the decline of 1p in time value. So although the share price has gone up 1p, the 200 series remains the same, the 220 actually falls by 0.5p and the 240 series by 1p.

Collectively, delta, theta, gamma and vega are known as the greeks.

Just like the futures contracts, option prices are also driven by supply and demand and so may trade above or below the fair price computed by the option model.

2.1 IN-, AT- AND OUT-OF-THE-MONEY OPTIONS

LEARNING OBJECTIVES

3.2.2 Understand what is meant by the in-the-money, out-of-the-money and at-the-money options

Options are referred to as being in-, at- or out-of-the-money.

What this tells us is whether the option is likely to be exercised by the buyer of the option. It also tells us if the option price, the premium, is made up of just time and volatility or if there is a minimum value to the option that should be included in the premium.

To establish whether the option strike price is in-, at- or out-of-the-money we need to compare the strike price to the underlying price.

If we have to buy two options, a call and a put with a strike price of 500 and the underlying is currently at 450, one of the options will have a price that is only reflecting time and volatility. This will be known as an out-of-the-money option but which one is it?

If we buy a call, we expect the price of the underlying to rise above the strike price. If we bought calls with a strike price of 500 and the underlying is only at 450 there is no value to the option other than the time to expiry and the likelihood that it will rise above 500 (the volatility). We will not exercise our right to buy the shares at 500 if we can buy them in the market at 450, so there is no minimum value that must be reflected in the premium. This is the out-of-the-money option.
However, the put option has been purchased because we thought the price of the underlying would fall below the strike price. If the underlying is at 450 and the strike price is 500 then the price of the option will include not only time and volatility but also the fact that the option must have a minimum price. This minimum price is the difference between the underlying and the strike price – in this case 50.

\[ \text{Strike price } 500 - \text{underlying price } 450 = 50 \]

In other words, as the buyer we can deliver the underlying at the strike price of 500 even though the underlying in the market is only at 450. The put option must be worth at least 50 even if no time or volatility is reflected in the price. This option is the in-the-money option.

When an option has a minimum value it is said to include intrinsic value as well as time and volatility in the premium. It is also described as an in-the-money option.

So we have options that can be:

- **In-the-money** – a call option where the exercise/strike price is lower than the underlying price or a put option where the exercise/strike price is higher than the underlying price. An in-the-money option is deemed to have an intrinsic value of the difference between the exercise price and the underlying asset price. **Exercise price – underlying asset price = intrinsic value.**

- **At-the-money** – an option whose exercise price is equal, or very close to, the current market price of the underlying asset. This option has little, or no, intrinsic value.

- **Out-of-the-money** – a call option whose exercise price is above the current underlying asset price or a put option whose exercise price is below the current underlying asset price. This option has no intrinsic value.

Let us look at an illustration. If the price of the BP stock in the example below is currently £6.00, the option strike prices will be in-, at- or out-of-the-money as shown below:

<table>
<thead>
<tr>
<th>Strike Price</th>
<th>Call Price</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>60</td>
<td>In-the-money</td>
</tr>
<tr>
<td>600</td>
<td>30</td>
<td>At-the-money</td>
</tr>
<tr>
<td>650</td>
<td>10</td>
<td>Out-of-the-money</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strike Price</th>
<th>Put Price</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>5</td>
<td>Out-of-the-money</td>
</tr>
<tr>
<td>600</td>
<td>20</td>
<td>At-the-money</td>
</tr>
<tr>
<td>650</td>
<td>60</td>
<td>In-the-money</td>
</tr>
</tbody>
</table>

You will notice that the 550 calls are in-the-money but the 550 puts are out-of-the-money. Only an at-the-money option can be described as a call and a put.

Do not forget that the premium of an out-of-the-money option is representing time and volatility only. If the price of the underlying shares does not change by expiry these options will be worthless as no time or volatility applies anymore so the option has no value to the buyer.
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It is important to remember also that options can quickly move from out-of-the-money to in-the-money and vice versa if the underlying is volatile. The amount of premium charged by the seller to the buyer must reflect volatility; in other words is the option strike price already or likely to be in-the-money? Market sentiment is a major influence on option prices, for instance investors that are uncertain if an underlying will rise in value may buy call options rather than the underlying itself. This results in the options, not the underlying market, reflecting the mood of the investors and as a result the option prices may be more volatile than the underlying, at least until the investors decide to participate in the underlying.

An example of when this may happen is if there are rumours about a share in the market.

<table>
<thead>
<tr>
<th>Option Price</th>
<th>Intrinsic Value (if in-the-money)</th>
<th>Time Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 INTRINSIC, TIME AND VOLATILITY COMPONENTS IN THE OPTION PRICE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEARNING OBJECTIVES**

3.2.3 Understand the composition of an option price for time and intrinsic value

The price of an option, as we saw in Section 2.1, is driven by whether the option is in- or out-of-the-money in terms of its intrinsic value. In addition time and volatility will play a part in determining the price, as we saw with the explanation of the ‘greeks’.

We can see this in the example below.

**EXAMPLE**

**Call Option**

Strike Price 500
Underlying 550 option price 85

Intrinsic value = 50 (550 is more than 500) Time/Volatility = 35 (option price 85 less intrinsic value 50).

**Put Option**

Strike Price 500
Underlying 550 option price 35

Intrinsic value = 0 (500 is less than 550) Time/Volatility = 35 (option price 35 less intrinsic value 0).

Pricing options is a complex process that utilises option pricing models and yet like all markets price is still driven by supply and demand.
2.3 INTERACTION WITH UNDERLYING ASSETS

The way in which options interact with the underlying market is principally the same as the explanation given in Chapter 2, which deals with futures.

We know that time plays an important part in the price of an option and so does the impact of changes to the underlying asset. For instance, a stock being delisted or promoted to the index will potentially change the share price significantly. We also know that the intrinsic value of an option is calculated using a comparison with the underlying asset price.

Likewise, changes to dividends and other corporate actions, or interest rate movements, impact on those elements of the fair value calculation.

2.3.1 Changes to Option Contracts as a Result of Corporate Actions

Occasionally it is necessary to adjust the size of existing option contracts in order to reflect capital changes to the underlying shares as a result of a rights issue, where, for example, the number of shares in existence may change. Whilst we know that the option and the underlying asset are linked, it is important to remember that holders of options are not entitled to dividends or coupons, which may be inherent in the underlying asset. Since the share price tends to fall by the amount of the dividend after it has been announced, it follows that the price of an option will reflect any value of expected dividend payments.

We can surmise from this that the underlying and the option are separate instruments but nevertheless are very closely linked throughout the life of the option.
# END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

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<th>Answer Reference</th>
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</tr>
<tr>
<td>or out-of-the-money?</td>
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CHAPTER FOUR

DERIVATIVE USE

1. RISK

This syllabus area will provide approximately 4 of the 50 examination questions
1. RISK

Derivative products are used to transfer risk between people who wish to hedge, or to protect, against risk and those who wish to assume risk.

As such, there are numerous people and organisations that use derivative products for a variety of reasons.

The market crash and subsequent recession saw significant use of derivatives to hedge risk as well as many speculators seeking to profit from the volatility and uncertainty in the markets.

In this chapter we will look at some of the users and their reasons for using the products.

1.1 HEDGING

LEARNING OBJECTIVES

4.1.1 Understand the concept of hedging and its use

We saw in Chapters 1 and 2 that one of the main uses of derivatives markets is to provide the mechanism for participants to protect assets. Hedging, as this is known, is therefore a fundamental concept to understand when learning about derivatives markets. The fact that derivatives, if used properly, can perform this function is a major reason for the exponential growth of the industry. Participants trading for hedging purposes are a major source of business in derivatives markets.

Hedging is a method of trading which reduces risk. In terms of derivatives, it is the buying or selling of futures and options against the value of the underlying asset or product. It often involves protecting the value of underlying assets using futures and options, but at the opportunity cost of not participating in the full upside profit potential.

Hedging is not an exact science. This means that it may not always be possible to eliminate risk altogether.

This risk that cannot be eliminated is known as the **basis risk**.

Basis risk arises due to imperfect correlations. If the basis between the future and the underlying price remained constant, then it would be possible to have a perfect hedge. Factors which affect the basis risk are easily visible. For example, in the commodity markets, products such as oil have many different qualities or grades. The oil which is being hedged may be of a different quality, and may be being delivered to a different location, from the oil as defined in the futures contract specification. This causes fluctuation in the basis risk.

It is very important when hedging that this basis risk is measured constantly.

Similarly, the instrument that is used for hedging may not be an exact replication of the asset which is being hedged. An example of this is a government bond future where a notional bond is used, which may not necessarily be an actual bond that is in existence.
The standardised nature of futures and options contracts also means that it will not always be possible to exactly match the value of the assets which are being hedged. This is because the contract size of derivative instruments is fixed. Therefore, futures contracts can be bought or sold only in multiples of $100,000, for example, whereas the value which is being hedged may be $550,000 but it is not possible to buy 5½ futures contracts.

**EXAMPLE**

A fund manager wants to lock in a FTSE 100 index level of 5500 and sells futures contracts as this will be the same as a sale of the stocks at the 5500 level.

\[
\begin{array}{ccc}
\text{Index} & \text{Fund manager sold futures at 6000 level} & \text{Futures} & \text{Price} \\
6500 & +1000 & -1000 & 6500 \\
5500 & -1000 & +1000 & 5500 \\
\end{array}
\]

We can see that by selling the futures at 6000 the portfolio will now neither gain nor lose as the profit/loss on the stocks is offset by the profit/loss on the futures.

Let us look at this concept in more detail.

It is very important when hedging to remember the basis risk that exists, because the futures or options contracts may not replicate exactly, in terms of value or quality, the underlying asset or product that is being hedged. It is imperative that this risk is measured constantly.

An example of hedging can be seen where a fund manager is reviewing his portfolio and is concerned that the UK stock market may fall in the short term. However, he does not wish to change the weighting in the portfolio; therefore, he is not looking at an asset allocation or to sell stock. He looks at two possibilities: first, he can sell FTSE futures contracts, which will provide him with a profit as the market falls, thereby offsetting the fall in value of the stocks; second, he could buy a three-month FTSE put option.

1. With the futures contracts the fund manager risks incurring a loss if the market should rise until he decides to close the position.
2. With the put option he can determine how much the insurance against a fall in the market will cost, and has the comfort that, if the market should rise, he will never pay more than the original cost of the option.

It is important to be able to calculate accurately the number of contracts needed to hedge. If the wrong number of contracts is used the result will be either that the hedge is not effective or, worse, the exposure may have been increased.
To calculate the number of contracts needed in any strategy, we need to have the unit of trading of the contract and the amount to be hedged.

**EXAMPLE**

If the FTSE 100 index futures contract has a unit of trading of £10 x the index and the index stands at 5000, then 1 FTSE futures contract represents £10 x 5000 = £50,000.

If we wish to hedge a FTSE-based portfolio with a value of £1,000,000 we need to divide the value to be hedged by the contract size, so:

\[
\frac{£1,000,000}{£50,000} = 20 \text{ contracts.}
\]

If we are using an option contract to hedge a position of 100,000 BP shares and the contract size from the contract specification issued by the exchange is 1,000 shares, then we need to divide the amount being hedged by the contract size, so:

\[
\frac{100,000}{1,000} = 100 \text{ contracts.}
\]

With options, we also need to consider the strike price to be used and the premium as this will affect when the hedge starts to take effect.

**EXAMPLE**

Index stands at 5100 on 3 January.
The March futures contract is trading at 5120.
The FTSE Feb 5000 put is quoted at 50p.

**Scenario One**
The fund manager sells 5 FTSE futures contracts @ 5100.
The market rises to 5250 by mid-February. The fund manager decides the market will not fall and buys 5 contracts at 5252 to close the position.

Outcome: the hedge has cost the fund manager 5 x 152 (5100 – 5252) x £10 = £7,600 dr.

**Scenario Two**
The fund manager buys 5 Feb 5000 puts @ 50p.
The market rises to 5250 by mid-February.
The 5000 puts are priced at 5p.

Outcome: the hedge has cost the fund manager £2,500 in option premium paid to open the position and he receives £250 when he closes the position, a net cost of £2,250.

\[
5 \times 50p \times £10 \times 100 = £2,500 \text{ premium paid}
\]
\[
5 \times 5p \times £10 \times 100 - £250 \text{ premium received}
\]

Both strategies gave protection against a fall in the market, but the put option restricted the cost of the hedge against a rise in the market at a net cost of £2,250.
EXAMPLE

Fund manager buys put option at 6000 level for 50

Let us compare the use of put options against futures in the same way as we showed the impact of the sale of the futures in the diagram earlier in this section.

We can see that by using the put option instead of the future, the fund manager was able to protect against a decline in the index, less the cost of the option, and was able to participate in the increase in the index less the cost of the option.

As the illustration showed, the fund manager has a choice of different products and different protection profiles.

Other examples should be looked at to understand the mechanics with different products.
EXAMPLE

In January, a producer of crude oil which is similar in quality to the Brent crude oil contract, available on ICE Futures, is concerned that oil prices will fall in the near future. He has large overheads to cover and does not wish to be exposed to this potential fall in oil prices, which will have an adverse effect on his business and cashflow. Currently, Brent crude is trading in the physical market at $65/bbl. He looks to the ICE Futures and sees that he can sell March Brent crude futures at $64.50/bbl.

The producer needs to hedge five million barrels of oil, which is his expected output. He has to calculate the number of futures contracts that are needed; each future = 1,000 barrels, so $5,000,000 ÷ 1,000 = 5,000 contracts.

He sells 5,000 contracts at $64.48. As expected, oil prices fall to $63.60 early in February, and he decides that he does not think the market will fall much more. He finds an oil refiner who is willing to buy his five million barrels of oil at $64.25/bbl. The oil futures that he sold at $64.48 in January can now be bought back, to relinquish his obligations, for say $63.70. He is happy to do this transaction.

Profit on futures transaction:

$$5,000 \times 78 \text{ ticks} (64.48 - 63.70) \times 10 = 3,900,000 \text{ cr}$$

The outcome is that he did sell his physical oil at a reduced price in the market, but he was able to offset some of the loss incurred with the profit that he made on his futures. The futures transaction protected him from the fall in prices, but if oil prices had risen in the marketplace, he would not have been able to fully participate in this profit. This is because he would have had to offset the loss that he made on the futures position.

Another type of hedging which should be considered is anticipatory hedging. This is used by both fund managers and traders in order to lock in price levels of investments that are to be made in the future.

An example of this follows.

EXAMPLE

A fund manager receives cash in from clients to start up a new fund. He will be investing £150,000,000 in UK long gilts but has only received a fraction of the money from the investors. Therefore the fund manager uses NYSE Liffe UK long gilt options to gain immediate exposure and to lock in the price of the investment that he will make when he has received all of the funds.

Each long gilt option is for one long gilt futures contract with a nominal value of £100,000.

Therefore depending on the actual gilts that the manager wants to buy, the fund manager must buy approximately 1,500 options contracts to cover his required investment of £150,000,000. When calculating the actual number of options required the fund manager must use the price factor as issued by the exchange as a multiplier to obtain the correct congruence or match. This is necessary because bond futures contracts are based on notional bonds, rather than on specific bonds.

By entering into this transaction, the fund manager can limit the exposure to loss by the amount of premium which is paid. Some of the potential profit is forfeited for the protection which is provided by the option.

Options are used in preference to futures for this strategy because futures have different risk characteristics, where the loss potential is unlimited.
These are very simplistic examples, and the decision on whether to use futures or options to hedge a portfolio or stock is made by taking into account many factors. They illustrate how the fund manager can disperse or minimise the impact of risk on his portfolio.

**Order Flow**

With all derivative transactions, there are several conditions that should be monitored as part of the control process over trading.

With a hedge trade the following need to be considered by a user:

- **Correlation between the asset to be hedged and the derivative being used** (for example, the FTSE 100 Index future is not a suitable hedging instrument for a portfolio of British and European equities).
- **The correct number of contracts for the value of the asset to be hedged** (if this is incorrect the portfolio or position will be under hedged or geared).
- **The price of the derivative compared to its fair value** (to ensure that the cost of the hedge is not adverse, and therefore that the use of the derivative is efficient. A fund manager may set a limit above or below the fair value which once reached will prevent the derivative being used).
- **Sufficient liquidity in the derivative contract to be used** (to ensure the hedging position can be closed easily if the hedge is no longer required. A simple way of controlling this is by setting a percentage limit by reference to the open interest that is published by the exchange. If the percentage of the open interest held reaches a certain level, the derivative position will be closed out).
- **That the hedging derivative position is closed out at the same time as the position in the assets being hedged is closed** (here there is the potential gearing and risk aspect as a hedging position in the derivative becomes instead a straight position in the derivative with the resultant exposure to the market).

Hedging is a process designed to reduce or remove the risk of a position in an asset or indeed another derivative.

Traders, in say equities, can hedge their exposures by using options and vice versa but do they hedge the position as exactly as possible straight away?

The answer for a trader is usually no. The reason is that the trader often has no idea how long they may have the exposure for. Let us look at an example.
EXAMPLE

It is early August and an option trader has gone short of 1,000 BP 650p call options expiring in October shares and today the shares are trading at 625p.

At the moment, the option series is out-of-the-money and therefore will not be exercised. The trader does not need the underlying BP shares at the moment but may do so by October. To buy one million BP shares now and incur the associated costs on the basis that the trader might have to deliver the shares does not make sense. Equally, being completely naked is a high risk.

The trader will look at the delta of the option. The delta of the call options will be at 1 if it is deep in-the-money, be at around 0.5 if it is at-the-money and will be towards 0.1 if it is deep out-of-the-money.

In this case, the 650 calls are currently 25p out-of-the-money with about ten weeks to maturity. The delta might be 0.3.

Therefore the trader needs to buy around 30% of the exposure or 300,000 shares.

If the share price moves to 650p the delta will change to 0.5 and the trader will need to buy another 200,000 shares. As we approach expiry the share price is at 680p and therefore there is a certainty that the option will be exercised by the holder and so the trader will need to have the full one million shares.

You can see that the trader will adjust the number of shares held in line with the delta of the option position, selling shares if it becomes less likely that the position will be assigned and buying shares if it becomes more likely to be assigned.

This can be a problem in a volatile share that is around the strike price on expiry as the option can be in-the-money and then out-of-the-money several times, requiring careful monitoring of the share position.

It therefore follows that any problems with trading the derivative that is being used to provide the hedge could themselves pose a significant risk.

The above examples are used in conjunction with other fundamental controls over trading such as:

- price conditions (at market/best, limit order, fill or kill);
- approved counterparty and/or market;
- authorised product;
- exposure/position limits;
- policies on partial fills across several accounts/funds;
- average pricing.
1.2 INCOME ENHANCEMENT

LEARNING OBJECTIVES

4.2.1 Know the difference between covered and naked writing
4.2.2 Know the risk associated with income enhancement strategies

1.2.1 Writing Options

Fund managers need to be able to enhance the performance of their funds in all market conditions. A strategy which enables them to achieve that in stable markets, or when there is low volatility, is income enhancement.

EXAMPLE

A fund manager buys or holds significant amounts of equity stock. He is willing to sell some of these holdings at certain levels and would like to increase income over and above the dividend, if possible. He looks to the equity options market.

He has purchased 500,000 BP shares at 600p and will be ready to sell half of the holding if the stock rises more than 10%. He notes that the 650 call options, expiring in two months, can be sold for 25p. He sells 250 contracts (1000 shares per contract) at 25p.

The fund manager has given the right to someone to call the 250,000 shares at 650p anytime in the next two months in return for £62,500 (250 x 1,000 x 25p) of premium paid to him immediately.

If the stock price in the market rises above 650p he may have to deliver the stock at 650p. If it does not rise above 650p he will not have to deliver the stock.

In the first scenario, he has effectively sold the stock for 675p (650 + 25) which meets his criterion of selling on a 10% plus share rise. (Note: his profit is restricted to the difference between 600p and 675p no matter to what price the stock rises.)

In the second scenario, he still has the stock, but has received income of £62,500, or in other words, he has reduced the purchase price to 575p. This means he is protected against a fall to this level on half of his holding.

In this example, the selling of call options by the fund manager is called covered writing, because there is stock to cover the delivery if called. If the fund manager had no BP stock and sold the options it would be called naked writing, as there is no stock to cover delivery. Naked writing is highly speculative with potentially unlimited loss once the protection effect of the premium is passed.

1.2.2 Volatility

As we have seen in Section 1.2.1, an investor can gain income from writing options against an asset held (covered writing) or simply against the asset without holding the asset itself (naked writing). The naked writer has significant risk as any sudden surge up (in the case of calls) or down (in the case of puts) in the price will leave them exposed to potentially significant losses.
In addition to writing options against assets there are strategies whereby more than one position is written at the same time. This strategy uses the fact that:

- the call and put position cannot both be in-the-money at the same time; and
- volatility in the price of the underlying asset and the option moves up and down, but can also stay high or low for some period of time.

If an investor holds a share in, for instance, a utility company, and believes that the volatility in the price of the shares will remain low (share price will not move sharply up or down), then he might consider writing a straddle, which will involve selling a call and put option at the same strike price.

**EXAMPLE**

It is early September and an investor believes that the price volatility of the utility EnergyCo will be low for the next three months and that the share price will remain close to the current market price of 260p.

In the option market the price of the October 260 calls is 25p and the price of puts is 18p.

The investor sells the straddle five times, ie, five contracts and each is for 1,000 shares.

Sell 5 October 260 calls @ 25p, premium received is 5 x 1000 x 25p = £1,250

Sell 5 October 260 puts @ 18p, premium received is 5 x 1000 x 18p = £900

The investor receives a total of £2,150.

The exposure is as follows:

If the investor is right and the volatility in ECO remains low, and the shares do not move up or down by more than the combined premium (25p + 18p = 43p), the investor will not make a loss.

So if the share price is anywhere between 303p (260p + 43p) and 217p (260p – 43p) on expiry, the investor has no loss. At 303p or 217p the investor breaks even, and at 260p the investor makes the maximum profit of 43p (or £430 per contract).

However, if the volatility in the share price were to increase and the shares moved above 303p or below 217p, the investor makes a loss. A buyer of the straddle is obviously expecting volatility to increase.

Using this strategy (called a straddle because the positions straddle the strike price) requires the investor to recognise they might be assigned on the position and, if it is an American-style option, that this may happen before expiry. If volatility is low then, as the share price remains steady and the option prices fall as the expiry date becomes closer, the investor may choose to take a profit on the position by closing out the straddle rather than waiting until expiry, when, unless the share price is the same as the strike price (in our example 260p), the investor will be assigned on either the call or put.

Note: Other types of strategies include spreads and strangles and examples of these are contained in the Appendix 2 and these should be studied, as questions may be included in the examination.
1.2.3 Option Strategies

Call Spread Strategy
Buy a call option at a low strike price and sell a call option at a high strike price.

Profit is limited to the difference between the two strike prices less the net premium cost.

Risk is limited to the net premium cost.

---

Put Spread Strategy
Buy a put option at a high strike price and sell a put option at a low strike price.

The maximum profit is limited to the difference between the two strike prices less the net premium cost.
**Long Straddle Strategy**
Buy a put option and buy a call option with the same strike price.

The potential for profit is unlimited.

Risk is limited to the premium cost of buying the call and put options.

<table>
<thead>
<tr>
<th>Profit</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strike price</td>
<td>Premium cost</td>
</tr>
<tr>
<td>Futures price</td>
<td>Breakeven point</td>
</tr>
</tbody>
</table>

**Short Straddle Strategy**
Sell a call option and sell a put option with the same strike price.

Profit is limited to the income received from the premium income.

Risk is unlimited if the market price moves more than either of the strike prices plus the premium income.

<table>
<thead>
<tr>
<th>Profit</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium income</td>
<td>Strike price</td>
</tr>
<tr>
<td>Futures price</td>
<td>Breakeven point</td>
</tr>
</tbody>
</table>
**Long Strangle Strategy**
Buy a put option with a lower strike price and buy a call option with a higher strike price.

The potential for profit is unlimited.

The risk is limited to the premium cost of buying the put and call options.

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<table>
<thead>
<tr>
<th>Profit</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strike price</td>
<td>Premium cost</td>
</tr>
<tr>
<td>Breakeven point</td>
<td></td>
</tr>
</tbody>
</table>

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**Short Strangle Strategy**
Sell a call option at a higher strike price and sell a put option at a lower strike price.

The potential for profit is limited to the premium income from selling the call and put options.

The risk is unlimited if the market price moves more than either strike prices plus the premium income.

---

<table>
<thead>
<tr>
<th>Profit</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium income</td>
<td>Strike price</td>
</tr>
<tr>
<td>Breakeven point</td>
<td></td>
</tr>
</tbody>
</table>

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1.2.4 Order Flow

Many of the considerations examined in Section 1.1 also apply to writing options.

Clearly if the option is trading above its theoretical fair value, this is an advantage for the writer. Another important point is that if one leg (call or put position) is assigned, then the other will most likely be closed out (unless the investor wishes to take a straight written/short position).

It is important to stress that in any written position there is the risk of assignment either on expiry if the position is in-the-money and is not closed or assigned early (American-style options). Therefore adequate funds or the underlying assets must be held if naked writing, and therefore greater risk, is to be avoided.

Short option positions are margined.

1.3 SPECULATION

LEARNING OBJECTIVES

4.3.1 Understand the effects of gearing when using derivatives as opposed to the underlying asset(s)

We examined hedging techniques, and the reasons why participants in derivatives markets need to be able to hedge their risks, in Section 1.1. We know that hedgers are a major source of business in derivatives markets.

The other major source of business for derivatives markets, which is imperative to their success, is speculators. This is because speculators have different reasons for trading in derivatives and therefore provide liquidity to the market and the ability for hedgers to lay off their risks.

Speculators are willing to take on the risk that hedgers are trying to alleviate. In assuming these risks, speculators receive higher rewards and aim to make higher profits from their trading. Speculators usually trade according to the direction in which they anticipate that the market will move. In most cases, speculators do not trade derivatives in relation to underlying assets that they may hold. They look for opportunities where they hope that they may make profits if their trading decisions are correct.

1.3.1 Buying Options

A speculator believes that BP shares, which are currently at 600p, will rise in the next few weeks. He has approximately £60,000 to invest. He could:

- purchase 10,000 shares at 600p; or
- buy 250 of the 650p call option contracts for 25p or £62,500.

The call options give him an exposure to 250,000 shares so, if BP stock price rises as he expects, his potential profit far exceeds the amount he would make through buying 60,000 shares, yet he has made the same outlay.
1. If the stock price rises to 700p, the 650p call options will be worth at least 50p. He will then sell them for £125,000 for a profit of £62,500. Had he bought the 10,000 shares he would sell them for £70,000 for a profit of £10,000.

2. If the stock price fails to rise or indeed falls, he risks losing all his £60,000 if he buys the options.

3. If the stock falls to 575p by the expiry of the options, the 650p options are worth nothing. However, if he had taken a conservative view and only bought the 10,000 BP stock, although it is showing a loss, it is still worth £57,500.

This characteristic of derivatives, which enables a far greater reward for the same (or much smaller) initial outlay, is called gearing or leverage.

The speculator therefore wants to assume risk for potentially much higher rewards.

### 1.4 ASSET ALLOCATION

#### LEARNING OBJECTIVES

4.4.1 Understand how derivatives are used by fund managers in asset allocation

Asset allocation is a strategy which is employed by fund managers to change the allocation or weighting of assets, either between asset classes (ie, equities, bonds and cash) or between different countries or areas.

Futures contracts are used to change exposures to underlying markets very quickly. By buying index futures in one country and selling index futures in another country, for example, a fund manager can very easily manage exposures to the equity markets in the countries concerned.

In many cases, fund managers have long-term investments and do not necessarily want to disturb the underlying portfolios. The use of futures contracts allows fund managers to gain/reduce exposures, whilst leaving the portfolio itself untouched. If futures contracts are used in addition to the underlying portfolio, this is known as a futures overlay. Generally, in this case the fund manager does not intend to disturb the underlying portfolio at all, and he will unwind the futures positions when it is appropriate to do so and market conditions are right.

The fund manager may have a longer-term strategy and wish to alter his underlying portfolio in line with this. He can use futures to manage actively the exposures immediately, then he has the time to decide exactly which of the assets he wishes to change in the underlying portfolio. The fund manager wants to ensure that he achieves good prices and it will normally take longer to execute transactions in the underlying market so he does not want to rush this process. Using futures buys him the time that he needs to implement this strategy efficiently.

**Tactical asset allocation (TAA)** is another term which is used in this process. The principle is very similar to the above strategy, with the difference that TAA is taking advantage of anticipated movements in the market and is known as a directional strategy. The fund manager does not usually intend to disturb his underlying portfolio with this strategy.
In many organisations, the asset allocation strategy is defined by an asset allocation committee, group or team. They will consider such issues as congruence of the product with the fund, liquidity of the futures contracts and where the contracts are trading in relation to the fair value. Once the strategy has been defined, the fund manager will implement it, taking into account any conditions which may be imposed by the committee.

In order to determine how many futures contracts are required to implement the change in exposure, a calculation is used. The type of calculation involved varies according to which futures contract is being used.

To work out how many index futures contracts are needed to replicate say £20 million of FTSE 100 index stocks, we simply divide the value by the size of the contract as follows:

\[ \frac{20,000,000}{\£10 \times \text{index level}} \]

If the index is at 6,000 this equates to:

\[ \frac{20,000,000}{60,000} = 333.33 \text{ contracts} \]

As we cannot deal in 0.33 of a contract the fund manager will buy or sell 333 contracts to represent £20 million of stock.

The use of futures in this strategy is very efficient and the benefits are easily recognisable:

- the cost of futures transactions is much less than the underlying market transactions – typically on a 1:10 ratio for commissions;
- futures transactions are very quick and efficient to implement and liquidity is usually good;
- futures transactions can be easily reversed if the assumptions are wrong;
- there is less execution risk with futures markets;
- because the portfolios do not have to be disturbed, associated coupons, tax and dividends are not affected.

For example, a fund manager has a £100 million portfolio composed of equity shares in the US and UK, gilt stocks and cash. The ratio is:

- 40% of the fund is invested in US equities;
- 20% in UK equities;
- 20% in UK gilt stock;
- 10% in Japanese stock; and
- 10% cash.

The fund manager believes that the US equity market is due to fall and that the Japanese one will rise. He expects this to occur in the next six to eight weeks. Two possible routes that he could take are:

1. The fund manager can adjust the balance of the portfolio by selling US shares and purchasing stocks in Japanese-based companies. This may take some time to achieve, as he will need to research the markets, then undertake several transactions. Commission fees will be incurred for each transaction.
2. Alternatively the fund manager can use derivatives, in this case index futures, to gain and reduce exposure to the respective markets. He will sell S&P index futures contracts and purchase Nikkei index futures.

If he is correct in his assumptions, the sale of the S&P futures at the original market level will make a profit, when he buys them back at a lower price, as the market falls. Similarly, the purchase of the Japanese index futures at the original market level will make a profit when they are sold at a higher price as the market rises. These profits are used to offset the reduced values which are recorded for the underlying portfolio in US equities and to offset the higher cost of increasing exposure to Japanese equities.

Let us look at the way in which the asset allocation would take place using futures contracts.

### Portfolio

<table>
<thead>
<tr>
<th>£100m</th>
<th>US Equities</th>
<th>UK Equities</th>
<th>UK Gilts</th>
<th>Japan Equity</th>
<th>Cash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>40m</td>
<td>20m</td>
<td>20m</td>
<td>10m</td>
<td>10m</td>
</tr>
<tr>
<td>Wants</td>
<td>30m</td>
<td>20m</td>
<td>20m</td>
<td>20m</td>
<td>10m</td>
</tr>
<tr>
<td>Change</td>
<td>-10m</td>
<td>0</td>
<td>0</td>
<td>+10m</td>
<td>0</td>
</tr>
</tbody>
</table>

Let us assume that the US equities are primarily those in the S&P 500 index and the Japanese stocks the fund manager wants are in the Nikkei 225 index.

The size of the respective futures contracts on the CME and Osaka stock exchange is $250 x the index point and ¥500 x the index.

The futures are trading at 1,520 and 20,490 respectively.

The exchange rates are $1.68 and ¥168 to the pound.

The manager needs to sell S&P futures representing £10 million and buy Nikkei futures representing £10 million.

**Calculation**

S&P £10m x $1.68/$250 x 1,520 = $16,800,000/$380,000 = 44 contracts

Nikkei £10m x ¥168/¥500 x 20,490 = 1,680,000,000/10,245,000 = 164 contracts

Thus the fund manager will sell 44 S&P futures on the CME and buy 164 Nikkei futures on the Osaka Securities Exchange.

Asset allocation is a decision to change the exposure of the portfolio, and no protection is given against the initial decision to change the underlying exposures being incorrect. Using the futures is a substitute for buying and selling the underlying equities and it has exactly the same effect on the portfolio.
The following table shows the effect of the asset allocation decision if the assumption is correct, and if it is incorrect. It demonstrates that, if there is a profit on the futures transaction, there is a corresponding loss on the equity portfolio.

<table>
<thead>
<tr>
<th>CORRECT ASSUMPTION</th>
<th>INCORRECT ASSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Market</strong></td>
<td><strong>Japan Market</strong></td>
</tr>
<tr>
<td>Sold futures high</td>
<td>Bought futures low</td>
</tr>
<tr>
<td>Buy futures lower</td>
<td>Sell futures high</td>
</tr>
<tr>
<td>Profit on futures</td>
<td>Profit on futures</td>
</tr>
<tr>
<td>Loss on equities offset</td>
<td>Higher equity prices replicated by futures profit</td>
</tr>
<tr>
<td>by futures profit</td>
<td></td>
</tr>
<tr>
<td><strong>US Market</strong></td>
<td><strong>Japan Market</strong></td>
</tr>
<tr>
<td>Sold futures low</td>
<td>Bought futures high</td>
</tr>
<tr>
<td>Futures price higher</td>
<td>Futures price lower</td>
</tr>
<tr>
<td>Loss on futures</td>
<td>Loss on futures</td>
</tr>
<tr>
<td>Profit on equities</td>
<td>Loss on futures</td>
</tr>
<tr>
<td>offsets loss on futures</td>
<td>replicates the loss which would have been made if the equities had been purchased</td>
</tr>
</tbody>
</table>

1.5 **ARBITRAGE**

**LEARNING OBJECTIVES**

4.5.1 Understand the concept of arbitrage and its use

An arbitrageur makes a profit from locking in the price difference between two products that are the same or similar but traded on different markets. For example, an arbitrageur might seek to profit from the price differences that arises between two futures contracts that have the same underlying, such as an index futures contract traded on two different exchanges.

As each contract is trading in its own market there are times when momentarily the price showing can differ by a small amount, perhaps a tick or two. By buying in the lower-priced market and selling in the higher-priced market the arbitrageur has created a long and short position. When the prices come back into line the position can be closed. We already know that the price of both contracts will be the same as the underlying on expiry but the arbitrageur may have the opportunity to close the position before this.

In calculating the profit from such a trade the arbitrageur must take into account any margin and commission costs. Another possible trade is between the futures contract and the underlying. If the futures contract is trading at a premium or a discount to its fair value the arbitrageur can simultaneously buy or sell the underlying and do the corresponding sell or buy of the futures contracts with the profit occurring on close-out when the future is trading at fair value.

The attraction of arbitrage is that there is limited exposure as one position will offset the exposure created by the other. However, as already noted, factors such as the cost of purchasing and holding the underlying or futures positions must be taken into account and cash flow – particularly any variation margin – will also need to be considered.

Failing to close both sides of an arbitrage position simultaneously will result in an exposure and potential losses. Perhaps not surprisingly most arbitrage in derivatives is carried out using computer trading programs.
## END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What do derivatives enable to be transferred?</td>
<td>Section 1</td>
</tr>
<tr>
<td>2. What is delta in the context of hedging option positions?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>3. What are the risks in using derivatives for hedging?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>4. Why is a volatile share on expiry a potential problem for a trader that has a short position?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>5. What is the delta of an at-the-money call option?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>6. What is covered writing?</td>
<td>Section 1.2.1</td>
</tr>
<tr>
<td>7. What is the risk that a naked writer runs?</td>
<td>Section 1.2.1</td>
</tr>
<tr>
<td>8. What are straddles and spreads strategies?</td>
<td>Section 1.2.3</td>
</tr>
<tr>
<td>9. What is gearing?</td>
<td>Section 1.3.1</td>
</tr>
<tr>
<td>10. What are the advantages of using futures in asset allocation strategies?</td>
<td>Section 1.4</td>
</tr>
</tbody>
</table>
CHAPTER FIVE

THE ROLE OF A DERIVATIVE EXCHANGE

1. STRUCTURE AND OBJECTIVES OF EXCHANGES
2. TRADING MECHANISMS
3. MEMBERSHIP AND RULES

This syllabus area will provide approximately 4 of the 50 examination questions
1. STRUCTURE AND OBJECTIVES OF EXCHANGES

LEARNING OBJECTIVES

5.1.1 Understand the role, aims and benefits of derivative exchanges
5.1.2 Know the primary requirements of a regulated exchange

An exchange (or market) is the place where futures and options are traded by members, which, may be corporates like banks or oil companies or individuals, which carry out their business under the rules and regulations of the exchange or market. The market in turn is subject to regulation by domestic government agencies.

Today there are many exchanges, some trading a wide and diverse variety of products, such as the CME Group and the ICE, and others specialising in specific types, such as the LME and the Tokyo Grain Exchange (TGE).

There are over 60 exchanges varying in size and importance, but all of them strive to provide the products that the growing user base requires. Some of the most successful exchanges are the oldest, like the CME Group and the LME. The LME was taken over by the Hong Kong Exchange (HKEx) in 2012. However, some newer markets have also been extremely successful at developing and introducing products that have proven popular, such as the Korean Stock Exchange (KSE) and the Taiwan Futures Exchange (TAIFEX).

A derivatives exchange will have many roles; however, some of the key functions it performs are:

- obtaining regulatory approval for the exchange to operate;
- establishing the rules and regulations by which elected members of the exchange are bound;
- designing the products that will be listed on the exchange for trading;
- providing the trading mechanism;
- appointing or creating a suitable clearing organisation to administer the settlement of transactions;
- marketing the exchange and its products to potential users;
- establishing methods for monitoring trading and resolving any disputes that may arise.

A key objective of an exchange is to have credibility with potential members and non-member users. To achieve this it must develop and provide suitable products. It must also ensure that as wide a participation as possible takes place so that there is sufficient trading volume, often referred to as liquidity.

Whilst the financial derivatives exchange ideally wants all participants in the underlying such as fund managers and major banks to be members and trade, it may also wish to encourage other types of members, like people prepared to buy and sell contracts all day long but rarely taking a position. These may be companies operating as market-makers (making bids and offers) or individuals risking their own money in the belief that they can make substantial income from trading futures and options. These individuals are known as locals.
This type of exchange also wants and needs external or non-member participation through the placing of orders with brokers to be transacted on the exchange. These kinds of organisations include investment managers, pension funds and hedge funds; private clients are also included.

Therefore when the exchange designs the products to be listed it must take into account the client base that will want to use the product, whether it is to speculate or hedge or to make a market.

Exchanges continuously design and introduce new products, usually after much research, although they may not always be as successful as expected, or the need requires, and may ultimately be delisted.

To create a successful future or option contract there needs to be:

- a large and liquid market in the underlying asset;
- access to frequent and accurate prices of the underlying asset;
- a broad user base;
- historic and projected volatility in the underlying asset.

Without these ingredients it is difficult for a contract to attract speculators and hedgers.

Without volatility there is little reason to hedge.

Without access to prices for the underlying asset it is hard for dealers to make a price for the future or option.

The responsibility for the management of the exchanges typically lies with the chief executive, who is accountable to the board of directors. Reporting to the board are their appointed committees who consider specific issues relevant to the day-to-day operation of the exchange. These issues typically concern trading, product development, membership and rules, and default management.

Many exchanges appoint lay non-executive directors, who are independent of member firms and the markets.

The benefits that derivatives exchanges offer can be summarised as:

- Organised and regulated trading environment.
- Participation of members in making prices and trading to provide liquidity.
- Provision of a central clearing counterparty organisation to oversee and regulate the settlement of transactions on the exchange, to manage risk and to provide elements of guarantee of the performance of the contracts traded.
- The facility to transact business with counterparty risk restricted to the central clearing counterparty.
- Provision of exchange defined and tradeable products.
- Publishing prices during trading and the provision of an official closing price for each contract at the end of each trading day to enable mark-to-market valuation of positions.
- The design, development and enhancement of products to be traded on the exchange.
Exchanges, like any business, must always be looking forward and developing their strategies. Therefore, exchanges, by and large, are constantly offering new and different products to supplement existing successful products, in order to remain competitive. One way in which many exchanges have achieved this is to merge with their respective stock exchanges, as the ability to trade the underlying asset and the derivative at the same time is becoming more important to the users of the markets. Examples of exchanges which are merged in this way are SGX and NYSE Euronext. Another competitive pressure for exchanges comes from new internet exchanges. These new exchanges may offer easier remote access and cost efficiencies. Private investors may be able to have more direct access to the markets.

2. TRADING MECHANISMS

2.1 OPEN OUTCRY AND ELECTRONIC TRADING

LEARNING OBJECTIVES

5.2.1 Understand electronic and open outcry methods of trading

There are essentially three types of trading methods used by exchanges:

- **Open outcry** – members gather together physically on a market floor in pits and shout their bids and offers. For open outcry trades the flow is basically:
  - instruction sent to trading pit;
  - order is transacted and details confirmed back to salesman;
  - trade is recorded in the exchange system for matching details with counterparty;
  - client’s back office receives statement confirming details of trade.

- **Electronic** – members enter bids and offers via a screen. This is sometimes known as screen-based trading.

- A **combination** of both open outcry and electronic trading systems, for all or some of the day, is used in certain markets. An example of this is the CME Group, where trading is carried out by the open outcry method as well as via electronic trading during the day, and after hours, on the electronic Globex® system. Ultimately, the market participants decide which method is preferred.

2.1.1 Exchange Technology

Increasingly, electronic trading is being used and will probably become the norm for all financial futures and options exchanges around the world in years to come. The commodity derivatives markets are also reviewing the merits of switching to electronic trading systems. NYSE Liffe has successfully migrated its commodity products to the LIFFE CONNECT™ system; and the LME has introduced LME Select as its electronic trading platform.
A number of exchanges have developed their own systems for electronic trading. Where the trading systems have proved to be very successful, the exchange may market the system to other exchanges which need trading technology. This helps to offset the enormous cost of developing the systems, and is especially useful for smaller exchanges. The technology is used as a base for the system, and then customised for each individual exchange’s requirements and given a brand name. An example of an exchange which marketed their system technology was the OM Group in Sweden. For example, the original version of LME Select was developed by OM Technology.

Most of the exchanges that continue to use open outcry trading argue that there is no better means of price discovery, particularly when the markets are extremely volatile. This was, of course, one of the historic reasons for the creation of the open outcry method of dealing. However, many consider that it is now an expensive method of trading, compared with the electronic markets, and does not allow the wide global access to the exchange that electronic trading does. It also offers transparency as traders can see for themselves what trading is taking place and have a good feel for what is going on.

An obvious advantage of electronic trading systems is that they have an automatic matching process and therefore do not require administration staff to manage this process. Other advantages which contribute to making it cheaper to operate are:

- no market floor, with its associated costs and infrastructure;
- trade details can be automatically loaded into risk and back office systems for STP;
- wider access to trading from global locations, as no local presence is necessary; and
- fewer trading errors (no mismatches of trades occur but trading errors can still occur which could be significant).

Electronic trading systems must have facilities for cancelling orders extremely quickly as well as being able to try and recognise obvious price errors. They also have to handle the surges in volume, which are inherent in derivatives markets, without performance being affected.

Another issue is that the technology used by exchanges must keep pace with developments in technology and the systems processes used by members. This can be an expensive business and consequently, electronic markets need high volumes of activity to generate sufficient income to maintain and develop systems.

However, many of the exchanges that were fierce supporters of the open outcry system have reviewed their strategy and moved wholly or mostly to electronic trading.

Examples of these exchanges are Liffe and the Marché à Terme International de France (MATIF) in Paris (now both merged into NYSE Euronext), both of which planned to introduce electronic trading systems alongside the open outcry method. In a matter of months, however, it was plain that the preference was for the electronically traded contracts and the open outcry system was abandoned.

During 2003, ICE Futures Europe (formerly the IPE) was another market that took the decision to move from open outcry to an electronic platform, in this case to the new ICE platform. However, many traders opposed this move and its implementation was delayed.
**LIFFE CONNECT™**

The trading system used by NYSE Liffe for its derivatives trading is called LIFFE CONNECT™. It uses open-ended architecture allowing access to the market through personal computers with customised front-end software. This gives the end-user flexibility to employ their own customised trading screens to connect to the NYSE Liffe trading host, which matches orders, disseminates prices, and reports trades. LIFFE CONNECT™ is an anonymous trading environment, with orders matched either on a price/time or pro-rata basis depending on the contract. The screens show transacted prices and the aggregate size of all bids and offers above and below the market level, updated on a real-time basis. It is important for all users to be able to see the central order book and to monitor the depth of the market. Electronic trading systems must be extremely reliable and stable. Therefore it is crucial that regular, rigorous testing takes place on the system to monitor performance and to test its capacity.

**LME Select**

The trading system used by the LME is called LME Select. Exchange members are connected to the system, which allows trading on all LME contracts. It operates between 01:00 and 19:00 (London time) alongside the open outcry and telephone markets and provides an STP route for matching and clearing trades through LCH.Clearnet. The LME is creating its own clearing capability, LME Clear, which is expected to be operational in 2014.

Like LIFFE CONNECT, the front end of the system allows traders a wide range of options, so that they can have trading screens which display their own particular preferences. There is in-depth analysis of the market available and information relating to executed trades, which can be used by members’ back office operations. As well as viewing their own orders in the electronic market, traders can see the bids and offers that are being quoted, to know the depth of the market and price trends at all times.

**Eurex New Trading System**

In December 2012 Eurex launched a new trading system. The system will be introduced in a migration process moving products on a step-by-step basis from the existing system.

The new system has been developed internally and is based on Deutsche Börse Group’s proprietary global trading architecture, which is already in use at the International Securities Exchange (ISE).

The system has been built on the four pillars of performance, efficiency, capacity and reliability.

With the new trading system, Eurex will cease to use the current MISS infrastructure and VALUES application programming interface (API).

Major benefits of the new system will be that time-to-market for introducing new products and features will be significantly reduced, as well as the ability to introduce new tools for further strategy and spread trading. In addition new interfaces will be provided for exchange participants, replacing or extending the existing ones. These new interfaces will be based upon industry standards such as FIX and FAST facilitating a faster implementation by participants.

*Source: Eurex*
2.2 STRATEGY TRADES

LEARNING OBJECTIVES

5.2.2 Understand block, basis, exchange for physical (EFP) and against actuals (AA) trades

On some exchanges members are able to undertake certain types of trades, which are different from normal trading. This may be because the trade is a large size order or requires the simultaneous transaction of a trade in the underlying.

In response to this, there are certain types of strategy trades which can be performed on exchanges. These strategies include:

- block trade;
- basis trade;
- exchange for physical (EFP);
- against actuals (AA).

1. **Block trade** – a block trade is a facility whereby wholesale clients can arrange for the execution of large trades without delay and with certainty of price. The price at which a block trade is transacted may not be the prevailing market price, but it is up to the exchange to ensure that such prices are fair and reasonable. The price and size of block trades must also be quoted in the central market. If an exchange member transacts a block trade for a client, it is their responsibility to ensure that the client meets the criteria for trading (ie, on NYSE Liffe they must be a wholesale client with sufficient knowledge, expertise and understanding of the markets). On NYSE Liffe for example, block trades are executed outside of the central market but, once completed, become indistinguishable from other positions in the market.

2. **Basis trade** – another type of strategy trade that is available on exchanges is a basis trade. A basis trade comprises a long cash position together with a short position in its respective futures contract or vice versa. Basis trades may be organised outside the central market and presented to the exchange for validation and execution. This is because the execution of the futures leg needs to be guaranteed and a cross transaction is needed between each counterparty. Once completed the volume, price and contract details are published in the central market and registered by the exchange.

3. **Exchange for Physical (EFP)** – as an alternative to physical and cash settled, some exchanges such as ICE Futures Europe permit exchange for physical on some contracts. The exchanges of futures for physicals involve simultaneous transactions in the commodities and futures markets.

In an EFP:

- one party buys the physical commodity and simultaneously sells or gives up a futures position;
- one party sells the physical commodity and buys or receives a long futures position.

Usually in an EFP the price and other terms for the future and the commodity is privately negotiated by the parties and not traded in the pit on the exchange.
Once completed, the futures positions created under the EFP are treated in the clearing process exactly the same as any other futures transaction, i.e., initial margin and variation margin are applied in the normal way. Traditionally, EFPs have been used in the commodity markets but are now also used more regularly in other products like precious metals, government bonds and currencies.

4. **Against Actuals (AA)** -- this is a transaction generally used by hedgers who want to exchange futures for cash positions.

### 2.3 AFTER HOURS TRADING

**LEARNING OBJECTIVES**

5.2.3 Know the reasons and methods for ‘after hours’ trading

A trading term which is sometimes used is **kerb trading**. This term means trades which are usually arranged outside market hours or trades which are needed to correct errors which have occurred in trading. These types of transaction are strictly controlled by the exchange and must be authorised.

The term ‘kerb’ is also used in the LME in a different context. At around 13:20, once the official pricing is complete, a period of trading known as the kerb begins in the ring until 14:45. The name ‘kerb’ is derived from the practice of members in the early part of this century to gather on the roadside after the morning session and to continue to trade. Floor trading on the LME is, in fact, only carried out during ring and kerb sessions.

**Ring trading** is so called because the LME uses a ring, with the traders sitting at fixed points around the circle. Trading takes place throughout the day with each LME contract traded in specific five-minute periods known as rings.

As well as trading after hours, the links that exist between some exchanges extend to being able to monitor positions in fungible contracts tradeable on different markets outside market hours.

### 3. MEMBERSHIP AND RULES

**LEARNING OBJECTIVES**

5.3.1 Understand the categories of exchange membership and the rights and privileges thereto (brokers, dealers, broker-dealers, non-clearing members and clearing members)

5.3.2 Understand the way in which all market participants can access derivatives exchanges

Each financial derivatives exchange has a membership, which is normally drawn from all parts of the financial services industry. NYSE Liffe’s membership originates from many countries, but a number of exchanges have a mostly domestic membership.
Membership is generally divided into two categories:

- **Non-clearing members (NCMs)** are companies which only wish to execute business on the exchange and not clear. This category can be sub-divided into those companies who only execute business for themselves, also known as proprietary traders, and those who execute client business as well as or instead of their own.

- **Clearing members** are companies who wish to execute business and who furthermore are authorised to settle business with the clearing house linked to the exchange. This category can be sub-divided into those companies who clear their own and their clients’ business (individual clearing members), and those who clear other non-clearing members business as well as their own (general clearing members (GCMs)). Clearing members may be required to have separate membership for execution purposes.

It is not possible to trade directly on a market without being a member. Non-members of exchanges must access the market through either a clearing member or a non-clearing member. All markets provide details of their members, including their category of membership, so that they can be contacted by end-users for trading purposes.

Some US exchanges, for example, issue seats that entitle the holder to execute business on the exchange and, in certain cases, carry voting rights. These must be held in order to be a member of an exchange and they can be purchased from the exchange or can be leased from other member firms, depending on availability.

In successful open outcry markets these seats are very valuable as the exchange can issue seats only in line with their capacity, so there is a waiting list. This in turn pushes up the prices of the seats.

The operational expenses of exchanges are funded by exchange levies or fees on all contracts traded. Additional income is provided by the membership fees charged for seats or trading permits.

Membership in the commodity division of some exchanges may be different from its financial market division as clients may be producers and corporate users of its commodities.

End-users (as non-members of exchanges are often called) will have similar options to access markets such as NYSE Liffe and Eurex. In addition, these exchanges make statistical and trading data available to end-users.

### 3.1 EXCHANGE MEMBERSHIP STRUCTURES

Let us look at some examples of the ownership structures of the major markets:

- **NYSE Euronext** is owned 100% by its shareholders, who do not need to be members or market participants. Therefore, NYSE Euronext is known as a demutalised exchange, where ownership is not restricted to the members of the exchange. Many exchanges started life as mutuals but today many of them have demutalised. NYSE Euronext is a merged market created by the stock exchanges and derivative exchanges of Belgium, France and the Netherlands together with Portugal and Poland. The Liffe market was brought into the grouping and today an extensive range of derivatives is offered via NYSE Liffe.
The NYSE Euronext rules govern the NYSE Liffe derivatives membership capacities, which an applicant may apply for, and the rights attached to these types of membership:

- **Brokers** are entitled to trade only for third parties (including other NYSE Liffe derivatives members).
- **Dealers** are entitled to trade for their own account. In addition, dealers are entitled to trade for other NYSE Liffe derivatives members of any NYSE Euronext market undertaking of which they are a member, providing that:
  - they are authorised or otherwise licensed or permitted to do so by the appropriate regulatory body; and
  - the national regulations in the jurisdiction of the relevant NYSE Euronext market undertaking permit such activity by such persons in that jurisdiction.
- **Broker-dealers** are entitled to trade for third parties and to trade for their own account.
- **NYSE Liffe clearing capacities** – NYSE Liffe’s members are also classified in terms of the member’s clearing capacity. NYSE Liffe clearing members can be either general clearing members or individual clearing members. Clearing members can either be brokers, dealers or broker-dealers.

General clearing members can clear their own NYSE Liffe business (financial futures and options and index and equity futures and options), the business transacted by other NYSE Liffe members (under the terms of a standard clearing agreement), and, if a broker or a broker-dealer, their clients' business (including member client business). A general clearing member, subject to meeting the relevant criteria, may also be authorised to clear NYSE Liffe commodity contracts.

Individual clearing members can clear their own NYSE Liffe business (financial futures and options and index and equity futures and options) and, if a broker or a broker-dealer, their clients’ NYSE Liffe business (including member client business), but may not clear the NYSE Liffe business transacted by other members.

As stated above, to become a clearing member of NYSE Liffe a member must also be a member of LCH.Clearnet. LCH.Clearnet prescribes its own separate criteria, including financial resource requirements.

The diagram below shows the possible relationship between the client and their broker.

![Diagram](dscportfolio.com)
NYSE were looking to develop their own clearing capability, however the proposed Intercontinental Exchange takeover of NYSE, with the subsequent use of ICE Clear, has removed that need for that development.

- **Eurex AG** is a public company, and is jointly operated by AG Deutsche Börse and the Swiss Exchange. It includes the clearing structure which is integrated under Eurex Clearing. It has been structured so as to allow other derivatives exchanges to participate at a later date, if it is appropriate.

Eurex offers both direct participation as a member firm of the exchange, and indirect participation as a customer of a member. Direct participation is possible by becoming a GCM, direct clearing member (DCM), or a NCM at Eurex. The difference between these memberships is their role in the clearing process.

Indirect participation is possible by becoming a customer of one of 583 Eurex members based in 20 countries worldwide. Access can take the form of traditional brokerage services as well as automated order routing.

Institutions wishing to trade directly at Eurex via the Eurex integrated trading and clearing system must be admitted as Eurex exchange members. Eurex does not permit personal memberships. However, once a company becomes a Eurex member, Eurex does not limit the number of traders that it registers on its behalf. Companies may apply for admission subject to the following conditions:

- conduct of derivatives trading in a commercial manner as well as evidence that the respective applicant is subject to proper banking or exchange regulation in its country of origin;
- admission and registration of at least one exchange trader;
- registration of at least one qualified back office staff member;
- minimum liable equity capital of €50,000, unless the applicant is a bank;
- compliance with mandatory technical requirements for connection to the Eurex system;
- participation in the clearing process – either by signing an agreement with a GCM or with a DCM, providing that the companies are 100% affiliated.

Additionally, all exchange members may apply for a market maker licence for one or more products. Market makers are obliged to quote binding bid and offer prices at any time, upon request, in the products for which they hold a licence. In turn, they are charged reduced transaction fees.
3.2 ACCESS TO MARKETS

The relationships between market members, clearing members and clients that allows access to the markets is shown below:

In the diagram the exchange member and the clearing member can be the same firm or two different firms. This is because trades can be given up under a global clearing arrangement to a firm of the client’s choice for clearing and settlement. This is explained in greater detail in Chapter 8.

In today’s electronic markets like NYSE Liffe, members can enable many trading screens including those provided to firms that do not have direct access to the trading system. These affiliates can use screens that are in the member’s name and, therefore, the member is responsible for any transactions undertaken by these affiliates.

Examples of the electronic systems used on LIFFE CONNECT™ and Eurex and how they are accessed are provided in Appendix 6.

When giving orders to trade in a market, the client will either give the executing broker the exact details of the trade that he wishes to do, or he may speak to the broker for his advice.

When orders are given over the telephone, the salesperson should always repeat the order details back to the client for confirmation. For audit purposes, all dealing line telephones are taped and can be replayed in the event of a dispute.

The client chooses the broker whom they wish to execute the trade in the market on their behalf, but they do not choose who the execution broker will trade with. In most cases, the client will never know, and indeed does not need to know, the other counterparty involved in the trade. In electronic markets, the other party to the trade is anonymous and so will never be known by the executing broker or the client. The nature of exchange-traded markets is that the clearing organisation stands behind each trade and guarantees its performance. Therefore, the execution broker is satisfied that they can transact business with any counterparty who is a trading member of the exchange. In exchange-traded markets, the execution broker often acts as agent on behalf of the client.
The situation is different with OTC markets as these are direct counterparty markets. All transactions are made between the client and the executing broker. No other counterparties are involved as far as the client is concerned, as there is no central market. The OTC broker may choose to hedge the trade that they have done with the client, with another counterparty but this is irrelevant to the client.

When placing orders to trade in futures and options the following details must be given:

- name of the exchange;
- type of future or option, eg, long gilt, FTSE 100 future, Brent crude;
- buy or sell;
- number of contracts;
- delivery month;
- price;
- name or number of account to which the trade is to be booked;
- give-up reference (if applicable).

The additional information is to be quoted for options only:

- put or call;
- exercise (or strike) price;
- opening or closing transaction (where applicable).

When the order has been executed, or filled, then the broker must confirm the details to the client. As a matter of good practice, this must happen each time that the order is partially filled, if it is not all completed at one time.

### 3.2.1 Placing Orders with a Broker

When clients give orders to the salesperson or into the market, they specify either the exact price at which they wish to deal, or they quote one of the following price rules:

- **Market** – trade immediately at the price prevailing.
- **Limit** – states a price above (buy) or below (sell) which the trade must not be done.
- **Stop** – a price at which if reached, the deal must be done. When stop orders are triggered they become market orders and are then executed at the best price possible. Usually associated with a closing deal, ie, client buys at 88 and tells the broker to sell if the price falls to 80, in order to restrict losses.
- **Good-till-Cancelled (GTC)** – the order is left open until the required price is reached or the client cancels the GTC order.
- **Good-for-Day** – similar to GTC but is only valid for the day on which the order is placed.
- **Fill or Kill** – execute in full immediately, or the order is cancelled.
- **Spread** – a simultaneous order to trade more than one expiry/delivery, eg, buy October, sell November. This is usually priced as the difference between the two quoted prices, eg, buy the spread at 10.
- **Discretion** – the client gives an order to buy a fixed number of contracts (500) up to a price of, for example, 95. They are currently trading 90 and the market may be thin, ie, only 20 contracts are on offer. Depending on the liquidity in the contract, if the dealer were to bid for a price for 500 contracts the price would immediately increase, probably beyond his limit. Therefore, he has discretion on the order, and buys the 20 at 90. The next offer may be for 200 at 91 so he also buys those. The market moves ahead again and he fills the balance of 280 at 94.
Note: if there is a duty to provide best execution then the broker must at all times deal at the best possible price available in the circumstances for the client, eg, if he has another order to sell at 95 he cannot deliberately wait for the market to reach that point before filling both orders.

3.3 OVERVIEW OF MAJOR MARKETS

LEARNING OBJECTIVES

5.4.1 Know the principal derivative exchanges across all major markets and the types of products traded: London (ICE Futures Europe, NYSE Liffe, LME); US (CBOE, CME Group, ICE Futures US); Europe (Eurex); Asia Pacific (ASX, HKEx, HKMEx, SGX, TSE, KRX)

The membership of an exchange will vary considerably and is not dependent on the products traded. For instance, NYSE Liffe and Eurex, both have an international membership, although NYSE Liffe trades a mix of international and domestic products as does Eurex, including German, Swiss and European equity-based products. NYSE Liffe is a good example of an exchange with a diverse membership. It has approximately 200 member companies and over 70% of these are foreign owned.

Each exchange sets its own rules and regulations under which it operates. These rules, and the way in which they are administered, are vital to the success and credibility of an exchange. After all, if an exchange is not managed properly and does not operate fairly, then it is unlikely to attract investors and traders. The rules must afford participants in an exchange proper protection. These rules are, however, subject to change and will be updated regularly.

On 1 April 2013, the Financial Services Authority (FSA) was replaced by the Financial Conduct Authority (FCA) and the Prudential Regulatory Authority (PRA) who assumed the previous regulation and role including exchanges. In order to do this, the regulation designates authorised exchanges as recognised investment exchanges (RIEs).

These RIEs are able to develop their own means of fulfilling their regulatory objectives and obligations whilst being overseen by the regulator.

Recognised Investment Exchanges (RIEs) in the UK:

- ICE Futures Europe;
- NYSE Liffe;
- London Metal Exchange (LME);
- London Stock Exchange (LSE);
- Electronic Data Exchange (EDX) London;
- Swiss Exchange (SWX) Europe,*
- PLUS Markets Group.

* In January 2008, the three Swiss financial market infrastructure providers SWX Group, SegalInterSettle (SIS) Group and Telekurs Group merged to become Swiss Financial Market Services AG. In August 2008, the new company was rebranded SIX Group. In 2009, trading in the 32 Swiss blue chip stocks (ie, the shares included in the Swiss market index and Swiss leader index), which today is operated on SWX Europe in London, relocated to SIX Swiss Exchange in Zurich. This measure simplified the regulation and compliance for issuers, market participants and the SIX Swiss Exchange itself.
In order to obtain RIE status, an exchange must meet the requirements set out in the Financial Services and Markets Act (FSMA), relating to:

- financial resources;
- the monitoring and enforcement of its rules;
- the investigation of complaints in respect of its business;
- the promotion and maintenance of high standards of integrity and fair dealing;
- the protection of investors;
- trading being conducted in an orderly and fair manner;
- co-operation with other regulatory bodies by the sharing of information or otherwise;
- the provision of default rules to deal with any cases of member default.

Under the terms of FSMA, an RIE must have its own internal arrangements for clearing transactions on the exchange. Otherwise, it must appoint a recognised clearing house (RCH), for example, LCH.Clearnet, to clear transactions on behalf of the exchange and guarantee performance.

Each exchange sets out its specific objectives to maintain market integrity and investor protection in a regulatory plan, which is reviewed each year. The exchange must conduct business in an orderly manner so as to ensure proper protection to investors.

The FCA is responsible for setting the standards for RIEs and also for monitoring the recognition requirements on an on-going basis.

Exchange rulebooks typically cover areas such as;

- the operation of the market and its contracts;
- membership, members and trading rights;
- trading procedures;
- enforcement of the rules;
- arbitration;
- expulsion and suspension;
- appeal procedures;
- default regulations;
- special rules for exchange linkages.

Each member of an exchange is furnished with a set of rules and regulations for the exchange.

Let us look at some of the major markets and the products they trade.

### 3.3.1 Europe

**NYSE Liffe**

The London International Financial Futures & Options Exchange (LIFFE) was established in London in 1982. It traded a wide range of financial futures and options products including contracts on interest rates, government bonds, indices and individual equities.

In 1996, LIFFE took over the leading soft commodity and agricultural exchange in Europe, the London Commodity Exchange (LCE), and today trades futures and options contracts on soft commodities such as sugar, coffee and cocoa, as well as agricultural commodities such as wheat, corn and rapeseed.
Records of trading in soft commodities derivatives in London go as far back as 1888. These early commodity contracts included a Brazilian coffee and a sugar contract.

Since its inception in 1982, LIFFE grew by over 40% each year into what was in 1998 the second biggest exchange by volume in the world, behind the CME Group. However, competition from other European exchanges, and in particular, the introduction of the euro created a difficult environment for the exchange in 1999.

LIFFE lost the liquidity in its flagship German bund contract to Eurex, and the Frankfurt-based exchange has also captured the liquidity in the new European Index products through its Euro STOXX range of products.

Euronext was formed in September 2000, as a result of the merger of the Amsterdam, Brussels and Paris exchanges. Euronext was the first and only pan-European exchange. It took over LIFFE in October 2001 and rebranded all the derivatives business. It also took over the Portuguese exchange Bolsa de Valores de Lisboa e Porto (BVLP) in 2002. By this time the exchange was the first fully integrated, cross-border, European market for equities, bonds, derivatives and commodities. Euronext has now itself been taken over by the NYSE and rebranded NYSE Liffe.

**Principal Contracts**

NYSE Liffe is a leading European exchange in the short-term interest rate contracts, having the hugely successful Euribor futures and options and the three-month Sterling futures and options.

In addition to its financial and commodity futures contracts, NYSE Liffe lists options contracts, which are either options based on the underlying futures contracts (options on futures) or premium paid options (traded options) on equities. Equity and index products include:

- Index futures, including futures on the FTSE 100, CAC 40®, AEX®, BEL 20®, PSI 20®.
- Equity futures, including contracts listed in London under the Universal Stock Futures brand, in Amsterdam and Lisbon.
- Equity options, including both short-term American-style options and long-term European-style options.
- Index options, including options on the FTSE 100, CAC 40, AEX, BEL 20, PSI 20
- Options on trackers.
- Currency futures, including USD/EUR and EUR/USD futures.

Clearing 21®, a recognised industry standard for clearing derivatives which was developed jointly by the CME and the NYMEX, has been adapted for the clearing of cash and derivatives trading at NYSE Euronext. It is a real-time netting software that clears trades in both equities and other financial instruments, and results in considerable cost savings for both local and remote users.

NYSE Euronext uses some of the settlement and depository services of Euroclear, an independent company based in Brussels which, as the largest international central securities depository (ICSD), has one of the world’s largest settlement systems for internationally traded securities.
In respect of derivatives, Euronext.liffe (through Euronext Paris) was a founding member of the Globex alliance. This was designed to allow (subject to certain exceptions) cross-membership, electronic cross-trading and cross-margining between the CME, Singapore exchanges, BM&F, the Montreal Exchange and the Spanish MEFF. Most of these exchanges use NYSE Euronext’s NSC system for trading futures.

NYSE Liffe also harmonised the contract specifications for equity options regarding contract size, expiration cycle, last day of trading and style (European or American). Newly introduced lifetimes in existing series were based on the harmonised contract specifications.

All settlement of Euronext transactions took place through Clearnet, which is the clearing organisation which acted as a CCP for all Euronext trades. There are significant benefits to using Clearnet because settlement instructions are netted, thereby reducing capital requirements and overall costs. The derivatives business traded through Euronext.liffe was an exception to this, as it settled through the LCH. However, LCH and Clearnet merged in 2003 to create the LCH.Clearnet Group, with two separate legal CPPs; LCH.Clearnet Ltd and LCH.Clearnet SA.

The main contracts NYSE Liffe listed in February 2009 included:

1. **Futures and options on short term interest rates**
   - Euribor, Euro Overnight Index Average (EONIA), short Sterling, Euroswiss and Euroyen.
   - eSwapnote® and US$ swapnote futures and options.
   - Japanese Government Bonds (JGBs) and UK gilts.

2. **Equity and index products**
   - Index futures (including futures on the CAC 40, AEX, BEL 20, PSI 20, FTSE 100, FTSE Eurotop 100, FTSEurofirst 80, FTSEurofirst 100).
   - Equity futures, including contracts listed in London under the Universal Stock Futures brand, in Amsterdam and Lisbon.
   - Equity options (including both short-term American-style options and long-term European-style options) on certain British, Belgian, Dutch and French equities.
   - Index options (including options on the CAC 40, AEX, BEL 20, PSI 20, FTSETM 100, FTSEurofirst 80, FTSEurofirst 100).
   - Options on trackers.

3. **Currency products**
   - Currency futures and options (including USD/EUR and EUR/USD futures).

4. **Commodity products**
   - Futures on a range of agricultural products (including cocoa, coffee, sugar, corn, wheat and rapeseed).
   - Options on commodities (including various agricultural products) and commodity futures (including cocoa, coffee, sugar, wheat and rapeseed).

**Eurex**

As part of the Deutsche Börse Group, Eurex is one of the most active exchanges in the world and the growth of the Eurex exchange has been remarkable. Today it trades financial futures and options including many on a wide variety of German, Swiss and Euro Index products. The German Bund contract is the most heavily traded contract on the exchange. Eurex also provides futures and options on futures for the Euro Bobl (3.5 to 5 years), Euro Schatz (1.75 to 2.25 years) and CONF (8 to 10 years Swiss Confederation bonds).
Principal Contracts

- **Finnish stock options**, as well as futures and options on the OMXH25, the Finnish equity index.
- **Index products** – various products listed, including those based on DowSTOXX, Deutscher Aktien Index (DAX) and the Swiss Market Index (SMI).
- **Equity products** – various products listed, including those based on German, Swiss, Nordic, Dutch, Italian and French equities.
- **Money market products** – Euribor and EONIA products listed.
- **Capital market products** – various products listed including Bund, Schatz, Bobl and Buxl.
- **Exchange-traded fund derivatives**.
- **Futures on commodity and energy indices**.
- **Futures and options on gold (cash settled)**.

Eurex was a pioneering exchange in the development of remote access to the market, installing terminals in over 500 members’ offices in over 20 different countries.

Eurex provides an automated and integrated joint clearing house for its members, thereby achieving centralised, cross-border risk management. Eurex offers participants the ability to trade efficiently and settle a comprehensive range of products via a single electronic system.

Eurex operates in three trading phases:

1. The pre-trading period is the initiating phase, where members may make inquiries or enter, change or delete orders and quotes in preparation for trading.
2. Orders and quotes are matched during the main trading phase.
3. The post-trading period is where all inquiry functions are available and market, limit or stop trades for the next day may be entered.

The pre-trading period starts at 07:30 (CET) and the post trading ends at 20.30 (CET).

Since launching the euro repo market, Eurex offers the entire range of products, from cash trading to futures and repos with terms of one day to 30 years.

Eurex has set up the EEX derivatives market, a central marketplace for electrical power in Germany, since its merger with the Leipzig Power Exchange.

The clearing house of Eurex is Eurex Clearing AG. It is a wholly-owned subsidiary of Eurex Frankfurt AG, founded in June 1998.

With the expansion of the Eurex system to enable cross-border settlements and multi-currency clearing, Eurex Clearing AG clears and settles all transactions as the CPP. Transactions in securities are settled delivery versus payment (DVP) through Clearstream Banking Frankfurt, Clearstream Banking Luxembourg, Euroclear, Brussels and SIS Group, Zürich.

All central security depositories have set up omnibus accounts and established a cross-border DVP-link. In addition to securities, clearing and settlement facilities, they also offer clearing members facilities for deposits of collateral. Cross-border settlement and multi-currency clearing are facilitated by links between Clearstream Banking Frankfurt/Luxembourg, Euroclear and SIS. The main advantages for members are centralised cross-border risk management and reduced margin requirements as a direct correlation is made between risk positions and portfolio diversification.
Eurex Clearing AG monitors the position accounts of every exchange participant. The balance and individual details of every transaction are made available by the system to the exchange participant concerned and the responsible clearing member. An exchange participant can query its existing positions and position movements on the individual position accounts during the day and adjust transactions of the current day (trades) and/or the previous day (positions).

Eurex Clearing AG manages positions, fees and premiums in three different types of account for every exchange participant:

- two principal position accounts (principal – P1/P2);
- one client position account (agent – A1);
- two market-maker position accounts (M1/M2).

A client position account is made available only to exchange participants who are authorised to conduct clients’ business.

3.3.2 London

ICE Futures Europe

The International Petroleum Exchange (IPE) was set up in London in 1980, and became part of the IntercontinentalExchange (ICE) in June 2001 and was subsequently renamed ICE Futures and later ICE Futures Europe. ICE and the New York Board of Trade (NYBOT) merged in 2006, which led to the founding of ICE Futures US.

ICE Futures Europe trades futures and options on energy products, such as Brent crude, gas oil and natural gas. It is a very successful exchange and its contracts are used as global benchmarks for physical pricing of energy products. The underlying value of contracts traded each day on ICE Futures runs into billions of US dollars as industry participants trade and protect their exposure to the physical energy market.

As a global market, ICE Futures operates its energy products for 21 hours each day. Not only does it run ICE Futures Europe but it also operates ICE Futures US and ICE Futures Canada. The largest part of the ICE exchange is its OTC offering, which provides both cleared and bilateral markets in natural gas, electric power and refined products.

Principal Contracts

ICE Futures Europe lists futures and options on futures, amongst others, on the following products:

Futures and Options on Futures

- Brent crude oil.
- West Texas Intermediate (WTI) crude oil.
- Gas oil.
- Natural gas (not options).
- Electricity – energy account (not options).
- Coal (not options).
- European Climate Exchange (ECX) carbon instruments.
The London Metal Exchange (LME)

The LME is a long-established and leading world market trading contracts on aluminium, copper and other non-ferrous metals. Its roots can be traced back to the Royal Exchange in London in 1571, but it was the Industrial Revolution which brought about the need for a forward market. The LME was not, however, formally established until 1877. Copper and tin have traded on LME since the beginning. The copper contract has been re-graded twice in its history with Grade A copper contract being traded today.

Trading is partly by a version of open outcry (known as the ring) and supported by a 24-hour inter-office telephone-based market. It is conducted on the LME trading floor in five-minute ring-trading intervals running between 11:40 and 17:00 (London time). LME Select, the electronic trading system, operates between 01:00 and 19:00 (London time) and is complementary to the open outcry and telephone market operated on the exchange.

As a world leader in its field, the LME operates on a global scale, with 95% of its business being generated from outside the UK. Like most commodity derivative markets, the vast majority of its business is derived from the participants related to the physical metal industry, rather than traders and speculators, although this has changed recently with hedge funds and other investors seeking alternative products to shares and debt instruments.

Participants at the LME include metal producers, smelters, processors and consumers of physical base metals. As the forces of supply and demand from all parts of the world meet at the LME, it lies at the heart of the price discovery mechanism for metals. Like ICE, LME therefore acts as the official global benchmark, in this case for the international pricing of its listed metals. LME lists forward, rather than futures, contracts.

Although these are similar to futures, forwards are not marked-to-market daily but are settled on the delivery day (known as the prompt date). The options, which are available for trading, are options based on the underlying forward contracts (options on forwards).

Other variances from normal market practice occur at the LME. It is a 24-hour market with the trading day at the exchange beginning at 11:40 hrs and each contract trading in five-minute intervals in the morning session until 13:10 hrs. There is a kerb trading session when all seven contracts trade simultaneously between 13:20 hrs and 14:45 hrs.

The official prices of the metals are announced at the end of the morning session and it is these prices which are used as the world benchmark prices. The second session begins at 14:55 hrs and continues until 16:15 hrs when another kerb session trades until 17:00 hrs. In between the official ring-trading times, the market members return to their offices and participate in inter-office trading. The inter-office trading does not actually cease during ring-trading; the focus is just changed. Therefore, after the close of the market at 17:00 hrs until it opens the next day, members trade between themselves with the trades being booked the following day at LCH.Clearnet Ltd, the clearing house.

Futures and Options on Futures

- Aluminium alloy.
- Grade A copper.
- Standard lead.
• Primary nickel.
• Primary aluminium.
• North American special aluminium alloy.
• Tin.
• Special high grade zinc.
• London Metal Exchange Index (LMEX).
• LMEmini – small size contracts in copper, aluminium and zinc.

**EDX London**

EDX London currently offers trading services on three linked derivatives exchanges:

• Stockholm Stock Exchange in Sweden;
• Copenhagen Stock Exchange in Denmark; and
• Norway’s Oslo Børs.

There are now more than 120 contracts offered, including standardised and flexible futures and options contracts on indices and single stocks. The combined daily average volume was over 600,000 contracts per day.

Trades on EDX London are executed on the CLICK trading platform – one of the world’s most advanced automated electronic order books. On-screen liquidity is provided by an efficient set of market maker rules and obligations. Additionally the unique market place service (MPS), populated by exchange brokers, provides enhanced liquidity for trading larger volumes and more complicated strategies. Trades are settled using the market-leading SECUR technology and are currently cleared through the LCH.Clearnet Ltd. EDX London also offers a service for OTC confirmation and clearing.

EDX London is part of the LSE and was created in 2003 as a jointly owned business by the LSE and OMX. EDX London combines the strength and liquidity of the LSE with the advanced equity derivatives technology of OM AB. The LSE is home to Europe’s largest and the world’s most international equity markets. OM AB was the market leader in exchange technology, powering many of the world’s derivatives exchanges. EDX London was created to bring the cash equity and derivatives markets closer together, broadening the scope of equity derivatives trading while cutting down risk and cost.

EDX London is an RIE, regulated by the UK’s Financial Conduct Authority.
In addition to the other products available to members, there is also the EDX London Russian Equity Derivatives Service, which enables equity and index derivatives based on international order book (IOB) Russian depositary receipt (DR) instruments to be traded on-exchange and cleared by LCH.Clearnet. EDX also lists Icelandic derivatives in conjunction with its Nordic partners.

3.3.3 United States of America and Canada

The Chicago Board of Trade (CBOT) was the first organised derivatives exchange set up in 1848. Today, it is one of the largest exchanges in the world and has developed its range of products traded and facilities for members to include financial as well as agricultural based products.

Key recent developments have been:

- the adoption of LIFFE CONNECT™ as its electronic trading platform that runs alongside open outcry trading;
- the successful implementation of the common clearing link with the CME;
- the OneChicago joint venture with the CME and CBOE to trade single stock futures.
- CBOT merged into CME Group in 2007.

The CME Group

In 2007 the Chicago Mercantile Exchange (CME) and the CBOT merged to create the CME Group. This today also includes NYMEX.

The combined exchange is the largest and most diverse in the world for trading futures and options contracts.

The exchange operates open outcry and electronic trading, and some three-quarters of the trades on the exchange are made electronically. The exchange operates the CME Globex trading platform.

The exchange offers many categories of products and types of contracts (see below); the trades in these products are cleared via CME Clearing, a division of the CME.

Principal Contracts

- **Commodities** – grains, livestock, oilseeds, dairy, lumber, and other products. NYMEX softs are also offered on the CME Globex trading platform.
- **Energy and metals** – NYMEX energy products and NYMEX/COMEX metal products are traded on the CME Globex trading platform. The CME Group also offers trading in standard and mini-sized precious metal products.
- **Equities** – futures and options products on key benchmark indices including small-, medium- and large-cap companies in the US, Europe and Asia.
- **Foreign exchange** – 41 futures contracts and 31 options contracts on more than 19 currencies.
- **Interest rates** – futures and options on Eurodollars, US Treasuries, swaps, and other dollar-related instruments.
- **Real estate** – products on the US residential and commercial real estate markets.
- **Total return asset contracts (TRAKRS)** – a series of market-based indices of stocks, bonds, currencies, commodities and other financial instruments.
- **Weather** – weather contracts based on aggregate temperatures on 35 cities around the world, as well as hurricane, snowfall and frost indices.
• **Currency Products** – for example, AUD/NZD, CHF/USD, GBP/CHF.
• **Emerging Market Pairs** – for example, RMB/EUR, BRL/USD.

**Chicago Board Options Exchange (CBOE)**

The Chicago Board Options Exchange (CBOE) was formed in 1973 and is today a multi-product exchange listing products in the following categories:

• futures;
• equity options;
• index options;
• options on ETFs;
• ETFs;
• interest rate options;
• structured products.

In 2003 the CBOE formed the CBOE Futures Exchange LLC (CFE) which is a fully electronic exchange using the CBOE direct trading platform. It trades volatility futures.

CBOE and CFE products are cleared by the Options Clearing Corporation (OCC).

**International Securities Exchange (ISE)**

The International Securities Exchange (ISE) was formed on 26 May 2000 and trades a variety of equity and index options. It is now owned by the Deutsche Börse Group, which acquired it in 2007.

The structure of the market is one of trading issues in bins (a group of issues), a total of ten bins, each with a primary market maker (PMM) and up to 16 competitive market makers (CMMs).

The ISE posts the best available bids and offers in each options series. Unlike other exchanges, which display the prices offered by the specialist in the options series, the ISE’s posted prices represent the most competitive bid and offer in the entire ISE market.

PMMs and CMMs provide continuous quotations in their bins, and the ISE market displays only the best bid and ask price in each option class. All orders at the ISE (customer, firm, and market maker) receive the same execution privileges. Trade counterparty information is not visible to anyone in the ISE marketplace, including PMMs. Both parties of a trade receive confirmations without learning the identity of the counterparty. Anonymous trading allows market makers and order-flow providers to post bid and ask quotations at their set prices, free from any influence of other market participants. This anonymity enables pure order executions.

The ISE operates a sophisticated trading system that executes trades in a fraction of a second, as well as providing immediate order cancellations and accurate audit trails.

Four major components work in unison to power the ISE’s technology environment:

• **Central exchange system** – the core of the trading system, the central exchange system houses the trade matching engine, processes quotes, and broadcasts trade information to market participants.
• **Order routing system** – order-flow providers route their orders to the ISE’s order routing system, a front-end system that submits orders to and returns confirmations from the central exchange system in the preferred message format of the order-flow providers.

• **Surveillance system** – developed by ISE, the surveillance system monitors marketplace activity. Automated alerts notify the ISE’s surveillance staff of unusual trading activity and potential violations of ISE trading rules.

• **Telecommunications network** – the telecommunications network receives market data feeds from underlying markets and disseminates ISE quotes to market participants.

The ISE is cleared by the OCC.

**OneChicago**

In the summer of 2002, a joint venture US single stock futures exchange was created, by the CME, CBOE and CBOT. It is called OneChicago and lists 80 well-known US stocks, narrow-based indices and ETF futures on its electronic trading system.

OneChicago also operate EFPs on several major securities.

• **National Futures Association (NFA)**

The NFA, in the US, plays an important role in the futures industry’s self-regulatory responsibilities, by screening all firms and individuals wishing to conduct business with the investing public. The NFA’s activities are overseen by the CFTC, the government agency responsible for regulating the US futures industry.

Virtually every firm or individual who conducts commodity futures or options business with the public must be a member of the NFA and registered with the CFTC. NFA member categories include commodity trading advisers (CTAs), commodity pool operators (CPOs), futures commission merchants (FCMs) and introducing brokers (IBs).

**Canadian Derivatives Exchanges**

The markets for derivatives products in Canada were rationalised in 2000. All financial derivatives products are now traded on the Montreal Exchange and the agricultural commodity derivatives are traded on the Winnipeg Commodity Exchange, which is now owed by ICE and trades as ICE Futures Canada. All derivatives products in Canada are cleared by the Canadian Derivatives Clearing Corporation.

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Types of products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winnipeg Commodity Exchange</td>
<td>Canola, barley, peas and wheat</td>
</tr>
<tr>
<td>Montreal Exchange</td>
<td>Interest rate futures and options</td>
</tr>
<tr>
<td></td>
<td>Index futures and options</td>
</tr>
<tr>
<td></td>
<td>Equity futures and options</td>
</tr>
</tbody>
</table>
3.3.4 Australia

The Australian Securities Exchange (ASX)

The Australian Securities Exchange (ASX) group was created through the merger of the Australian Stock Exchange and the Sydney Futures Exchange in 2006.

The ASX has a diversified range of futures and options markets – including markets for equities and interest rates as well as agricultural, energy and environmental markets. It has introduced cattle futures and is contemplating starting water futures.

Derivatives markets continue to evolve and gain in importance in the domestic and global financial and commodity markets. Also, new markets that trade futures and options are joining the existing community and perhaps, not unexpectedly, these exchanges are found in locations such as China, India, South America, Asia and the Middle East.

3.3.5 Asia

Singapore Exchange (SGX)

The Singapore Exchange Derivatives Trading (SGX-DT) Division was formerly the Singapore International Monetary Exchange (SIMEX), until the stock and derivatives exchanges merged in 1999. SIMEX was established in 1984. Over the years, SGX-DT’s range of international products and trading activity has grown, making it one of the leading derivatives exchanges in Asia.

The exchange offers a diverse range of international products. It is a founder member of GLOBEX and together with the CME, SGX-DT established the world’s first mutual offset system (MOS) in 1984 – a futures trading link across time-zones offering products such as Eurodollar, Euroyen and Japanese government bond futures. In addition, SGX-DT was the first to launch future contracts based on the Japan and Taiwan stock indices.

The exchange operates the electronic trading system (SGX ETS). They complement each other, providing extended trading opportunities spanning different time-zones, giving customers ultimate flexibility. The SGX ETS provides global electronic trading access through members’ in-house systems, Bloomberg and independent software vendors including Easyscreen, GL, Nyfix and Patsystems.
SGX-DT lists the following products:

<table>
<thead>
<tr>
<th>PRODUCT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGX Eurodollar</td>
</tr>
<tr>
<td>SGX Euroyen Tokyo Interbank Offered Rate (TIBOR)</td>
</tr>
<tr>
<td>SGX Euroyen London InterBank Offered Rate (LIBOR)</td>
</tr>
<tr>
<td>SGX Euroyen TIBOR options</td>
</tr>
<tr>
<td>SGX Euroyen LIBOR options</td>
</tr>
<tr>
<td>SGX JGB</td>
</tr>
<tr>
<td>SGX mini-JGB</td>
</tr>
<tr>
<td>SGX Singapore interest rate future</td>
</tr>
<tr>
<td>SGX Singapore government bond</td>
</tr>
<tr>
<td>SGX Nikkei 225</td>
</tr>
<tr>
<td>SGX Nikkei 300</td>
</tr>
<tr>
<td>SGX MSCI Hong Kong+</td>
</tr>
<tr>
<td>SGX MSCI Singapore</td>
</tr>
<tr>
<td>SGX MSCI Taiwan</td>
</tr>
<tr>
<td>SGX MSCI Japan Index</td>
</tr>
<tr>
<td>SGX Middle East crude oil</td>
</tr>
<tr>
<td>SGX Straits Times index</td>
</tr>
<tr>
<td>SGX S&amp;P CNX Nifty</td>
</tr>
<tr>
<td>SGX Dynamic Random Access Memory (DRAM)</td>
</tr>
<tr>
<td>Single Stock Futures</td>
</tr>
</tbody>
</table>

**Hong Kong Exchanges and Clearing Ltd (HKEx)**

Hong Kong Exchanges and Clearing Ltd (HKEx) was formed in 2000 by the merger of the stock and derivatives exchanges in Hong Kong.

HKEx is the holding company of the Stock Exchange of Hong Kong Ltd, Hong Kong Futures Exchange (HKFE) Ltd, Hong Kong Securities Clearing Company Ltd, HKFE Clearing Corporation Ltd and the Stock Exchange of Hong Kong (SEHK) Options Clearing House Ltd.

The HKFE Clearing Corporation Ltd (HKCC), a wholly-owned subsidiary of HKEx, clears and guarantees all futures and options trades (except stock options) through its facilities using the standardised portfolio analysis of risk (SPAN) of risk margin system. All stock options contracts traded on the exchange are cleared through a central clearing house, the SEHK Options Clearing House (SEOCH), also a wholly-owned subsidiary of the HKEx.

HKEx uses an electronic trading system for all its derivative contracts, called Hong Kong Automated Trading System (HKATS).

HKEx is regulated by the Hong Kong Securities and Futures Commission.
HKEx lists the following products:

<table>
<thead>
<tr>
<th>Type of product</th>
<th>Example of product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity index products</td>
<td>MSCI China free index futures</td>
</tr>
<tr>
<td></td>
<td>Hang Seng index futures</td>
</tr>
<tr>
<td></td>
<td>Hang Seng index options</td>
</tr>
<tr>
<td></td>
<td>Mini Hang Seng index futures</td>
</tr>
<tr>
<td>Equity products</td>
<td>Stock futures</td>
</tr>
<tr>
<td></td>
<td>Stock options</td>
</tr>
<tr>
<td></td>
<td>International stock futures</td>
</tr>
<tr>
<td></td>
<td>Options on international stock futures</td>
</tr>
<tr>
<td>Interest rate products</td>
<td>One-month Hang Seng Interbank Offered Rates (HIBOR) future</td>
</tr>
<tr>
<td></td>
<td>Three-month HIBOR future</td>
</tr>
<tr>
<td></td>
<td>Three-year exchange fund note future</td>
</tr>
</tbody>
</table>

**Tokyo Stock Exchange (TSE)**

The Tokyo Stock Exchange (TSE) offers trading in financial futures and options. As its name suggests it also offers equities and other securities. It has an integral clearing facility for futures and options which also uses the SPAN portfolio-based margining system.

**Principal Contracts**

- Topix futures;
- Topix options;
- Topix sector index futures;
- S&P/Topix 150 futures;
- Equity options;
- JGB futures;
- Options on JGB futures.

Note: as mentioned in Section 1 of this chapter, HKEx has successfully taken over the LME.

**Hong Kong Mercantile Exchange (HKMex)**

The Hong Kong Mercantile Exchange (HKMex) lists futures contracts on gold and silver.

**Korea Exchange (KRX)**

The Korea Exchange (KRX) currently holds the number one position in terms of volume of activity, with approaching four billion contracts traded in 2011.

The exchange lists products on equity index and individual equities, interest rates, commodities and currencies.
Key contracts are:

- Korta Composite Stock Price Index (KOSPI) 200 futures and options;
- US dollar futures;
- 3-year T-Bond futures.

Although formed in 1956, the Korea Stock Exchange did not start trading listed KOSPI index products until 1996–97. Since then the growth in trading of derivatives on the exchange has been exceptional.

We have only begun to scratch the surface of the huge list of derivatives exchanges, which exist and are being developed continuously around the world. We can also see from learning about some of the links which have formed between exchanges that the ability for customers to trade global products is paramount. Another important requirement is the efficiency of trading systems and the settlement process. Therefore, we have seen a lot of consolidation and particularly the merging of stock and derivatives exchanges to form new sleeker, more efficient and cost-effective organisations.

### 3.4 OVERVIEW OF DEVELOPING MARKETS

**LEARNING OBJECTIVES**

5.5.1 Know the principal developing derivative exchanges and the types of products traded: Brazil (BM&FBOVESPA); China (Dalian, Shanghai, Zhengzhou); Dubai (Gold and Commodities Exchange); India (National Stock Exchange, Multi Commodity Exchange, United Stock Exchange of India); Mexico (MDF); Russia (Moscow Exchange); South Africa (Johannesburg Stock Exchange)

There are several markets in Latin America:

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Types of products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buenos Aires Futures Market, Argentina</td>
<td>Futures and options on futures on corn, soybean, sunflower seed and wheat.</td>
</tr>
<tr>
<td>Rosario Futures Exchange, Argentina</td>
<td>Futures on cattle, corn, sorghum, sunflower seed, wheat, bonds and T-notes.</td>
</tr>
<tr>
<td>Bolsa de Mercadorias &amp; Futuros, Brazil (BM&amp;F)</td>
<td>Futures, forwards and options on futures on gold, index, interest rates, exchange rates, sovereign debt, swaps, flex options and agricultural commodities.</td>
</tr>
</tbody>
</table>

### 3.4.1 Brazil – Bolsa de Mercadorias e Futuros (BM&F) (The Mercantile & Futures Exchange)

The BM&F was founded in July 1985, with trading starting on 31 January 1986. In 1991, the BM&F signed an operational agreement with the São Paulo Commodities Exchange (Bolsa de Mercadorias de São Paulo (Bmsp)), a longstanding market that was formed in 1917.
In 1997, the Brazilian Futures Exchange of Rio de Janeiro, which was founded in 1983, consolidated into BM&F; in 2002, the BM&F launched the Brazilian commodities exchange, which united the commodity exchanges from the states of Gaias, Mato Grosso do Sul, Minas Gerais, Parana and Rio Grande do Sul, and from the city of Uberlandia. The BM&F renders clearing and settlement services to this new exchange, which started trading in October 2002. The BM&F has proved to be a very successful exchange.

In 2008, the Brazilian Stock Exchange (Bovespa) and the BM&F merged to create the Brazilian Securities, Commodities and Futures Exchange – BM&FBOVESPA SA, the world’s third largest exchange in terms of market value.

**Principal Contracts**

- One-day interbank deposit futures.
- Other products include gold, indices, bonds and agricultural commodities.

Bovespa lists options on securities with the index futures and options listed on the BM&F.

The BM&F exchange is the major derivative market in South America.

### 3.4.2 Mexico

In Mexico, Mercado Mexicano de Derivados (MexDer) (Sociedad of Anonima de Capital Variable (SA de CV)) is the Mexican derivatives exchange. It began operations on 15 December 1998, with the listing of futures on financial underlying assets, and is incorporated as a corporation under Mexican law (SA de CV), authorised by the Secretaría de Hacienda y Crédito Público (SHCP) (Ministry of Finance and Public Credit).

MexDer and its clearing house (Asigna) are self-regulatory entities that function under the supervision of the following financial authorities:

- SCHP;
- Banco de Mexico; and
- Comisión Nacional Bancaria y de Valores (CNBV) (National Banking and Securities Commission).

The exchange lists, amongst others, the following contracts:

- Mexican Peso/US Dollar futures;
- The Mexican Stock Exchange price and quotations Index futures and options;
- A 91-Day treasury bill and three-year bond futures;
- Options on ETFs – iShares S&P500 Index IVV/Nasdaq 100-Index Tracking StockSM, QQQQSM;
- Futures and options on some individual stocks.

### 3.4.3 China

China has three derivatives exchanges that are ranked amongst the top 40 in the world today:

- Dalian Commodity Exchange (DCE);
- Shanghai Futures Exchange (SFE); and
- Zhengzhou Commodity Exchange (ZCE).
The **Dalian Commodity Exchange (DCE)** was founded on 28 February 1993 as a self-regulated, non-profit organisation. Today it is the biggest agricultural commodities futures trading centre in China and, according to the FIA at the end of 2011 was 15th globally in terms of volume, the highest of the Chinese markets.

Its product range is based on soya bean and corn, the latter being in the top tier of agricultural products traded in the first half of 2008 (Source: Futures Industry Association).

The **Shanghai Futures Exchange (SHFE)** is the result of the merging of three exchanges:

- Shanghai Metal Exchange;
- Shanghai Commodity Exchange; and
- Shanghai Cereals & Oils Exchange.

SHFE started trading in May 1999 and it currently trades aluminium, copper and natural rubber, as well as fuel oil and zinc.

The **Zhengzhou Commodity Exchange (ZCE)** was established in 1992. It trades futures contracts on wheat, rapeseed oil, cotton, sugar, green bean and pure terephthalic acid (PTA).

### 3.4.4 India

India is home to several exchanges that trade derivatives products including:

- National Stock Exchange of India (NSE);
- Multi Commodity Exchange of India (MCX); and
- United Stock Exchange of India (USE).

Key contracts traded include the S&P CNX Nifty index futures and options on the NSE and silver, euro/rupee, dollar/rupee, crude oil and natural gas futures on MCX. In operation for just over a year, India’s newest exchange, the USE, trades currency futures and options.

The growth in derivatives trading in India has seen the exchanges becoming established in the leading global exchanges. In 2011 the NSE was ranked 5th in volume of activity, MCE 9th and the USE 13th.

### 3.4.5 Moscow Exchange

The Moscow Exchange (Moscow Interbank Currency Exchange – MICEX) derivatives market is called FORTS (Futures and Options in Real-Time Settlement) and is a leading trading venue for derivatives in Russia and Eastern Europe. FORTS combines the advanced infrastructure, reliability and guarantees of Open Joint Stock Company (OJSC) MICEX-RTS as well as state-of-the-art technologies for futures and options trading with more than ten years of stable and successful market development.

OJSC MICEX-RTS acts as an organiser of trading on FORTS. Clearing is performed by joint stock company, RTS Clearing Center, specialising in clearing services on the derivatives market.

OJSC MICEX-RTS develops and implements instruments that allow market participants to hedge against market risk on the stock, FX, debt and commodity markets.
The derivatives which are available for trading on FORTS are based on the RTS index, MICEX index, Russian Volatility index, sector indices, shares and bonds of Russian issuers, the Russian Federation government bonds, foreign currencies, average overnight MosIBOR rate, three-month MosPrime rate and commodities including Urals and Brent oil, gasoil, gold, silver, and sugar.

Trading hours of the FORTS Market are from 10:00 am to 6:45 pm and from 7:00 pm to 11:50 pm Moscow time.

Source: http://rts.micex.ru/a467

3.4.6 Dubai Gold and Commodity Exchange (DGCX)

With Dubai historically being an international hub for the physical trade not only of gold but also many other commodities, the establishment of the Dubai Gold and Commodities Exchange (DGCX) was the next logical step for the region and the local economy. The DGCX commenced trading in November 2005 as the region’s first commodity derivatives exchange and has become the leading derivatives exchange in the Middle East.

The exchange trades gold and silver futures and options, Indian rupee and other currency pairs futures as well as steel amongst its listed products.

3.4.7 Johannesburg Stock Exchange (JSE)

The JSE was established in 1887 and by 2000 the exchange had successfully listed its first ETF.

In 2001 the JSE acquired the South African Futures Exchange (SAFEX) and became the leading exchange in Africa for the trading of both equities and equity and agricultural derivatives trading.

The JSE agreed to retain the Safex branding and created two divisions – Safex Financial Derivatives and Safex Agricultural Derivatives.

The JSE Ltd is licensed as an exchange under the Securities Services Act, 2004. The JSE has evolved from a traditional floor-based equities trading market to a modern securities exchange providing fully electronic trading, clearing and settlement in equities, financial and agricultural derivatives and other associated instruments and has extensive surveillance capabilities. The JSE is also a major provider of financial information.

The JSE has several successful derivatives sectors including:

**Equity** – products include:
- can-do options;
- single stock futures;
- equity index futures;
- variance futures;
- SAVI Top 40;
- dividend futures;
- equity options;
- international derivatives.
Commodity – products include:
- Chicago corn futures & options;
- Crude oil futures;
- Gold futures;
- Options on commodity futures;
- Platinum futures;
- SAVI white maize;
- Grain futures & options.

and

Currency – products include:
- Currency futures and options on sterling, yen, dollar and Australian dollar all against the rand;
- Commodities covering agriculture, metals and oil.
## END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is a key objective of an exchange?</td>
<td>Section 1</td>
</tr>
<tr>
<td>2. What are the four ingredients for a successful futures or options contract?</td>
<td>Section 1</td>
</tr>
<tr>
<td>3. How would you define a derivatives exchange or market?</td>
<td>Section 1</td>
</tr>
<tr>
<td>4. Why are derivatives and stock exchanges merging?</td>
<td>Section 1</td>
</tr>
<tr>
<td>5. What does open outcry mean?</td>
<td>Section 2.1</td>
</tr>
<tr>
<td>6. What is the electronic trading system used on the LME called?</td>
<td>Section 2.1.1</td>
</tr>
<tr>
<td>7. What is EFP?</td>
<td>Section 2.2</td>
</tr>
<tr>
<td>8. What is a block trade?</td>
<td>Section 2.2</td>
</tr>
<tr>
<td>9. What is the difference between a clearing member and a non-clearing member of an exchange?</td>
<td>Section 3</td>
</tr>
<tr>
<td>10. What is a limit order?</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>11. What is needed for an exchange to gain RIE status?</td>
<td>Section 3.3</td>
</tr>
<tr>
<td>12. Which major index products are listed on NYSE Liffe and Eurex?</td>
<td>Section 3.3.1</td>
</tr>
<tr>
<td>13. What is EDX?</td>
<td>Section 3.3.2</td>
</tr>
<tr>
<td>14. How would you describe the HKEx?</td>
<td>Section 3.3.5</td>
</tr>
<tr>
<td>15. Which European exchange has been taken over by which exchange in the Far East?</td>
<td>Section 3.4</td>
</tr>
<tr>
<td>16. What products are traded on the FORTS system?</td>
<td>Section 3.4.5</td>
</tr>
</tbody>
</table>
CHAPTER SIX

THE ROLE OF THE CLEARING HOUSE

1. THE STRUCTURE AND OBJECTIVE OF CLEARING HOUSES 121
2. MEMBERSHIP AND RULES 123
3. OVERVIEW OF CLEARING HOUSES 126

This syllabus area will provide approximately 3 of the 50 examination questions
1. THE STRUCTURE AND OBJECTIVE OF CLEARING HOUSES

1.1 THE STRUCTURE OF A CLEARING HOUSE

LEARNING OBJECTIVES

6.1.1 Understand the purpose of a clearing house and its relationship with the exchange

The clearing organisation of an exchange is fundamental to the integrity, and, therefore, the credibility of the market, because it independently deals with the post-trade process, providing a form of segregation between dealing and settlement, as well as providing risk management to the process. It is the clearing organisation which usually acts as the guarantor of the contracts that are traded and is often referred to as the clearing house or, in the US, clearing corporation. There are approximately 50 clearing houses worldwide serving futures and options markets.

The benefits of a clearing organisation are fundamental to the characteristics of exchange-traded products. In most cases, it acts as the central guarantor to each and every deal which is transacted on the exchange(s) covered by the clearing organisation. Therefore, every organisation that transacts business on an exchange can look at the clearing structure and take comfort from the risk management procedures which are in place to ensure investor protection. The robustness and efficiency of the clearing organisation employed by the exchange are vital to its success and integrity.

The main role of the clearing organisation is usually to act as CCP for all trades on the exchanges for which it acts. This means that rather than member A and member B being counterparties to the contract traded, the clearing organisation becomes the counterparty to both member A and member B. Should member B default on the transaction in any way, the clearing organisation will still guarantee member A the performance of the contract.

Over time, the structure of clearing organisations has changed and, of course, the various organisations themselves differ according to their independence from the exchange whose contracts they clear. The least independent are not even incorporated as separate companies and are divisions of the exchange in question. This is true of arrangements at the CME Group, SGX-DT, Thermal Systems Integration For Fuel Economy (TIFFE) and in London. These clearing organisations are, to all intents and purposes, indistinguishable from the exchanges.

As mentioned earlier, in London the futures exchanges and LCH.Clearnet Limited are regulated by the UK regulator. Regulation of overseas clearing organisations varies from country to country, but typically falls to the principal regulator of securities business. The US arrangements are more complicated than elsewhere, and the regulation of the clearing of futures and options on futures (CME Group, NYMEX) falls to the CFTC, while regulation of clearing of options on equities (Options Clearing Corporation (OCC)) falls to the Securities and Exchange Commission (SEC).
LCH.Clearnet is an RCH under UK regulation and as such it sets out its own regulatory objectives in the same way that the UK exchanges do as RIEs. The UK regulator oversees LCH.Clearnet in this function to ensure that it has proper risk management policies and maintains the financial integrity of the markets. LCH.Clearnet must be able to ensure the performance of transactions effected on the exchanges and as CCP to all clearing members of the exchanges, assumes the risk inherent in that role. It must provide an appropriate range of clearing and settlement services to the exchanges for which it clears business. These services must be of sufficiently high standard in order that the exchanges can meet their own regulatory objectives as RIEs. Each of the clearing members of LCH.Clearnet is also regulated by the FCA, therefore LCH.Clearnet co-operates with the FCA to ensure that it facilitates the exchange of information about its members.

However LCH.Clearnet is the subject of a takeover by the LSE. As noted in the previous chapter, some markets, such as NYSE Liffe, were looking to take their clearing away from LCH.Clearnet and to develop an inhouse clearing facility.

As CCPs, the clearing organisations become counterparties to each trade. This vitally important process is called novation.

### 1.1.1 Principles for Financial Market Infrastructures

Candidates should look at the IOSCO Principles for financial market infrastructures. This publication is available on the BIS website (www.bis.org) and the IOSCO website (www.iosco.org).

Introducing the IOSCO Principles at this point will allow you, if necessary, to cross reference the IOSCO Principles later in the workbook, ie, Principal 4 in the Credit Risk section (Chapter 10, Section 1.2), Principle 14 in the Segregation section (Chapter 8, Section 5.1.1) and Principle 17 in the Operational Risk section (Chapter 10, Section 3.1). This would provide scope for future exam items on the IOSCO Principles once the impact of the regulation becomes clear and this regulation becomes embedded into infrastructure.

### 1.2 THE CENTRAL COUNTERPARTY (CCP) CONCEPT

#### LEARNING OBJECTIVES

6.1.2 Understand the concept of central counterparty (CCP) and its application

The central clearing counterparty concept is based on the independent involvement of a party that will manage and guarantee the settlement of the trade in addition to the initial trading counterparties.

The CCP deals with clearing members who meet the criteria for membership. A key role is to manage the risk of a member failing to settle its obligations. This is done by a process of margining.

The CCP becomes the legal counterparty to each side of the trade, through a process called novation (see Section 1.3) and thus it stands between the original counterparties to the trade and guarantees the settlement of the trade.
The CCP concept is well known in on-exchange derivatives markets but, more recently, it has become the standard in many equity markets; for example, the LSE has in the UK securities markets operated with a CCP model in conjunction with LCH.Clearnet since 2001.

Following the market crash of 2008, regulators sought greater control over counterparty/default risk in the OTC derivatives market. See Chapter 9 for further information.

The CCP plays a vital role in ensuring the credibility of the markets and giving the trading parties certainty of settlement of their trades. It manages counterparty and settlement risk.

The central clearing counterparty concept is embraced by central banks, regulators and governments around the world as the optimum way to reduce the risk of failure to settle transactions and it is being incorporated into regulatory directives and legislation worldwide.

1.3 NOVATION

**LEARNING OBJECTIVES**

6.1.3 Understand the process of novation

The legal term which is used to describe the cancellation of the original contractual relationships and the substitution of two new ones with the clearing organisation is novation. This process can take place only after the original trades between the two counterparties have been registered.

In this process, the clearing organisation becomes the buyer to every seller, as traded in the market and the seller to every buyer, as traded in the market. Once this process takes place, the clearing members have a relationship for each trade with the clearing organisation. They no longer have a contractual relationship with each other and, therefore, they are only concerned with the standing of the clearing organisation in the event of a default in the market.

2. MEMBERSHIP AND RULES

**LEARNING OBJECTIVES**

6.2.1 Know the requirements for a clearing member status

6.2.2 Understand the relationship between the clearing house and clearing member

Each clearing organisation sets out its own criteria for membership which includes minimum capital requirements and costs of membership.

In order to become a clearing member of LCH.Clearnet, companies must fulfil (and continue to fulfil, as long as they are members) the following obligations.

- **Legal authority** – to trade futures and options.
The Role of the Clearing House

Chapter Six

- **Contractual basis** – members must acknowledge the relationship with LCH.Clearnet as being on a principal-to-principal basis.
- **Regulation acceptance** – members must acknowledge in the clearing member agreement that they accept LCH.Clearnet’s regulations.
- **Regulatory capital** – members must comply with the regulatory capital requirements relating to the full scope of their activities. LCH.Clearnet has the right to require additional resources at any time from any member.
- **Financial reporting** – members must provide quarterly annual financial statements within 30 days of the end of each quarter, as well as annual audited accounts. LCH.Clearnet obtains members’ regulatory reporting returns directly from the FCA.
- **Fit and proper staff** – members must demonstrate that their senior officers have the personal integrity to direct the business and that their managers and staff have appropriate specific experience in handling the operation of futures and options clearing.
- **Banking arrangements** – members are required to participate in the protected payments system (PPS) for making payments to and from LCH.Clearnet Ltd. Therefore members must have agreements in place with one or more PPS authorised banks.

LCH.Clearnet sets **minimum requirements** for net liquid assets and core capital of members. These levels are typically co-ordinated with the levels set by the exchanges and vary according to the nature of clearing business undertaken.

**Note:** Only clearing members of an exchange will also be members of the clearing organisation.

As CCP to all trades, the clearing organisation is exposed to the potential default of its members and must manage the associated risk efficiently. It does this by imposing stringent membership requirements and continuously reviewing existing members, by position monitoring and margining.

Position monitoring is performed on a daily basis and involves the analysis of each member’s risk in relation to their ability to cover their margin liabilities and delivery obligations.

The relationship between the clearing organisation and its members is typically a principal-to-principal arrangement. This means that the clearing organisation recognises only the clearing member. Most clearing organisations operate a facility for members to run two accounts with them. This allows for members to segregate their own proprietary business from that of their clients. This is very useful for identifying clients’ assets in the event of a member default. There is a possibility of a third account which is for clients whose business is not required to be segregated.

Where LCH.Clearnet, for example, offers a dual account facility, there is no right of offset allowed between the accounts. However, within each member’s individual account the positions are netted so that the member has to pay only the net margin requirement. This is not always the case, and some clearing organisations, particularly in the US, margin the proprietary and client accounts gross. The fundamental difference between net and gross margining at clearing organisation level is that in the former the gross margin, collected by brokers, is divided between the broker and the clearing organisation, while in the latter it is held by the clearing organisation.
In the UK, safekeeping and segregation of client margin held by brokers is governed by the client money rules of the UK regulator and relevant European directives. In the event of a default, whilst some clearing organisations may use excess proprietary account funds to cover losses in the client account, they may also use excess client funds to cover losses in the proprietary account, if necessary. All client funds must be held by brokers in FCA-approved bank accounts.

The clearing organisation has a banking and treasury function which manages all of the margin payments, settlements and interest monies that are handled for its members. The treasury area must be run very efficiently, to ensure that the margin requirements demanded from its members are met in full every day. It is important that this process is performed in a timely manner because the clearing organisation must cover the risks of its members. Also, in the case of variation margin, the clearing organisation must collect in all the losses from members’ positions in the markets and pass the funds out for members’ positions which are in profit.

At LCH.Clearnet, the treasury operations department collects all monies due from its members via its PPS. This is a system which allows LCH.Clearnet to automatically debit or credit funds to and from the clearing members’ accounts, for all currencies used by LCH.Clearnet. PPS allows the LCH.Clearnet treasury department to ensure that all settlement of funds is completed every day by 9:00 am. As a condition of being a clearing member of LCH.Clearnet, each member must use an authorised PPS bank and agree to settle funds in this way.

Option premiums are paid or received with the clearing organisation each day as, in most cases, is the variation margin, the daily profit or loss, on futures contracts that are marked-to-market.

The clearing organisation has a major role to play in the delivery process for futures and options contracts. As each contract is traded, it has the clearing organisation, as the counterparty, exchange any of underlying asset or cash due under the delivery obligations made through them.

The clearing organisation oversees the delivery process on behalf of the exchange and sets out the rules and procedures which clearing members and their clients must abide by. These rules are set out in co-operation with the exchange. Each clearing organisation publishes its rules and timetables for the delivery process.
3. OVERVIEW OF CLEARING HOUSES

LEARNING OBJECTIVES

6.3.1 Know the principal clearing houses and their major markets: CME Group/OCC; LCH.Clearnet/Eurex; ICE Clear

3.1 LCH.CLEARNET LTD

LCH.Clearnet has some 117 members representing a cross-section of the industry.

LCH.Clearnet clears business on the following markets.

- NYSE Liffe;
- LME;
- LSE – EquityClear;
- SWX Europe (EquityClear);
- RepoClear (see below);
- SwapClear (see below);
- EnClear (see below).

The clearing of ICE Futures Europe was transferred from LCH.Clearnet to the exchange’s own clearing house, ICE Clear Europe, in November 2008. As previously noted NYSE Liffe clearing will also transfer to ICE Clear if the ICE – NYSE takeover is completed.

LCH.Clearnet introduced RepoClear in August 1999. It is a centralised clearing and netting facility for the European government repo and cash bond market. Austrian, Belgian, Dutch and German government bonds and German Jumbo Pfandbriefe repos and cash bonds are currently cleared through RepoClear. The main benefit for banks using RepoClear is the ability to net the risks for balance sheet reporting purposes. In common with other markets cleared by LCH.Clearnet, RepoClear uses a margin facility and netted settlement. Having LCH.Clearnet as the CCP to all transactions significantly reduces operational risk.

SwapClear is similar to RepoClear in its operation and purpose, but it is for certain interbank and interest-rate swap transactions. It allows the netting of several counterparty swap books multilaterally in a single account, with LCH.Clearnet as the counterparty. Multilateral netting is at the heart of central clearing and delivers notable benefits in the form of reduced credit risks.

EquityClear is a CCP service for the LSE’s electronic order book SETS and also SWX Europe. In addition to the benefits of reduced counterparty risks and multilateral settlement netting that are common to the other markets, EquityClear increases the liquidity on SETS which in turn leads to tighter trading spreads being offered and more business being transacted. As LCH.Clearnet is the CCP to all SETS trades at the point of execution, it provides post-trade anonymity for SETS. EquityClear makes use of a real-time feed from SETS, via LCH.Clearnet into CREST sustaining an efficient matching process.
EnClear was launched in December 2002. It is a service for the operation of the registration, clearing and physical delivery of OTC power contracts executed on the European Energy Derivatives Exchange (Endex). The initial contracts cleared are two Dutch power contracts (Dutch Peak and Dutch Baseload). The contracts are presented to Endex for onward submission to LCH.Clearnet (which is responsible for administering physical delivery) for clearing. The physical delivery of positions that remain open at a contract’s expiry will be transferred from LCH.Clearnet to the Amsterdam Power Exchange (APX).

EnClear also covers the contracts on the ICE, for instance, the natural gas basis swaps.

OTC UK gas and power contracts traded bilaterally or via voice brokers were added to this service in 2004, followed by a freight division in 2005, and OTC UK emissions contracts in 2006.

A huge benefit for banks and other institutions in being members of LCH.Clearnet is that it offers cross-product offsets for certain of its products across the markets that it clears. This means that members benefit further from reduced risks and operational costs.

ICE Clear Europe®

ICE Clear Europe® is ICE’s London-based clearing house, which is recognised by the UK regulator. ICE Clear Europe provides clearing services for all ICE Futures Europe® contracts and all cleared OTC contracts transacted in ICE’s global OTC markets. This includes all ICE OTC cleared energy products.

Further details on ICE Europe are available at www.theice.com.

Eurex AG

Eurex AG clears the markets for the Deutsche Börse Group as the chart below shows.
Eurex operates a series of licences enabling members to clear types of products on Eurex and Deutsche Börse as shown in the table in Section 3.2.

3.2 US CLEARING ORGANISATIONS
The Options Clearing Corporation (OCC) is the largest equity derivatives clearing house in the world, serving major markets like the ISE and the CBOE.

Founded in 1973, it was the first clearing house given an AAA rating by Standard & Poor’s.

The OCC operates under the jurisdiction of both the SEC and the CFTC. Under its SEC jurisdiction, the OCC clears transactions for put and call options on common stocks and other equity issues, stock indices, foreign currencies, interest rate composites and single-stock futures. As a registered derivatives clearing organisation (DCO) under CFTC jurisdiction, it offers clearing and settlement services for transactions in futures and options on futures.

OCC is equally owned by six participant exchanges that trade options:

- NYSE Amex;
- Boston Stock Exchange;
- CBOE;
- ISE;
- NYSE Arca; and
- NASDAQ OMX Philadelphia Stock Exchange (PHLX).

The OCC also provides clearing services for stock futures, commodity futures and options for:

- CBOE Futures Exchange;
- NASDAQ OMX PHLX;
- OneChicago
- BATS Trading;
- NASDAQ Stock Market.

System for Theoretical Analysis and Numerical Simulations (STANS) is described in detail in Chapter 7, Section 1.2.
The Role of the Clearing House

Chapter Six

Exchanges and Clearing Organisations

This table shows the major markets and their clearing organisation.

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Clearing Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYSE Liffe</td>
<td>NYSE Liffe Clearing</td>
</tr>
<tr>
<td>ICE Futures Europe</td>
<td>ICE.Clear Europe</td>
</tr>
<tr>
<td>LME</td>
<td>LCH.Clearnet</td>
</tr>
<tr>
<td>EUREX</td>
<td>EUREX Clearing</td>
</tr>
<tr>
<td>NYSE Euronext</td>
<td>LCH.Clearnet</td>
</tr>
<tr>
<td>CME Group</td>
<td>CME Group Clearing</td>
</tr>
<tr>
<td>CBOE</td>
<td>Options Clearing Corporation (OCC)</td>
</tr>
<tr>
<td>ISE</td>
<td>Options Clearing Corporation (OCC)</td>
</tr>
</tbody>
</table>

3.3 CHICAGO MERCANTILE EXCHANGE (CME) GROUP

In April 2003, the Chicago Mercantile Exchange (CME) signed an agreement with the CBOT for the CME to provide clearing and related services for all CBOT products. On 2 January 2004, the CME began providing clearing and related services for all CBOT products under the common clearing link.

Operating today as the CME Group, its wholly owned clearing house clears, settles and guarantees all the contracts listed by the CME Group including:

- agricultural;
- energy;
- foreign exchange;
- equity indices;
- interest rates;
- metals;
- real estate;
- weather.

In addition through ClearPort it also centrally clears OTC and credit derivatives.

Source: www.cmegroup.com
### END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What does the clearing organisation act as?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>2. What are the main roles of the clearing organisation?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>3. Who regulates LCH.Clearnet?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>4. What is novation?</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>5. List the requirements that a firm must meet to become a clearing member of LCH.Clearnet.</td>
<td>Section 2</td>
</tr>
<tr>
<td>6. What type of relationship arrangement exists between the clearing organisation and its members?</td>
<td>Section 2</td>
</tr>
<tr>
<td>7. Why does the clearing organisation need to manage risk efficiently?</td>
<td>Section 2</td>
</tr>
<tr>
<td>8. What is EquityClear?</td>
<td>Section 3.1</td>
</tr>
<tr>
<td>9. What is the OCC?</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>10. Which margin system is used on OCC?</td>
<td>Section 3.2</td>
</tr>
</tbody>
</table>
CHAPTER SEVEN

THE BASICS OF MARGIN

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4. CALCULATING INITIAL MARGIN 154

This syllabus area will provide approximately 4 of the 50 examination questions
1. INTRODUCTION

There are a few characteristics of derivatives products which make them, in some cases, different from other types of investments. For instance, derivatives products can be sold, even if you do not own them in the first place, as an opening transaction, which is not always possible for certain participants or products.

When you buy British Petroleum (BP) shares in the equity market, for example, you have to pay the full value of the shares. Therefore, if you bought 1,000 BP shares at a price of £6.10, you would have to pay £6,100 (plus commission and stamp duty) in settlement. The settlement of exchange-traded derivatives is quite different in this respect as the full value of the contract which is being bought or sold is not exchanged in settlement at the time of the purchase or sale.

The settlement of exchange-traded derivatives products is in the form of margins. The amount of margin which is paid for derivatives is only a fraction of the full underlying value of the transaction. In many cases, it is from 3-5% of the full value.

Margining is performed on a daily basis and involves the continuous reassessment of the extent to which the clearing organisation is at risk to the member defaulting. To insure against this risk, the clearing organisation collects a good faith deposit or initial margin on all open positions. It also revalues positions at the end of each day and pays or receives the daily profit or loss. This is known as variation margining.

1.1 INITIAL MARGIN

LEARNING OBJECTIVES

7.1.1 Know the purpose of initial margin

1.1.1 Purpose of Initial Margin

Initial margin is a one-off deposit that is paid to the clearing organisation for opening transactions. This deposit is held by the clearing organisation throughout the time that the position is maintained. The clearing organisation must have some kind of insurance that any obligations can be fulfilled. It is returnable once the position is closed and there are no further obligations.

The initial margin requirement is calculated by the clearing organisation for each exchange. The parameters are set by the clearing organisation, in conjunction with the relevant exchange, using standard calculation methodologies.

In most markets, the exchange dictates that members must charge at least this rate to clients; however, they can levy any rate above the exchange level, if they wish.

In other markets (usually commodity markets) members may finance the margin requirements of their clients, but where this happens they must meet regulatory capital requirements relating to the counterparty risk of their clients. The LME is an example of a market which operates like this.
Initial margin is usually determined by the clearing organisation as a set amount per contract. The amount for each product varies, as it is related to the current volatility of the particular product. The margin rate will be sufficient to cover an approximate 3-5% movement in the price of the contract on one day. The rate which is set is designed to cover the potential risk of default on each position. Therefore each clearing member must deposit enough funds to cover the risks on their total open positions, gross or net, depending on the clearing house policy. In turn, the clearing members will then calculate the initial margin for their clients.

As clients’ and clearing members’ positions can change every day, the initial margin requirements to be paid to the clearing organisation must be recalculated every day.

The clearing organisation will be constantly monitoring the initial margin rates and parameters and can revise the rates from time to time, as appropriate to market conditions. This decision will be undertaken in co-operation with the relevant exchange. Where initial margin rates may have been increased to reflect the volatility in certain contracts, as conditions in the market become more stable, they may revise the rate charged to a lower rate. This may not necessarily be the original rate which was charged before the rates were increased.

The frequency of these changes is purely related to the volatility of the contracts on the exchange. However, the clearing organisation will look to balance the need for efficiency of the margining system with the administrative burden of changes to the margin parameters. Therefore, the frequency of changes is kept to a minimum.

1.1.2 Intra-Day Margin

LEARNING OBJECTIVES

7.2.3 Know the meaning of intra-day margin calls

In times of very large movements, up or down, in the price of a contract in the course of a single trading day, the clearing organisation or exchange will recalculate the initial margin requirement within that day. An additional amount may be required per contract for all open contracts which are affected. It is unlikely that all contracts will be affected, because the news that caused the volatility may concern for example, a foreign economy, which has a knock-on effect only for domestic government bonds. If the clearing house believes that the situation is only temporary, and that conditions will quickly return to a more stable environment, then they will leave the initial margin requirement at its original level for the next day, only calling the intra-day margin as a one-off payment. In extreme cases intra-day margin can be calculated and called each day for several days. This is a burden both for the clearing organisation and for the clearing members.
It is more likely however, that the initial margin level will be changed as a result of volatile conditions. The intra-day margin call is made to cover the increased risk, since the original initial margin was paid in the morning and then the new increased initial margin rate will be called from the next day onwards. Intra-day margins can be called from the clearing members by the clearing organisation up to any time as determined in their rules. The clearing members must pay the required amount to the clearing organisation; however, depending on the time of day that the call is made, it may be difficult for the clearing member to receive the funds from their clients. They must endeavour to receive the funds, and at the very least must contact the client and let them know that additional funds are due.

In this respect, it is necessary that clearing members are able to recalculate margin requirements during the day on their own systems, so that they can see accurately which clients are affected and reconcile the amounts that are due.

Some clearing organisations calculate the initial margin requirements for their members on a net basis. This means that they net together all of the positions within each account held at the clearing organisation, ie, segregated client accounts and non-segregated house account. The result is that the clearing member receives the benefit of all possible offsets across the whole of their clients’ positions and their own trading positions respectively. Accordingly, the initial margin requirement that is paid to the clearing organisation for their client account should be much less than the individual amounts that are being called from the clients. This buffer of initial margin is held by the clearing member as additional funds which can be called upon in the event of a default.

In the US, the clearing organisations margin the clearing members on a gross basis. In this way the clearing organisation has full cover by individual client in the event of a default. The full amount of initial margin paid by clients to clearing members is paid to the clearing organisation.

1.1.3 Spot Month Margin

LEARNING OBJECTIVES

7.2.3 Know the meaning of spot margin calls

This is an additional rate of margin that is charged by the clearing organisation to ensure that customers have adequate funds for settlement upon delivery and also to discourage speculators in the delivery period. It covers the risk of a default during the delivery process. Spot month margins are charged in addition to initial margin. There are no offsets allowed for spread positions. Initial and spot month margins are released by the clearing organisation on settlement day +1, once they are satisfied that delivery has been effected correctly.

Some exchanges also increase the rate of initial margin as the delivery period approaches. This is used as a deterrent for clients and clearing members which have positions in the delivery period, with no intention of going to delivery.
1.1.4 Buffer Margin

**LEARNING OBJECTIVES**

7.2.3 Know the meaning of buffer margin calls

This is an additional margin which can be called from clearing members for their positions in anticipation of major events. This may be called where it is expected that a major event which is planned is likely to cause extreme movements in the market prices. Such events may be general elections.

1.2 **STANDARD PORTFOLIO ANALYSIS OF RISK (SPAN) AND SYSTEM FOR THEORETICAL ANALYSIS AND NUMERICAL SIMULATIONS (STANS)**

**LEARNING OBJECTIVES**

7.1.2 Understand the principles of SPAN and STANS margin systems

1.2.1 **Standard Portfolio Analysis of Risk (SPAN)**

The method for calculating initial margin varies from clearing organisation to clearing organisation. It may be different for futures than equity and index options. However, in 1988, the CME devised a method known as standard portfolio analysis of risk (SPAN), variations of which are now widely used around the world for the calculation of the initial margin on futures and options.

SPAN is a portfolio-based margining system which calculates an efficient margin requirement across an entire futures and options portfolio. It takes into account any offsets which may be allowed in the parameters, for example between long positions in one month against short positions in another month or between offsetting positions in price-related but discrete contracts. The end calculation is therefore an accurate reflection of the risk to the clearing organisation of each clearing member’s position portfolio.

SPAN looks at a set of 16 possible changes in market conditions within the boundaries of the risk parameters set by the clearing organisation. These 16 different scenarios are collectively known as the risk array. The profit or loss for one open position in each futures and options contract is worked out under each scenario, for valuing positions. Each open position in the member’s portfolio is calculated and totalled across the same underlying contract. By combining all of the individual arrays, the final result is the largest potential loss for the portfolio, which is charged as initial margin. This initial margin figure is known as the scanning risk. (For a detailed example of SPAN see Appendix 1.)

London SPAN, is the version of SPAN which has been slightly modified for use by LCH.Clearnet in the London market, compared to the original SPAN developed by the CME. It uses pricing models to calculate the option prices. The binomial model is used for equity and index options but the Black-76 model is used for options on futures.
Because SPAN is a portfolio-based margining system, it is important to understand that, although the clearing organisation will publish the initial margin rates applicable for each contract, this is only the starting point for initial margin calculations. If a client or clearing member has lots of different positions in a market, the margin calculation under SPAN will take into account any offsetting positions where applicable. This has the effect of reducing the overall initial margin requirement to be paid to the clearing organisation.

London SPAN allows the following offsets:

- **Inter-Month Spread** – this is where long positions (in the same contract) in one month can be offset by the same number of short positions (in the same contract) in another month. London SPAN recognises this and assumes that the futures prices will move by exactly the same amount across all contract months, so no initial margin requirement is calculated as the risk in one position is offset by the benefit of the other.

However, this will not happen exactly, so an inter-month spread charge is calculated under SPAN and a margin requirement is charged to cover this basis risk.

- **Inter-Commodity Spread** – this is where certain offsets are allowed for spread positions across different products in the same portfolio. This offset is granted because the prices of related contracts are assumed to move by the same amount. The products which apply to this offset strategy are only those specified by the clearing organisation and the exchange.

The initial margin is calculated as normal for the individual product contracts and an inter-commodity spread credit is applied to reduce the initial margin requirement to be paid to the clearing organisation.

All futures, and options on futures, are charged initial margin on trade day + 1 (T+1) when the position is opened. The clearing organisation must cover the risk that it incurred of the holder of the position not being able to fulfil its financial obligations.

Long option positions are not charged initial margin because once the premium has been paid for the option, on T+1, then there is no further risk to the clearing organisation. The worst that can happen is that the option can expire at zero. If a long option is exercised then the clearing organisation will call margin to cover the delivery obligations.

Under London SPAN at LCH.Clearnet, long positions in premium paid options do create an initial margin requirement; however, this requirement is always negated by the credit of the net liquidating value (NLV). NLV is the valuation of the option at the current market price. The NLV will always be greater than the initial margin requirement and any residual credit may be used to cover other initial margin requirements for equity options in the portfolio.

Short option positions are margined because there is an obligation to make or take delivery and therefore there is a risk of default. If the short option is not held until delivery then it must be re-purchased, which is also a risk as the price may be significantly higher than the original price received when the option was sold.

This margin requirement is typically calculated using SPAN or a similar exchange margin method.
1.2.2 System for Theoretical Analysis and Numerical Simulations (STANS)

Cross-Margin Programs

The OCC introduced cross-margining in 1989 to reduce systemic market risk by recognising the offsetting value of hedged positions maintained by firms at multiple clearing houses. By allowing for intermarket hedges, the OCC is able to enhance firms’ liquidity and financing capabilities through reduced initial margin requirements, fewer margin variations and smaller net settlements.

Since cross-margining’s inception, the number of products eligible for offset has increased significantly. The OCC currently participates in cross margin programs with the CME and ICE Clear US as well as offering an internal cross-margin program for products where OCC clears both the SEC and CFTC regulated contracts.

History

After the increased volatility of the late 1980s, advantages of the cross-margin program became evident. Member firms were experiencing significant liquidity draws as a result of margin calls being issued by one clearing house against a position where the member maintained an offsetting position at another clearing house.

For example, a clearing member who was synthetically long an index option position while short the futures contract would be required to satisfy a margin call with the options clearing house, even though the member maintained an offsetting position with the futures clearing house. Despite being hedged, the member would be obligated to meet a cash settlement when, in the aggregate, the overall risk of the position was insensitive to changing prices in the marketplace.

Participation

Cross-margining was designed for firms with memberships across various clearing organisations which guarantee products that are highly correlated. Owing to differences in securities and futures related customer protection requirements, the program is only open to clearing members and their affiliates, and market professionals, which includes market makers and futures locals.

In order to facilitate the cross-margin process, participating clearing houses establish joint clearing accounts for each member. In the event of a default, the clearing houses’ arrangement provides for the treatment of all assets and obligations associated with the cross-margin account as well as the other clearing accounts of the defaulting member.

Margins

Clearing level margins are computed based on the combined positions maintained in the cross-margin accounts using OCC’s proprietary system for theoretical analysis and numerical simulations (STANS). STANS is a portfolio-based margin methodology that utilises a sophisticated options pricing model to identify the economic risk inherent in a portfolio. By combining hedged positions cleared at separate clearing houses into a single portfolio for margin and settlement purposes, the real risk of that portfolio can be determined. This results in a more appropriate margin requirement, which is typically lower than if margins were calculated separately. The average daily margin savings realised by firms participating in cross-margining have been significant.
Operational

Cross-margin trades are executed on the exchanges for which the participants’ clearing organisations clear trades and typically are transferred to a joint account via a clearing member trade agreement (CMTA) or give-ups. At the end of each trading day, the futures clearinghouses transmit closing positions and settlement activity to the OCC, which in turn calculates clearing level margining and then produces and distributes position, margin and settlement reports to clearing members.

Summary

Cross-margining has proven to be a viable tool for participating firms, allowing them to enhance the efficiency and the ability in meeting their financial obligations to the marketplace. This is especially important during periods of increasing market volatility. By recognising intermarket hedged positions cleared by different clearing organisations, cross-margining increases the overall efficiency of the clearing and settlement process, providing reduced initial margin requirements as well as increased liquidity in the form of net settlements.

Source: OCC

We will now look at another major margin system used by derivatives clearing houses.

1.3 COLLATERAL

LEARNING OBJECTIVES

7.1.3 Know the common forms of collateral used to cover initial margin liabilities

Initial margin obligations at the clearing organisation can be covered in various ways. Cash in the currencies of the contracts traded is most commonly used, but bank guarantees, government treasury bonds and bills, certificates of deposits and certain equities may also be accepted. Each exchange will publish the range of collateral that it is willing to accept.

Interest is paid on cash held by most clearing organisations at a pre-defined rate.

If cash is used to cover initial margin requirements, a surplus amount may be deposited to avoid daily cash movements and the associated costs, because the initial margin requirements are recalculated each day. The clearing member may or may not receive interest, depending on the individual policies of the clearing organisation. In turn, the clearing member may or may not pay interest to its clients. It is a situation which is negotiable by each client.
The Basics of Margin Chapter Seven

The collateral that the broker will accept from a client is usually negotiable. There may, however, be restrictions about where it must be held and also an arrangement fee. In some cases, the client may have to check with its trustees whether they have any additional restrictions which prevent the collateral from being re-registered into the name of the clearing member at the exchange or clearing organisation. This is because this would be a change of beneficial ownership, which means that in the event of the clearing member defaulting, the clearing organisation will see it as assets belonging to the clearing member. The assets could be seized by the clearing organisation, even though the actual owner of the assets may not be involved in the cause of the default. Therefore, there is a credit risk for the client with the clearing member.

A discount, or haircut, is applied to the value of most forms of collateral. If the clearing member or clearing organisation had to liquidate the assets in the event of a default, the full value may not be realised. Cash deposits to cover initial margin requirements are not discounted in any way, as they are already in cash and would not have to be liquidated. Other haircut percentages which can be applied are set according to the liquidity of the collateral type.

The following table shows acceptable collateral for any exchanges cleared by LCH.Clearnet as well as their respective valuation haircut percentages.

<table>
<thead>
<tr>
<th>Government Securities (Description &amp; Bloomberg Code)</th>
<th>Term</th>
<th>Base Haircut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian Treasury Bill (ACTB)</td>
<td>7 calendar days &lt;= 1yr</td>
<td>0.63%</td>
</tr>
<tr>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.00%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.75%</td>
</tr>
<tr>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>2.75%</td>
</tr>
<tr>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
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</tr>
<tr>
<td></td>
<td>&gt; 30yrs</td>
<td>3.75%</td>
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<tr>
<td>Australian Government Bond (ACGB)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>3.75%</td>
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<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>3.75%</td>
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<td></td>
<td>&gt; 30yrs</td>
<td>3.75%</td>
</tr>
<tr>
<td>Austria</td>
<td></td>
<td></td>
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<tr>
<td>Austrian Treasury Bill (RATB)</td>
<td>4 business days &lt;= 1yr</td>
<td>0.25%</td>
</tr>
<tr>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.00%</td>
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<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
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<td>5.13%</td>
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<td></td>
<td>&gt; 30yrs</td>
<td>5.13%</td>
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<td>Belgium</td>
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<td>Term</td>
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<td>Denmark</td>
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<tr>
<td>France</td>
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<tr>
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<td>Germany</td>
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<td></td>
<td>&gt; 30yrs</td>
<td>6.38%</td>
</tr>
<tr>
<td>Italy</td>
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<td>Buoni Ordinari del Tesoro (BOTS)</td>
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<td>Buoni del Tesoro Poliennali (BTPS)</td>
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<td>9.50%</td>
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<td>Japanese Treasury Discount Bill (JTD)</td>
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<td>3.63%</td>
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<td></td>
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<td>Luxembourg</td>
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<td>1.25%</td>
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## Government Securities

(Description & Bloomberg Code)

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<th>Securities</th>
<th>Term</th>
<th>Base Haircut</th>
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<td><strong>Netherlands</strong></td>
<td>Dutch Treasury Certificate (DTB) Dutch Government Bond (NETHER)</td>
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<td></td>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>0.88%</td>
</tr>
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<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>1.88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>6.25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 30yrs</td>
<td>6.25%</td>
</tr>
<tr>
<td><strong>Norway</strong></td>
<td>Norwegian Treasury Bill (NGTB) Norwegian Government Bond (NGB)</td>
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<td>0.88%</td>
</tr>
<tr>
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<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>2.25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>2.88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>4.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 30yrs</td>
<td>4.00%</td>
</tr>
<tr>
<td><strong>Spain</strong></td>
<td>Spanish Letras del Tesoro (SGLT) Spanish Government Bond (SPGB)</td>
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<td>1.25%</td>
</tr>
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<td></td>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>3.50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>7.75%</td>
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<td>10.25%</td>
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<td>&gt; 11yrs &lt;= 30yrs</td>
<td>13.00%</td>
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<tr>
<td><strong>Sweden</strong></td>
<td>Swedish Treasury Bill (SWTB) Swedish Government Bond (SGB)</td>
<td>4 business days &lt;= 1yr</td>
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<tr>
<td></td>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>0.75%</td>
</tr>
<tr>
<td></td>
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<td>&gt; 3yrs &lt;= 7yrs</td>
<td>2.50%</td>
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<td></td>
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<td>&gt; 7yrs &lt;= 11yrs</td>
<td>2.88%</td>
</tr>
<tr>
<td></td>
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<td>&gt; 11yrs &lt;= 30yrs</td>
<td>4.13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 30yrs</td>
<td>4.13%</td>
</tr>
<tr>
<td><strong>United Kingdom</strong></td>
<td>United Kingdom Treasury Bill (UKTB) United Kingdom Gilt (UKT)</td>
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<td>0.25%</td>
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<td></td>
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<td>1.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>3.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>5.38%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 30yrs</td>
<td>7.63%</td>
</tr>
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<td><strong>United States</strong></td>
<td>United States Treasury Bill (B) United States Treasury Bond (T)</td>
<td>2 business days &lt;= 1yr</td>
<td>0.25%</td>
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<tr>
<td></td>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.38%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>2.88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>3.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>7.00%</td>
</tr>
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## The Basics of Margin

### Exchange-Traded Derivatives

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<th>GNMA Mortgage backed Securities (Description &amp; Bloomberg Code)</th>
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<td>General National Mortgage Association (GNMA)</td>
<td>New (0 – 30 months)</td>
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<td>Medium (30–60 months)</td>
<td>14.00%</td>
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<td></td>
<td>Seasoned (&gt; 60 months)</td>
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</table>

See link below for detail of concentration limits [NB: haircuts stated in the circular at this link are subject to change over time]:

http://www.lchclearnet.com/member_notices/circulars/2012-04-25.asp

<table>
<thead>
<tr>
<th>Government Agencies &amp; Securities issued under Government Credit Guarantee Schemes (Description &amp; Bloomberg Code)</th>
<th>Term</th>
<th>Base Haircut</th>
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<td><strong>US Agencies</strong></td>
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<tr>
<td>Federal National Mortgage Association (FNMA)</td>
<td>3 business days &lt;= 1yr</td>
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<tr>
<td>Federal Home Loan Mortgage Corporation (FHLMC)</td>
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<tr>
<td>Federal Home Loan Banks (FHLB)</td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>3.25%</td>
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<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>4.00%</td>
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<tr>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>6.38%</td>
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</table>

See link below for detail of concentration limits [NB: haircuts stated in the circular at this link are subject to change over time]:


<table>
<thead>
<tr>
<th>EUR Agencies</th>
<th>Term</th>
<th>Base Haircut</th>
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</thead>
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<tr>
<td></td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.25%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>2.25%</td>
</tr>
<tr>
<td></td>
<td>&gt; 7yrs &lt;= 11yrs</td>
<td>2.63%</td>
</tr>
<tr>
<td></td>
<td>&gt; 11yrs &lt;= 30yrs</td>
<td>6.63%</td>
</tr>
</tbody>
</table>

See link below for detail of concentration limits [NB: haircuts stated in the circular at this link are subject to change over time]:


<table>
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<tr>
<th>Australia</th>
<th>Term</th>
<th>Base Haircut</th>
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</thead>
<tbody>
<tr>
<td>Government Guaranteed Bonds</td>
<td>3 business days &lt;= 1yr</td>
<td>0.63%</td>
</tr>
<tr>
<td>Government Guaranteed CDs</td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.00%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.75%</td>
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</table>

<table>
<thead>
<tr>
<th>Austria</th>
<th>Term</th>
<th>Base Haircut</th>
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<tbody>
<tr>
<td>Government Guaranteed Bonds</td>
<td>3 business days &lt;= 1yr</td>
<td>0.25%</td>
</tr>
<tr>
<td>Government Guaranteed CDs</td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>1.00%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>2.25%</td>
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<table>
<thead>
<tr>
<th>France</th>
<th>Term</th>
<th>Base Haircut</th>
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<tr>
<td>Government Guaranteed Bonds</td>
<td>3 business days &lt;= 1yr</td>
<td>0.13%</td>
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<tr>
<td>Government Guaranteed CDs</td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>0.88%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.88%</td>
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<table>
<thead>
<tr>
<th>Germany</th>
<th>Term</th>
<th>Base Haircut</th>
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<tr>
<td>Government Guaranteed Bonds</td>
<td>3 business days &lt;= 1yr</td>
<td>0.25%</td>
</tr>
<tr>
<td>Government Guaranteed CDs</td>
<td>&gt; 1yr &lt;= 3yrs</td>
<td>0.88%</td>
</tr>
<tr>
<td></td>
<td>&gt; 3yrs &lt;= 7yrs</td>
<td>1.63%</td>
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</table>
The Basics of Margin Chapter Seven

<table>
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<th>&gt; 1yr &lt;= 3yrs</th>
<th>&gt; 3yrs &lt;= 7yrs</th>
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<tbody>
<tr>
<td>Netherlands</td>
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<td>Government Guaranteed CDs</td>
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<td>Sweden</td>
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<td>Government Guaranteed CDs</td>
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<td>United States</td>
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<td></td>
<td>Government Guaranteed CDs</td>
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**Other Stipulations**

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<tr>
<th>Haircuts</th>
<th>FX</th>
<th>To capture the potential FX exposure related to cover being provided in a currency other than the underlying liability, a 4% incremental FX haircut will be applied upon all securities, regardless of the currency of the asset.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Certain collateral can at times be subject to additional haircuts above those stated. Members lodging this collateral will be contacted directly as appropriate, and further details can be obtained by contacting CaLRM.</td>
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<tr>
<td></td>
<td>Market of Issue</td>
<td>Government securities must be issued in the home country of the issuer and be denominated in the domestic currency to be acceptable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Government agencies and securities issued under Government Credit Guarantee Schemes must both be issued in the home country of the issuer and be denominated in the domestic currency to be acceptable. These instrument categories to be maintained using ISIN lists.</td>
</tr>
<tr>
<td></td>
<td>Excluded instruments</td>
<td>Zero coupon bonds and stripped bonds.</td>
</tr>
<tr>
<td></td>
<td>Concentration Controls</td>
<td>In addition to the concentration limits in place upon particular asset types as noted above, LCH.Clearnet reserves the right to manage specific concentrations in margin collateral in all circumstances. Where positions are considered to be excessively concentrated, members will be contacted directly with a view to re-alignment of their portfolio.</td>
</tr>
</tbody>
</table>

**Other Collateral (Description & Bloomberg Code)**

<table>
<thead>
<tr>
<th>Precious Metals</th>
<th>Gold Bullion (XAU)</th>
<th>14.00%</th>
</tr>
</thead>
</table>

See link below for detail of concentration limits [NB: haircuts stated in the circular at this link are subject to change over time]:

http://www.lchclearnet.com/member_notices/circulars/2012-08-21.asp
2. VARIATION MARGIN

LEARNING OBJECTIVES

7.2.1 Know the purpose of variation margin

2.1 HOW VARIATION MARGIN WORKS

In addition to initial margin, the clearing organisation also pays and collects the profit or loss that is accruing on the open futures and options on futures positions as the price moves up or down each day. This movement generates a pay and receive situation for members with open positions. The clearing organisation will call in and pay out this net amount to each clearing member daily. This amount is known as variation margin.

In turn, as for initial margin, the clearing member will calculate the variation margin settlement amount for each client’s positions. A net settlement will be calculated in each currency for each market. In order to prevent the unnecessary administration of transferring small amounts of various currencies on a daily basis, many clients prefer to leave a surplus of funds with their clearing member to cover their variation margin requirements. The clearing member may, or may not, pay interest on these surplus funds or on funds covering margin requirements, depending on the individual agreement with the clearing member and the interest policies of the market concerned.

Variation margin is not applicable to premium-paid traded options, such as individual equity options on NYSE Liffe. This is because these contracts are settled up-front on T+1 with an exchange of premium. There is no further requirement for marking these contracts to market, so no variation margin is calculated.

For other types of futures contracts, usually known as forwards, the variation margin is calculated each day, but any profits accrued are not paid out until the settlement date of the contract. This applies even if the position is closed out on the exchange early on in its life. The profit will stay with the clearing organisation until the settlement (delivery) date. Any profit that is accrued can be used to offset initial margin requirements, but it does not attract interest, as it is unrealised. All losses which occur must be settled on a daily basis, but they can be offset by earlier profits which remain with the clearing organisation. This is true of contracts traded on the LME and the Swedish markets. It is possible to use collateral to cover losses on forward contracts.
2.1.1 Calculating Variation Margin

LEARNING OBJECTIVES

7.2.2 Be able to calculate variation margin on a given position: government bonds; short-term interest rates; equity futures

The calculation of variation margin requires:

- number of contracts in the position;
- whether the position is long or short;
- opening or brought forward price;
- official exchange closing price;
- tick size and value from the contract specification.

We can now work out how many ticks the contract has moved and what that represents in terms of profit or loss on the position.

EXAMPLE

A client buys 1 March short Sterling future at 93.43 on 14 January.

The client sells the position at 93.49 five days later on 21 January.

<table>
<thead>
<tr>
<th>Date</th>
<th>Trade Price</th>
<th>Net Position</th>
<th>Closing Price</th>
<th>Daily Price Movement</th>
<th>Daily Settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>14/1</td>
<td>93.43</td>
<td>+1</td>
<td>93.44</td>
<td>+1</td>
<td>£12.50 profit</td>
</tr>
<tr>
<td>15/1</td>
<td>93.42</td>
<td>-1</td>
<td>93.42</td>
<td>-2</td>
<td>£25.00 loss</td>
</tr>
<tr>
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<td>93.45</td>
<td>+3</td>
<td>93.45</td>
<td>+3</td>
<td>£37.50 profit</td>
</tr>
<tr>
<td>19/1</td>
<td>93.47</td>
<td>+2</td>
<td>93.47</td>
<td>+2</td>
<td>£25.00 profit</td>
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<td>93.48</td>
<td>+1</td>
<td>93.48</td>
<td>+1</td>
<td>£12.50 profit</td>
</tr>
<tr>
<td>21/1</td>
<td>93.49</td>
<td>0</td>
<td>93.49</td>
<td>+1</td>
<td>£12.50 profit</td>
</tr>
<tr>
<td>TOTAL</td>
<td>+6</td>
<td>+6</td>
<td>+6</td>
<td>£75.00 profit</td>
<td></td>
</tr>
</tbody>
</table>

The tick value is the value of a one point (0.01 in this case) movement in the contract price. For the short sterling contract on NYSE Liffe, this price is calculated by multiplying the notional contract size by the length of time of the notional time deposit underlying the contract in years, multiplied by the minimum tick size movement of 0.01%.
It follows that the calculation of the tick size for the short sterling future will be shown as:

Notional contract size = £500,000
Three-month short sterling contract in years = 3 ÷ 12
Minimum tick size movement = 0.01% (0.0001)

The tick value of the short sterling is therefore:

\[ £500,000 \times \frac{3}{12} \times 0.01\% = £12.50 \]

Since each tick equals £12.50 and the profit on the trade was six ticks or points (i.e., the difference between the buying and selling price), this reflects a profit of \( (6 \times 12.50) = £75.00 \).

**Note:** We need to be careful. Every type of future has a tick size and value, sometimes called the minimum price movement and value, but that value can be different. For instance, look at these common contracts and their tick size and value.

<table>
<thead>
<tr>
<th>Contract</th>
<th>Minimum Movement or Tick Size</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTSE 100 Index Future</td>
<td>0.5</td>
<td>£5</td>
</tr>
<tr>
<td>Long Gilt Future</td>
<td>0.01</td>
<td>£10</td>
</tr>
<tr>
<td>Brent Crude Sterling</td>
<td>0.01</td>
<td>£12.50</td>
</tr>
<tr>
<td>S&amp;P 500 Index Future</td>
<td>0.01</td>
<td>$2.50</td>
</tr>
<tr>
<td>Eurobund Future</td>
<td>0.01</td>
<td>€10</td>
</tr>
</tbody>
</table>

The initial margin of £500 per contract will be called from the clearing organisation on 15/1 and held until 22/1 when it will be returned (on T+1).

<table>
<thead>
<tr>
<th>clearing house</th>
<th>member A pays debit VM</th>
<th>clearing house</th>
<th>member B receives credit VM</th>
</tr>
</thead>
</table>

So the formula for calculating variation margin is:

Number of contracts x number of ticks movement x tick value

Variation margin for futures and options on futures must always be settled in cash, because the clearing member must always settle with the clearing organisation in cash as there must be a member with the opposite position who is making a profit and the clearing house will therefore be paying that profit to them.
Further Examples of the Calculation of Variation Margin

Using the formula given above the calculation of variation margin is as follows:

**EXAMPLE**

Long Gilt future – from the contract specification published by the exchange, tick size and value 0.01 and £10.

Buy 1 Long Gilt future @ 101.05 – end of day price 101.10

Contract has moved 5 ticks so $5 \times £10 = £50$ which is a profit and will therefore be received T+1.

**EXAMPLE**

FTSE 100 Index future – from the contract specification published by the exchange, tick size and value 0.5 and £5.

Sell 1 FTSE 100 Index future@ 5500 – end of day price 5502.5

Contract has moved 5 ticks so $5 \times £5 = £25$ which is a loss as the price has moved higher and will therefore be paid on T+1.

3. DEFAULT

**LEARNING OBJECTIVES**

7.3.1 Know the consequence of an inability to cover the margin in relation to the clearing house and the clearing member

7.3.2 Understand the purpose of the clearing house default procedures and guarantee

7.3.3 Understand the responsibility of central counterparties in managing market risk

7.3.4 Understand clearing house fire drills in relation to their: importance; purpose; frequency

If the clearing member is unable to fulfil its obligations and cannot pay the variation margin or initial margin call, then the clearing house, under its rules, may close out all of the member’s open positions.

All variation margin profits and losses will be offset against each other, and any remaining debit balance will be covered from initial margin, which has been deposited in the form of cash or collateral. Debit interest penalties may be incurred by clients if cash is not in place to cover variation margin with their clearing member. If the client cannot pay the variation margin, then the clearing member may instigate its own default procedures.
3.1 WHY IS DEFAULT SUCH AN ISSUE?

The failure of a member to honour the obligations that it has created in the market would, if any resulting loss or damage was to occur to other members or their clients, potentially destroy the credibility of the exchange.

Consequently, as part of the overall risk management process, the clearing house will establish what would constitute a default situation and what action it can take as well as how it can protect the exchange. (As we will see in Section 2.2 of Chapter 8 default situations are not necessarily just related to non-payment of margin calls.) It does this by establishing default rules and a default fund.

As we have noted, any default presents potentially increased risk for counterparties to the defaulting party and systemically to the whole market.

The collapse of Lehman Brothers and MF Global presented huge risks to financial institutions including investment funds’ and thereby to the fund investors.

Regulators took note of this and have pushed regulatory reforms that seek to reduce this risk. The CCP concept for OTC products is one such reform. However the reason why this is so high on the agenda can be explained by the fact that when Lehman Brothers went bankrupt in 2008, LCH.Clearnet, successfully unwound $9 trillion in interest rate swaps, comprising over 66,000 trades.

We can look at how LCH.Clearnet deals with this issue.

The default rules, as set down by LCH.Clearnet, define the situations which constitute a default:

• non-payment of any funds due to LCH.Clearnet;
• any breach of LCH.Clearnet regulations or the clearing member agreement;
• any breach of exchange or regulatory requirements;
• the commencement of insolvency proceedings against any member.

There are other cases where LCH.Clearnet deems it necessary to question the suitability of members to continue to meet their obligations. In the past, under such circumstances, LCH.Clearnet has been able to arrange amicably the winding down or transfer of the member’s open positions and business, and this has been followed by the subsequent resignation of the clearing member.

In the event of a default at LCH.Clearnet, the defaulting member’s funds (comprising initial margin and any surplus funds) will be used to cover losses and any costs incurred. LCH.Clearnet has had five defaults to manage in recent years for the following reasons:

• Drexel Burnham Lambert Ltd – failure to meet margin obligations;
• Woodhouse Drake and Carey (Commodities) Ltd – failure to meet regulatory requirements;
• Baring Brothers & Co. Ltd – insolvency proceedings;
• Griffin Trading Company – inability to finance losses and failure to meet regulatory requirements;
• Lehman Brothers International Europe – collapse of the investment bank.

In each of these situations, there have been sufficient funds held by LCH.Clearnet in the form of margin to cover the losses and costs incurred, so no further action has been taken.
When a default occurs, LCH.Clearnet can take any of the following actions:

- close out and settle open contracts belonging to the defaulting member;
- transfer open client positions to another member;
- hedge the market risk of the defaulting member’s open positions by entering into new contracts on the exchange;
- hedge the market risk of the defaulting member’s open positions by entering into other off-exchange transactions.

LCH.Clearnet has a default procedure laid down, as detailed below, in the event that sufficient funds are not available from the defaulting member. The funds will be used in the order shown, until the losses are covered.

In order to ensure that the default backing is sufficient for the markets’ needs, the initial margin requirements across all members are tested daily. All contracts are tested using extreme price movement parameters on a value-at-risk (VaR) model developed by LCH.Clearnet. The default fund (DF) is satisfactory at this time but steps would be taken to increase it, if it is shown in testing to be inadequate.

The default management process must be set out by LCH.Clearnet as part of its responsibilities as a recognised clearing house, under FCA rules.

The following chart shows the measures that are built into LCH.Clearnet’s default protections. Working from the foot of the diagram, the fundamental building block is that clearing members do indeed have sufficient resources and operational capability to perform with respect to the markets that they clear through the LCH.Clearnet as the CCP. Above this on the chart, the disciplines of variation and initial margin, together with the ability to call intra-day margin, are then applied.

All of these measures are then supported by the various cash contributions from the clearing members into LCH.Clearnet’s member default fund, which again is supported by the firm’s capital. Towards the top of the diagram there is a specific additional element with respect to SwapClear contributions, whereby LCH.Clearnet has the right to request £50 million from each remaining SwapClear member on a non-voluntary basis.
LCH.Clearnet’s Default Protections

| Remainder of LCH.Clearnet’s capital |
| SwapClear Contributions |
| Remaining Default Fund |
| LCH.Clearnet’s own capital (up to £20 million) |
| Defaulter’s Own Default Fund Contribution |
| Intra-Day Margining |
| Initial Margin |
| Variation Margin |
| Membership Criteria |

Source: LCH.Clearnet Group

3.2 CLEARING HOUSE FIRE DRILLS

With regulators wanting OTC transactions like swaps to be centrally cleared the process of managing a default becomes crucial to the clearing house and members.

‘Fire drills’ have become a key part of the clearing house procedures designed to assist the orderly management of a default.

Clearing house members have to comply with the LCH.Clearnet Clearing House Procedures if they are to be members and a key requirement is:

Each clearing member shall maintain current written risk management policies and procedures which address the risks that the relevant clearing member may pose to the clearing house, including any policies and procedures that the clearing house may reasonably request be incorporated therein. Upon the request of the clearing house, a clearing member shall promptly provide the clearing house with a copy of its current policies and procedures for review by the clearing house.

As part of the procedures we can look at the supplementary criteria applicable to SwapClear applicants, where there is a requirement to comply with the following:

a. successfully participate, or demonstrate that it has: (i) an affiliated SCM that can successfully participate; or (ii) an LCH approved outsourcing party that can successfully participate in a SwapClear ‘fire drill’ run by the clearing house which shall involve submitting a bid for a notional portfolio of trades within a specific currency in a specified timeframe. Submission of a bid outside the timeframe specified by the clearing house or submitting a bid that is unreasonable will constitute a failure of the fire drill and the applicant’s SwapClear clearing member application will not be approved.
b. be able to participate or demonstrate that it has: (A) an affiliated SCM that can participate; or (B) an LCH Approved Out-sourcing Party that can successfully participate in the default management process as operated by the clearing house;

c. in the event of a default, be able to receive from the clearing house and process SwapClear contracts, and any associated hedge trades, in financial products mark-up language (FpML) format or separated value electronic format.

The process of the fire drill centres around the unwinding of a defaulted member’s positions.

As noted above, LCH.Clearnet’s current members are required to test and confirm their ability to manage the process of downloading a set of dummy default portfolios from LCH.Clearnet’s website. They must then be able to value the portfolios in their internal risk management systems and provide LCH.Clearnet with accurate valuations and bids on a timely basis.

New members are required to undergo a personalised fire drill (called a ‘driving test’) of the default management process.

The files will be sent in comma-separated values (CSV) and FpML formats.

**Summary of the Fire Drill:**

- SwapClear will simulate a ‘live’ default of AcmeBank1 which has a portfolio of circa 212,000 trades.
- The defaulting portfolio comprises of trades denominated in six currencies – CHF, EUR, GBP, JPY, USD and ZAR. All eligible trade types including the variable notional swap (VNS) and forward rate agreement (FRA) will be included in this exercise.
- Traders from Default Management Group (DMG) will convene at a location advised directly to the group on the date of the simulated default to begin the risk neutralisation of the portfolios.
- All SwapClear members, including new joiners, will be required to participate in the auction of the risk neutralised defaulted portfolios.
- SwapClear members offering client clearing services will be required to participate as a ‘backup clearer’ to facilitate the porting of client portfolios.

Source: www.lchclearnet.com/member_notices/circulars/2012-01-16_1.asp

### 3.3 MANAGING RISKS

The importance of the CCP is its ability to manage risk. As noted in Chapter 6, Section 1.2, the parties to transactions require the certainty of settlement and this is what the CCP provides.

#### 3.3.1 Margin Calls and Collateral

There are several references to margin calls and collateral in this manual, as this is a major method of managing the risk of a member or counterparty failing to meet their obligations.

By applying margin calls to open positions which require the clearing member with that position to provide collateral (initial margin), the CCP is able, should default occur, to use that collateral to ensure that the CCP has sufficient funds to cover institutional losses in a default in normal market conditions.
EXAMPLE

A clearing member of the CCP has futures positions and has £6 million in US Treasury bonds deposited with the CCP as initial margin collateral.

The member has a VM call of £5 million but fails to make payment in settlement.

The CCP puts the member into default and sells the collateral it was holding to generate funds for the settlement of the VM. Remember the CCP has paid out the VM to members with the opposite positions.

The CCP now closes down the positions (or in the case of clients’ positions may transfer them to another member) of the defaulting member, again using the proceeds from the sale of collateral to cover any costs.

Any remaining balance is returned to the clearing member.

It is essential that the CCP manages the exposure that the member’s positions create through the calculation of VM and initial margin. However, there are other ways in which the CCP manages the risk of a default by a member.

3.3.2 Default Funds and Insurance

CCPs can create default funds by requiring members to contribute a monetary amount to a fund that will be used if the initial margin held by the CCP is insufficient to cover the obligations of the defaulted member. LCH.Clearnet refers to its member default fund, for example.

In addition the CCP may have insurance in place should the initial margin and default fund (there may be a second call on members for contribution) be insufficient.

3.3.3 Membership

A further control mechanism is the set of criteria applied for membership of the CCP. Strict standards relate to such things as capital, management, technology and competency. Failure to meet and maintain these standards can result in cancellation of membership of the CCP. This is the fundamental risk control of entry to CCP membership.

Members are monitored to ensure maintenance of these standards and in particular the financial and credit status of the member is constantly reviewed.

3.3.4 Market Risk

The CCP will also monitor the exposures of members as well as the volatility of the instruments and the markets. As a result, initial margin rates are adjusted to maintain the risk management levels the CCP requires and members must be prepared to meet these requirements on both an intra-day and overnight basis. Note that, intra-day margin is an additional margin call which is required from time-to-time in volatile market conditions.
4. **CALCULATING INITIAL MARGIN**

**LEARNING OBJECTIVES**

7.1.4 Be able to calculate basic initial margin on a given position: government bonds; short-term interest rates; equity futures

In its most simple form, initial margin is based on a rate per lot or contract. To calculate the amount of initial margin, therefore, involves two elements:

1. the number of contracts in the open position; and  
2. the rate per contract charged.

Note that the rate charged by the clearing house to a member firm may differ from that charged to a client by the member. What cannot happen is that the rate charged by the member to their client is less than the rate charged by the clearing house.

**EXAMPLE**

Client A opens a futures position by purchasing 20 futures contracts with an initial margin rate of £1,500.

The initial margin amount is, therefore, $20 \times £1,500 = £30,000$.

However, suppose that the client sells 20 June futures and purchases 20 September futures. The risk profile is very different and, as both positions cannot be losing money at the same time, the initial margin can be reduced by offsetting the long and short position. What will apply will be a spread or offset rate, say, £750 per contract.

The initial margin is, therefore, not $40 \times £1,500$, but perhaps $40 \times £750 = £30,000$.

To calculate the initial margin for a specific contract it is necessary first to ascertain the margin rate from the relevant exchange or clearing house and in the case of a non-clearing member, from the clearing broker.

Clearing houses have different ways of applying offsets and different rates for different products and positions.

The fundamental point is that initial margin is required to cover the risk associated by a movement in the value of the position, and the holder’s ability to meet its obligation.

Initial margin on options can be different; here the buyer has often paid its obligation by settling the premium amount with the seller. The seller, however, still has an obligation if the buyer exercises its right. As a result, the writer of an option must put up initial margin which will be related to the value of the underlying that would be delivered in the event of exercise.

Margin systems like SPAN and STANS (covered in Sections 1.2.1 and 1.2.2 of this chapter) apply more sophisticated margin assessments based on portfolios of positions and offsets.
**END OF CHAPTER QUESTIONS**

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is initial margin?</td>
<td>Section 1.1.1</td>
</tr>
<tr>
<td>2. What is a buffer margin?</td>
<td>Section 1.1.4</td>
</tr>
<tr>
<td>3. What does SPAN stand for?</td>
<td>Section 1.2.1</td>
</tr>
<tr>
<td>4. What is STANS?</td>
<td>Section 1.2.1</td>
</tr>
<tr>
<td>5. What is a risk array?</td>
<td>Section 1.2.2</td>
</tr>
<tr>
<td>6. List three types of collateral that a clearing organisation might accept.</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>7. Which has the greater collateral value, government bonds or equities?</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>8. Can you cover initial margin with cash?</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>9. What is variation margin?</td>
<td>Section 2.1</td>
</tr>
<tr>
<td>10. Why is variation margin settled only in cash?</td>
<td>Section 2.1</td>
</tr>
<tr>
<td>11. What is tick size?</td>
<td>Section 2.1.1</td>
</tr>
<tr>
<td>12. What is the formula to calculate the variation margin?</td>
<td>Section 2.1.1</td>
</tr>
<tr>
<td>13. What is a default under the LCH.Clearnet Default Rules?</td>
<td>Section 3.1</td>
</tr>
<tr>
<td>14. What two elements are necessary to calculate the amount of initial margin?</td>
<td>Section 4</td>
</tr>
</tbody>
</table>
CHAPTER EIGHT

CLEARING AND SETTLEMENT

1. PAYMENT AND RECEIPT (CLEARING HOUSE AND CLEARING MEMBER) 159
2. THE RELATIONSHIP BETWEEN THE CLEARING MEMBER AND THE CLIENT 162
3. DELIVERIES 166
4. GLOBAL CLEARING AND PRIME BROKERAGE 181
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This syllabus area will provide approximately 9 of the 50 examination questions
1. PAYMENT AND RECEIPT (CLEARING HOUSE AND CLEARING MEMBER)

LEARNING OBJECTIVES

8.1.1 Know the function of a clearing house in the delivery and settlement process

1.1 THE ROLE OF THE CLEARING HOUSE

The settlement of the obligations incurred by transacting business on an exchange is made with the clearing house. The obligations incurred by a client or end-user (i.e., someone who is not a member of the clearing house) are settled via their broker (see figure below).

We know, from Chapters 5 and 6, how the clearing house works and also just how many diverse products are traded on exchanges. The treasury and delivery departments at the clearing house ensure that members are aware of the obligations that need to be met, or for which the clearing house will be making payments.

It is important to remember that there are strict deadlines associated with the settlement and delivery processes.

There are two possible relationships in the market-clearing structure as shown below.
1.2 PAYMENT AND RECEIPT OF MARGINS AND PREMIUMS

LEARNING OBJECTIVES

8.1.2 Know the process for payments and receipts to and from the clearing house

To introduce this chapter covering settlement, we shall start by reminding ourselves of some of the calculations that we have already looked at in Chapters 2 and 3.

The amount of money which must be paid as premium for an option is calculated in the following way:

Example of trade: purchase of 250 BP April 650 Call options at 11p.

\[(\text{Number of contracts}) \times (\text{Underlying contract size}) \times (\text{Premium price}) \div 100\]

The underlying size of the contract is needed for the calculation. In this case, it is 1,000 shares as determined by NYSE Liffe.

\[250 \times 1,000 \times 11 \div 100 = £27,500\]

This amount must be paid to the clearing broker on T+1, since the amount of premium due will be debited from the clearing broker’s account at the clearing organisation on T+1.

Each day the clearing organisation will call in from and pay out to the clearing member the net amount of profit or loss that is accruing on the open futures positions and options on futures positions. This amount is known as variation margin.

Let us remind ourselves how variation margin is calculated each day. In our example, a client buys one Euronext.liffe March short Sterling future at 93.43 on 14 January. The client sells the position at 93.49 five days later on 21 January.

<table>
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<tr>
<th>Date</th>
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</tr>
<tr>
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<td>+6</td>
<td></td>
<td>+6</td>
<td></td>
<td>£75.00 profit</td>
</tr>
</tbody>
</table>
Since the value of each tick value is £12.50 and the profit on the trade was six ticks or points (i.e., the difference between the buying and selling price), this reflects an overall profit of 6 x £12.50 or £75.00.

It must be remembered that variation margin for futures and options on futures must always be settled in cash. This is because the clearing member must always settle with the clearing organisation in cash.

The calculation of initial margin is normally performed using a portfolio risk based margining method. This involves complicated algorithms which take a set of scenarios. You will remember that the two most common margin methods that we looked at in Chapter 7 were SPAN and STANS.

Unlike variation margin, it is possible to cover initial margin requirements at the clearing organisation with various forms of collateral. Initial margin is a deposit to cover the risk on open positions and therefore the cash or collateral is returnable once the obligation of the position has been closed.

### 1.3 CLEARING MEMBER AND CLEARING HOUSE RESPONSIBILITIES

#### LEARNING OBJECTIVES

8.1.3 Understand the responsibilities of the clearing member to a clearing house

It is also imperative to understand the different requirements for each clearing house.

The operations team at a clearing member must be aware of the following:

- The source and time of the availability from the clearing house of the data needed for settlement.
- The time and method by which any payments to the clearing house must be made (e.g., protected payment systems).
- The source within internal systems for the reconciliation of the settlement amounts.
- The internal procedures for instructions to effect the settlement.
- Procedures for lodging and withdrawal of collateral.

The client’s or end-user’s operations team must be aware of the following:

- The source and time of the availability from the clearing member of the data needed for settlement (e.g., electronic data transfer, fax, hard copy report).
- The time and method by which any payments to the clearing member must be made.
- The source within internal systems for the reconciliation of the settlement amounts.
- The internal procedures for instructions to effect the settlement (e.g., instructions to custodian, standard settlement instructions).

Let us look at the implications for the clearing member which has an obligation to the clearing house.

First and foremost the clearing member must settle the amounts due with the clearing house. Otherwise it risks being put into default.
It will obviously need to do this for its principal trading activity but must also do so for its client’s business, whether or not a client settles its obligations to the clearing member.

Clearly there must be:

- good communication between clearing member and client;
- provision of timely and accurate settlement data to the client;
- speedy resolution of any discrepancies or queries;
- monitoring of settlement receipts/payments from bank accounts, particularly Nostro accounts;
- funding lines available should a delay occur in receipt of settlement from the client;
- procedures to incorporate any shortfall from a client in the client money calculations (where applicable);
- procedures to deal with non-payment of margin calls (see Chapter 7).

In addition, the clearing member must have adequate procedures to deal with the settlement of any delivery that occurs on a derivative position, as it remains under an obligation to the clearing house to ensure delivery takes place as per the timetable laid down, whether or not its client(s) comply with the delivery timetable.

### 2. THE RELATIONSHIP BETWEEN THE CLEARING MEMBER AND THE CLIENT

#### LEARNING OBJECTIVES

8.2.1 Understand the different operational roles for both the client and the clearing member in respect of: clearing of trades; reconciliations; payment of margin; contract settlement

8.2.2 Understand the key risks for each party in respect of: clearing of trades; reconciliations; payment of margin; contract settlement

#### 2.1 PROCESSES IN TRADE CLEARING AND SETTLEMENT

**Client services** may be a separate function which deals only with the settlement of business directly with clients. These clients could be internal clients, such as other departments’ trading accounts, proprietary traders, branch offices and subsidiary companies; or external clients, such as fund management houses, other banks or brokerage houses and private clients.

The client services team will, typically, be responsible for the following primary functions.

**Input or Verification of Client Trades**

In order to segregate duties, an important control function is for the client area or trade processing function to input trades and the reconciliations area to check them, or vice versa. Details of the matched trades, which have been checked against the market output, are input to the correct client account.
T+1 Trade Queries
Any trades queries not resolved on trade day must be resolved by client services on T+1.

Checking Commission Rates
All client trades should be checked to ensure that the correct rate of commission has been charged. It varies from market to market and client to client.

Settlement of Margins and Cash Movements
Cash movements must be settled on time. The client services area must advise the funding area of any likely receipts and non-receipts of funds as soon as possible, so that funds can be placed in case they need to be borrowed. The efficiency of this process will allow the funding area greater flexibility to attain better rates for deposits and/or loans.

Movement of Collateral
The client services area receives instructions from clients regarding the pledge or release of collateral.

Treasury Management Advice
The client services team should be able, if required, to advise clients on the methods available to cover margin requirements. This will vary from market to market and the funding conditions at the time.

Monitoring Give-up Trades and Give-in Trades
The client services team may receive confirmation from clients of trades which have been executed elsewhere and are being given up to the broker for clearing.

Advice of Assignment/Delivery
Advice of delivery or information regarding assignments must be given to clients in a timely manner. Additionally, the client services team must monitor all client positions which are approaching delivery or expiry, and ensure that the relevant clients are aware of the consequences and the delivery process, if applicable.

Interest Calculations and Reporting
Daily and monthly interest calculations must be made available. These will normally be calculated on the internal settlement system, but will require checking for the correct balances.

In addition to these primary functions, the client services team may be involved in the monitoring, calculation and payment of brokerage to other brokers on behalf of clients. It also has a crucial role in risk management, as it has close contact with and knowledge of the client. It is often in a position to spot potential problems, and can alert relationship and risk managers.

The client services team may be involved with marketing to clients because of the importance of the back office function and operational risk. It may be required to demonstrate to potential or existing clients, evidence of controls and procedures in place, as well as giving advice on various operational functions.
Client Liaison and Review

The client services team will be responsible for looking after its clients and ensuring that they are receiving a good level of service at all times. Regular contact and face-to-face meetings are conducted to review with the client the appropriateness and efficiency of the service.

An Example Step-by-Step Flow from Trade to Final Delivery

1. The client places his order with the salesman at his chosen broking firm.
2. The salesman takes the order and confirms details of the instruction back to the client.
3. The details of the order are entered into the electronic trading system. The system is set up so that only the minimum amount of detail needs to be entered, in order to save time.
4. The salesman can see various details of the latest bids and offers on the screen at his desk.
5. The trade is then completed and a transaction number is automatically allocated to it.
6. The salesman contacts the client to confirm that he has filled the order and relays the details.
7. The trade details automatically appear in the exchange settlement system.
8. Where they are separate, there is a file transfer from the exchange settlement system to the delivery and settlement system. This system also has an automatic feed into the broker’s back office system for the settlement process to start.
9. Initial margin on short options and all futures positions is calculated and monitored against collateral held.
10. Positions may now be marked to market (futures) and variation margin calculated and settled daily.
11. Positions are closed out against offsetting transactions.
12. Open positions are either tendered during the delivery period or on expiry, and options are exercised or assigned.
13. The delivery process for tendered and exercised positions takes place as per the exchange and clearing house rules and the conditions contained in the contract specification.
14. On expiry the contracts not being delivered cease to exist.
The client must be able to manage the following:

- record details of the trade;
- reconcile the position to the broker;
- calculate the settlement amount including variation margin, initial margin and option premium;
- provide timely payment and or payment instructions for receipts;
- provide broker with collateral as required to cover margin calls;
- mark-to-market (MTM) open positions for profit and loss (P&L) purposes;
- carry out valuations for trader/client reporting/statements;
- deal with exercise/tenders of positions and update records;
- manage assignments and update records.

### 2.2 KEY RISKS FOR CLEARING MEMBER AND CLIENT

The major risks in the clearing and settlement of derivatives revolve around data and deadlines.

We have seen from the table in Section 2.1 that there are numerous processes and procedures involved in the clearing and settlement of futures and options. As the broker has a liability with the clearing house, remember that the clearing house often recognises only its member firms and so they have the responsibility for the settlement, not the client.
We can therefore summarise that the key areas of concern for the broker are:

- capturing the trades;
- allocation of the trades to client and proprietary accounts;
- reconciliation of the trades and positions to the clearing house;
- verifying the margin calls;
- adequate funding to settle trades (and deliveries) with the clearing house;
- distribution of the settlement data to the client;
- receipt of the settlement amounts from the client;
- monitoring open positions and managing close outs.

A problem in any of these areas is likely to have severe consequences and in some cases could lead to a default situation.

As far as the client is concerned, the risk is failing to reconcile the broker’s positions to their own internal records and the inability to settle margin calls on time. In the first instance, there could be errors in the trades and/or positions and in the latter case a broker may close positions and refuse to have any further dealings with the client.

3. DELIVERIES

LEARNING OBJECTIVES

8.3.1 Understand the key stages in the delivery process for the following cash and physically settled future/option contracts: equity index futures; equity futures; interest rate futures; currency futures; government bond futures; commodity futures (metals/softs/agricultural); energy futures (oil/gas/power/emissions)

8.3.2 Understand the following terms with respect to deliveries: tender; exercise; assignment; Exchange Delivery Settlement Price (EDSP); last trading day; notice day; price factor

8.3.3 Be able to calculate the invoice amount for both physical delivery and cash settlement

3.1 THE DELIVERY MECHANISM

Many derivative products are designed to go to delivery, i.e., the underlying asset on which the derivative is based will physically move from seller to buyer. However, the delivery for some products may be a cash amount rather than the asset itself.
Cash Settlement Contracts (Index and Interest Rate Futures)

For example, an index future or option contract is designed to provide an instrument that tracks the market or sector on which it is based. The FTSE 100 Index is composed of shares in the top 100 companies. To effect physical delivery for the futures and options contracts based on this index, shares in all 100 companies will need to be delivered – an onerous, costly and, therefore, unattractive prospect, particularly as the number of shares for each company will vary according to its weighting in the index. Instead, on delivery, the futures and options contracts are settled by a cash payment/receipt. Remember, options on index futures will become index futures positions on delivery.

Likewise, an interest rate future like the three-month short Sterling or the Eurodollar is cash-settled. The final payment/receipt is made against the exchange delivery settlement price (EDSP) published by the exchange.

The delivery process is different for each product and varies from exchange to exchange. The UK and US government bond futures contracts have a delivery period during which delivery can be initiated on any day. The commodity contracts also have a delivery or tender period during which delivery can be initiated. The length of the tender period is variable depending on the commodity involved. Other futures contracts have a single delivery day on which delivery can be initiated.

If physical delivery of the asset is in the contract specification, the process can vary from product to product, typically in reflection of different cash market delivery practices.

For futures contracts, it is always the holder of the short position which has the rights and can decide at what point during the delivery period, that delivery will be entered into. In certain cases, like government bond futures contracts, the seller has the right to decide what will be delivered.

The reason for this is the nature of physical delivery. The holder of the short position will always be the party which has to deliver the physical asset, while the holder of the long position will be paying cash to buy the asset. It is a more involved process to move assets into the approved point. Therefore, the seller of these assets needs to have more flexibility than the party which has to pay funds into the relevant place.

If a notional contract, such as a government bond, is being delivered, the seller has the choice because they can deliver any of the bonds which meet the acceptable criteria laid down by the exchange and are published on the deliverable list. If the seller has a range of bonds on the deliverable list, then they can choose which of the bonds is most preferable for them to deliver. There will be one bond which is known as cheapest to deliver. This bond offers the maximum profit or minimum loss for the seller.

These delivery obligations are all laid down by the exchange in the contract specifications, so each participant should understand the procedures involved in the delivery process. The buyer should understand that they are subject to the actions of the holder of the short position.

It is important to remember that not all positions are taken through to delivery. In general only 3–4% of contracts go to physical delivery. The underlying value of those transactions can, however, be very high. If a contract is not required to be held until delivery, an opposing trade can be transacted in the market and the position can be closed out so that no further obligations are outstanding.
At delivery or expiry of each contract, the exchange will issue the price, at a time determined in the contract specification, which will be used to calculate the settlement figure for each contract. This price is known as the exchange delivery settlement price (EDSP). For government bond contracts, the EDSP is used to calculate the invoicing amount; for interest rate contracts and index contracts, which are cash settled, it is used to calculate the settlement amount.

There are variations to the rules, procedures and timings governing delivery, and it is important to recognise this and check on the specific situation that applies for the market and product on a case-by-case basis. Failure to do this can result in serious financial penalties levied by the exchange/clearing organisation and also possible financial loss due to error. Since clearing members are directly responsible to the clearing organisation, there is a risk of reputational damage if delivery procedures are not adhered to.

In Chapter 2 the definitions of the first notice day, last notice day and last trading day were given. These are three very critical days in the delivery process:

**First Notice Day**

This is the first day that the holders of short positions can give notification to the exchange/clearing organisation that they wish to tender a position for delivery. A holder of a long position must have closed their position the previous trading day if they did not want the possibility of taking delivery against their position.

**Last Notice Day**

This is the final day that notification of delivery will be possible. On most exchanges all outstanding short futures contracts will be automatically delivered to open long positions.

**Last Trading Day**

This is often the day preceding the last notice day and is the final opportunity for holders of long positions to trade out of their positions and avoid delivery.

Ultimately, it is always the clearing member’s responsibility to ensure that delivery of contracts is effected strictly in accordance with the relevant exchange or clearing organisation procedures. More importantly, it is also the clearing member’s responsibility to ensure that delivery does not happen unless the clearing member or its client is fully aware of the situation and consent to the delivery. Accidental delivery processes can be extremely costly!

It is therefore very important that all of the clearing member’s staff and its clients are fully aware of the consequences of going to delivery in each contract. The exact procedures and timings are very important but they should always be confirmed when entering the delivery period as procedures and timings change from time to time. A common mistake which occurs is with local times. Most exchanges quote delivery times in their local time, which in itself should not present too many problems but confusion can occur when in the UK we change from Greenwich Mean Time (GMT) to British Summer Time (BST).
It is vitally important that positions which are coming up to the delivery period are monitored by both the clearing member and the end-clients. The clearing member will need to ensure that its clients are fully aware of the delivery situation and their responsibilities. Ultimately, the clearing member is liable if the delivery process is entered into by mistake or procedures are not followed thoroughly.

If the delivery procedures are not followed in accordance with the rules and regulations, the exchanges have a range of penalties and fines which may be invoked. In some cases, these are quite heavy as they are designed to be prohibitive and to ensure that the delivery procedure is very efficient. This has a direct effect on the success of the exchange and the reason for participants wanting to trade on the exchange. If the delivery process were not efficient, and participants could not be sure that making or taking delivery would take place properly, then it might deter them from trading on the exchange.

For clearing members, the payment of fines and penalties is not the only issue. There is a significant element of reputational risk because the exchange is at liberty to publicise information relating to fines for breaches of delivery procedures. Ultimately, the exchange could suspend the clearing member and revoke their rights to trade on the exchange if they felt that the clearing member was not managing their business properly.

### 3.2 LCH.CLEARNET DELIVERY PROCEDURES

LCH.Clearnet sets down all its delivery rules and procedural requirements in its rulebook. One of the key stipulations is that LCH.Clearnet procedures must be read in conjunction with the rules of the exchange. The exchange rules and administrative procedures will always take precedence in cases of conflict.

LCH.Clearnet defines its delivery procedures, some of which are common to all contracts which LCH.Clearnet clear. These address issues such as:

- nomination of transferors and transferees;
- how tendered lots are to be allocated to receiving members;
- house and client accounts are always treated separately;
- making the EDSP available on the clearing processing system (CPS);
- margin remains held as both initial and variation margin on open contracts subject to delivery;
- the method of delivery of information which needs to be communicated to LCH.Clearnet;
- the delivery timetables.

LCH.Clearnet has introduced a stand-alone computer system specifically for electronically communicating delivery information to its members, applicable to NYSE Liffe deliverable bond contracts only. A product called the deliveries package enables all NYSE Liffe bond deliveries to be automated in this way. All clearing members involved in bund and gilt deliveries must submit and retrieve delivery information using this system.

Users of the deliveries package are issued with security passwords, which are updated at every bond delivery period.
A key factor to note is that members must always be sure to meet delivery deadlines, notwithstanding the performance or failure of the electronic communication system. Therefore, LCH.Clearnet stresses that members should allow sufficient time to fulfil deadlines as laid down in the procedures. Failure to do so will constitute late delivery for which fines and possible other disciplinary action could be imposed by the exchange.

3.2.1 The Process of Delivery

The exact process involved in delivery varies from exchange to exchange and often from contract to contract. However, the process can be followed by looking at key stages which apply in general. The process used at NYSE Liffe for UK gilt contracts is given as an illustration.

Stage One

Once a short position has been tendered for delivery, the holder advises the clearing organisation of the number of contracts, the asset to be delivered and if relevant, whether it is from the proprietary (house) or client account. This may be communicated electronically using the relevant delivery system.

Stage Two

The clearing organisation allocates the short position to a corresponding long position and notifies the member which is the holder of the long position.

For NYSE Liffe contracts, this allocation is always on a random basis. The process that LCH.Clearnet employs gives each clearing member’s account a sequential number according to its mnemonic sequence. The system chooses a random starting number then it begins to allocate the short positions to corresponding long positions in sequence from the starting point.

Stage Three

The clearing organisation calculates the invoice amount and advises both the short and long position holders of the amount it requires to be paid/received. This calculation takes into account the variation margin that has already occurred by incorporating the EDSP on the day of notice and a price factor.

The formula used for the calculation of the invoice amount for a delivery of a NYSE Liffe government bond futures contract is:

\[(\text{EDSP} \times \text{price factor} \times \text{unit of trading}) + \text{accrued interest}\]

Note: accrued interest on bonds is the interest from the last payment date up to the trade date (delivery date for the future).

Stage Four

The short position holder delivers the quantity of asset to the clearing organisation and receives the invoice amount. The clearing organisation delivers the asset to the long position holder in exchange for the invoice value.
The clearing members for the long and short positions need to have accounts at the relevant depository, ie, Euroclear UK and Ireland, to be able to make and take delivery from the clearing organisation account at the depository.

I. The Delivery Process for Government Bond Futures

Where futures markets offer a government bond futures contract, it normally relates to a notional bond rather than an actual bond which is available for trading. If the participant wishes to enter into the delivery process for a government bond contract then they need to study the contract specification carefully. For example:

<table>
<thead>
<tr>
<th><strong>Long Gilt Future</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit of trading</strong></td>
</tr>
<tr>
<td><strong>Delivery months</strong></td>
</tr>
<tr>
<td><strong>First notice day</strong></td>
</tr>
<tr>
<td><strong>Last notice day</strong></td>
</tr>
<tr>
<td><strong>Delivery day</strong></td>
</tr>
<tr>
<td><strong>Last trading day</strong></td>
</tr>
<tr>
<td><strong>Quotation</strong></td>
</tr>
<tr>
<td><strong>Min. price movement</strong></td>
</tr>
<tr>
<td><strong>(Tick size and value)</strong></td>
</tr>
<tr>
<td><strong>Trading hours</strong></td>
</tr>
</tbody>
</table>

- **Contract Standard**

Delivery may be made of any gilts on the list of deliverable gilts in respect of a delivery month as published by the exchange on or before the tenth business day prior to the first notice day of such delivery month. Holders of long positions on any day, within the notice period, may be delivered against, during the delivery month. All gilt issues included on the list will have the following characteristics:

- having terms as to redemption such as provide for redemption of the entire gilt issue in a single instalment on the maturity date falling not earlier than 8.75 years from, and not later than 13 years from, the first day of the relevant delivery month;
- having no terms permitting or requiring early redemption;
- bearing interest at a single fixed rate throughout the term of the issue payable in arrears semi-annually (except in the case of the first interest payment period which may be more or less than six months);
- being denominated and payable as to the principal and interest only in pounds and pence;
- being fully paid or, in the event that the gilts issue is in its first period and is partly paid, being anticipated by the board to be fully paid on or before the last notice day of the relevant delivery month;
- not being convertible;
\begin{itemize}
  \item not being in bearer form;
  \item having been admitted to the official list of the LSE;
  \item being anticipated by the board to have on one or more days in the delivery month an aggregate principal amount outstanding of not less than £3 billion, in the case of a gilt issue which was first issued more than 12 months before such delivery month or £1.5 billion otherwise, which by its terms and conditions, if issued in more than one tranche or tap or issue, is fungible.
\end{itemize}

- **Exchange Delivery Settlement Price (EDSP)**

  The NYSE Liffe market price at 11:00 hrs on the second business day prior to settlement day. The invoicing amount in respect of each deliverable gilt is to be calculated by the price factor system. Adjustment will be made for full coupon interest accruing as at settlement day.

  As each gilt issue trades in the cash market with varying coupons and final maturity dates, the exchange must find a mechanism by which these securities can be valued and traded at one unique price prevailing on the exchange. This involves the creation of an index with a value which can be uniformly applied to all of the bonds making up the list of securities which may be delivered. This list is known as the deliverable basket. A price factor system is designed to reprice each of these issues onto a uniform scale, which can be used at the exchange. These price factors are determined by a formula that calculates the price at which a specific issue would trade to yield, 6% in the case of NYSE Liffe long gilt contracts, as of the delivery date. NYSE Liffe publishes the price factor for each gilt in the deliverable basket as delivery approaches.

  Delivery of the NYSE Liffe long gilt contract is physical at maturity and as in other deliverable contracts the seller has the choice of which long gilt is going to be delivered. However, the seller does not have a free choice. The gilt must be selected from the list of deliverable gilts issued by the exchange. This list of deliverable gilts with their associated price factors and accrued interest amounts is published by the exchange ten days prior to the last trading day of the relevant delivery month and distributed to its members.

  Gilt deliveries must take place through the London clearing house’s account at CREST, as LCH. Clearnet is counterparty to each delivery.

  As no single gilt exists to meet the exact NYSE Liffe long gilt contract specification, the buyers of the gilt in the delivery process must pay an invoice amount in settlement which takes into account the varying specifications of the gilt which is delivered.

  We have already learnt that the formula for the invoicing amount is:

\[
(EDSP \times \text{price factor} \times \text{unit of trading}) + \text{accrued interest}
\]

- **Cheapest to Deliver**

  As we have already said, the seller has the choice of which of the gilts to deliver, from the deliverable list issued by the exchange. At delivery, the buyer should expect to receive the gilt, which will create the maximum profit or minimum loss for the seller when assessing the fair price of the futures contract. This is known as the **cheapest to deliver** gilt.
In order to determine the cheapest to deliver gilt, you need to know the price, or conversion, factors which are applicable. These price factors are issued by the exchange. It enables the calculation of the price at which the gilt will trade, for each one nominal, to yield the notional 7% coupon of the NYSE Liffe long gilt futures contract during the delivery period. The use of the conversion factor allows higher coupon gilts to be deliverable, when yields are below the notional 7% coupon.

- **Last Trading Day**
  The last trading day is the final time that the long or short positions can be closed out by equal and opposite trades. After trading ceases any remaining open positions will go to delivery.

2. **The Delivery Process of Gilts through CREST**
   Delivery of the underlying gilt stocks, in respect of NYSE Liffe long gilt and five-year gilt contracts, are made through CREST in one of three ways:

   1. through the CREST book entry transfer system;
   2. using stock transfer forms (STFs) accompanied by the appropriate physical certificate(s);
   3. using STFs, which have been either certified by the Bank of England or the LSE or have been enfaced by CREST.

   Matching acceptance instructions must be input by the transferee via its CREST terminal. Payment for the delivered gilts will be made to LCH.Clearnet from the transferee via the CREST book entry system.

   Transferors must deliver gilts to LCH.Clearnet by the method specified on the seller’s delivery notice.

   The transferor must input the necessary confirmed inward delivery details via their CREST terminal. Sellers must ensure that sufficient gilts are in their transferor’s CREST account to meet the delivery in full so that the delivery will not fail. Payment for delivered gilts is made to the transferor through the CREST book entry system.

   Not all clearing members have direct access to CREST accounts, but often their clients will have their own accounts. If the clearing member delegates the function and allows their clients to deliver the gilts directly to LCH.Clearnet’s account in CREST, then they must ensure that the clients understand the procedures and timings exactly. Ultimately, whatever the client does or does not do, the responsibility always lies with the clearing member. In this situation, the clearing member can have very little control over what happens.

3.2.2 **The Delivery Process for Commodities**

Like financial contracts, the vast majority of commodity derivatives contracts are not held through to delivery. The trades can be closed out by offsetting positions in the market if the participant does not wish to make or take delivery. In fact, the amount of a commodity underlying the futures transactions which take place is likely to be far greater than the actual amount of the commodity which is in existence. For commodities markets, it is very important that the exchange and clearing organisation is monitoring the positions all the time and is aware if there are likely to be problems with the supply of a particular commodity (due to drought or flooding, for example).

We have already stated in Chapter 2 that the nature of physically delivered commodity derivatives requires careful monitoring as the consequences of delivery are much more involved and cannot be entered into lightly.
In order to understand the complexities of commodity derivatives more fully, we will look at an example of delivery of oil at NYMEX. A description of the delivery procedures for NYMEX West Texas crude can be found in Appendix 4. It outlines all of the various processes which are involved in the physical delivery of oil. These include issues such as where the oil will be delivered to, where the oil is currently being stored, different ways of delivering the oil such as pumping into tanks or transfer of title, the nomination of officials and inspectors to oversee the delivery, the presentation of the certificates detailing the quality and quantity of oil, various taxes and duties payable and procedures in the event of dispute.

### 3.2.3 Delivery of CME Agricultural Contracts

‘Softs’, such as grains, are perishable goods and therefore the delivery mechanism needs to reflect this. Also there will be issues like the quality/grade of the goods being delivered.

We saw earlier in Section 1.2 of Chapter 2 the specification for the soybean contract:

<table>
<thead>
<tr>
<th>Contract size</th>
<th>5,000 bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick size</td>
<td>¼ cent per bushel ($12.50 per contract)</td>
</tr>
<tr>
<td>Contract months</td>
<td>January, March, May, July, August, September, November</td>
</tr>
<tr>
<td>Last trading day</td>
<td>The business day prior to the 15th calendar day of the contract month.</td>
</tr>
<tr>
<td>Last delivery day</td>
<td>Second business day following the last trading day of the delivery month.</td>
</tr>
<tr>
<td>Deliverable grades</td>
<td>No. 2 yellow at par, No. 1 yellow at 6 cents per bushel over contract price and No. 3 yellow at 6 cents per bushel under contract price.</td>
</tr>
</tbody>
</table>

We can see the grades that are accepted for delivery against this contract. A grader will check the quality of the soybeans before accepting them from the seller. There is also the question of the transportation and warehousing, which may well occur as the commodity is delivered between seller and buyer.

### 3.2.4 Option Delivery Process

The process for the exercise and assignment of options is very similar to that for futures. There are, however, some key differences to be aware of:

1. An option contract has a strike price, which is the price at which the asset or futures contract will be delivered, and, therefore, there is no calculation of an invoice amount.
2. Whereas the holders of short futures position decide to go to delivery, with options it is the holders of the long positions which have the right, but not the obligation, to make or take delivery. Whether delivery is made or taken depends on whether they are holding call or put options.

The terms exercise and assignment and expiry are generally associated with options as opposed to the term delivery, which is mostly associated with futures contracts.

Where the holder of a long option position decides to exercise their right, a corresponding position at the clearing organisation will be assigned.
The following table shows what happens with the underlying asset when options are exercised and the corresponding position is assigned against.

<table>
<thead>
<tr>
<th></th>
<th><strong>LONG</strong> (Buyer in Market)</th>
<th><strong>SHORT</strong> (Seller in Market)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CALL</strong> (Towards, Buy)</td>
<td><strong>EXERCISE</strong></td>
<td><strong>ASSIGNED</strong></td>
</tr>
<tr>
<td>1.</td>
<td>Buy underlying or long futures position</td>
<td>2. Sell underlying or short futures position</td>
</tr>
<tr>
<td><strong>PUT</strong> (Away, Sell)</td>
<td>3. Sell underlying or short futures position</td>
<td>4. Buy underlying or long futures position</td>
</tr>
</tbody>
</table>

1. A long call position may result in buying the underlying or the creation of a long corresponding futures position.
2. A short call position may result in selling the underlying or the creation of a short corresponding futures position.
3. A long put position may result in selling the underlying or the creation of a short corresponding futures position.
4. A short put position may result in buying the underlying or the creation of a long corresponding futures position.

**Remember**

A call does not always give you the right to buy and a put does not always give you the right to sell. It is dependent on whether you are a buyer or seller of a call or a put.

Whereas any outstanding open short futures positions will go to delivery, option contracts must be exercised at expiry. On some markets it is possible to set criteria with the clearing organisation/exchange to exercise automatically any in-the-money options. Particular care must be taken if this facility is utilised however, for client positions where, for cost reasons, an option that is only just in-the-money may not be worth exercising.

If an option gets to the end of its life and it is not worth exercising because it is out-of-the-money, then it can be left to expire worthless. This is known as abandoning the option. It will simply cease to exist after the expiry date.

It is important for clients which have short option positions to know if they have been assigned as soon as possible. As this can happen on any day for American-style options, it requires defined procedures for alerting the clients and careful monitoring by the clearing member.

When options on futures are exercised, the option position ceases to exist and it is replaced by either a long futures position (call) or a short futures position (put). Where the option series that is listed is not a futures delivery month, it will create a futures position in the next available month, eg, February option = March future.
The general process for the settlement of the underlying asset is very similar to that of futures, with the delivery and settlement being made through clearing organisation accounts in domestic securities settlement systems (CREST for LCH.Clearnet in relation to UK equities; and the Eurex Clearing AG or the Swiss Securities Clearing Corporation (SIS) for Eurex in relation to German and Swiss equities).

It is important to remind ourselves that delivery is an important part of the overall clearing and settlement process for derivatives, and that rules exist that clearing brokers, agents and clients must adhere to. Key issues include:

- The delivery process for financial products is different from that for commodities.
- Usually margin remains in place on positions until the delivery process is completed.
- Futures are tendered for delivery.
- Options are exercised and assigned.
- Delivery can be cash-settled, physical-settled or exchange for physical.

Let us compare two delivery situations.

## DELIVERY OF JGB FUTURES ON TSE

Open positions that have not been closed out by the end of the last trading day must go to delivery.

The exchange lists deliverable bonds and conversion factors for each bond future.

A holder of a short position may deliver any deliverable JGB providing that each component (as classified by issue and type of bond) is in multiples of ¥100 million. The seller has to deliver book-entry bonds (kept in the account of the Bank of Japan book-entry transfer system).

In Japan, certain juridical entities, such as financial institutions and non-residents, are exempted from withholding tax on the interest income from JGBs, while others are subject to taxation. For this reason, specific arrangements are necessary between non-taxable and taxable buyers and sellers when delivery of accrued interest is involved (as it is with delivery of bonds). The TSE receives, by 3.00pm on the next business day following last trading day, detailed information from members regarding the tax status of their positions. The TSE then divides long/short positions into non-taxable and taxable positions. The TSE will take action over a situation where non-taxable long and short positions are unequal by designating all or part of the greater of the two as taxable final positions.

Delivery of JGBs is then made for each set of positions by tax status. Under the DVP settlement system of the Bank of Japan financial system network, payment is made simultaneously with delivery of the bonds.

Options on JGB bonds are American style and can therefore be exercised by the buyer any time prior to expiration. Exercised options are assigned by random selection to a member carrying a short position.

On expiry all in-the-money options are exercised automatically unless a member instructs otherwise. All unexercised options expire at the end of the last trading day.

An exercise of a call option on the JGB future creates a long futures position for the buyer at the strike price of the option and a corresponding short futures position for the seller.

The exercise of put option creates a short futures position for the buyer at the strike price of the option and a corresponding long futures position for the seller.
DELIVERY OF LME COPPER CONTRACT

The process of delivery of a commodity like Grade A copper is made under the rules of the clearing house and the terms of the contract specification. Timings and method of notifying the clearing house are laid down in the rules and must be followed.

Two additional factors for commodity delivery are the grade of the underlying and, for commodities like copper, cocoa or grains, warehousing.

Copper Grade A Futures and Traded Options

One of the original metals, copper shared an era of history with tin as a fundamental component of the Bronze Age. However, its primary properties in modern-times are its electrical conductivity and heat-transfer ability, making it invaluable for use in the building construction and electrical industries. Copper's malleability, strength and corrosion-resistant qualities also make it an excellent alloying agent for the production of intricate shapes – particularly in brass and bronze.

This alloying factor made copper one of the most important industrial metals of the 19th century and it naturally became the flagship contract of the LME when it was established in 1877. The copper industry was quick to recognise the LME as its international pricing mechanism. This role is still fundamental to the ongoing success of the LME copper contract. LME futures, traded options and TAPOs contracts provide the optimum combination of physical contract and risk management mechanisms for today's industry members, whereby sale and purchase contracts can be hedged to an advantage. Today some 94% of all copper futures trading is carried out on the LME.

LME Copper Grade A Futures Contract Specification

<table>
<thead>
<tr>
<th>Contract</th>
<th>Grade A copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot size</td>
<td>Lot size 25 tonnes (with a tolerance of +/– 2%)</td>
</tr>
<tr>
<td>Form</td>
<td>Grade A cathodes conforming to BSEN 1978:1998</td>
</tr>
<tr>
<td>Weight</td>
<td>Each parcel of copper cathodes placed on warrant shall not exceed four tonnes</td>
</tr>
<tr>
<td>Delivery dates</td>
<td>Daily for cash to three months (first prompt date two working days from cash). Then every Wednesday from three months to six months. Then every third Wednesday from seven months out to 63 months</td>
</tr>
<tr>
<td>Quotation</td>
<td>US dollars per tonne</td>
</tr>
<tr>
<td>Minimum price movement</td>
<td>50 US cents per tonne</td>
</tr>
<tr>
<td>Clearable currencies</td>
<td>US dollar; Japanese Yen; Sterling; Euro</td>
</tr>
</tbody>
</table>

Source: LME
THE LMEsword SYSTEM

Every lot of material for which a warrant is issued is held in an LME-approved warehouse. The warrant gives right of possession to the specific lot of material against which it was issued. The warehouse companies, acting through their agents in London, issue warrants. The LME has many different warehouse locations and the delivery of warrants is at the seller’s option.

In January 1999, the LME and the London Clearing House launched a joint initiative called LMEsword that became fully operational in July 1999.

LMEsword is a secure electronic transfer system for LME warrants which can now be held in a central depository. All LME warrants are produced to a standard format with a barcode. Warehouse companies issuing these warrants ensure that the details are known to LMEsword which acts as a central database, holding details of ownership and is subject to stringent security controls. The ownership of LME warrants can be transferred between LMEsword members in a matter of seconds and all rent payments are automatically calculated.

LMEsword brings a number of benefits, particularly in administrative efficiency, by removing the physical transfer of warrants and the manual operations that are involved. It also reduces the number of times a warrant has to be passed by hand, as warrants no longer need to be physically transferred from owner to owner every time the material is bought or sold.

We can see how different the delivery for the two products is and therefore operations teams must have available the delivery details applicable for all types of derivatives traded by their organisation, even though most contracts are not delivered.

3.3 INVOICING FOR BOND DELIVERY

Let us recap on the invoicing process for bond deliveries.

The clearing organisation calculates the invoice amount and advises both the short and long position holders of the amount it requires to be paid/received. This calculation takes into account the variation margin that has already occurred by incorporating the EDSP on the day of notice and a price factor.

The formula used for the calculation of the invoice amount for a delivery of a NYSE Liffe government bond futures contract is:

\[
(\text{EDSP} \times \text{price factor} \times \text{unit of trading}) + \text{accrued interest}
\]

Note: NYSE Liffe publishes a list of the deliverable bonds together with their price factors and accrued interest amounts prior to the first notice day.
3.4 CASH-SETTLED FUTURES AND OPTIONS

The following are examples of the stages in the settlement process for cash-settled futures and options where there is no delivery of the underlying and, instead, a monetary amount is exchanged.

**EXAMPLE: INDEX FUTURE**

On the last trading day (LTD), a futures contract stops trading at a specific time set by the exchange. The exchange then announces the final closing price (EDSP).

Cash settlement on LTD + 1 will be the difference between the EDSP and the closing market (MTM) price on the day prior to LTD x number of open contracts at expiry.

Reflected in client statement as closing trades at EDSP to net position down to zero.

**EXAMPLE: INDEX OPTION**

ITM Options only auto-exercised on last trading day by reference to the EDSP (of underlying index or index future).

Long option position closed out on auto-exercise by opposite sold contract (at nil premium).

Cash settlement received by long = EDSP – option strike price x number of contracts open at expiry.

3.5 ACCESS TO TRADE EMISSION RIGHTS

1. Trading in emission allowances with a licence to trade on the exchange
   Participants admitted to trading on the spot and derivatives market of the EEX have access to trading in emission allowances and certified emissions reduction (CER) futures. Admission for trading in emission allowances only is possible. To that end a clearing agreement has to be signed, proof of equity to the amount of €50,000 has to be furnished and the admission forms have to be completed. The costs for participation in exchange emissions trading only amount to €5,000 each for the spot and derivatives market and comprise web-based access for one workstation.

2. Trading in emission allowances without a licence to trade on the exchange
   Brokers, financial service providers and clearing banks provide easy access for participation in exchange trading without a licence to trade on the exchange.

3.5.1 Contract Specification

**Clearing Structure**

The clearing structure consists of European Commodity Clearing (ECC) as the central counterparty and several banks as the clearing members.

The clearing process on ECC is the same as for all futures contracts traded on exchanges. The trading participants have to deposit margins for the obligations entered into and arising from transactions with their clearing member and the clearing members in turn have to deposit margin with ECC.
Settlement
Settlement takes place between ECC and clearing members on a T+2 basis for spot trades and on expiry of the futures contracts.

Variation margin is calculated in the normal way, i.e., the EEX establishes a settlement price for every futures contract in accordance with the current market price of the futures contract. The variation margin is then credited or debited to the clearing member’s account.

European Union (EU) Emission Allowances
The stocks of EU emission allowances are kept by national registers. This inventory management also includes the issue of the EU emission allowances, as well as their deletion, in return for emissions which have taken place. For the purpose of inventory management the national registers establish accounts for plant operators and others. ECC also has such an account with the German register, the German emissions trading authority, Deutsche Emissionshandelsstelle (DEHSt), at the German Federal Environment Agency. In addition to this collective account which serves the purpose of fiduciary safe-keeping, ECC and the clearing members also keep internal accounts for inventory management of the EU emission allowances kept in the collective account. ECC keeps these accounts for the clearing members and the clearing members in turn keep these accounts for their affiliated trading participants (non-clearing members).

Delivery of the EU emission allowances takes place two settlement days after the conclusion of the transaction and or after the last day of trading of a futures contract.

Note: the EU emission allowances delivered are EU emission allowances which are kept in the account of ECC kept in trust at the German register (DEHSt).

Settlement is made by transferring the EU emission allowances within the internal inventory accounts of the ECC and by means of the change of the share in the total inventory in the account of ECC kept in trust at DEHSt.

On the day of the delivery, the buyer of EU emission allowances purchases the corresponding share in the total inventory of EU emission allowances, which are recorded in the account of ECC kept at DEHSt upon the payment of the purchase price.

On the day of the delivery, the seller of EU emission allowances transfers his corresponding shares in the total inventory which are recorded in the account of ECC kept at DEHSt.

Custody of EUAs
Participants can deposit EU emission allowances in fiduciary safekeeping of ECC by transferring a corresponding number of EU emission allowances to the collective account of ECC at DEHSt.
4. GLOBAL CLEARING AND PRIME BROKERAGE

LEARNING OBJECTIVES

8.4.2 Know the process flow for a trade under a global clearing arrangement

4.1 THE CONCEPT OF GLOBAL CLEARING

ETD transactions can be broken down into two component parts:

- **execution** is the trading in the markets; and
- **clearing** is the settlement of the trades after trading, whereby business is recorded and positions are maintained.

Clients often wish to trade or execute business with several different brokers. There are many reasons for this, including expertise in certain markets or contracts, size of the trade, benchmarking and perhaps for relationship reasons. Obviously, this causes increased administration for the back office as the settlement process is duplicated with each broker.

The definition of global clearing is:

**The channelling of the settlement of all futures and options trades through a single counterparty or through a number of counterparties geographically located.**

Typically, the organisations which offer global clearing services are large investment banks. They generally have the biggest network of offices and exchange memberships, because these are used to support their own proprietary trading; and global clearing has grown from this base and from the need to provide a service to their clients, which may have a requirement to trade derivatives products globally.

The appointment of a single clearer which settles all of the client’s trading, providing one statement and consolidated reports, can be extremely beneficial to clients. The streamlining of settlement should result in enhanced error and risk control, increased broker service levels (including value-added services) and lower funding costs for bank charges and margining.

4.2 GLOBAL CLEARING PROCESS

LEARNING OBJECTIVES

8.4.3 Understand how exchanges and clearing houses handle give-ups

The process by which the global clearer obtains the trades executed by other brokers is known as a give-up.
The executing broker on NYSE Liffe, for example, uses a facility which is known as a give-up or an allocation.

In the LIFFE CONNECT™ environment, for example, there is a field in the trading system which is for the allocation mnemonic. The trades details will automatically transfer into the TRS and will appear in the allocated global clearer’s account to be accepted. If the allocation reference is not input into LIFFE CONNECT™, then it can be input to TRS and allocated from there to the global clearer.

Once the trade has been allocated or ‘given up’ to the global clearer, and has been accepted, the risk which the executing broker assumed ceases, providing that they have executed the order correctly.

When the trade details appear in the global clearer’s account they need to be accepted. Normally, the global clearer will need confirmation from the client of the details of the trade before accepting it, since the risks attached to it pass to the clearer when it registers the trade. However, some clearers will accept trades accompanied by agreed references.

4.2.1 Give-up and Take-up Trades on Eurex

The give-up functionality allows members to transfer trades to other members.

The receiving member and the respective clearing member are required to accept or reject the give-up. Only transactions originated on the trading day (current give-up) or the previous business day (historical give-up) may be designated.

The acceptance of transferred trades is called take-up. Give-up trades are only possible for transactions on the A1 account. Additionally, it is not possible to give up a closing transaction.

GCMs have to accept the give-ups and take-ups of their NCMs. Depending on the settings in the member relationship window, acceptance is either performed automatically or manually. Acceptance must occur on the same day the give-up transaction takes place.

Give-up and take-up clearing members have the possibility of inquiring (pending) trades that are designated for give-up or take-up.

After a trade has been given up to another member, the status of the transaction will be marked with status ‘G’ for reference. The trade will not be transferred until the give-up clearing member has accepted the give-up and until the appointed take-up exchange member and its clearing member accepts or ‘takes up’ the trade. The transaction will receive the status ‘T’ for take-up after both the take-up clearing member and exchange member have accepted the trade. The suffix ID will be applied, displaying a ‘1’ to refer to the reversal trade that has been transferred and a ‘2’ to refer to the take-up trade. For historical give-ups/take-ups the HIT field is filled with an ‘H’ to indicate a historical transaction.
4.2.2 Brokerage

The trades are manually input or automatically transmitted to the broker’s back office system with the reference of the executing broker. In most cases, the client agrees that the clearing broker should charge them the agreed rate of execution commission on the trade. This means that the client in effect notices no difference to the trade, as it has the full amount of commission deducted that it would have done had it been executed and cleared with the same broker. The global clearer must then record the information, accounting for the execution commission which is to be accrued and paid to each executing broker at the end of each month. In order to claim the execution commission due to them, each executing broker must send the global clearer an invoice detailing each of the trades during the month and the commission due. This process is common practice in the markets and is known as brokerage.

The alternative is for the client themselves to pay the executing broker’s commission separately, but this erodes one of the benefits of global clearing.

This process can be complicated as, for various reasons, the executing broker may not actually execute the trade themselves. Orders may have to be given to another broker for execution. Therefore, the trade will not necessarily be given to the global clearer from the source that they were expecting. Due to the increasing complexity of the situation the trades may be allocated to the incorrect clearing broker. It is the responsibility of the broker’s back office to oversee this process, and to promptly confirm and accept trade details being allocated to them as well as chase trade allocations that they may be expecting.

4.2.3 Confirmation of Give-up Trades

The confirmation of trade details from the client to the global clearer is very important in this process. The exchanges have deadlines each day for accepting trades, after which time the trades will return to the execution broker’s clearing member, who will require them to be margined the next day. Exchanges may fine the clearing members involved if the give-up process is not completed on trade day to deter this bad practice.

The reason for the need for this confirmation is to protect both the client and the global clearer. Once the trade is accepted in the market then the global clearer takes on the risk and responsibility of the trade. Some global clearers will put an agreement in place between themselves and their client which allows the global clearer to accept any trades which they are informed are for their client and come from a recognised source and contain a recognised reference. This eases the burden for the client of having to confirm trades in the timescales required. However, the client takes on the risk if a trade is accepted in error or has incorrect details. If the trade has been executed incorrectly, then the client will have to revert to the executing broker to sort out the problem.
The global clearing process can be illustrated as follows:

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**Note:** The exchange matching process does not happen separately for electronic markets since trades are automatically matched as they are executed.

### 4.2.4 Client Documentation for Global Clearing Clients

To keep the clearing process as organised as possible, the client must sign an execution or give-up agreement with each broker that they execute, or are likely to execute, business with. This sets out the terms by which the global clearer will accept trades; and is a tri-partite agreement, signed by the client, the executing broker and the global clearing broker. This will cover any eventualities where a give-up trade is not accepted, for whatever reason.
Clearing and Settlement Chapter Eight

Exchange-Traded Derivatives

The settlement of derivatives transactions is heavily reliant on technology, and this is exaggerated by the provision of global clearing services, because of the increased level of business. The global clearer is processing hundreds of trades every day, across many different exchanges, for hundreds of different clients. There is significant risk involved and the global clearer needs to have reliable, robust systems to take in all of the information, process it and deliver it to clients. The reconciliation of business must be performed efficiently because of the short settlement period (T+1) for derivatives, and also because the gearing effect of derivatives can lead to huge exposures in underlying values in a very short time. The portfolio-based margining systems that we examined earlier in Chapter 7 are very efficient, but would be almost impossible for the global clearer to replicate manually, in the event that there was a system failure.

The reliance on technology is increasing. Global clearers are moving towards STP, where the minimal amount of manual intervention and rekeying of data takes place, in their attempt to continually improve the efficiency of the settlement process.

Settlement with the clearing organisation, group office or agent takes place early the next morning and therefore the global clearer must be able to access their systems, download reports and perform reconciliations as soon as possible each day. If the global clearer is a direct clearing member, they must settle with the clearing organisation each day and therefore they must be able to calculate margins and call their clients for funds. Additionally, they need to be able to check positions and produce position reports for their clients each day, so they can trade in the knowledge that the positions are correct in the market. This has even more significance in the delivery period. If the system is unavailable, or has unreliable data, then the global clearer is running a significant risk in the markets because it cannot perform any of these vital functions.

4.2.5 The Advantages and Disadvantages of Global Clearing

LEARNING OBJECTIVES

8.4.1 Understand the advantages and disadvantages of global clearing

The advantage of global clearing is that settlement is streamlined, giving enhanced error and risk control, increased broker service levels and lower costs. Today this advantage is even beginning to extend into the OTC derivatives world, where some firms can act as a settlement agent on behalf of the contracted counterparty to an OTC transaction.

In most cases where global clearing is offered, the broker will provide a client technology application, which allows the client to have access to all of their trades, positions and cash balances held with the global clearer. This is most advantageous when the client has all of their positions with one global clearer.

Most client technology applications are real time so clients are able to check the trades booked to their accounts during the day. A major advantage of these systems is the reporting functionality, which means that information is readily available, rather than waiting for emails, fax or hard copies. If all positions are held with the global clearer, then reconciliations and onward reporting can be completed more efficiently. The systems may also have a two-way facility which allows the client to confirm trades, advise of trade settlements and send/receive messages. Additional facilities which may be available are contract and exchange information, margin rate information and expiry and delivery calendars.
The method which is used to deliver client technology applications varies from organisation to organisation, but more and more use is being made of the internet as a means of delivery. Most importantly, the information must be delivered and exchanged in a secure environment.

Global clearing will enable the client to save costs, such as bank charges, because payments can be kept to a minimum. Funding costs will be lower, as the client will benefit from reduced margins, because all of their positions are in one place and the maximum offsets will be allowed. There will be fewer individual movements of funds, and because there is only one counterparty to pay, bank charges will be saved. The client should be able to negotiate reasonable rates of credit interest for funds held by the global clearer, and lower execution and clearing commissions, because of the consolidation of business. The streamlined settlement process means that the administration of the derivatives business should be more efficient.

Global clearing may not always be the best solution for clients. For example, it may be more beneficial to appoint a clearer for each geographical area, so that advantage can be taken of specialist expertise. Although large global investment banks offer a truly global clearing service, it does not mean that they have exchange membership or offices in each country.

Most large institutions are likely to have execution and clearing services on each of the major markets, such as NYSE Liffe, Eurex, NYSE Euronext, CME Group, TSE, SFE and SGX-DT. On other markets they may have execution facilities, but use a clearing agent to process the trades. In some locations it is not viable to have either execution or clearing facilities and so a local agent may be used, enabling the broker to draw on their skills and specialist local knowledge.

The operational management of the agents and third parties is important if the global clearing process is to work successfully. Communication, relationship management and reconciliation are all vitally important between the global clearer and their sub-clearers in much the same way as a global custodian in securities has to manage its non-inhouse sub-custodians.

As far as the client is concerned, their relationship is with the global clearer, and it is not necessarily relevant who the global clearer chooses as its agents in the markets where it does not have execution and/or clearing facilities. Depending on the client’s agreement with the clearer, it could have a bearing on the creditworthiness of the global clearer and the client may therefore wish to be advised of the agents which are being used in these markets.

It is important to realise that there are also some disadvantages to global clearing. For example, it concentrates all of the client’s risk with one counterparty, and there are confidentiality issues in having all positions held by one broker. Additionally, clients can become locked in to the clearing broker by making use of the value-added services that it offers and by relying heavily on the knowledge and expertise of the clearing broker’s client service team, which can make moving to another clearing broker difficult.

However, many clients decide that the advantages outweigh the disadvantages, and this has been a major factor in the globalisation of the industry.

**Note:** the clearing broker assumes the responsibility for settling the trades given up to it on behalf of the client. This represents a significant risk as the liability to settle with the clearing house is that of the clearing broker.
4.3 VALUE-ADDED SERVICES

LEARNING OBJECTIVES

8.4.4 Know the definition and purpose of single currency settlement and average pricing

Client services receive many and varied requests from their clients with regard to derivatives settlement, which has led to the provision of what is termed value-added services.

Some of the types of value-added services that a client trading in derivatives will expect to receive, usually at no extra cost, are:

- **Single currency margining** – this service is for clients trading in various markets around the world and having numerous currencies to settle. It involves the deposit of one currency which is equal to, or more than, the total amount due in all currencies. To calculate this, each currency is notionally converted to the base currency. Interest will be received on the currency deposited and charged on the currencies which are in debit. An intra-day FX risk is incurred.

- **Client technology platform** – many brokers now offer their clients a system for real-time viewing and reporting of their derivatives data. This data typically includes trade confirmations, positions, ledgers, margin requirements and settlement prices. This can promote the automation of the clients’ matching and reconciliation processes, improving efficiency and reducing the cost of errors. This is especially useful for global clearing clients, as they can use the datafeed of all their information for onward transmission to their internal settlement and risk management systems, eg, this may allow the client to manipulate the data to produce ‘what-if’ scenarios for risk-management or funding prediction purposes. Also, it is difficult, and can be costly, for clients to receive independently margining data and settlement prices, which are supplied at no extra cost via the broker’s system link. There are some confidentiality and security issues which need to be considered carefully before engaging this type of service.

- **Training** – some brokers offer training to their clients. This may involve formal training courses or visits to the broker’s or client’s office to observe the settlement processes first hand. This service is mutually beneficial to the broker and the client as it helps each party to understand the issues and constraints that the other faces. Additionally, it helps the broker to ensure that the client has a good understanding of the business in which they are participating.

- **Average prices** – this service is offered to clients who trade bulk orders which then have to be divided between individual accounts. This is necessary because a bulk order can be partially filled at different prices and allocation at an average price avoids the need to decide which account should receive which price(s). The client agrees the degree of rounding for the average price and must always be provided with the actual traded price information. When the average price has to be rounded up or down, then the client must agree with the broker how they will settle any residual difference which is left.
A fund manager from the Asset Management Company (TAMC) gives an order to his broker:

**EXAMPLE**

A fund manager from the Asset Management Company (TAMC) gives an order to his broker:

**Buy 300 NYSE Liffe FTSE Mar futures at market**

The order is confirmed as follows: To be split between his clients as follows:

- **Buy 100 FTSE Mar futures @ 5930** Client A = 100 contracts
- **Buy 200 FTSE Mar futures @ 5935** Client B = 50 contracts
- **Buy 100 FTSE Mar futures @ 5938** Client C = 225 contracts
- **Buy 100 FTSE Mar futures @ 5939** Client A = 125 contracts

The average price = 5935.40

The broker accounts for the trade like this:

**TAMC Average Price Account**

- + 100 FTSE Mar futures @ 5930
- + 200 FTSE Mar futures @ 5935
- + 100 FTSE Mar futures @ 5938 Actual market prices
- + 100 FTSE Mar futures @ 5939
- − 500 FTSE Mar futures @ 5935.40

The net position in the TAMC client average price account must always equal **ZERO**

Additionally the broker books these trades as per the client’s request:

- **TAMC Client a/c A:** + 100 FTSE Mar futures @ 5935.40
- **TAMC Client a/c B:** + 50 FTSE Mar futures @ 5935.40
- **TAMC Client a/c C:** + 225 FTSE Mar futures @ 5935.40
- **TAMC Client a/c D:** + 125 FTSE Mar futures @ 5935.40

### 4.4 PRIME BROKERAGE

#### LEARNING OBJECTIVES

8.4.5 Understand the benefits of entering into a prime brokerage relationship

Many investment banks and specialist providers now offer their customers a fully integrated service solution which is termed **prime brokerage**.

Prime brokerage services typically include:

- operations – offering a specialised, high quality service in clearing and custody;
- accounting;
- securities lending;
- business administration – including human resources and office space;
Clearing and Settlement

Chapter Eight

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- technology – custom IT solutions and support;
- online portfolio reporting;
- trading and execution; and
- financing structures.

The benefits to customers of prime brokerage services is the focus on client service integrated across all products, the advantages of economies of scale and access to revolutionary technology.

Prime brokers are extensively used by hedge fund managers, not just for their derivatives activities but also for other products.

Typically the prime broker can allow the fund manager to gear or leverage their derivatives positions against collateral the prime broker is holding and also permit the hedge fund to sell short in the securities markets which again can be leveraged by the use of derivatives.

4.5 DRAWBACKS OF THE PRIME BROKERAGE RELATIONSHIP

LEARNING OBJECTIVES

8.4.6 Understand the drawbacks of entering into a prime brokerage relationship

Prime brokerage is a service used by many investment funds, particularly hedge funds. The wide range of services offered and described in Section 4.4 are an obvious benefit. However there are some drawbacks to the use of a prime broker.

4.5.1 Assets and Collateral

Prime brokers will offer services related to loans of cash and securities as well as requiring collateral to cover margin calls on derivatives positions the client may have with them.

The prime broker would like to be able to utilise the assets used as collateral to offset the administrative costs they incur in managing those assets. In the agreements between the parties clauses related to hypothecation and rehypothecation are included. In law hypothecated collateral cannot be utilised by the taker of the collateral and can only be used if a default occurs.

However, if the client agrees to rehypothecate the assets, the prime broker can now use these assets (subject to additional regulatory/legal constraints that may apply).

If assets are in turn used as collateral by the prime broker against, for example, loans they may hold elsewhere there is a risk that, should the prime broker collapse, the client may not be able to secure the return of their assets.

If the client will not rehypothecate assets the prime broker will almost certainly levy administration fees to cover the costs mentioned above.
4.5.2 Counterparty Risk
The prime broker relationship is of major significance for a client and reliance on the services offered by the prime broker is very important from a risk perspective. Any failure of the prime broker to provide services as agreed in the prime brokerage agreement and or service level agreement will impact on the client.

4.5.3 Confidentiality
The client must accept that the prime broker will see most if not all of the client’s derivatives trading activity and positions in the same way as a global clearing broker. In the case of the prime broker this will potentially extend to OTC derivatives as well.

The client needs to be comfortable that this sensitive information is treated as confidential and is held securely in the prime broker’s systems.

4.5.4 Consolidation of Risk
A single prime broker arrangement will result in all of the client’s activity and assets being held by and operationally managed in an efficient arrangement. However it is clear that this also represents a consolidation of risk.

If the prime broker were to collapse then the client may be exposed to serious difficulties. A way to mitigate this would be to have more than one prime broker arrangement.

4.5.5 Risks to the Prime Broker
The services typically offered by a prime broker put pressure on their systems and resources because of the coverage of securities and on- and off-exchange derivatives. If we add to this the services related to lending, effective collateral management is clearly a major function. A failure to complete this task correctly puts the prime broker at significant risk. In addition as they provide the global clearing facilities covered earlier in Section 4.2 they have to settle the obligations on client’s positions with the clearing house.

It therefore follows that the prime broker cannot take on clients that cannot or do not meet their obligations within the prime brokerage and service level agreements.
5. POSITION AND CLOSE-OUT MANAGEMENT

5.1 MANAGING POSITIONS

LEARNING OBJECTIVES

8.5.1 Know the purpose, importance and key associated risks of managing positions in relation to: house; segregated client; non-segregated client; clearing house/exchange

Futures positions can be held gross. This means that both long and short positions can be held in the same contract, creating a flat exposure, as one side is equal and opposite to the other side.

This occurs because in members’ accounts at the clearing organisation, they may hold the positions of clients who have sold the contracts and clients who have bought the contracts.

If the positions were netted out at the clearing organisation, the position would not represent the clients’ positions exactly. Therefore, if a client wished to go to make or take physical delivery of the underlying asset on a short position, it may not be possible, because the position may not exist at the clearing organisation.

You can see this illustrated in the example following. If Client 5 wants to go to delivery on their short 150 position, this is possible even if the member’s position were held net at the clearing organisation. However, if Client 4 also wants to go to delivery on their short 225 position, it is not possible as there would only be a total of 219 positions at the clearing organisation.

In the example, Client 3 has both a long and a short position. This may be because they have one omnibus account with the clearing member for all of their own clients’ positions. Therefore, the same situation applies for clients’ positions with clearing members as it does for clearing members’ positions with the clearing organisation.

Net positions are calculated on certain exchanges for margining purposes only.

<table>
<thead>
<tr>
<th>Clearing Member at Clearing Organisation</th>
<th>Long Position</th>
<th>Short Position</th>
<th>Gross Position</th>
<th>Net Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYSE Liffe Long Gilt</td>
<td>1,056</td>
<td>1,275</td>
<td>+1,056</td>
<td>−1,275</td>
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</table>
### Clearing Member at Clearing Organisation

<table>
<thead>
<tr>
<th></th>
<th>Long Position</th>
<th>Short Position</th>
<th>Gross Position</th>
<th>Net Position</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Client 1</strong></td>
<td>Long Gilt</td>
<td>55</td>
<td>0</td>
<td>+55</td>
</tr>
<tr>
<td><strong>Client 2</strong></td>
<td></td>
<td>78</td>
<td>0</td>
<td>+78</td>
</tr>
<tr>
<td><strong>Client 3</strong></td>
<td></td>
<td>192</td>
<td>325</td>
<td>+192</td>
</tr>
<tr>
<td><strong>Client 4</strong></td>
<td></td>
<td>426</td>
<td>225</td>
<td>+426</td>
</tr>
<tr>
<td><strong>Client 5</strong></td>
<td></td>
<td>0</td>
<td>150</td>
<td>0 –150</td>
</tr>
<tr>
<td><strong>Client 6</strong></td>
<td></td>
<td>89</td>
<td>75</td>
<td>+89 –75</td>
</tr>
<tr>
<td><strong>Client 7</strong></td>
<td></td>
<td>216</td>
<td>500</td>
<td>+216 –500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1,056</td>
<td>1,275</td>
<td>+1,056 –1,275</td>
</tr>
</tbody>
</table>

In order to relinquish any obligations in the market, a close-out instruction must be given by the client. This instruction determines which long position (or part position) to close out against which short position (or part position).

#### 5.1.1 Segregated and Non-Segregated Positions

A clearing member or broker maintains segregated and non-segregated accounts to meet the regulatory requirements relating to client money rules. The clearing house also maintains segregated and non-segregated accounts so that house and client positions are separated. A broker will do the same but in some cases a client can opt to have their position held in a non-segregated account. However, by doing so they lose the protection that segregation offers.

It must of course be remembered that UK regulations and indeed those of other regulators apply to the processes of settlement of client transactions. Client money rules do not allow the use of one client’s money to offset a liability of another client and a broker is in breach of the rules if they were to do so. (Client money is covered in detail in the CISI UK Financial Regulation manual.)
5.1.2 Changes to the Client Assets Sourcebook (CASS)

Under the EMIR there will be changes to the way in which client money is dealt with and, in particular, in respect of defaults like that of, for instance, MF Global.

The paper published by the former regulator, the FSA, is split into three parts.

a. Part I outlines the segregation and porting measures in Articles 39 and 48 of the EU Regulation on OTC derivatives, central counterparties and trade repositories, commonly referred to as the European Market Infrastructure Regulation (EMIR) (http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:201:0001:0059:EN:PDF) and consequential changes to the client assets sourcebook (CASS).

b. Part II sets out our proposals for introducing multiple pooling. These proposals are partly born out of the changes outlined in Part I and could result in the most significant changes we have made to the client assets regime in over 20 years.

c. Part III is a discussion on the wider client assets review currently underway, which is focused on getting a better result in the context of client assets in a firm’s insolvency.

The paper makes reference to porting and the explanation is below.

What is Porting?

1.3 Pursuant to EMIR, when a clearing member firm becomes insolvent, the client transactions (also referred to as ‘positions’) it holds in client accounts at a CCP and the margin supporting those transactions, may be transferred to another client account held by a back-up clearing member. This process is called ‘porting’ (‘port’ and ‘ported’ should be read accordingly). The margin may be client money.

The following is taken from the FSA’s Consultation Paper CP12/22.

Part I: Changes to CASS required by EMIR (CP)

1.6 When a clearing member defaults, one of the measures introduced by EMIR will require CCPs to try to port the transactions of the failed clearing member’s clients and associated margin to a back-up clearing member, or return any balance on the segregated accounts directly to the clients. Clearing members of CCPs will often be ‘firms’ as defined in the old FSA Handbook, and now as defined by the FCA, with permission to hold client money.

1.7 Under the current CASS rules, the failure of a firm triggers a primary pooling event. On a primary pooling event, all client money is pooled for distribution. To comply with EMIR we therefore propose to amend CASS to exclude client money that is held by a clearing member firm in a client transaction account at a CCP from the pooling that occurs if that firm becomes insolvent.

1.8 As a European regulation, EMIR is directly applicable to CCPs and firms in the UK. We expect CCPs to be able to apply for authorisation under EMIR in early 2013 and CASS must accommodate the EMIR requirements by then. These rules came into force on 1 January 2013.
Part II: Introduction of multiple client money pools (CP)

1.9 EMIR and the consequent changes to CASS explained in Part I will only allow a CCP to ‘port’ the margin it holds in clearing members’ client transaction accounts, and not the client money margin the clearing member could be holding. The difference between the gross margin received by the clearing member from its clients and the net margin it places at the CCP in its net client transaction accounts, will be held by the clearing member and will remain subject to pooling, following a primary pooling event.

1.10 To make porting net client transaction accounts a viable option we propose to introduce ‘client money sub-pools’ into the client assets regime. The proposed changes to CASS explained in Part II of this paper will allow firms to operate legally and operationally separate client money sub-pools. This would allow a clearing member firm to operate discrete sub-pools of client money comprising, for example, the margin held in a particular net client transaction account at a CCP and the client money the clearing member holds in relation to that transaction account. If the clearing member became insolvent and a CCP ported the positions to a backup clearing member, the insolvency practitioner would be able to make the margin that the insolvent clearing member held as client money in relation to the transaction account available to facilitate porting.

1.11 Given the advantages that multiple pooling could provide and potential client demand for such arrangements, we propose to make multiple sub-pools available to other types of business. We are consulting on allowing firms the discretion to create specific sub-pools based, for example, on a class of clients or business lines. We will also discuss whether in addition to, or in the place of, this discretion to create sub-pools, we should require firms to have separate client money sub-pools; for example, for retail and non-retail clients or for margined and non-margined business.

1.12 Introducing client money sub-pools would be the most radical change that has been made to the client money regime in over 20 years. Since the mandatory segregation of client money into discrete pools was last considered by the industry, the financial markets, firms and their clients, financial products, the economic climate and technology have moved on dramatically. The implementation of EMIR against the backdrop of our commitment to a review of the wider client assets regime is a good opportunity to revisit this.

Part III: Client Assets Regime: Achieving better results (DP)

1.13 Part III is a discussion paper (DP) that provides an overview of the fundamental review of the client money and custody assets regime. The fundamental review is focused at improving the regime to lead to better results if a firm that holds client money and/or custody assets becomes insolvent. The objectives of the review are to:

- improve the speed of return of client assets following the insolvency of an investment firm;
- reduce the market impact of an insolvency of an investment firm that holds client assets; and
- achieve a greater return of client assets to clients following the insolvency of an investment firm.

Students should access and study the Consultation Paper at which can be found on the FCA website – www.fca.org.uk/static/pubs/cp/cp12-22.pdf.
5.2 CLOSE-OUTS

LEARNING OBJECTIVES

8.5.2 Understand the following position management terms: FIFO; LIFO; close outs; settlement busts

There are various common methods for performing close outs where positions have been held gross:

- **First-in, first-out (FIFO)** – close out the oldest long position against the oldest short position.
- **Last-in, first-out (LIFO)** – close out the most recent trade (long or short) against the oldest position (long or short).
- **Maximum profit** – close out an equal number of long and short positions to realise the maximum amount of profit.
- **Maximum loss** – close out an equal number of long and short positions to realise the maximum loss.
- Positions can be designated to be left open, for instance, if they are part of a specific strategy.

There are other close-out methods which are used and it is also possible to give manual instructions to close out specific positions. A position which has been closed out and effectively no longer exists is known as *flat*.

If a position is closed out incorrectly or in error, then it is possible to ‘bust the settlement’. This is the term used for reversing the closing action and re-opening a position.

When a client gives their broker an instruction to close out a position the clearing member (ie, their broker or, if they are not a clearing member, the clearing member the broker uses) must also close the position at the exchange or clearing house.

**Note:** if positions in any one type of contract are held gross long and short going in to the delivery period, the long position holder could be forced to take delivery at any time from the first notice day. Therefore, positions must be particularly carefully managed at these times.

Exchanges publish the open interest for each contract and delivery month. This is an important measure of liquidity. Close-outs may be subject to deadlines, and are not usually permitted after the publication of the open interest as this would devalue the credibility of the statistics.

5.3 CORPORATE ACTIONS

LEARNING OBJECTIVES

8.5.3 Understand the impact of the following on open positions: corporate actions; option exercises

When a corporate action happens on the underlying asset, there are two key things that will happen. Firstly the exchange will decide on any change to the contract specifications; secondly, an open option position that is an American-style option may become more likely to be exercised early.
Corporate actions are events such as:

- mergers and demergers;
- rights issues;
- capitalisations;
- dividends;
- takeovers; and
- stock splits.

In each case the exchange will decide whether there is any need to change the strike prices and/or number of shares per contract or to alter the delivery terms.

When a dividend is announced there is no change to the option specification, as the dividend amount is reflected in the share price.

The exchange views each corporate action and publishes the events and actions needed. On liffe.com a general notice is published setting out what the operations teams need to do.

The following is an example of a demerger. Further examples can be found in the Appendices 3 and 5.
**CORPORATE ACTION NOTICE**

**London Market**

<table>
<thead>
<tr>
<th>Notice No: CA/2011/126/Lo</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE DATE:</td>
</tr>
<tr>
<td>11 April 2011</td>
</tr>
<tr>
<td>EFFECTIVE DATE:</td>
</tr>
<tr>
<td>26 May 2011</td>
</tr>
</tbody>
</table>

### Flexible Individual Equity Option Contract (201F)
- TPU, TPQ, TPJ, TPX

### Universal Stock Futures Contract (56)
- TPG

### Flexible Universal Stock Futures Contract (66F)
- TPY, TPZ

**TNT NV DEMERGER**

This notice is issued pursuant to the Corporate Actions Policy for Euronext Derivatives Markets which is available on the NYSE Euronext website at www.nyx.com/liffe/rules. It requires the immediate attention of members’ staff involved with the trading and settlement equity products on these markets. Members should ensure that clients are made aware of the arrangements detailed in this notice.

1. **Background:** TNT NV (“TNT”) announced a demerger of its Express business, whereby shareholders shall receive one TNT Express share for every TNT share held. Subsequently, TNT shall be renamed to PostNL. TNT Express (“TNTE”) shares will be listed on NYSE Euronext Amsterdam.

2. **ISIN TNT:** NL000009066. **ISIN PostNL:** not yet announced. **ISIN TNTE:** NL009739424.

3. **Effective Date:** 26 May 2011.

4. **Conditions:** Subject to shareholder approval at the Extraordinary Shareholders Meeting to be held on 25 May 2011.

5. **Contract Adjustments:**
   - Packaged method.
   - The contracts will be contracts on a package of one PostNL share and one TNTE share (“a unit”) and shall be referred to by NYSE Liffe as TNT NV ex event package contracts.
   - Physical delivery contracts: delivery of one lot = \((100 \text{ PostNL shares}) + (100 \text{ TNTE shares})\).
   - Cash delivery contracts: for cash-settled contracts, the EDSP shall be generated using the official closing price of PostNL and TNTE on NYSE Euronext Amsterdam on the last trading day as follows:
     \[
     \text{EDSP} = (1 \times \text{PostNL share price}) + (1 \times \text{TNTE share price})
     \]

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The Euronext Derivatives Markets comprise the markets for derivatives operated by Euronext Amsterdam, Euronext Brussels, Euronext Lisbon, Euronext Paris and LIFFE Administration and Management, referred to respectively as the Amsterdam, Brussels, Paris and London markets. Euronext is part of the NYSE Euronext group.
Options:
• **Lot size:** The lot size shall remain unchanged as 100 units per lot.
• **Exercise prices:** Exercise prices shall remain unchanged.

Futures:
• **Lot size:** The lot size shall remain unchanged as 100 units per lot.

6. **Further Maturities:** On and from the effective date, no further maturities shall be made available for trading.

*New Corporate Action Service:* Corporate Action guidance can be provided for all NYSE Liffe products, even for positions created outside the regulated market. So if you did not find the necessary information in this Notice, than please visit CAS, or contact NYSE Liffe, Quality of Derivative Markets.

For further information in relation to this notice, members should contact:

**NYSE Liffe:**
Quality of Derivative Markets  +31 (0)20 550 4296  corporateactionsteam@nyx.com

**NYSE Liffe Clearing:**
Business Operations  +44 (0)20 7379 2656  nyseliffeclearing@nyx.com

Note the changes that will apply to the futures and options contracts. It is essential that the position records and database are correctly amended to reflect the policy adopted for the corporate action.

**Early Exercise**

When a corporate action such as a dividend is announced, there may be in-the-money options that are attractive to exercise early. This is particularly so for participants like market makers who pay no stamp duty or commission on trades.

To avoid being assigned on open short call options, investors will often decide to close out the position and re-open it after the shares go ex-dividend, when early exercise becomes less likely.

**Settlement of OTC Transactions**

OTC settlement involves a different set of processes and skill sets. The client services team settling OTCs must be aware of the payment dates, and may have to margin and value products periodically.

The data is not usually available from a clearing house, and so must be recorded, monitored and settled from internal records.

As OTCs are individually tailored specifically to the client needs, it is imperative that these details are confirmed and agreed as soon as possible. Therefore, establishing links with the counterparty that will expedite this process is essential. Documentation obviously plays a key role, but so too does system information like event calendars and triggers that will alert the team that a settlement action is needed or about to happen.
Today clearing houses such as LCH.Clearnet and Clearnet provide clearing for certain types of OTC transactions carried out by their members.

The settlement of OTC products is covered in detail in the CISI's IOC OTC Derivatives Administration workbook.
## END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When performing settlement, what is one of the issues which a client must be aware of?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>2. What happens to a position on expiry which is not being delivered?</td>
<td>Section 1.1</td>
</tr>
<tr>
<td>3. What is and who provides the:</td>
<td>Section 3.3</td>
</tr>
<tr>
<td>a. EDSP;</td>
<td></td>
</tr>
<tr>
<td>b. price factors; and</td>
<td></td>
</tr>
<tr>
<td>c. list of deliverable bonds?</td>
<td></td>
</tr>
<tr>
<td>4. Name one of the five key issues at delivery.</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>5. How much equity is required in order to trade in emission allowances?</td>
<td>Section 3.5</td>
</tr>
<tr>
<td>6. Why may clients wish to execute business with different brokers?</td>
<td>Section 4.1</td>
</tr>
<tr>
<td>7. What does the give-up functionality allows?</td>
<td>Section 4.2</td>
</tr>
<tr>
<td>8. What is a disadvantage of global clearing?</td>
<td>Section 4.2.5</td>
</tr>
<tr>
<td>9. Name a value-added service which a broker may offer.</td>
<td>Section 4.3</td>
</tr>
<tr>
<td>10. Define the client service function called single currency margining.</td>
<td>Section 4.3</td>
</tr>
<tr>
<td>11. What is prime brokerage?</td>
<td>Section 4.4</td>
</tr>
<tr>
<td>12. What details are given in a close-out instruction?</td>
<td>Section 5.2</td>
</tr>
<tr>
<td>13. Name three corporate actions or events.</td>
<td>Section 5.3</td>
</tr>
<tr>
<td>14. If there is a 1:5 subdivision of share capital, what might happen to existing option exercise prices?</td>
<td>Section 5.3</td>
</tr>
</tbody>
</table>
CHAPTER NINE

DERIVATIVE REGULATION AND COMPLIANCE

INTRODUCTION 203
1. REGULATION 203
2. OTHER KEY INDUSTRY REGULATIONS 210
3. COMPLIANCE 217

This syllabus area will provide approximately 8 of the 50 examination questions
INTRODUCTION

The principal objectives of compliance and regulation are to ensure that:

• users of derivative products are aware of the characteristics of the products and the risks involved; and
• the exchange or counterparty is sound and sufficiently capable to operate in the products and run the markets.

This protection extends to the protection of users from themselves as well as from external counterparties, and applies equally to brokers and clients. Brokers have rules and regulations governing transactions in derivatives, whether for their own trading or for client business. Clients need the comfort that exchanges and brokers are regulated, and that documentation is in place giving details of how the relationship is to be structured.

Regulation and compliance are often complex subjects, varying from organisation to organisation and from location to location. Each country where futures and options markets exist will operate under the rules and regulations specific to that jurisdiction and these can vary enormously.

1. REGULATION

1.1 MAJOR DERIVATIVE MARKET REGULATORS

LEARNING OBJECTIVES

9.1.1 Know the principal regulators in the following jurisdictions: UK; EU; US

<table>
<thead>
<tr>
<th>EU</th>
<th>Country</th>
<th>Website</th>
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</thead>
<tbody>
<tr>
<td>Financial Conduct Authority (FCA)</td>
<td>UK</td>
<td>fca.org.uk</td>
</tr>
<tr>
<td>Prudential Regulatory Authority (PRA)</td>
<td>UK</td>
<td>bankofengland.co.uk/pra/</td>
</tr>
<tr>
<td>Autorité des Marchés Financiers (AMF)</td>
<td>France</td>
<td>amf-france.org</td>
</tr>
<tr>
<td>Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)</td>
<td>Germany</td>
<td>bafin.de</td>
</tr>
<tr>
<td>European Securities Markets Authority (ESMA)</td>
<td>EU</td>
<td>esma.europa.eu</td>
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</table>

<table>
<thead>
<tr>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity Futures Trading Commission (CFTC)</td>
</tr>
</tbody>
</table>
1.2 APPROACH TO REGULATION AND DIRECTIVES

LEARNING OBJECTIVES

9.1.2 Understand the principal regulators' approach to regulation: changes of approach in the UK regulatory regime after 1 April 2013; the approach of the US regulatory regime; directives

There is a significant amount of change taking place in the regulation of securities and derivatives markets as part of the ongoing aftermath of the events in 2008.

The use of derivatives, extent of leverage, capital requirements against exposures and other issues like the central clearing of OTC derivatives have been looked at and addressed either through new legislation or by updating existing regulation.

Some key developments have been related to European Directives such as:

- the Alternative Investment Fund Managers Directive (AIFMD);
- UCITS IV;
- MiFID II Review, and
- in the US, the Dodd-Frank Act.

The main reasons for the regulatory changes may be heavily related to the OTC derivatives market and particularly credit derivatives, but some aspects do impact in the on-exchange market.

1.2.1 Drivers

The main drivers behind the changes are to have more:

1. harmonisation of treatment of derivatives products;
2. transparency;
3. adequate capital to meet obligations;
4. central clearing of derivatives;
5. protection of client assets and positions.

1.2.2 The UK Financial Services Act 2012

The UK Financial Services Act 2012 came into effect on 1 April 2013 and affects the regulatory structure in the UK.

The key change is that the Financial Services Authority (FSA) has been replaced by three regulatory bodies: the Financial Policy Committee (FPC), the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA).
HM Treasury provides the following detail:

**A New Approach to Financial Regulation**

The new system gives the Bank of England macro-prudential responsibility for oversight of the financial system and, through a new, operationally independent subsidiary, for day-to-day prudential supervision of financial services firms managing significant balance-sheet risk. The FSA will cease to exist in its current form. A proactive new conduct of business regulator (the Financial Conduct Authority) will also be created to protect consumers, promote competition and ensure integrity in markets.

The legislation implements these reforms by:

- establishing a macro-prudential authority, the Financial Policy Committee (FPC) within the Bank of England, to monitor and respond to systemic risks;
- clarifying responsibilities between the Treasury and the Bank of England in the event of a financial crisis by giving the Chancellor of the Exchequer powers to direct the Bank of England where public funds are at risk and there is a serious threat to financial stability;
- transferring responsibility for significant prudential regulation to a focused new regulator, the Prudential Regulation Authority (PRA) established as a subsidiary of the Bank of England; and
- creating a focused new conduct of business regulator – the Financial Conduct Authority (FCA) – which will supervise all firms to ensure that business across financial services and markets is conducted in a way that advances the interests of all users and participants.

Source: www.hm-treasury.gov.uk/fin_financial_services_bill.htm.

Details of the FPC macro-prudential tools can be found at: www.hm-treasury.gov.uk/d/condoc_fpc_tools_180912.pdf.

Full details of the Act can be found at: www.legislation.gov.uk/ukpga/2012/21/pdfs/ukpga_20120021_en.pdf.

Under the FCA firms must conduct business in accordance with the Conduct of Business Sourcebook, see Appendix 7.

**US Regulatory Environment**

The major piece of legislation in the US is the Dodd-Frank Act which addresses amongst other things the key issues of governance and oversight. It does this by implementing changes that:

- affect the oversight and supervision of financial institutions;
- provide for a new resolution procedure for large financial companies;
- create a new agency responsible for implementing and enforcing compliance with consumer financial laws;
- introduce more stringent regulatory capital requirements;
- effect significant changes in the regulation of OTC derivatives;
- reform the regulation of credit rating agencies;
- implement changes to corporate governance and executive compensation practices;
- incorporate the Volcker Rule;
- require registration of advisers to certain private funds; and
- effect significant changes in the securitisation market.
A key development under the Act is the creation of the Financial Stability Oversight Council (FSOC).

In addition there have been major changes to the way in which the OTC derivatives market operates including for some products the use of trading platforms, CCPs and repositories.

### 1.3 AGREEMENTS AND DOCUMENTATION

Throughout this workbook there are references to actions, processes and procedures that are subject to oversight by the regulator. The safe use of derivatives by end-users is a key objective of the UK regulators, for instance, and so areas like margin calls, client money and collateral require a broker to meet both clearing house and regulatory requirements.

However, the protection of the market, users and participants is crucial and so documentation and agreements naturally play an important part in the overall regulatory environment.

### 1.4 KEY OBJECTIVES AND FUNCTIONS OF DOCUMENTATION AND AGREEMENTS

#### LEARNING OBJECTIVES

9.1.3 Understand the key objectives and functions of documentation and agreements

The objectives behind documentation and agreements that exist in the markets are to:

- provide the legal basis for doing business;
- set out the terms and conditions that will apply;
- provide protection and rights to counterparties in compliance with regulation.

### 1.5 CONTENT OF AGREEMENTS AND DOCUMENTATION

#### LEARNING OBJECTIVES

9.1.4 Understand the principal purpose of client agreements: risk warnings; client classification; know your client

The content of these important documents is based around a need for both counterparties to be able to operate in a safe and reasonable environment.

Key elements that affect the content relate to the client and their understanding of the markets and products, and also the way in which the client’s broker will operate when undertaking transactions for them.
Key to this will be areas like:

- Know Your Customer (KYC);
- client assets;
- segregation between a firm and client money and assets.

Within these areas we find regulation that must be complied with, for instance, the conduct of business rules and classification of the client.

Typical areas that are covered in agreements between a client and a firm related to exchange-traded derivatives are:

- types of products and markets covered by the agreement;
- requirements related to the placing of orders, including authorised parties;
- processes and deadlines associated with the settlement of transactions, including contingent liabilities such as initial and variation margin calls;
- how information will be communicated, including what, if any, direct access to systems is available;
- what right (i.e., under what terms) a party can terminate the agreement and, in what circumstances, how it will be dealt with and what roles and responsibilities there are on each party;
- what charges may be applied to trades, including commissions and fees;
- what interest rates will be paid or charged on cash positions.

This list is not exhaustive; many other specific clauses will often be found in agreements.

In addition, the regulation may require that the client receives a specific risk warning that highlights things like the possibility of losing all, or most, of the funds invested, contingent liabilities and obligations that must be met and implications of writing options.

It is crucially important to understand the liabilities that each party has and what action can be taken in the event of problems occurring.

The agreements are designed to protect both parties.

As a result, there are some specific areas that may have a separate agreement.

### 1.6 CLIENT AGREEMENTS

**LEARNING OBJECTIVES**

9.1.4 Understand the principal purpose of client agreements: risk warnings; client classification; know your client

Brokers will have agreements in place with their clients covering the key terms of doing business. These agreements set out the legal framework for the relationship, and cover areas such as:

- authorised personnel (who can place orders);
- margin rates and accepted collateral;
- constraints (if any) on types of products;
• when and how settlement will take place;
• delivery;
• rights of termination of the agreement;
• rights of close out (why, when and how the broker has the right to close positions – an important risk control for the broker in event of the failure of the client to honour obligations, documents provided, including any risk warning, confirmations and statements).

1.7 GIVE-UP AGREEMENTS

LEARNING OBJECTIVES

9.1.5 Understand the purpose of standard give-up agreements

We saw in Chapter 8 that the process of global clearing is widely used.

The process is simple enough, but the risks that each party potentially face can be very significant as responsibilities are, in effect, being transferred from one party, the executing broker, to another party, the clearing broker.

What happens if the clearing broker does not accept the trade for clearing? What does a clearing broker do if a trade is offered up but the client has not notified the trade? How does the executing broker get paid their fee?

A give-up agreement is essential to enable the terms and conditions and the roles and responsibilities to be properly in place and understood by all parties.

It is important to realise that a trade on a derivatives exchange cannot be left in limbo.

Any trade in futures and options has to be cleared and settled by the member of the clearing house in whose name the trade appears.

Consequently, there must be clearly defined procedures that all parties adhere to. As these procedures may differ from exchange to exchange the give-up agreement will detail the specific requirements, as well as any general conditions that will apply.

Examples of give-up agreements can be found in Appendix 8.

1.8 CLEARING AGREEMENTS

LEARNING OBJECTIVES

9.1.5 Understand the purpose of standard clearing agreements

Clearing agreements cover the terms and conditions whereby a clearing member of a clearing house will accept transactions into their name which they will be responsible for settling.

The counterparty here is a non-clearing member of the exchange or a third party (end-user).
As the clearing member has responsibility to settle the obligations with the clearing house, the agreement will cover areas such as:

- position limits;
- margin rates;
- collateral types (often cash or letter of credit including a minimum balance that must be in the account at all times);
- rights of cancellation of the agreement;
- conditions whereby close-outs can be effected (ie, breach of limit);
- rights of segregation and waivers (when permitted).

The following is an illustration of the kind of relationships and agreements.

Source: dscportfolio.com

### 1.9 CLIENT MONEY

**LEARNING OBJECTIVES**

9.1.6 Understand the purpose of client money rules: segregation; non-segregation

Unless a client has waived their right to segregation (this may be prohibited by regulation anyway) a firm must maintain the client’s money and/or assets in segregated accounts (segregated meaning separate from the capital of the firm).
If a client fails to settle an obligation the firm cannot use another client’s money to settle that obligation and must instead provide their own capital to make up the shortfall. Therefore, the firm must calculate its client money position each day.

Should a client not settle, it is not always a simple matter of the firm providing funding on the client’s behalf, as lending money and overdrafts can be prohibited by regulations and exchange/clearing house rules.

2. OTHER KEY INDUSTRY REGULATIONS

LEARNING OBJECTIVES

9.2.1 Understand the implications of current legislation: Capital Requirements Directive (CRD) based on Basel (Accords); Markets in Financial Instruments Directive (MiFID); the Dodd-Frank Act 2010

9.2.2 Understand the implications of forthcoming legislation: Basel III; European Market Infrastructure Regulation (EMIR); the MiFID reviews (MiFID II)

2.1 THE CAPITAL REQUIREMENTS DIRECTIVE (CRD)

The Basel Accord, Basel II, has been implemented in the EU via the Capital Requirements Directive (CRD).

Basel II is a revision of the existing framework, which aims to make it more risk-sensitive and representative of modern banks’ risk management practices. There are four main components to the new framework:

- It is more sensitive to the risks that firms face: the new framework includes an explicit measure for operational risk and includes more risk-sensitive risk weightings against credit risk.
- It reflects improvements in the firms’ risk management practices, for example, by the introduction of the internal-ratings-based (IRB) approach that allows firms to rely to a certain extent on their own estimates of credit risk.
- It provides incentives for firms to improve their risk management practices, with more risk-sensitive risk weights as firms adopt more sophisticated approaches to risk management.
- It aims to leave the overall level of capital held by banks collectively broadly unchanged.

The CRD directly affects banks and building societies and certain types of investment firms. The new framework consists of three pillars.

- **Pillar 1** of the new standards sets out the minimum capital requirements firms will be required to meet for credit, market and operational risk.
- Under **Pillar 2**, firms and supervisors have to take a view on whether a firm should hold additional capital against risks not covered in Pillar 1 and must take action accordingly.
- The aim of **Pillar 3** is to improve market discipline by requiring firms to publish certain details of their risks, capital and risk management.
2.1.1 CRD IV

CRD IV was published in July 2011 and builds on the previously amended Directive. The main objectives are to ensure that the effectiveness of bank capital and liquidity regulation in the EU is strengthened and its adverse impacts on confidence in banks and pro-cyclicality of the financial system are contained while maintaining the competitive position of the EU banking industry.

This translates into the following four general policy objectives to:

1. enhance the financial stability;
2. enhance safeguarding of depositors’ interests;
3. ensure international competitiveness of the EU banking sector;
4. reduce pro-cyclicality of the financial system.

There is more detailed explanation of CRD IV from the EU and the FCA in Appendix 10.

2.1.2 Basel III

The financial crisis underlined a number of weak areas in the Basel II rules. On 12 September 2010, the Group of Central Bank Governors and Heads of Supervision, the oversight body of the Basel Committee for Banking Supervision (BCBS), issued a press release announcing its full endorsement of the agreement it had reached on 26 July 2010 in relation to the proposed reforms to the Basel II framework. These proposed reforms were endorsed by G20 on 12 November 2010 at the Seoul Summit and are now referred to as Basel III.

Basel III was essentially designed to address the weaknesses of the recent crisis; however, its intent is to prepare the banking industry for future economic downturns as well. The framework enhances firm-specific measures and includes macro-prudential regulations to help create a more stable banking sector.

The basic structure of Basel III remains unchanged with three mutually reinforcing pillars.

Key Elements of Basel III

Better Capital Quality
Basel III has introduced a much stricter definition of capital. Higher-quality capital means more loss-absorbing capacity, which in turn means that banks are stronger, allowing them to withstand periods of stress better.

Capital Conservation Buffer
Banks are required to hold a capital conservation buffer of 2.5%. The purpose of the conservation buffer is to ensure that banks maintain a cushion of capital that can be used to absorb losses during periods of financial and economic stress.

Countercyclical Buffer
The objective of the countercyclical buffer is to increase capital requirements in good times and decrease in bad times. The buffer slows banking activity when it overheats and encourages lending when times are tough. The buffer ranges from 0% to 2.5%, consisting of common equity or other fully loss-absorbing capital.
Minimum Common Equity and Tier 1 Capital Requirements
The minimum requirement for common equity, the highest form of loss-absorbing capital, is raised from the current 2% to 4.5% of total risk-weighted assets. The overall Tier 1 capital requirement, consisting not only of common equity but also of other qualifying financial instruments, increased from the minimum of 4% to 6%. The minimum total capital requirement remains at the current 8% level; however, the required total capital increased to 10.5% when combined with the conservation buffer.

Leverage Ratio
The financial crises pointed out that the value of many assets fell more quickly than assumed from historical experience. As a result, Basel III rules include a leverage ratio to serve as a safety net. A leverage ratio is the relative amount of capital to total assets (not risk-weighted). This aims to put a cap on swelling of leverage in the banking sector on a global basis. A 3% leverage ratio of Tier 1 will be tested before a mandatory leverage ratio is introduced in January 2018.

Liquidity Ratios
A framework for liquidity risk management will be created. A new liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) will be introduced in 2015 and 2018, respectively.

Systemically Important Financial Institutions (SIFIs)
As part of the macro-prudential framework, systemically important banks will be expected to have loss-absorbing capability beyond the Basel III requirements. Options for implementation include capital surcharges, contingent capital and bail-in-debt.

Basel II vs Basel III

<table>
<thead>
<tr>
<th>Basel II</th>
<th>Requirements</th>
<th>Basel III*</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>Minimum Ratio of Total Capital to Risk (Weighted) Assets (RWAs)</td>
<td>10.50%</td>
</tr>
<tr>
<td>2%</td>
<td>Minimum Ratio of Common Equity to RWAs</td>
<td>4.5% to 7%</td>
</tr>
<tr>
<td>4%</td>
<td>Tier 1 Capital to RWAs</td>
<td>6%</td>
</tr>
<tr>
<td>2%</td>
<td>Core Tier 1 Capital to RWAs</td>
<td>5%</td>
</tr>
<tr>
<td>None</td>
<td>Capital Conservation Buffer to RWAs</td>
<td>2.50%</td>
</tr>
<tr>
<td>None</td>
<td>Leverage Ratio</td>
<td>3%</td>
</tr>
<tr>
<td>None</td>
<td>Countercyclical Buffer</td>
<td>0% to 2.5%</td>
</tr>
<tr>
<td>None</td>
<td>Minimum Liquidity Coverage Ratio</td>
<td>TBD (2015)</td>
</tr>
<tr>
<td>None</td>
<td>Minimum Net Stable Funding Ratio</td>
<td>TBD (2018)</td>
</tr>
<tr>
<td>None</td>
<td>Systemically Important Financial Institutions Charge</td>
<td>TBD (2011)</td>
</tr>
</tbody>
</table>

*Basel III requirements will be progressively phased-in over the next eight years.

Transitional Arrangements
The BCBS and the G20 leaders agree that the reforms should be introduced in a way that does not impede the recovery of the real economy. In addition, time is provided for translation of the new internationally agreed standards into national legislation.
This will increase the capital requirements of banks significantly but should reduce the potential for the collapse of a bank because of the exposures it carries, particularly in the OTC derivatives markets.

The combination of centrally clearing some OTC products and the increased capital adequacy needed against other OTC derivative exposures should reduce systemic risk levels and at the same time move more and more OTC products towards the centrally cleared concepts as this helps to mitigate against capital requirements by removing counterparty risk.

Note: this has already been happening with services for OTC products namely swaps and repurchase agreements through SwapClear and RepoClear offered by LCH.Clearnet since 1999.

Note: there is considerable discussion, consultation and lobbying going on in respect of some parts of Basel III like capital buffers and leverage ratios.

Further details of Basel III can be found at the website of the Bank for International Settlement, bis.org.

2.2 MARKETS IN FINANCIAL INSTRUMENTS DIRECTIVE (MiFID)

MiFID is intended to promote a single market for wholesale and retail transactions in financial instruments. For the first time there are European requirements covering investment advice, operation of multilateral trading facilities and services related to commodity derivatives (all areas already being regulated in the UK). Benefits for UK firms accrue chiefly to those wishing to do business in other member states on a passported basis which, under MiFID, can be performed across a wide range of services and on a firmer footing than under the current Investment Services Directive (ISD), which MiFID replaced.

One major area of MiFID that concerns users of derivatives is in the use of commodity derivatives. For certain types of users of these products, like some commodities firms who were previously outside the scope of the ISD, MiFID will apply.

Most firms that fall within the scope of MiFID also have to comply with the CRD, which sets requirements for the regulatory capital a firm must hold. Those firms newly covered by MiFID are subject to directive-based capital requirements for the first time.

In common with other regulation, MiFID has been reviewed and revised following consultation with industry participants. Such consultation is currently taking place.

The Futures and Options Association has responded to such a consultation from the EC and their EC by the Futures and Options Association can be found on the Futures and Options Association website foa.co.uk.
2.2.1 The MiFID Review

Below are some examples of the impact of MiFID II:

- **Scope** – the proposals expand the scope of MiFID, both in terms of the types of firms and instruments (e.g., structured deposits and emissions allowances) captured. This will also introduce authorisation and registration regimes for additional firms, such as data reporting providers and third country firms. Current exemptions will be narrowed to bring more commodities firms into the scope of MiFID. This will result in increased regulatory scrutiny and more extensive compliance obligations for firms which are not currently captured by MiFID.

- **Transparency** – the proposals extend transparency requirements to additional asset classes that are not currently in scope, such as bonds, structured finance products, derivatives and emissions allowances. They also extend requirements to different trading venues, such as organised trading facilities (OTFs). However, their application will be calibrated to each type of asset class and type of trading undertaken.

- **Product intervention** – the product intervention proposals also include the introduction of position limits in respect of commodity derivatives and emissions allowances (including spot contracts and derivatives). This will require trading venues to impose limits and to inform the national regulators of them. National regulators and ESMA will have powers to force positions to be reduced and have the ability to impose limits in exceptional circumstances (e.g., to ensure market stability). Restricting regulators’ ability to impose limits in this way should minimise the risk of firms routinely being required to comply with several different limits in similar instruments.

*Source: Deloitte MiFID II key proposals and impacts (deloitte.com)*

*Note:* the latest and most up-to-date information on MiFID, CRD and UCITS III can be found at fca.org.uk; candidates are advised to visit this website.

2.3 **EUROPEAN MARKET INFRASTRUCTURE REGULATION (EMIR)**

Since the market crash of 2008 the regulatory environment has undergone significant change both in Europe and the US.

Much of this change is related to the OTC derivative markets but some does impact the on-exchange market. For example, the credit default swap (CDS) product is now standardised with both on-exchange, cleared products and, for non-listed CDSs (and other derivatives) a CCP/Trade Repository process.

The European Market Infrastructure Regulation (EMIR) applies in Europe and as can be seen from the information below from EMIR, published 15 September 2010, the regulation became effective at the end of 2012.

In the section headed ‘Scope’ we see that the regulation applies to financial and non-financial firms but the manufacturers using derivatives to hedge FX risk would be exempt from the CCP concept.

Also the use of trade repositories will enable transparency by publishing aggregate positions in classes of OTC derivatives, which will complement the transparency provided in on-exchange markets through the information provided by clearing houses.
Making derivatives markets in Europe safer and more transparent

As part of its ongoing work in creating a sounder financial system, the European Commission has tabled today a proposal for a regulation aimed at bringing more safety and more transparency to the OTC derivatives market. In its draft regulation, the Commission proposes that information on OTC derivative contracts should be reported to trade repositories and be accessible to supervisory authorities. More information will also be made available to all market participants. The Commission also proposes that standard OTC derivative contracts be cleared through central counterparties (CCPs). This will reduce counterparty credit risk, ie, the risk that one party to the contract defaults. The Commission’s proposal, fully in line with the EU’s G20 commitments and the approach adopted by the United States, now passes to the European Parliament and the EU Member States for consideration. Once adopted, the regulation would apply from end 2012.

Michel Barnier, Commissioner for Internal Market and Services said: ‘No financial market can afford to remain a Wild West territory. OTC derivatives have a big impact on the real economy: from mortgages to food prices. The absence of any regulatory framework for OTC derivatives contributed to the financial crisis and the tremendous consequences we are all suffering from. Today, we are proposing rules which will bring more transparency and responsibility to derivatives markets. So we know who is doing what, and who owes what to whom. As well as taking action so that single failures do not destabilise the whole financial system, as was the case with Lehman’s collapse.

Key elements of the proposal:

• **Greater transparency** – currently, reporting of OTC derivatives is not mandatory. As a result, policymakers, regulators but also market participants do not have a clear overview of what is going on in the market. Under the Commission’s proposal, trades in OTC derivatives in the EU will have to be reported to central data centres, known as trade repositories. Regulators in the EU will have access to these repositories, enabling them to have a better overview of who owes what and to whom and to detect any potential problems, such as accumulation of risk, early on. Meanwhile, the new European Securities and Markets Authority (ESMA) will be responsible for the surveillance of trade repositories and for granting/withdrawing their registration. In addition, trade repositories will have to publish aggregate positions by class of derivatives to give all market participants a clearer view of the OTC derivatives market.

• **Greater safety – Reducing counterparty risks** – under the current situation, participants in the OTC derivatives market do not sufficiently mitigate counterparty credit risk, which refers to the risk of loss arising from one party not making the required payments when they are due. Under the Commission’s proposal, OTC derivatives that are standardised (ie, they have met predefined eligibility criteria), such as a high level of liquidity, would have to be cleared through central counterparties (CCPs). CCPs are entities that interpose themselves between the two counterparties to a transaction and thus become the ‘buyer to every seller’, as well as the ‘seller to every buyer’. This will prevent the situation where a collapse of one market participant causes the collapse of other market participants, thereby putting the entire financial system at risk. If a contract is not eligible and therefore not cleared by a CCP, different risk management techniques must be applied (such as requirements to hold more capital). As CCPs are to take on additional risks, they will be subject to stringent business conducts and harmonised organisational and prudential requirements to ensure their safety – such as internal governance rules, audit checks, greater requirements on capital etc.
Derivative Regulation and Compliance

Chapter Nine

• Greater safety – Reducing operational risk – the OTC derivatives market allows for a high degree of flexibility in defining the economic and legal terms of contracts. As a consequence, there are a number of highly bespoke and complex contracts in the market that still require significant manual intervention in many stages of the processing. This increases operational risk, ie, the risk of loss due to, for example, human error. The Commission’s proposal requires market participants to measure, monitor and mitigate this risk, for example by using electronic means for confirming the terms of OTC derivative contracts.

• Scope – the proposal applies to all types of OTC derivatives. It applies both to financial firms who use OTC derivatives but also to non-financial firms that have large positions in OTC derivatives. It also applies to CCPs and trade repositories. However, when non-financial firms (such as manufacturers) use OTC derivatives to mitigate risk arising from their core business activities (‘commercial hedging’ used to protect against exchange rate variations for example), they are exempt from the CCP clearing requirements.’

Source: FCA UK, Europa.eu

2.4 DODD-FRANK ACT

In the US a major initiative has been the proposals made in the Dodd-Frank Act, commonly known as the Volcker Rule. This wide ranging Act covers areas like credit cards, overseeing Wall Street and regulating the Federal Reserve; however, it is also aimed at the derivatives markets and in particular the OTC derivatives markets like credit default swaps.

One of the reasons that the Act was put forward was the so-called ‘too big to fail’ idea that resulted in governments in Europe and the US bailing out large financial institutions. In the US this included not just banks but institutions like insurer AIG which had to be rescued.

A significant proposal was the segregating of riskier activities of banks into ring fenced stand-alone entities so that, if they went wrong and caused significant losses, this would not impact on, for example, the retail business of the bank.

There were also the issues surrounding hedge funds, short selling and securities lending. The original Volcker Rule banned Wall Street banks from owning, investing in or sponsoring hedge funds for their own profit if it involved gambling with depositors’ money. However changes to the Act now permit banks to own hedge funds under certain conditions.

Overall, the Act attempts to stop institutions taking excessive risks and creating a situation that occurred in 2008 when governments were faced with having to bail out banks because of the systemic risk of them failing, the so called ‘too big to fail’ scenario mentioned above.

In this context, a key part of the Dodd-Frank Act relates to what are described as ‘risky’ derivatives. The Act requires products like CDSs to be centrally cleared and also regulated by the SEC and the CFTC. Both regulators have submitted a series of studies on how to best achieve this regulation.

Some products such as riskier commodities, equity and low-grade credit contracts will have to be placed in separate affiliates with higher capital costs.
The Act also addresses another major issue in the OTC derivatives market: the giving of a credit rating to OTC derivatives and products like collateralised debt obligations (CDOs). The Act suggests that some credit ratings given to products could be misleading and ‘overly rosy’ and so the Act looked at permitting investors to sue and the regulators to fine rating agencies that get it wrong.

See also Chapter 1, Section 1.3.2.

Current Situation

There are major issues with Dodd-Frank both from a political point and implementation issues for the regulators. It is therefore important for students to access the latest data in respect of the progress of the implementation. A good website for this is doddfranksummary.com.

Summary

As can be seen above the outcome of the many issues surrounding risk and the OTC derivatives market that materialised in the market crash of 2008 have been or are being addressed by the regulators. It is important to note how much of the proposed change is adopting the tried and trusted methodology of controlling risk that we know works so effectively in the exchange-traded environment.

An overview of the Volcker Rule can be found on the CFTC website, cftc.gov.

3. COMPLIANCE

LEARNING OBJECTIVES

9.3.1 Understand the role and significance of the compliance officer
9.3.2 Understand the importance of controlled functions and clear definitions of staff responsibilities

A compliance function has two principal areas of responsibility:

- to create, implement and maintain suitable internal rules and procedures to ensure observance of any relevant regulations; and
- to monitor activities on a regular basis and in all areas of the organisation to ensure that business is conducted in accordance with the regulations.

Compliance covers a particularly wide spectrum and includes:

- dealing;
- clients;
- controls against activities that may be damaging to the business;
- advertising;
- marketing;
- market integrity; and
- informing people in an organisation of the need for rules and regulations and for compliance with them.
The compliance function in an organisation will be responsible for ensuring adherence to the rules of exchanges on which it transacts business and the rules and regulations governing clearing on the exchanges where it may be a member.

In addition, it will be responsible for overseeing crime prevention within the organisation by monitoring internal controls.

Money laundering prevention has been the legal responsibility of firms since April 1994 and it is usually delegated to the Compliance department. It is covered by the procedures and practices for ‘knowing your customer’, where there is responsibility on the part of the organisation to understand the client’s business profile, performing a thorough credit check and recording their banking details.

The operations area must also be suspicious of last-minute changes to settlement instructions or payment requests to third parties, for instance. Controls must be in place to prevent this practice and attempts by clients or counterparties must be communicated to the compliance department.

With derivatives it is particularly important that the compliance function ensures high levels of controls exist over exposures, margin calls and collateral. Responsibilities for key controls and functions must be clearly defined and enforced.

Staff obviously have responsibilities in their day-to-day work that relate to the oversight by compliance, particularly those processes and procedures highlighted in Chapter 8.
**END OF CHAPTER QUESTIONS**

Think of an answer for each question and refer to the appropriate section for confirmation.

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<td>Section 3</td>
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CHAPTER TEN

RISK AND CONTROLS

1. CATEGORIES OF RISK 223
2. MARKET RISK 225
3. OPERATIONAL RISK 226

This syllabus area will provide approximately 8 of the 50 examination questions
1. CATEGORIES OF RISK

Risk in relation to any activities in the financial markets is usually broken down into three high-level types of risk, which are market, credit and operational risk.

In derivatives use, identifying and managing these three risks is hugely important and, as seen in Chapter 9, the regulator expects firms to comply with various pieces of legislation covering areas such as leverage, exposures and capital adequacy. In particular the regulators have identified the merits of the central clearing process, built on margining, in mitigating the risk of derivatives use.

Internally, firms must have adequate mechanisms to identify and manage risks and will make extensive use of procedure manuals, policies on pricing for the valuation of derivative positions and collateral to cover margin calls.

1.1 CREDIT AND COUNTERPARTY RISK

LEARNING OBJECTIVES

10.1.1 Know the main constituents of credit and counterparty risk

Credit and counterparty risks can be defined as the risks of financial loss due to the failure of a counterparty to meet obligations. This loss can be failure to receive either cash or assets, or both, and the cost of replacement. In addition, counterparty risk can be related to the failure or error in the provision of services, for example, by a global clearer or a prime broker, in which case there is an overlap with other risks such as operational, legal and concentration risks.

1.2 METHODS OF MITIGATING CREDIT AND COUNTERPARTY RISKS

LEARNING OBJECTIVES

10.1.2 Understand the main methods for mitigating credit risk
10.1.3 Know the purpose of Potential Future Exposures (PFEs)
10.1.4 Know the purpose of Credit Valuation Adjustments (CVA)

Credit risk is traditionally controlled by position limits, KYC and due diligence and possibly margin and collateral. Counterparty risk related to services is managed by contractual agreements and service level agreements, as well as by due diligence and sound management and review.

Credit risk is primarily about the possibility of default and, therefore, the controls mentioned above will focus on areas such as:

1. **KYC and relationship management** – particularly when unexpected transactions occur either by size or market, or even frequency;
2. **anti-money laundering (AML) checks** – in respect of client account opening and ongoing instructions such as the movement of assets and cash;
3. **margin calls and collateral** – adequacy of the collateral value and timely receipt of payments;
4. **large exposures** – checking against internal limits.

The accurate and timely production of reconciled and revalued positions (including the collateral value, when applicable) is vital to the control of credit risk, as is the monitoring of the payment of liabilities.

There are also several key functions that will be carried out between trade capture and final close out or delivery (see Chapters 6, 7 and 8). It is the case that some of these functions are serviced by a third party, such as a prime broker, as we saw in Chapter 8. There are counterparty risks associated with this relationship. Likewise the use of systems is vital in derivatives operations and is often linked to a third party provider, with reliance therefore on the service provided by that party.

Agreements like the prime broker and service level agreements (SLAs) seek to set out the terms of the services so both parties clearly understand their roles and responsibilities.

The use of practices like portfolio aggregation, collateral and netting has been used to reflect the ongoing importance to financial institutions of accurate exposure measurement in calculating their counterparty credit risk.

In addition, there is the use of longstanding methodology, like credit rating and today there is also the analysis of potential future exposure (PFE) and credit valuation adjustment (CVA) within the risk manager’s tools.

### 1.2.1 Potential Future Exposure (PFE)

Potential future exposure (PFE) quantifies the counterparty risk/credit risk by evaluating trades already done against possible market prices in the future, over the lifetime of the transactions. PFE is also a building block for CVA, another activity which has gained in importance in managing the credit risk of derivatives activity.

### 1.2.2 Credit Valuation Adjustment (CVA)

Credit valuation adjustment (CVA) can be described as the difference between the risk-free portfolio value and the true portfolio value, taking into account the possibility of a default by a counterparty.

The changed regulatory environment requires that CVA be both marked-to-market and actively hedged.

PFE and CVA are crucially important for clearing houses looking to be CCPs for products like swaps.
2. MARKET RISK

2.1 DEFINING MARKET RISK

LEARNING OBJECTIVES

10.2.1 Know the main constituents of market risk (energy, equities, interest rates, currencies, commodities, volatility, liquidity)

Market risk can be defined as the risk of financial loss due to trading and investment decision errors, liquidity issues, adverse market movements or breaches of market rules and regulations.

Liquidity is a significant risk that can be illustrated by the problems created by not being able to obtain the underlying for delivery, which can occur in products based on commodities, for example when there is crop damage or political activities create shortages of supply.

This is not restricted to commodities and incidents have occurred where a market squeeze, known as cornering the market in the US, has resulted in liquidity problems in German government bonds in the run-up to futures maturity and delivery.

Whilst market risk is primarily about areas such as exposures and liquidity, contingent liabilities, for instance variation margin funding causing early termination of a strategy and rogue traders with hidden and unauthorised deals, and thus unknown exposure, are also relevant.

2.2 METHODS FOR MITIGATING MARKET RISK

LEARNING OBJECTIVES

10.2.2 Know the main methods for mitigating market risk
10.2.3 Know the purpose of Value at Risk (VaR)

Market risk, like credit risk, is controlled by the use of various well-established processes, many of which involve sophisticated modelling like value at risk (VaR) but the involvement of the operations teams in this process is vitally important.

Control methods include the tasks that operations teams are very much involved in day-to-day, including, of course, the reconciliation of the market positions, as reflected in the positions held at the clearing house or the broker, and the value of positions by the reconciliation of futures’ initial and variation margin requirements.

This needs to be viewed as an intra-day requirement and not just an end-of-day process.

Market movements can create substantial changes in values and potential margin calls, so this is managed, as we saw in Chapter 7, on margin, where the clearing house can employ various margin call processes, including an intra-day call.
2.2.1 Value-at-Risk (VaR)

Based around three variables, value-at-risk (VaR) is a statistical technique that measures the level of financial risk within a portfolio over a specific time frame.

The three variables are:

1. Amount of potential loss.
2. Probability of the amount of loss happening.
3. The time frame.

If we assume that for a firm there is a 10% VaR of £200 million then in any given month that means a 10% chance of a loss of more than £200 million.

The firm should expect that a £200 million loss could occur once every ten months.

3. OPERATIONAL RISK

3.1 CHARACTERISTICS OF OPERATIONAL RISK

LEARNING OBJECTIVES

10.3.1 Know the main characteristics of operational risk

Operational risk is made up of several subsets of risk categories and each one is important, as the risks in one category may well create a risk situation in another, the so-called systemic risk that starts in one process and affects another process elsewhere.

It is important to recognise that operations risk is a subset of operational risk and that each subset will have its own process of identification and management of the specific risk in the subset.

Some of the major subsets of risk are:

1. **Legal** – the risk that agreements designed to protect and provide mitigation of risk events are not enforceable, are out of date or are not relevant to the services or liabilities.
2. **Regulatory** – the risk that a firm is in breach of regulations applicable to its operation and could therefore face financial penalties or even withdrawal of its licence. Key areas include segregation of client assets, correct client documentation, proper management of margin calls and collateral.
3. **Resource** – the risk that there is insufficient management and operational capability and competency in the derivatives team.
4. **Risk of fraud** – the inability of the operations team to maintain fully reconciled and accurate positions and cash flows so that fraudulent activities, including rogue trading, can occur.

**Note:** although it happened some years ago, the case study of Nick Leeson and Barings Bank is still worth researching, as it demonstrates the importance of recognising and managing operational and other risks where derivatives are being used. More recent case studies in this area include Société Générale, MF Global and UBS.
Almost all operational risks are either people- or process-orientated, and the impact of operational risk can be both financial and reputational. There is also the regulatory risk that a severe breach of regulation could result in a cancellation of licence/authorisation to operate, defined as a ‘killer risk’.

This is an extensive universe with many and diverse potential risks that need to be effectively managed.

### 3.2 BASEL DEFINITION

#### LEARNING OBJECTIVES

10.3.2 Know the BIS definition of operational risk

Operational risk is defined by the Bank of International Settlements (BIS) as being the risk of financial loss, resulting from inadequate or failed internal processes, people and systems or from external events.

### 3.3 METHODS OF MITIGATING OPERATIONAL RISK

#### LEARNING OBJECTIVES

10.3.3 Understand the main methods of mitigating operational risk

Operational risks are managed through a combination of methods, including risk indicators, procedural controls, measuring the effectiveness of these controls and reviewing the procedures which will be affected by business, market and regulatory changes.

Operational risk is subject to several influences and sensitivities which include:

- business profile;
- products used;
- strategies;
- volatility in the underlying;
- technology;
- resource levels;
- process complexity;
- communication.

The procedures operated will each have a control or series of controls designed to manage the inherent risks that are known.

Some examples of key controls are:

- validation and verification of transactions;
- reconciliation of positions;
- reconciliation of cash and assets;
- collateral management;
- monitoring positions for exercise, assignment, delivery and expiry.
Other standard methods of control include the ‘four eyes principle’, exceptions and tolerances, and indirectly the audit and compliance process.

3.4 MAPPING OPERATIONAL RISK IN A DERIVATIVES OPERATIONS ENVIRONMENT

Understanding the risk sources and the impact of that risk is called risk mapping. This involves the analysis of the workflow and the critical tasks through the clearing and settlement process. It is also prudent to consider any risk sources that could occur prior to clearing and settlement. These include pre-trade checks on:

- authorised products;
- deal limits;
- position and exposure limits;
- counterparty limits; and
- liquidity limits.

Some other areas in the organisation, such as the credit risk team and compliance, will monitor some of these.

However, the operations area is involved in some of this process as the information produced on positions, for example, is critical to an accurate risk management process. Key functions such as reconciliation and error resolution must be effective; otherwise the dealing function is hampered, or the organisation may be put at risk by ‘hidden’ positions and unauthorised exposures. As these present not only an unacceptable risk, but also a breach of regulations, the consequences are clear.

3.5 MANAGING SPECIFIC RISK SITUATIONS

LEARNING OBJECTIVES

10.3.4 Understand the importance of managing risk in the following operational activities: allocation; position limits; margining; collateral; reconciliation; close outs; deliveries; early exercise of options

Within derivatives operations, the use of systems and technology is extensive. Everything from margin calculations to value-added services to clients are run on in-house and/or external systems.

Important interfaces exist for processes such as trade registration with the clearing house, submitting exercise and tender notices, and receiving assignment and delivery notification.

It is therefore important to understand the operational risk that exists in specific situations.

3.5.1 System/Technology Risk

This risk can include the following:

- Inadequate controls over the input and management of static data in the systems.
  This will cover critical data such as:
a. contract size;
b. tick size and value;
c. expiry/maturity dates;
d. option styles.

- Inability of systems to handle specific types of derivative products and their characteristics such as:
  a. initial margin method;
  b. settlement and/or MTM calculation (variation margin, option premium);
  c. mark-to-market process for valuations;
  d. delivery process;
  e. close-out process.

- Inability to provide vital risk management information, because of:
  a. lack of knowledge of the systems capabilities by staff and management;
  b. inaccurate exception reports;
  c. inaccurate client money calculations;
  d. faulty margin reconciliation and cash management;
  e. corrupt data on in- and out-of-the-money option positions for exercise and assignment.

The reliance on systems to provide not only vital internal functions, but also client services, such as single currency settlement, average pricing and direct client access to data via intranets, means that any system failure, corruption of data in the system, unauthorised access or delay in setting up a new client or product on the system is a significant risk to the business.

The use of systems must be accompanied by strict controls and segregation of certain functions, such as static data, trade input, client account setup and treasury functions.

3.5.2 Operations Processes

Positions in derivatives represent exposures and the positions must be reconciled to those held by the clearing house or broker. As some products, like futures, are not only MTM each day but that MTM amount is also settled, any incorrect position will result in problems agreeing the settlement amount.

We must also remember that some products go to physical delivery and positions that remain open at the clearing house can become subject to the delivery process. Therefore, maintaining the correct net and gross positions, through correct close out of longs and shorts, is vital. So too is managing the tender, exercise and assignment process, as these will alter the open position, which must be amended accordingly. If an option position is assigned but the dealers are not informed and/or the position in the records is not amended, the dealer is trading on an incorrect position and this could cause a severe financial loss.

We can summarise the specific risks as:

- **Responsibilities**
  It is important to assign responsibility to manage the processes of:
  - position agreement to clearing house/broker and internal records;
  - tendering and exercising for delivery and amending positions;
  - checking for assignments (remember some options could be exercised early) and notifying dealers as well as amending positions;
reconciling settlement figures (premium, variations and initial margin) to internal records. This will highlight any position/price error.

• **Reporting**
  The systems in the derivatives operations area will also provide key regulatory reports and reporting information, either directly to the regulator or to the compliance department; and therefore any lack of control over the quality and timeliness of the data used could lead to a potential breach of regulations.

Since 2008 the requirements for reporting to regulators and internally to risk and compliance have increased.

### 3.5.3 Process Risk

As we have seen in this manual, the use of derivatives creates some specific procedures and processes, which in turn have risks associated with these key functions. Some are listed below and anyone working in a derivatives team must understand them.

• **Trade Capture and Input**
  This operational risk issues that arise include:
  - source of trade data (ie, manual or automated);
  - deal ticket processing;
  - format considerations in terms of clarity of information;
  - volume fluctuation;
  - peaks and troughs, influenced by issues like economic announcements;
  - timely and accurate allocation of trade or account bookings;
  - allocations (transactions may need to be allocated across several accounts, because several orders may be completed as a single trader in the market or a fund manager can place a single order to be allocated across several funds. Therefore, great care needs to be taken to ensure that there are no errors in the process of allocating the trade that will create an incorrect position for a client).

• **Valuation**
  The operational risk issues that arise include:
  - sources of prices;
  - input method: manual/automatic;
  - validation of prices;
  - generation of profit/loss figures;
  - valuing collateral.

• **Reconciliations**
  The operational risk issues that arise include:
  - positions;
  - intra-day;
  - end of day;
  - trade day + 1;
  - initial margin;
  - variation margin;
  - option premium;
  - cash position/ledger balance;
• **value dated payments and receipts;**
• **nostro/bank reconciliations;**
• **profit/loss account;**
• **collateral.**

• **Client Settlement**
The operational risk issues that arise include:
• **production of settlement information;**
• **automatic/overnight-associated reconciliation timing;**
• **trigger payment instructions;**
• **collateral requests;**
• **instructions;**
• **value date of payments and internal control in the interim, ie, cash margin.**

• **Funding**
The operational risk issues that arise include:
• **deadlines;**
• **allocation of collateral;**
• **source of funding;**
• **exceptions;**
• **instructions;**
• **payments/receipts;**
• **borrowing stock to ensure timely delivery of futures or options.**

• **Management Information**
The operational risk issues that arise include:
• **expiries and delivery periods;**
• **credit exposure intra-day;**
• **profit/loss versus settlement requirements;**
• **justification of payments;**
• **breaches of controls;**
• **position limits, which act as a major control feature over exposure and the operations area, are often a key source of reconciling/validating data against the dealer’s position records.**

• **Clearing and Settlement Process**
The operational risk issues that arise include:
• **Delivery** – the possibility of the underlying not being available at the required time or errors in tendering or exercising positions or the ability to recognise an assignment.
• **Close outs** – unnecessary delivery situation, because of failure to close out positions.
• **Collateral** – failure to monitor value of collateral against initial margin requirement.
• **Exercise of options** – failure to understand the difference between exercise rights of American- and European-style options or the possibility of early exercise of options, failure to close out the option position or to exercise an in-the-money option.
• **Position limits** – failure to record transactions accurately, resulting in breaches of position limits internally or at exchanges.
• **Margin** – inability to calculate or reconcile margin requirement.
• **Reconciliation** – failure to perform critical reconciliations such as open positions, variation margin, initial margin and option premium.
SUMMARY

Operational risk in a derivatives operation needs to be fully understood by all personnel.

A failure to handle routine functions, covered elsewhere in this manual (margin, delivery and close outs) may lead to severe financial and reputation loss and breaches of regulation.

Issues such as money laundering and systems risk have significant implications in derivatives operations.

In the last three years the increased regulatory and investor/shareholder concerns, relating to the use of derivatives, has meant that it is even more important that adequate awareness of risk and suitable oversight are in place.
## END OF CHAPTER QUESTIONS

Think of an answer for each question and refer to the appropriate section for confirmation.

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Glossary

Accrued Interest
Interest due on a bond or other fixed income security which must be paid by the buyer of a security to its seller. Usual compensation: coupon rate of interest times elapsed days from prior interest payment date (ie, coupon date) up to but not including settlement date, is used in the calculation of the invoice amount for bond futures being delivered.

Actuals
An actual physical commodity someone is buying or selling, eg, soybeans, corn, gold, silver, Treasury bonds.

AEX
Amsterdam Exchanges, now part of NYSE Euronext (NYX).

Against Actuals
A transaction generally used by two hedgers who want to exchange futures for cash positions. Also referred to as 'versus cash'.

Agent Bank
A commercial bank that provides services as per their client’s instructions.

Agent
One who executes orders for or otherwise acts on behalf of another (the principal) and is subject to its control and authority. The agent takes no financial risk and may receive a fee or commission.

Allocation (Give Up)
The process of moving the trade from the executing broker to the clearing broker in exchange-traded derivatives (ETDs).

American-Style Option
The holder of the long position can choose to exercise the position into the underlying instrument until the expiry date.

Arbitrage
The simultaneous buying and selling of two different derivatives, or a derivative and its underlying where the fair value prices are different. The arbitrageur has a riskless trade as the exposure is flat and the profit is the difference between the two prices traded.

Asian Option
See Average Rate Option.
Asset Allocation
The use of derivatives by a fund manager to immediately gain or reduce exposure to different markets or asset classes.

Assignment
The process by which the holder of a short option position is matched against a holder of a similar long option position who has exercised his right.

At-The-Money (ATM)
An option whose exercise price is equal, or very close to, the current market price of the underlying share. This option has no intrinsic value when the strike and underlying price are equal.

At-The-Money (Currency Option)
An option where the strike is the same as the current spot or forward market rate.

Average Rate Option
An option where the settlement is based on the difference between the strike and the average price of the underlying over a predetermined period. Also known as an Asian Option.

Average Strike Option
An option that pays the difference between the average rate of the underlying over the life of the option and the rate at expiry.

Bargain
Another word for a transaction or deal. It does not imply that a particularly favourable price was obtained.

Base Currency
Currency chosen for reporting purposes.

Base Rate
The rate of interest set by the banks as a basis for the rate on loans and deposits. Can be used as a reference value for certain derivatives.

Basel III
See Capital Requirements Directive.

Basis (Gross)
The difference between the relevant cash instrument price and the futures price. Often used in the context of hedging the cash instrument.
**Basis (Value or Net)**
The difference between the gross basis and the carry.

**Basis Risk**
The risk that the price or rate of one instrument or position might not move exactly in line with the price or rate of another instrument or position which is being used to hedge it.

**Basis Trade**
A trade simultaneously of a future and the underlying; a facility offered by some exchanges.

**Bermudan-Style Option**
An option which the holder can choose to exercise on any of a series of pre-determined dates between the purchase of the option and expiry. See *American-Style Option, European-Style Option.*

**Best Execution**
The requirement for a broker to obtain the best market price when buying or selling a marketable investment on behalf of the client.

**Bid**
- The price or yield at which a purchaser is willing to buy a given security.
- To quote a price or yield at which a purchaser is able to buy a given security.
- The investor’s selling price of units in a unit-linked policy.

**Bilateral Netting**
A netting system in which all trades executed on the same date in the same security between the same counterparties are grouped and netted to one final delivery versus payment.

**Block Trade**
A purchase or sale of a large number of futures or options normally much larger than what constitutes a ‘normal’ size trade in the market in question. Not all exchanges permit block trades.

**Bond**
A certificate of debt, generally long-term, under the terms of which an issuer contracts, inter alia, to pay the holder a fixed principal amount on a stated future date and, usually, a series of interest payments during its life.
Glossary

Bretton Woods Agreement
An agreement that set a system of exchange rate stability after World War II, with all member currencies having a par value pegged to the US$, allowing a 1% variance. This was agreed by major economists from 44 countries. The International Monetary Fund and the World Bank were set up at this conference. The dismantling of the agreement led to the launch of the first financial futures contracts in 1975.

Broker
An agent, often a member of a stock exchange firm or an exchange member himself who acts as intermediary between buyer and seller. A commission is charged for this service.

Broker/Dealer
Firm that operates in dual capacity in the securities marketplace: as principal trading for its own account and as broker representing clients on the market.

Broking
The activity of representing a client as agent and charging commission for doing so.

CAC 40
French equity index on which futures and options are traded on NYSE Euronext.

Calendar Spread
The simultaneous purchase (or sale) of a futures or options contract for one date and the sale (or purchase) of a similar futures contract for a different date. See Spread.

Call Option
An option that gives the buyer the right, but not the obligation, to buy a specified quantity of the underlying asset at a fixed price, on or before a specified date. The seller of a call option has an obligation because they have sold the right to take delivery of the underlying asset if the option is exercised by the buyer.

Call Spread
The purchase of a call option coupled with the sale of another call option at a different strike, expecting a limited rise or fall in the value of the underlying. The sale reduces the cost of the purchase.

Capital Markets
A term used to describe the means by which large amounts of money (capital) are raised by companies, governments and other organisations for long-term use and the subsequent trading of the instruments issued in recognition of such capital.
Glossary

**Capital Requirements Directive (CRD)**
The means by which Basel II (the revised Basel Accord) has been implemented in Europe.

**Cash Market**
Traditionally, this term has been used to denote the market in which commodities were traded for immediate delivery against cash. Since the inception of futures markets for T-bills and other debt securities, a distinction has been made between the cash markets in which these securities trade for immediate delivery and the futures markets in which they trade for future delivery.

**Cash Settlement**
The settlement in cash rather than a physical asset of a derivative, eg, index and interest rate futures and options.

**Central Securities Depository (CSD)**
An organisation that holds securities in either immobilised or dematerialised form thereby enabling transactions to be processed by book entry transfer. Also provides securities administration services.

**Certificate**
Paper form of shares (or bonds), representing ownership of a company (or its debt).

**Certificate of Deposit (CD)**
A money market instrument in bearer form issued by a bank certifying a deposit made at the bank. Usually acceptable as collateral against margin calls.

**Cheapest to Deliver**
The cash security that provides the lowest cost (largest profit) to the arbitrage trader; the cheapest to deliver instrument is used to price the futures contract and is the most likely to be delivered against the future.

**Clean Price**
The total price of a bond less accrued interest.

**Clearing**
The centralised process whereby transacted business is recorded and positions are maintained.

**Clearing Agent**
An institution that settles transactions for a large number of counterparties.

**Clearing Broker**
The clearing agent for the trading broker in the market where the trade will settle. It is usually the party with which the sub-custodian will actually settle the trade.
Glossary

Clearing Corporation
Formerly the Board of Trade Clearing Corporation, which cleared the business of the Eurex US exchange which started in 2004 but was subsequently closed.

Clearing Fee
Fee charged by the clearing house or clearing broker usually per trade or contract/lot.

Clearing House
Company that acts as central counterparty for the settlement of on-exchange transactions (also some OTC transactions, eg, Swapclear). The clearing organisation acts as the guarantor of the performance and settlement of contracts.

Clearing Organisation
Another name for a clearing house.

Clearing System
System established to clear transactions.

Clearnet
The clearing house for NYSE Euronext (NYX) now merged with LCH.

Clearstream
Central securities depository (CSD) and clearing house based in Luxembourg and Frankfurt and owned by Deutsche Börse.

Closing Trade
A bought or sold trade which is used to partly offset an open position, to reduce it or to fully offset it and close the position out.

Collateral
An acceptable asset used to cover a margin requirement.

Commission
Charge levied by a firm for agency broking.

Commodity
The raw materials traded on specialist markets. See also Soft and Hard Commodities.

Commodities and Futures Trading Commission (CFTC)
A US regulatory organisation.
Glossary

**Commodity Futures**
These comprise five main categories; agriculturals, eg, wheat and potatoes; softs, eg, coffee and cocoa; precious metals, eg, gold and silver; non-ferrous metals, eg, copper and lead; and energies, eg, oil and gas.

**Commodity Futures Modernization Act (CFMA)**
Commodity Futures Modernization Act introduced in the US to change the regulatory environment in derivatives markets.

**Commodity Swap**
A swap involving either two commodities or a commodity and a floating-rate.

**Common Stock**
US term for securities that represent ownership in a corporation. The two most important common stockholder rights are the voting right and dividend right. Common stockholders’ claims on corporate assets are subordinate to those of bondholders, preferred stockholders and general creditors.

**Compliance Officer**
Person appointed within an authorised firm to be responsible for ensuring compliance with the rules.

**Conduct of Business Rules (COBs)**
Rules introduced by the Financial Services Authority to dictate how firms conduct their business. They deal mainly with the relationship between firm and client.

**Confirm**
An agreement for each individual over-the-counter (OTC) transaction which has specific terms.

**Conflict of Interest**
Circumstances that arise if a firm has an investment which could encourage it not to treat its clients favourably. The more areas in which a firm is involved the greater the number of potential conflicts.

**Consideration**
The value of a transaction calculated as the price per share multiplied by the quantity being transferred.

**Contract**
The standard unit of trading for futures and options. It is also commonly referred to as a lot.

**Contract for Difference (CFD)**
Contract designed to make a profit or avoid a loss by reference to movements in the price of an item. The underlying item cannot change hands.
**Glossary**

**Contract Note**
Legal documentation sent by brokers/banks to clients providing details of a transaction completed on their behalf.

**Contract Specification**
A derivative exchange designs its own products and publishes a contract specification setting out the details of the derivative contract. This will include the size or unit of trading and the underlying, maturity months, quotation and minimum price movement and value (see also Tick Size) together with trading times, methods and delivery conditions.

**Convergence**
The movement of the cash asset price toward the futures price as the expiry date of the futures contract approaches. On expiry, they will both have the same value, as time or volatility is no longer affecting the derivatives price.

**Corporate Action**
One of many possible capital restructuring changes or similar actions taken by the company, which may have an impact on the market price of its securities, and which may require the shareholders to make certain decisions.

**Correlation**
Refers to the degree to which fluctuations of one variable are similar to those of another.

**Cost of Carry**
The net running cost of holding a position (which may be negative), eg, the cost of borrowing cash to buy a bond, less the coupon earned on the bond while holding it.

**Counterparty**
A trade can take place between two or more counterparties. Usually one party to a trade refers to its trading partners as counterparties.

**Coupon**
Generally, the nominal annual rate of interest expressed as a percentage of the principal value. The interest is paid to the holder of a fixed-income security by the borrower. The coupon is generally paid annually, semi-annually or in some cases quarterly depending on the type of security.

**Covered Option**
An option bought or sold offsetting an existing underlying position.
Glossary

**Covered Writing**
The sale of call options. The seller owns the underlying which would be required to cover the delivery, if the position is assigned.

**Credit Default Swap**
A swap where one side is a default event that results in the payment of the related loss and the other is the payment of a premium to secure the protection. If no event occurs then the seller of the protection keeps the premium.

**Credit Derivatives**
Credit derivatives have as the underlying asset some kind of credit default. As with all derivatives, the credit derivative is designed to enable the risk related to a credit issue, such as non-payment of an interest coupon on a corporate or sovereign bond, or the non-repayment of a loan, to be transferred.

**Credit Risk**
The risk that a borrower, or counterparty to a deal, or issuer of a security will default on repayment or not deliver its side of the deal. Also known as counterparty risk.

**Cross Currency Interest Rate Swap**
An interest rate swap where the interest payments are in two different currencies and the exchange rate, for the final settlement, is agreed at the outset of the transaction.

**Currency Exposure**
Currency exposure exists if assets are held or income earned, in one currency while liabilities are denominated in another currency. The position is exposed to changes in the relative values of the two currencies such that the cost of the liabilities may be increased or the value of the assets or earning decreased.

**Currency Futures**
Contracts calling for delivery of a specific amount of a foreign currency at a specified future date in return for a given amount of say US Dollars.

**Custodian**
Institution holding securities in safekeeping for a client. A custodian also offers different services to its clients like settlement and portfolio services. This can include services related to derivatives where the custodian settles and margin calls on trades with the client’s broker.

**Customer – Non-Private**
Customer who is assumed to understand the workings of the investment world and therefore receives little protection from the Conduct of Business Rules.
Glossary

Customer – Private
Customer who is assumed to be financially unsophisticated and therefore receives more protection from the Conduct of Business Rules.

Dealer
Individual or firm that acts as principal in all transactions, buying for his own account.

Default
Failure to perform on a derivatives contract or trade, either cash settlement or physical settlement or to be in default of other exchange or clearing house rules.

Deliverable Basket
The list of securities that meet the delivery standards of futures contracts, eg the list of deliverable bonds against a bond future published by the exchange.

Deliverable List
See Deliverable Basket.

Delivery
The physical movement of the underlying asset on which the derivative is based from seller to buyer.

Delta
The sensitivity of an option price to changes in the price of the underlying product. Also used to determine the amount of underlying needed to hedge a derivative position and vice-versa.

Dematerialised (form)
Circumstances where securities are held in a book entry transfer system with no certificates.

Derivative
A financial instrument whose value is dependent upon the value of an underlying asset.

Derivative Instruments
Instruments that are based on other underlying instruments. Examples are options on shares or futures on bonds or forwards on commodities or swaps on interest rates.

Derivative Securities
See Derivative Instruments.

Direct Market Participant
A broker, broker/dealer or any direct member of an exchange.
Glossary

Dirty Price
The total price of a bond including accrued interest.

Discount
The amount by which a future is priced below its theoretical price or fair value. If the fair value of an index future is 3000 and it is trading at 2990 it is described as trading at a discount of 10 points to its fair value.

Discount Factor
The number by which a future cash flow must be multiplied in order to calculate its present value.

Discount Rate
The rate of interest charged by the Federal Reserve in the US to banks to whom money has been lent. It is also a term used by other central banks for the same purpose. Some derivatives reference sources are based on it.

Discount Securities
Non-interest bearing short-term securities which are issued at discount and redeemed at maturity for full face value.

Deutsche Börse
The German Stock and Derivatives Exchange Group that includes Eurex.

Diversification
Investment strategy of spreading risk by investing the total available in a range of investments. Derivatives are sometimes used to achieve this. See also Asset Allocation.

Dividend
Distribution of profits made by a company to its shareholders if it chooses to do so.

Dodd-Frank Act
A bill that aims to increase government oversight of trading in complex financial instruments, such as derivatives. The restrictions placed on the types of proprietary trading that financial institutions are allowed to practice are intended to prevent the collapse of major financial institutions.

Domestic Bond
Bond issued in the country of the issuer and according to the regulations of that country.

Dow Jones Index
A share index used in the US which is the underlying for futures and options contracts.
**Glossary**

**Depository Trust Company (DTC)**
The central securities depository (CSD) for shares in the US.

**Due Diligence**
The carrying out of duties with care and perseverance. Due diligence is generally referred to in connection with the investigations of a company, carried out by accountants to ascertain the value of that company and also applies from a regulatory point of view that firms and key personnel should carry out their duties with due diligence to the regulatory environment.

**Duration**
A measure of the relative volatility of a bond; it is an approximation for the price change of a bond for a given change in the interest rate. Duration is measured in units of time. It includes the effects of time until maturity, cash flows and the yield-to-maturity. Bond futures are used to manage duration.

**Eligible Counterparty**
One of the three client classifications under the Markets in Financial Instruments Directive (MiFID).

**Emerging Market**
Often a non-industrialised country with:

- low or middle per capita income, as published annually by the World Bank;
- undeveloped capital markets (ie, the market represents only a small portion of their gross domestic product (GDP)).

Investors sometimes prefer to use derivatives that give an exposure to shares, commodities, interest rates or currencies on the emerging market but which are traded on established derivative markets or off-exchange with banks.

**Equity**
A common term to describe stocks or shares.

**Equity/Stock Options**
Contracts based on individual equities or shares. On exercise of the option the specified amount of shares are exchanged between the buyer and the seller through the clearing organisation.

**EUREX**
German-Swiss derivatives exchange created by the merger of the German (DTB) and Swiss (SOFFEX) exchanges; part of the Deutsche Börse.

**EURIBOR**
A measure of the average cost of funds over the whole euro area based on a panel of 57 banks. It is the underlying for the highly successful LIFFE interest rate futures and options.
Glossary

**Euro**
The name of the single European currency.

**Eurobond**
An interest-bearing security issued across national borders, usually issued in a currency other than that of the issuer's home country. Having no regulatory protection, only governments and top rated multinational corporations can issue Eurobonds that the market will accept.

**Euroclear**
An international central securities depository (ICSD), operating a book-entry clearing facility for most Euro-currency and foreign securities. Owners of the UK’s domestic CSD.

**Euroclear UK & Ireland Ltd**
The central securities depository (CSD) organisation in the UK that holds UK and Irish company shares in dematerialised form and clears and settles trades in UK and Irish company shares. It operates the CREST system.

**European Style Option**
An option which can only be exercised on the expiry date.

**Execution and Clearing Agreement**
An agreement signed between the client and the clearing broker. This agreement sets out the terms by which the clearing broker will conduct business with the client including how trades to be received from other execution brokers will be advised to the clearing broker.

**Exchange**
Marketplace for trading futures and options. The derivative exchange develops (see Contract Specification), markets and lists its own products, as well as setting out the membership criteria, rules and regulations for trading.

**Exchange Delivery Settlement Price (EDSP)**
The price determined by the exchange for the closing out of the futures position and the calculation of the final value for the cash or physical delivery of the underlying instrument or cash settlement.

**Exchange of Futures for Physical (EFP)**
Common in the energy markets. A physical deal priced on the futures markets, with the derivative transacted off-exchange but recognised by the exchange for clearing.
Glossary

**Exchange Owned Clearing Organisation**
Exchange or member-owned clearing organisations are structured so the clearing members each guarantee each other with the use of a members’ default fund and additional funding like insurance, with no independent guarantee.

**Exchange Rate**
The rate at which one currency can be exchanged for another.

**Exchange-Traded Derivative (ETD)**
ETD is the common terminology used to describe exchange-traded derivatives which are the standardised products. It also differentiates products which are listed on an exchange as opposed to those offered over-the-counter (OTC).

**Exchange-Traded Funds (ETFs)**
Passively managed basket of stocks that mirrors a particular index and that can be traded like ordinary shares. They trade intraday on stock exchanges, like securities, at market-determined prices. In essence, ETFs are index funds that trade like stocks.

**Execute and Eliminate Order**
The amount that can be tracked immediately against displayed orders is completed, with the remainder being rejected.

**Execution**
The action of trading in the markets.

**Execution and Clearing Agreement**
An agreement signed between the client and the clearing broker. This agreement sets out the terms by which the clearing broker will conduct business with the client.

**Execution-Only Agreement**
Tri-partite agreements that are signed by the executing broker, the clearing broker and the client. This agreement sets out the terms by which the clearing broker will accept business on behalf of the client.

**Exercise**
The process by which the holder of an option may take up their right to buy or sell the underlying asset.

**Exercise Price**
The fixed price, per share or unit, at which an option conveys the right to call (purchase) or put (sell) the underlying shares or units. Also known as Strike Price.
**Exotic Options**

New generation of option derivatives, including look-backs, barriers, baskets and ladders. They have different terms from standardised traded call and put options.

**Expiry Date**

The last date on which an option holder can exercise their right. After this date an option is deemed to lapse or be abandoned.

**Face Value**

The value of a bond, note, mortgage or other security that appears on the face of the issue, unless the value is otherwise specified by the issuing company. Face value is ordinarily the amount the issuing company promises to pay at maturity. Face value is also referred to as par value or nominal value. For instance, a bond future that has a unit of trading of £100,000 will require a bond with a face value of £100,000 to be delivered if tendered.

**Fair Value**

For futures, it is the true price not the market price, allowing for the cost of carry. For options, it is the true price, not the market price, as calculated using an option pricing model.

**Fill or Kill Order**

Type of order input into an electronic trading platform. It is either completed in full against displayed orders or rejected in full.

**Final Settlement**

The completion of a transaction when the delivery of all components of a trade is performed. In the case of delivery of a derivative it can be the final amount due on close out, maturity or delivery. At final settlement any collateral covering margin calls is returned.

**Financial Conduct Authority (FCA)**

On 1 April 2013 the Financial Services Authority (FSA) was replaced under a change to regulation by the Financial Conduct Authority (FCA) and the Prudential Regulatory Authority (PRA) which assumed the previous regulation and role.

**Financial Futures/Options Contracts**

Used to describe futures or options contracts based on financial instruments like currencies, debt instruments, interest rates and financial indices.


The legislation that created the single UK regulator, the Financial Services Authority (FSA).
Financial Services Act 2012 (FSA 2012)
The legislation that created the single UK regulator, the Financial Services Authority (FSA) was the FSMA 2000, which has now been replaced by the Financial Services Act (2012) which created the Financial Conduct Authority (FCA) and the Prudential Regulatory Authority (PRA) to replace the FSA.

Financial Services Authority (FSA)
The agency designated by the Treasury to regulate investment business as required by the Financial Services Act 1986. It is the main regulator of the financial sector and was formerly called the Securities and Investments Board (SIB). It assumed its full powers on 1 December 2001. In April 2013 the FSA was replaced by the Financial Conduct Authority (FCA) and the Prudential Regulatory Authority (PRA).

First Notice Day
The first day as listed in the contract specification that the holders of short positions can give notification to the exchange/clearing house that they wish to effect delivery.

Fit and Proper
Under the Financial Services Act everyone conducting investment business must be a fit and proper person. The Act does not define the term, a function which is left to the regulators such as the FCA.

Fixed Income
Interest on a security that is calculated as a constant specified percentage of the principal amount and paid at the end of specified interest periods, usually annually or semi-annually, until maturity.

Fixed-Rate
A borrowing or investment where the interest or coupon paid is fixed throughout the arrangement.

In an fixed rate agreement (FRA) or coupon swap, the fixed-rate is the fixed interest rate paid by one party to the other, in return for a floating-rate receipt (ie, an interest rate that is to be re-fixed at some future time or times).

Flat Position
A position which is not only equal in terms of long and short amounts or value but has been fully closed out so that no liability to make or take delivery exists, ie, no exposure.

Flex Options
FLexible EXchange® Options (FLEX Options) are customised equity or index option contracts introduced originally in 1993 by the Chicago Board Options Exchange. They provide investors with the ability to customise key terms in the option contract such as exercise prices, exercise styles and expiry dates. Basically, they are a cross between OTCs and exchange-traded products.
Glossary

**Floor**
A package of interest-rate options whereby, at each of a series of future fixing dates, if an agreed reference rate such as London Inter-Bank Offered Rate (LIBOR) is lower than the strike rate, the option buyer receives the difference between them, calculated on an agreed notional principal amount for the period until the next fixing date.

**Floorbrokerage**
The process of delegating the execution of futures and options to another counterparty who then charges a floorbrokerage fee for doing the trade. The floorbroker then gives up or allocates the trade to the broker concerned or if a client trade to the clearing broker of the client’s choice who deals with the clearing and settlement.

**Foreign Exchange**
Exchange of one currency into another one.

**Forex**
Abbreviation for foreign exchange (currency trading).

**Forward Market**
Where a price is agreed now for delivery of goods in the future. Used in currency, securities and commodities markets, often in conjunction with dealing in immediate delivery as a safety net. See Spot Market.

**Forward Delivery**
Transactions that involve a delivery date in the future.

**Forwards**
These are very similar to futures contracts but they are not mainly traded on an exchange. Often they are not marked-to-market daily but settled only on the delivery date. However, for some forward contracts there is a mark-to-market process and any loss occurring during the life of the contract is paid to the clearing house and profits are held by the clearing house until settlement on maturity with interest being paid on the amount held.

**Front Running**
The illicit utilising by brokers and market makers of advance warning or information for personal or corporate profit. Illegal on derivative exchanges.

**FTSE 100 index**
Main UK share index based on 100 leading shares.
Glossary

**Fund Manager**
Individuals or specialists companies responsible for investing the assets of a fund in such a way as to maximise its value. They do this by following a strategy to buy and sell equities and other financial instruments.

**Fungible Contract**
A futures contract with identical administration in more than one financial centre. Trades in various geographical locations can be offset.

**Futures**
An agreement to buy or sell an asset at a certain time in the future for a certain price.

**Future Value**
The amount of money which can be achieved at a given date in the future by investing (or borrowing) a given sum of money now at a given interest rate, assuming compound re-investment (or re-funding) of any interest payments received (or paid) before the end.

**Gamma**
The rate at which the delta of an option changes.

**Gearing**
The characteristic of derivatives which enables a far greater reward for the same, or much smaller, initial outlay. It is the ratio of exposure to investment outlay, and is also known as leverage.

**Gilt**
Domestic sterling-denominated long-term bond backed by the full faith and credit of the UK and issued by the Treasury.

**Gilt-Edged Security**
UK government borrowing through the issue of bonds that is considered a very safe investment in terms of the likelihood of default.

**Give-Up**
The process of giving a trade to a third party who will undertake the clearing and settlement of the trade.

**Give-Up Agreement**
See Execution-only Agreement.

**Global Clearing**
The channelling of the settlement of all futures and options trades through a single counterparty or through a number of counterparties geographically located.
Glossary

**Global Custodian**
Institution that safekeeps, settles and performs the processing of income collection, tax reclaim, multi-currency reporting, cash management, foreign exchange, corporate actions and proxy monitoring for clients’ securities in all required marketplaces.

**Global Depository Receipt (GDR)**
A security representing shares held in custody in the country of issue.

**GLOBEX**
The overnight trading system operated by the Chicago Mercantile Exchange (CME).

**Gold**
Widely used commodity and regarded as a safe haven in times of uncertainty.

**Granter**
Another term for a person who has sold an option position to a buyer.

**‘Greeks’**
A collective term for delta, gamma, theta and vega which relate to the movement in price of an option as a result of the movement in the underlying price, the rate of that movement and time erosion.

**Gross**
A position which is held with both the bought and sold trades kept open rather than being netted out.

**Haircut**
Amount by which collateral put up against margin is discounted.

**Hard Commodities**
Commodities such as tin or zinc. Futures and options on them are traded on specialist derivative exchanges like the London Metal Exchange (LME).

**Hedge Ratio**
Determining the ratio of the futures to the cash position so as to reduce price risk. Also the proportion of the underlying asset needed to delta hedge an option.

**Hedging**
A trading method which is designed to reduce or mitigate risk. Reducing the risk of a cash position in the futures instrument to offset the price movement of the cash asset. A broader definition of hedging includes using futures as a temporary substitute for the cash position.
Hong Kong Exchanges (HKEx)
The amalgamated exchange body in Hong Kong.

Holder
A term describing a person who has bought a derivatives contract that creates an open long position.

Income Enhancement
Strategy that uses written call options to generate premium against underlying assets held.

Independent Clearing Organisation
A clearing house or organisation that is quite separate from the actual members of the exchange, and will guarantee to each member the performance of the contracts by having them registered in the organisation’s name.

Index Funds
Unit trusts or mutual funds which invest in the constituent parts of an index.

Indirect Market Participation
Non-broker/dealers, such as institutional investors, who are active investors/traders.

Initial Margin
The deposit that the clearing house calls as protection against a default of a contract. It is returnable to the clearing member once the position is closed. The level is subject to changes in line with market conditions.

Inside Information
Information relating to a security which is not publicly known, which would affect the price of the security if it was public.

Insider
Directors, employees, shareholders and other persons having inside information.

Insider Dealing
The criminal offence whereby those with unpublished price-sensitive information deal, advise others to deal or pass the information on. Maximum penalty is seven years’ jail and an unlimited fine. Where sudden severe movements in a share price occur the regulatory authority will check dealings in derivatives on the share as well as share trades to establish if any insider dealing has possibly occurred.

Institutional Investor
An institution that is usually investing money on behalf of others. Examples are mutual funds and pension funds.
Integration
The third stage of money laundering, in which the money is finally integrated into the legitimate economy. See Placement, Layering.

IntercontinentalExchange (ICE)
The IntercontinentalExchange (ICE) is the owner of ICE Futures. It operates energy and other commodity markets, both through OTC platforms and also futures and options exchanges in the US, Europe and Canada.

Interest Rate Futures
Based on a debt instrument such as a government bond or a Treasury bill as the underlying product, it requires the delivery of a bond or bill to fulfil the contract.

International Equity
An equity of a company based outside the UK but traded internationally.

International Securities Exchange (ISE)
With the Chicago Board Options Exchange (CBOE), ISE is one of the two major US electronic option exchanges; now acquired by Eurex.

In-The-Money
A call option where the exercise price is below the underlying share price or a put option where the exercise price is above the underlying share price.

An option whose strike is more advantageous to the option buyer than the current market rate. See At-The-Money, Out-of-The-Money.

Intra-Day Margin
An extra margin call which the clearing organisation can call during the day when there is a very large movement up or down in the price of the contract.

Intrinsic Value
The amount by which an option is in-the-money.

Investment Banks
A bank that has multiple activities, eg, banking, principal trading and asset management.

Investment Grade
A grading level used by certain types of funds for determining assets that are suitable for investment in by the fund.
**Glossary**

**Investment Business**
Dealing, advising or managing investments. Those doing so need to be authorised.

**Investment Services Directive (ISD)**
Now superseded by MiFID in 2007, this was an EU Directive imposing common standards on investment business. It helped to open up the greater use of derivatives, particularly off-exchange, by funds.

**Investment Trust Company (ITC)**
Company whose sole business consists of buying, selling and holding shares. The difference with unit trusts is that investors do not receive a part of the profits of the company managing the trust.

**Investments**
Items defined in the legislation and to be regulated by the regulatory authority, including shares, bonds, options, futures, life assurance and pensions.

**Invoice Amount**
The amount calculated under the formula specified by the futures exchange, which will be paid in settlement of the delivery of the underlying asset.

**Know Your Customer**
The Conduct of Business Rules requiring investment advisers to take steps, before giving investment advice, to determine the financial position and investment objectives of the client.

**Last Notice Day**
The final day that notification of delivery of a futures contract will be possible. On most exchanges all outstanding short futures contracts will be automatically delivered to open long positions.

**Last Trading Day**
Often the day preceding last notice day which is the final opportunity for holders of long positions to trade out of their positions and avoid ultimate delivery.

**Layering**
The second stage of money laundering, in which the money is passed through a series of transactions to obscure its origin. See Placement, Integration.

**Leverage**
The magnification of gains and losses by only paying for part of the underlying value of the instrument or asset; the smaller the amount of funds invested, the greater the leverage. It is also known as gearing.
**Glossary**

**Liffe Connect™**
LIFFE electronic dealing system.

**Limit Order**
Type of order input into SETS. If not completed immediately the balance is displayed on the screen and forms the order book.

An order in which a customer sets the maximum price he is willing to pay as a buyer or the minimum price he is willing to accept as a seller.

**Liquidation**
Term used to describe the closing of open positions.

**Liquidity**
A liquid asset is one that can be converted easily and rapidly into cash without a substantial loss of value. In-the-money market, a security is said to be liquid if the spread between bid and asked price is narrow and reasonable size can be done at those quotes.

**Liquidity Risk**
The risk that a bank may not be able to close out a position because the market is illiquid.

**Local**
An individual member of an exchange who trades solely for their own account.

**Local Currency**
Currency of the country of settlement.

**London Clearing House (LCH)/LCH.Clearnet**
A clearing house central counterparty (CCP) organisation; in 2003 it merged with Clearnet in Paris to create the LCH.Clearnet group.

**London Inter-Bank Bid Rate (LIBID)**
The rate at which one bank will lend to another.

**London Inter-Bank Offered Rate (LIBOR)**
The rate used when one bank borrows from another bank. It is the benchmark used to price many capital market and derivative transactions.

**London Metal Exchange (LME)**
Market for trading in derivatives of metals such as copper, tin and zinc.
**Glossary**

**London Stock Exchange (LSE)**
Market for trading in securities. Formerly known as the International Securities Exchange (ISE) of the UK and Republic of Ireland.

**Long**
A term to describe a market view or a bought position in a derivative, which is held open. Thus a fund manager or a trader may be bullish of the equity market and is contemplating going long of say 50 index futures. If purchased they have a long position.

**Long Position**
Refers to an investor or traders’ account in which he has purchased and is holding open a bought position. The position may be created as a result of the combination of several trades and therefore can increase or decrease. If the position is sold off in its entirety, the position will become flat.

**Lot**
A common term used to describe the standard unit of trading for futures and options but equally it is also often referred to as a contract.

**Managed Fund**
A unit-linked policy where the managers decide on the allocation of premiums to different unitised funds.

**Mandatory Event**
A corporate action that affects the securities without giving any choice to the security holder. Likely to affect the contract specification of any related derivative.

**Margin**
Initial margin is collateral placed by one party with a counterparty or clearing house at the time of a deal, against the possibility that the market price will move against the first party, thereby leaving the counterparty with a credit risk.

In a loan, margin is the extra interest above a benchmark such as LIBOR required by a lender to compensate for the credit risk of that particular borrower.

Money or assets that must be deposited by participants in securities lending, repos or OTC derivatives markets as a guarantee that they will be able to meet their commitments at the due date.

**Mark-to-Market**
The process of revaluing an OTC or exchange-traded product each day. It is the difference between the closing price on the previous day against the current closing price. For exchange-traded products this is referred to as variation margin.
Glossary

**Market**
Description of any organisation or facility through which items are traded. All exchanges are markets.

**Market Forces**
Supply and demand allowing buyers and sellers to fix the price without external interference.

**Market Maker**
A trader who works for an organisation such as an investment bank. They quote bids and offers in the market and are normally under an obligation to make a price in a certain number of contracts. They create liquidity in the contract by offering to buy or sell.

**Market Price**
In the case of a security, the market price is usually considered as the last reported price at which the stock or bond has been sold. In derivatives it can be the current price showing hence the term trade ‘at market’.

**Market Risk**
Also called position risk. The risk that the market value of a position falls.

**Markets in Financial Instruments Directive (MiFID)**
A European directive which, from November 2007, set authorisation and on-going compliance rules for investment firms, regulated markets and multilateral trading facilities across the EU.

**Market Value**
The price at which a security is trading and could presumably be purchased or sold.

**MATIF**
Former French derivatives exchange now part of NYSE Euronext.

**Maturity**
The date on which the derivative ceases.

**Model Risk**
The risk that the computer model used by a bank for valuation or risk assessment is incorrect or misinterpreted.

**MONEP**
Former French options exchange now part of NYSE Euronext.
Money Laundering
The process whereby criminals attempt to conceal the true origin and ownership of the proceeds of their criminal activities and to legitimise these proceeds by introducing them into the mainstream of financial activities.

Money Market
The market for the purchase and sale of short-term financial instruments. Short-term is usually defined as less than one year.

Mutual Fund
Fund operated by an investment company that raises money from shareholders and invests it in stocks, bonds or other instruments (unit trust, investment fund, SICAV – BEVEK).

Naked Option
An option bought or sold for speculation, with no offsetting existing position behind it.

Naked Writing
Where the seller does not own the stock corresponding to the call option which he has sold and would be forced to pay the prevailing market price for the stock to meet delivery obligations, if called.

National Association of Securities Dealers Automated Quotations (NASDAQ)/NASDAQ OMX
The world’s largest exchange company.

Netting
Trading partners offset their positions thereby reducing the number of positions for settlement. Netting can be either bilateral, multilateral or continuous net settlement.

Nikkei Futures
Main share index in Japan. Futures and options are listed on this index.

Nikkei Dow Index
Futures contracts traded on the Tokyo, Singapore and Osaka Stock Exchanges.

Nominal Amount
Value stated on the face of a security (principal value, par value). Securities processing: number of securities to deliver/receive.

Non-Clearing Member
A member of an exchange who does not undertake to settle their derivatives business. This type of member must appoint a clearing member to register all their trades at the clearing organisation.
Glossary

Non-Private Customer
A person who is not a private customer or who has requested to be treated as a non-private customer.

Notional
Most derivatives and contracts for differences require a notional principal amount on which strategies and settlement can be calculated.

Novation
The process where registered trades are cancelled with the clearing members and substituted by two new ones – one between the clearing house and the clearing member seller, the other between the clearing house and the clearing member buyer.

New York Mercantile Exchange (NYMEX)
The largest energy derivatives exchange. Part of the CME Group.

NYSE Euronext (NYX)
A pan-European securities and derivatives exchange listing Dutch, French, Portuguese and Belgium securities and derivatives plus the derivative products traded on NYSE Liffe.

Offer Price
The price at which a trader or market maker is willing to sell a contract.

Omnibus Account
Account containing the holdings of more than one client.

Open Order
A purchase or sale order at a stated price that is good-til-cancelled or executed.

Open Outcry
The style of trading whereby traders face each other in a designated area such as a pit and shout or call their respective bids and offers. Hand signals are also used to communicate. It is governed by exchange rules.

Opening Trade
A bought or sold trade that is held open to create a position.

Open Interest
The number of contracts both bought and sold which remain open for delivery on an exchange. Important indicator for liquidity.
Glossary

**Open Position**
The number of contracts which have not been off-set at the clearing organisation by the close of business.

**Operational Risk**
The risk of losses resulting from inadequate systems and control, human errors or management failings.

**Option**
In the case of the buyer, the right, but not the obligation, to take (call) or make (put) for delivery of the underlying product and in the case of the seller, the obligation to make or take delivery of the underlying product.

**Option Premium**
The sum of money paid by the buyer, for acquiring the right of the option. It is the sum of money received by the seller for incurring the obligation, having sold the rights, of the option. It is the sum of the intrinsic value and the time value.

**Options on Futures**
These have the same characteristics as an option, the difference being that the underlying product is either a long or short futures contract. Premium is not exchanged as the contracts are marked to market each day.

**Order-Driven Market**
A stock market where brokers acting on behalf of clients match trades with each other either on the trading floor of the exchange or through a central computer system.

**Ordinary Shares**
Known as common stock in the US and equities in the UK. Shareholders are the owners of a company and are protected so the maximum loss is the value of their shares and not the full debt of the company. Ordinary shares are divided into preferred and deferred ordinaries.

**Out-of-The-Money (OTM)**
A call option whose exercise price is above the current underlying share price or a put option whose exercise price is below the current underlying share price. This option has no intrinsic value.

**Out-Trade**
A trade which has been incorrectly matched on the floor of an exchange.
Over-The-Counter (OTC)
A one-to-one agreement between two counterparties where the specifications of the product are completely flexible and non-standardised. A negotiated trade where counterparty risk is potentially an issue.

Par Value
See Face Value.

Pension Fund
Fund set up by a corporation, labour union, governmental entity or other organisation to pay the pension benefits of retired workers. Pension funds invest billions annually in the securities markets and are therefore major market players who also use derivatives markets.

Physical Delivery
A derivative contract that on delivery will result in the asset being delivered, eg, bond futures, stock options, commodities.

Pit
The designated area on the market floor where a particular contract is traded. It may have an alternative name in some markets eg, on the LME trading takes place in the ring.

Placement
The first stage of money laundering, in which the money is placed in the banking system. See Layering, Integration.

Portfolio
List of investments held by an individual or company, or list of loans made by a bank or financial institution. Can also be the derivatives positions held by a trader/dealer.

Premium
An option premium is the amount paid up-front by the purchaser of the option to the writer.

Present Value
The amount of money which needs to be invested (or borrowed) now at a given interest rate in order to achieve exactly a given cashflow in the future, assuming compound reinvestment (or refunding) of any interest payments received (or paid) before the end. See Future Value.

Pre-Settlement
Checks and procedures undertaken immediately after execution of a trade prior to settlement.
Glossary

**Price (Conversion) Factor**
The price at which a bond would trade, per one nominal, to yield the notional coupon of the futures contract on the delivery day (or the first day in the deliverable month if this applies).

**Principal Trading**
When a firm uses its own money for trading. Also called *Proprietary Trading*.

**Principal-to-Principal Market**
A market where the clearing house only recognises the clearing member as one entity, and not the underlying clients of the clearing member.

**Principal Value**
That amount inscribed on the face of a security and exclusive of interest or premium. The amount is the one used in the computation of interest due on such a security.

**Private Customer**
An individual person who is not acting in the course of carrying on investment business.

**Proprietary Trader**
A trader who deals for an organisation such as an investment bank taking advantage of short-term price movements as well as taking long-term views on whether the market will move up or down.

**Prudential Regulation Authority (PRA)**
The Prudential Regulation Authority (PRA), which is a subsidiary of the Bank of England, is responsible for the prudential regulation of financial firms, including banks, investment banks, building societies and insurance companies.

**Put Option**
An option that gives the buyer the right, but not the obligation, to sell a specified quantity of the underlying asset at a fixed price, on or before a specified date. The seller of a put option has the obligation (because they have sold the right) to take delivery of the underlying asset if the option is exercised by the buyer.

**Realised Profit**
Profit which has arisen from a real sale.

**Recognised Clearing House (RCH)**
A recognised clearing house (RCH) is a provider of centralised clearing processes that has been approved by a regulator.
Recognised Investment Exchange (RIE)
A recognised investment exchange (RIE) is a trading exchange or platform that has been approved by a regulator.

Reconciliation
The comparison of a person’s records of cash and securities position with records held by another party and the investigation and resolution of any discrepancies between the two sets of records. Crucially important in derivatives business to reduce operational risk.

Reputational Risk
The risk that an organisation’s reputation will be damaged by being in breach of regulations, poor service or having inadequate controls over risk and performance.

Rights Issue
Offer of shares made to existing shareholders. As a corporate action it may change the strike price and number of shares on which an option or share future is based.

Right of Offset
Where positions and cash held by the clearing organisation in different accounts for a member are allowed to be netted.

Ring
See Pit.

Risk Warning
In the UK a document that must be despatched and signed by private customers before they deal in traded options.

Rollover
A rollover can be when the next leg of a swap is calculated or when a futures position in an expiring month is rolled to the next maturity. For example, the position in the March expiry is closed out and reopened in the next available maturity, say the June expiry.

Security
Can mean any instrument in the markets but generally refers to bonds and equities.

Securities House
General term covering any type of organisation involved in securities although usually reserved for the larger firms.
Glossary

Securities and Exchange Commission (SEC)
The securities and investment regulatory body in the US.

Segregated Account
Account in which there is only the holdings of one client.

Segregation of Funds
Where the client assets are held separately from those assets belonging to the member firm.

Serious Fraud Office (SFO)
A UK government department, established to tackle large-scale fraud.

Settlement
The fulfilment of the contractual commitments of transacted business.

Settlement Date
The date on which a trade is cleared by delivery of securities against funds (actual settlement date, contractual settlement date).

Share Futures
Based on individual shares. Delivery is fulfilled by the payment or receipt of cash against the exchange calculated delivery settlement price. Also called stock futures and universal stock futures.

Share Option
A right sold to an investor conferring the option to buy or sell shares of a particular company at a predetermined price and within a specified time limit.

Short
A term used to describe a market view that if traded would create a sold position in a derivative that is held open. For instance, a fund manager believes the equity market might fall and so contemplates going short by selling index futures to hedge the portfolio of shares held. Opposite of a long.

Short Position
The selling of securities or commodities that are not already owned that creates a position.

Society for Worldwide Interbank Financial Telecommunications (SWIFT)
Secure electronic communications network between banks.
**Soft Commodities**
Description given to commodities such as sugar, coffee and cocoa, traded through LIFFE since its incorporation of the former London Commodity Exchange.

**Speculation**
A deal undertaken because the dealer expects prices to move in his favour and thereby realise a profit.

**Speculator**
The speculator is a trader who wants to assume risk for potentially much higher rewards.

**Spot Delivery**
A delivery or settlement of currencies on the value date, two business days later.

**Spot Market**
Market for immediate as opposed to future delivery. In the spot market for foreign exchange, settlement is in two business days ahead.

**Spot Month**
The first month for which futures contracts are available.

**Spot Rate**
The price prevailing in the spot market.

**Spread**
- The difference between bid and asked price on a security or derivative.
- Difference between yield on or prices of two securities of different types of maturities.
- In underwriting, difference between price realised by an issuer and price paid by the investor.
- Difference between two prices or rates. What commodities traders would refer to as the basis.

A trading strategy in which a trader buys one instrument and sells another, related instrument with a view to profiting from a change in the price difference between the two. A futures spread is the purchase of one futures contract and the sale of another; an option spread is the purchase of one call (or put) and the sale of another.

The difference between one price or rate and another, eg, the extent to which a swap fixed-rate is higher than a benchmark Treasury bond yield, or the extent to which the floating-rate in a swap is above or below LIBOR.

**Standardised Portfolio Analysis of Risk (SPAN)**
A form of margin calculation which is used by various clearing organisations.
Glossary

**Standard Settlement Instructions**
Instructions for settlement with a particular counterparty which are always followed for a particular kind of deal and, once in place, are therefore not repeated at the time of each transaction.

**Standing Instruction**
Default instruction, eg, provided to an agent processing payments or clearing securities trades; provided by a shareholder on how to vote shares (for example, vote for all management recommended candidates).

**Standard & Poor’s**
A US index provider and ratings agency, which produces some specific indices on which futures and options contracts are based. The CME introduced S&P 500 index futures as the first index-based derivative.

**Stock**
In some countries (eg, US), the term applies to ordinary share capital of a company. In other countries (eg, UK), stock may mean share capital that is issued in variable amounts instead of in fixed specified amounts, or it can describe government loans.

**Stock Dividend**
Dividends paid by a company in stock instead of cash. As a corporate action it does not usually change the contract specification.

**Stock Exchange of Singapore (SGX)**
The merged central Stock Exchange of Singapore and the derivative exchange SIMEX.

**Stock Market**
Term used to describe where securities are/have been traded, eg, ‘today on the stock market shares closed higher’.

**Stock Index Futures/Options**
Based on the value of an underlying stock index like the FTSE 100 in the UK, the S&P 500 index in the US and the Nikkei 225 and 300 in Japan. Delivery is fulfilled by the payment or receipt of cash against the exchange calculated delivery settlement price. These are referred to both as indices or indexes.

**Stop (Order)**
An owner of a physical security that has been mutilated, lost or stolen will request the issuer to place a stop (transfer) on the security and to cancel and replace the security.
Glossary

**Straddle**
The purchase or sale of a call combined with the purchase or sale of a put at the same strike (generally purchased with both at-the-money).

**Straight-Through Processing (STP)**
Computer transmission of the details of a trade, without manual intervention, from their original input by the trader to all other relevant areas – position keeping, risk control, accounts, settlement, reconciliation.

**Strike Price**
The fixed price, per share or unit, at which an option conveys the right to call (purchase) or put (sell) the underlying shares or units.

**Strike Price/Rate**
The price or rate at which the holder of an option can insist on the underlying transaction being fulfilled. Also known as exercise price.

**Swap**
Where two parties exchange a series of periodic payments based on a notional principal amount over an agreed term. Swaps can take the form of interest rate swaps, currency swaps and equity swaps.

**System for Theoretical Analysis and Numerical Simulations (STANS)**
A margin system developed and used by the Option Clearing Corporation.

**Tender**
Futures positions that are depending on the market short on or before expiry are tendered for delivery.

**Theoretical Value**
Another term for fair value of a futures or options contract.

**Theta**
A term used to describe the rate of decline of time value in an option price.

**Tick Size**
The value of a one point movement in the contract price.

**Time Value**
The amount by which an option’s premium exceeds its intrinsic value. Where an option has no intrinsic value the premium consists entirely of time value.
## Glossary

### Traded Option
An option which is traded on an exchange.

### Trader
An individual who buys and sells securities with the objective of making short-term gains.

### Trading Permits
These are issued by exchanges and give the holder the right to have one trader at any one time trading in the contract(s) to which the permit relates.

### Treasury Bill
Money market instrument issued with a life of less than one year issued by the US and UK governments. Good collateral against margin calls.

### Treasury Bonds (US)

### Treasury Note
A government obligation with maturities of one to ten years, carrying a fixed rate of interest.

### Treasury Notes (US)
US government bond issued with two, three, five and seven-year maturity. Underlying for futures traded on CBOT.

### Triple A - Rating
The highest credit rating for a bond or company - the risk of default (or non-payment) is negligible.

### Underlying (Asset)
The asset or product from which the future or option’s price is derived and which may be deliverable.

### Unrealised Profit
Profit that has not arisen from a sale - an increase in value of an asset.

### Value at Risk (VaR)
The maximum amount which a bank expects to lose, with a given confidence level, over a given time period.
Glossary

Variation Margin
The process of revaluing an exchange-traded product each day. It is the difference between the closing price on the previous day against the current closing price. It is physically paid or received each day by the clearing organisation. It is often referred to as the mark-to-market.

Vega
Another part of the greeks; it is a measure of the rate of change in an option’s price caused by changes in volatility.

Versus Cash
See Against Actuals.

Volatility
The range or scatter of the price of an underlying or a derivative around a mean. Volatility is a crucial part of option pricing and therefore option price models, as the price of the option is affected by both the volatility of the underlying and the specific option series. Option strategies like straddles are based on the expected volatility of the underlying through to maturity.

Warrants
An option which can be listed on an exchange, with a lifetime of generally more than one year.

Warrant Agent
A bank appointed by the issuer as an intermediary between the issuing company and the (physical) warrant holders, interacting when the latter wants to exercise the warrants.

Writer
A person who has sold an open derivatives contract and is obliged to deliver or take delivery upon notification of exercise from the buyer.

XETRA
Dealing system of the Deutsche Börse.
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
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<td>A</td>
<td>Agent</td>
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<td>AA</td>
<td>Against Actuals</td>
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<td>ACGB</td>
<td>Australian Government Bond</td>
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<td>AEX</td>
<td>Amsterdam Exchanges</td>
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<td>AIFMD</td>
<td>Alternative Investment Fund Managers Directive</td>
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<td>AMF</td>
<td>Autorité des Marchés Financiers</td>
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<tr>
<td>AML</td>
<td>Anti-Money Laundering</td>
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<tr>
<td>API</td>
<td>Application Program Interface, American Petroleum Institute</td>
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<td>APX</td>
<td>Amsterdam Power Exchange</td>
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<td>ASP</td>
<td>Application Service Provider</td>
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<tr>
<td>ASX</td>
<td>Australian Securities Exchange</td>
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<tr>
<td>AUD</td>
<td>Australian Dollar</td>
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<tr>
<td>BaFIN</td>
<td>Bundesanstalt für Finanzdienstleistungsaufsicht</td>
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<tr>
<td>BATS</td>
<td>Better Alternative Trading System</td>
</tr>
<tr>
<td>BBF</td>
<td>Brazilian Futures Exchange</td>
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<tr>
<td>bbl</td>
<td>(Oil) Barrel</td>
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<tr>
<td>BCBS</td>
<td>Basel Committee on Banking Supervision</td>
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<td>BCD</td>
<td>Banking Consolidation Directive</td>
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<tr>
<td>BEL20</td>
<td>Benchmark Stock Market Index of Euronext Brussels</td>
</tr>
<tr>
<td>BGB</td>
<td>Belgian Government Bond</td>
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<tr>
<td>BGTB</td>
<td>Belgian Treasury Bill</td>
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<td>BIS</td>
<td>Bank for International Settlements</td>
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<td>BKO</td>
<td>Bundesschatzanweisungen</td>
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<tr>
<td>BM&amp;F</td>
<td>Bolsa de Mercadorias &amp; Futuros, Brazil (The Mercantile &amp; Futures Exchange)</td>
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<tr>
<td>BM&amp;FBOVESPA SA</td>
<td>Brazilian Securities, Commodities and Futures Exchange</td>
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<td>BMSP</td>
<td>Bolsa de Mercadorias de São Paulo</td>
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<tr>
<td>BOBL</td>
<td>Bundesobligationen</td>
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<tr>
<td>Bovespa</td>
<td>Bolsa de Valores, Mercadorias &amp; Futuros de São Paulo (Brazilian Stock Exchange)</td>
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<tr>
<td>BOT</td>
<td>Buoni Ordinari del Tesoro</td>
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<tr>
<td>BP</td>
<td>British Petroleum</td>
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<td>BSEN</td>
<td>British Standards European Norm</td>
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<td>BST</td>
<td>British Summer Time</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>BTF</td>
<td>Bons du Trésor à taux fixe et à intérêts précompté</td>
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<tr>
<td>BTP</td>
<td>Buoni del Tesoro Poliennali</td>
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<tr>
<td>BVLP</td>
<td>Bolsa de Valores de Lisboa e Porto</td>
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<tr>
<td>BUBILL</td>
<td>German Treasury Bill</td>
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<tr>
<td>CAD</td>
<td>Capital Adequacy Directive</td>
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<tr>
<td>CAN</td>
<td>Canadian Government Bond</td>
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<tr>
<td>CBOE</td>
<td>Chicago Board Options Exchange</td>
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<tr>
<td>CBOT</td>
<td>Chicago Board of Trade</td>
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<tr>
<td>CCP</td>
<td>Central Clearing Counterparty</td>
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<tr>
<td>CCTS</td>
<td>Certificati di Credito del Tesoro</td>
</tr>
<tr>
<td>CD</td>
<td>Certificate of Deposit</td>
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<tr>
<td>CDS</td>
<td>Credit Default Swap</td>
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<tr>
<td>CEBS</td>
<td>Committee of European Banking Supervision</td>
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<tr>
<td>CER</td>
<td>Certified Emissions Reduction</td>
</tr>
<tr>
<td>CET</td>
<td>Central European Time</td>
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<tr>
<td>CETI</td>
<td>Common Equity Tier 1</td>
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<tr>
<td>CFD</td>
<td>Contract for Difference</td>
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<tr>
<td>CFE</td>
<td>CBOE Futures Exchange</td>
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<tr>
<td>CFFX</td>
<td>China Financial Futures Exchange</td>
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<tr>
<td>CFMA</td>
<td>Commodity Futures Modernisation Act</td>
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<tr>
<td>CFTC</td>
<td>Commodity Futures Trading Commission</td>
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<tr>
<td>CME</td>
<td>Chicago Mercantile Exchange</td>
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<tr>
<td>CMM</td>
<td>Competitive Market Maker</td>
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<tr>
<td>CMTA</td>
<td>Clearing Member Trade Agreement</td>
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<tr>
<td>CNBV</td>
<td>National Banking &amp; Securities Commission (Mexico)</td>
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<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
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<tr>
<td>COBS</td>
<td>Conduct of Business Rules</td>
</tr>
<tr>
<td>COMEX</td>
<td>Commodity Exchange</td>
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<tr>
<td>COREPER</td>
<td>Comité des Représentants Permanents (Committee of Permanent Representatives)</td>
</tr>
<tr>
<td>CPO</td>
<td>Commodity Pool Operator</td>
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<tr>
<td>CPS</td>
<td>Clearing Processing System</td>
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<tr>
<td>CPSS</td>
<td>Committee on Payment and Settlement Systems</td>
</tr>
<tr>
<td>CRD</td>
<td>Capital Requirements Directive</td>
</tr>
</tbody>
</table>
CRR Capital Requirements Regulation
CSD Central Securities Depository
CSI Commodity Systems Inc
CSP Content Service Provider
CSV Comma Separated Value
CTA Commodity Trading Advisers
CTB Canadian Treasury Bill
CVA Credit Valuation Adjustments
DAX Deutsher Aktien Index
DBB Deutsche Bundesbahn
DBR Deutsche Bundesrepublik
DCE Dalian Commodity Exchange
DCM Direct Clearing Member
DCO Derivatives Clearing Organisation
DEHSt German Emissions Trading Authority
DF Default Fund
DGB Danish Government Bond
DGCX Dubai Gold and Commodity Exchange
DGTB Danish Treasury Bill
DMG Default Management Group
DR Depositary Receipt
DRAM Dynamic Random Access Memory
DTB Dutch Treasury Bill
DTC Depository Trust Company
DvP Delivery versus Payment
EBA European Banking Authority
ECB European Central Bank
ECC European Commodity Clearing
ECMI Enhanced Clearing Member Interface
ECX European Climate Exchange
EDSP Exchange Delivery Settlement Price
EEX European Energy Exchange
EFP Exchange (of Futures) for Physical
ELMS Euronext.liffe Market Services
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>EMIR</td>
<td>European Market Infrastructure Regulation</td>
</tr>
<tr>
<td>EMU</td>
<td>European Monetary Union</td>
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<tr>
<td>ENDEX</td>
<td>European Energy Derivatives Exchange</td>
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<tr>
<td>EONIA</td>
<td>Euro Overnight Index Average</td>
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<tr>
<td>ESMA</td>
<td>European Securities Markets Authority</td>
</tr>
<tr>
<td>ETD</td>
<td>Exchange-Traded Derivative</td>
</tr>
<tr>
<td>ETF</td>
<td>Exchange-Traded Fund</td>
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<tr>
<td>ERU</td>
<td>Emission Reduction Unit</td>
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<tr>
<td>ETC</td>
<td>Exchange Traded Commodities</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>EUA</td>
<td>EU Emission Allowance</td>
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<tr>
<td>FCA</td>
<td>Financial Conduct Authority</td>
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<td>FCM</td>
<td>Futures Commission Merchant</td>
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<td>FIA</td>
<td>Futures Industry Association</td>
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<td>FIFO</td>
<td>First-In, First-Out</td>
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<td>FLEX</td>
<td>FLEXible EXchange®</td>
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<td>FOREX</td>
<td>Foreign Exchange</td>
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<td>FORTS</td>
<td>Futures and Options on Russian Trading System</td>
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<td>FPC</td>
<td>Financial Policy Committee</td>
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<td>FpML</td>
<td>Financial Products Mark-up Language</td>
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<td>FRA</td>
<td>Forward Rate Agreement</td>
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<tr>
<td>FRTR</td>
<td>Obligations Assimilables de Tresor</td>
</tr>
</tbody>
</table>
| FSA     | i. The former UK regulator, Financial Services Authority  
<p>|         | ii. Financial Services Agency (Japan) |
| FSA 2012| Financial Services Act 2012 |
| FSF     | Financial Stability Forum |
| FSMA 2000| Financial Services and Markets Act 2000 |
| FSOC    | Financial Stability Oversight Council |
| FX      | Foreign Exchange |
| GCM     | General Clearing Member |
| GDR     | Global Depository Receipt |
| GDP     | Gross Domestic Product |
| GFD     | Good-for-Day |
| GMT     | Greenwich Mean Time |</p>
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>GCC</td>
<td>Government Securities Clearing Corporation</td>
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<tr>
<td>GTC</td>
<td>Good-Till-Cancelled</td>
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<tr>
<td>GTD</td>
<td>Good-Till-Date</td>
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<td>HEX</td>
<td>Helsinki Exchange</td>
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<td>HIBOR</td>
<td>Hang Seng Interbank Offered Rates</td>
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<td>HKATS</td>
<td>Hong Kong Automated Trading System</td>
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<td>HKCC</td>
<td>Hong Kong Clearing Corporation</td>
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<td>HKEx</td>
<td>Hong Kong Exchanges and Clearing</td>
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<td>HKFE</td>
<td>Hong Kong Futures Exchange</td>
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<td>HKMex</td>
<td>Hong Kong Mercantile Exchange</td>
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<td>HMT</td>
<td>Her Majesty’s Treasury</td>
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<tr>
<td>IB</td>
<td>Introducing Broker</td>
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<tr>
<td>ICE</td>
<td>IntercontinentalExchange</td>
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<td>ICSD</td>
<td>International Central Securities Depository</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IMM</td>
<td>International Monetary Market</td>
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<td>IOB</td>
<td>International Order Book</td>
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<td>IOSCO</td>
<td>International Organisation for Securities Commissions</td>
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<td>IPE</td>
<td>International Petroleum Exchange</td>
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<td>IRB</td>
<td>Internal Ratings Based</td>
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<td>IRS</td>
<td>Interest Rate Swap</td>
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<td>Investment Services Directive</td>
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<td>ISDA</td>
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<td>International Securities Identification Number</td>
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<td>ISV</td>
<td>Independent Software Vendor</td>
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<tr>
<td>ITC</td>
<td>Investment Trust Company</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>JSE</td>
<td>Johannesburg Stock Exchange</td>
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<td>KOSPI</td>
<td>Korta Composite Stock Price Index</td>
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<td>KRX</td>
<td>Korea Exchange</td>
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<tr>
<td>KYC</td>
<td>Know Your Customer</td>
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<td>LCE</td>
<td>London Commodity Exchange</td>
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<td>LCH</td>
<td>London Clearing House</td>
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<tr>
<td>Abbreviation</td>
<td>Definition</td>
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<tr>
<td>LCR</td>
<td>Liquidity Coverage Ratio</td>
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<tr>
<td>LIBID</td>
<td>London Inter-Bank Bid Rate</td>
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<td>LIBOR</td>
<td>London Inter-Bank Offered Rate</td>
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<td>Liffe</td>
<td>London International Financial Futures &amp; Options Exchange</td>
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<tr>
<td>Lifo</td>
<td>Last-in, first-out</td>
</tr>
<tr>
<td>LLDPE</td>
<td>Linear Low Density Polyethylene</td>
</tr>
<tr>
<td>LLP</td>
<td>Linear Low-Density Polyethylene</td>
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<td>LME</td>
<td>London Metal Exchange</td>
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<td>Lmex</td>
<td>London Metal Exchange Index</td>
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<td>LP</td>
<td>Liquefied Petroleum</td>
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<td>Marché à Terme International de France</td>
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<td>MCX</td>
<td>Multi Commodity Exchange (of India)</td>
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<td>MexDer</td>
<td>Mercado Mexicano de Derivados (Mexican Derivatives Exchange)</td>
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<td>MiceX</td>
<td>Moscow Interbank Currency Exchange</td>
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<td>Markets in Financial Instruments Directive</td>
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<td>MMbtu</td>
<td>One Million British Thermal Units</td>
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<td>Mos</td>
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<td>Market Place Service (EDX London)</td>
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<td>MRIA</td>
<td>Matter Requiring Immediate Attention</td>
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<td>MTM</td>
<td>Mark(ed)-to-Market</td>
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<td>National Association of Securities Dealers Automated Quotations</td>
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<td>Full Form</td>
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<td>NSC</td>
<td>Norfolk Southern Corporation</td>
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<td>NSCC</td>
<td>National Securities Clearing Corporation</td>
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<td>National Stock Exchange (of India)</td>
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<td>NSFR</td>
<td>Net Stable Funding Ratio</td>
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<td>Open-Ended Investment Company</td>
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<tr>
<td>OJSC</td>
<td>Open Joint Stock Company</td>
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<td>OTC</td>
<td>Over-the-counter</td>
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<td>OTF</td>
<td>Organised Trading Facility</td>
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<td>P&amp;L</td>
<td>Profit and Loss</td>
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<td>P</td>
<td>Principal</td>
</tr>
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<td>PFE</td>
<td>Potential Future Exposure</td>
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<td>Philadelphia Stock Exchange</td>
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<td>PMM</td>
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<td>PP</td>
<td>Polypropylene</td>
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<td>PPS</td>
<td>Protected Payments System</td>
</tr>
<tr>
<td>PRA</td>
<td>Prudential Regulation Authority</td>
</tr>
<tr>
<td>PTA</td>
<td>Pure Terephthalic Acid</td>
</tr>
<tr>
<td>RAGB</td>
<td>Austrian Government Bond</td>
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<td>RATB</td>
<td>Austrian Treasury Bill</td>
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<td>RCH</td>
<td>Recognised Clearing House</td>
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<td>Repurchase Agreement</td>
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<td>RFGB</td>
<td>Finnish Government Bonds</td>
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<td>Finnish Treasury Bill</td>
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<td>RIE</td>
<td>Recognised Investment Exchange</td>
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<tr>
<td>RTS</td>
<td>Russian Trading System</td>
</tr>
<tr>
<td>RWA</td>
<td>Risk Weighted Asset</td>
</tr>
<tr>
<td>S&amp;P</td>
<td>Standard and Poor’s</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>SA de CV</td>
<td>Sociedad de Anonima de Capital Variable</td>
</tr>
<tr>
<td>SAFEX</td>
<td>South African Futures Exchange</td>
</tr>
<tr>
<td>SEC</td>
<td>Securities and Exchange Commission</td>
</tr>
<tr>
<td>SEHK</td>
<td>Stock Exchange of Hong Kong</td>
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<td>SEOCH</td>
<td>SEHK Options Clearing House Ltd</td>
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<td>Sydney Futures Exchange</td>
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<td>Singapore Exchange</td>
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<td>SGX-DTD</td>
<td>Singapore Exchange Derivatives Trading Division</td>
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<td>SGX ETS</td>
<td>Singapore Exchange Electronic Trading System</td>
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<td>SHFE</td>
<td>Shanghai Futures Exchange</td>
</tr>
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<td>SIB</td>
<td>Securities and Investments Board</td>
</tr>
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<td>SIFI</td>
<td>Systemically Important Financial Institutions</td>
</tr>
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<td>SIMEX</td>
<td>Singapore International Monetary Exchange</td>
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<td>SIS</td>
<td>SegalIntersettle (Swiss Securities Clearing Corporation)</td>
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<td>Service Level Agreements</td>
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<td>Small and Medium Enterprises</td>
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<td>Swiss Market Index</td>
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<td>Sarbanes-Oxley</td>
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<td>SPAN</td>
<td>Standardised Portfolio Analysis</td>
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<tr>
<td>SPGB</td>
<td>Spanish Government Bond</td>
</tr>
<tr>
<td>SSL</td>
<td>Secure Socket Layer</td>
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<tr>
<td>STANS</td>
<td>System for Theoretical Analysis and Numerical Simulations</td>
</tr>
<tr>
<td>STF</td>
<td>Stock Transfer Form</td>
</tr>
<tr>
<td>STIR</td>
<td>Short-Term Interest Rate</td>
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<td>STP</td>
<td>Straight-Through Processing</td>
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<tr>
<td>SWED</td>
<td>Swedish Government Bond</td>
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<tr>
<td>SWTB</td>
<td>Swedish Treasury Bill</td>
</tr>
<tr>
<td>SWX</td>
<td>Swiss Exchange</td>
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<tr>
<td>TAA</td>
<td>Tactical Asset Allocation</td>
</tr>
<tr>
<td>TAIFEX</td>
<td>Taiwan Futures Exchange</td>
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<td>TAPO</td>
<td>Traded Average Price Option</td>
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<td>TB</td>
<td>Treasury Bill</td>
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<td>TG</td>
<td>Transposition Group</td>
</tr>
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Glossary

TGE Tokyo Grain Exchange
THA Treuhandanstalt
TIBOR Tokyo Interbank Offered Rate
TIFFE Thermal Systems Integration For Fuel Economy
TFX Tokyo Financial Exchange
TRAKRS Total Return Asset Contracts
TRS Trade Registration System
TSE Tokyo Stock Exchange
UCITS Undertakings for Collective Investment in Transferable Securities
UNFCCC United Nations Framework Convention on Climate Change
UKTB United Kingdom GBP Treasury Bill
UNFCC United Nations Framework Convention on Climate Change
USE United Stock Exchange (of India)
VALUES Virtual Access Link Using Exchange Services
VaR Value at Risk
VAN Value-Added Network
VIX Volatility Index
VNS Variable Notional Swap
VPN Virtual Private Network
VWAP Volume-Weighted Average Price
ZAR South African Rand
ZCE Zhengzhou Commodity Exchange
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<th>Title</th>
<th>Page</th>
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**APPENDIX 1**

**LONDON SPAN MARGIN RISK ARRAY FOR AN INDIVIDUAL EQUITY OPTION**

<table>
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<tr>
<th>Underlying Price Changes</th>
<th>Implied Volatility Changes</th>
<th>Equity Price (p/share)</th>
<th>Implied Volatility (%)</th>
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<tr>
<td>U/lying price down 3/3 range</td>
<td>volatility up</td>
<td>270</td>
<td>27.5</td>
</tr>
<tr>
<td>U/lying price down 3/3 range</td>
<td>volatility down</td>
<td>270</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying price down 2/3 range</td>
<td>volatility up</td>
<td>277</td>
<td>27.5</td>
</tr>
<tr>
<td>U/lying price down 2/3 range</td>
<td>volatility down</td>
<td>277</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying price down 1/3 range</td>
<td>volatility up</td>
<td>283</td>
<td>27.5</td>
</tr>
<tr>
<td>U/lying price down 1/3 range</td>
<td>volatility down</td>
<td>283</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying price unchanged</td>
<td>volatility up</td>
<td>290</td>
<td>27.5</td>
</tr>
<tr>
<td>U/lying price unchanged</td>
<td>volatility down</td>
<td>290</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying price up 1/3 range</td>
<td>volatility up</td>
<td>297</td>
<td>27.5</td>
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<tr>
<td>U/lying price up 1/3 range</td>
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<td>U/lying price up 2/3 range</td>
<td>volatility up</td>
<td>303</td>
<td>27.5</td>
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<tr>
<td>U/lying price up 2/3 range</td>
<td>volatility down</td>
<td>303</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying price up 3/3 range</td>
<td>volatility up</td>
<td>310</td>
<td>27.5</td>
</tr>
<tr>
<td>U/lying price up 3/3 range</td>
<td>volatility down</td>
<td>310</td>
<td>22.5</td>
</tr>
<tr>
<td>U/lying up extreme move</td>
<td>volatility unchanged</td>
<td>330</td>
<td>25.0</td>
</tr>
<tr>
<td>U/lying down extreme move</td>
<td>volatility unchanged</td>
<td>250</td>
<td>25.0</td>
</tr>
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</table>

London SPAN divides the contracts into groups of futures and options relating to a single underlying asset (eg, FTSE 100 futures and FTSE 100 options are based on the cash index). Individual equity options are margined separately and treated as ‘portfolios’ in their own right.

At the first stage of calculation, London SPAN simulates how the value of a ‘portfolio’ would react to changing market conditions. This is done by forming a series of market scenarios based on permutations of the input parameters and evaluating the ‘portfolio’ under these conditions. In the above example, the underlying scanning range for the option is +/- 20 pence per share, the volatility shift parameter is +/- 10%, the closing share price is 290 pence per share and the implied volatility is 25%.

London SPAN uses 16 scenarios in which the underlying price increases or decreases by proportions of the underlying scanning range and the implied volatility increases or decreases by 2.5% (10% of 25%).
Having defined the scenarios, London SPAN then evaluates the potential profits/losses for each futures month or option series by comparing the current price with the calculated price for each of the 16 scenarios. Option prices are estimated using a version of the ‘binomial’ option pricing model except for the FTSE 100 European Style options, which being priced off the future, are evaluated using a Black-Scholes model known as the ‘Black-76’ option pricing model. The 16 profits/losses for each futures month or option series form a risk array.

Risk arrays are calculated each day using the closing underlying prices.
APPENDIX 2

WARRANTS AND DERIVATIVES WARNING NOTICE (COB 5.4.6 E)

This notice is provided to you, as a private customer, in compliance with the rules of the regulatory authority. Private customers are afforded greater protections under these rules than other customers are and you should ensure that your firm tells you what this will mean to you. This notice cannot disclose all the risks and other significant aspects of warrants* and/or derivative* products such as futures*, options* and contracts for differences* (*delete as appropriate). You should not deal in these products unless you understand their nature and the extent of your exposure to risk. You should also be satisfied that the product is suitable for you in the light of your circumstances and financial position. Certain strategies, such as a ‘spread’ position or a ‘straddle’, may be as risky as a simple ‘long’ or ‘short’ position.

Although warrants and/or derivative instruments can be utilised for the management of investment risk, some of these products are unsuitable for many investors. Different instruments involve different levels of exposure to risk and in deciding whether to trade in such instruments you should be aware of the following points. (Include or delete as appropriate.)

1. **Warrants**

A warrant is a time-limited right to subscribe for share, debentures, loan stock or government securities and is exercisable against the original issuer of the underlying securities. A relatively small movement in the price of the underlying security results in a disproportionately large movement, unfavourable or favourable, in the price of the warrant. The price of warrants can therefore be volatile.

It is essential for anyone who is considering purchasing warrants to understand that the right to subscribe which the warrant confers is invariably limited in time with the consequence that if the investor fails to exercise this right within the predetermined time-scale then the investment becomes worthless.

You should not buy a warrant unless you are prepared to sustain a total loss of the money you have invested, plus any commission or other transaction charges.

Some other instruments are also called warrants but are actually options (for example, a right to acquire securities which is exercisable against someone other than the original issuer of the securities, often called a ‘covered warrant’).

2. **Off-Exchange Warrant Transactions**

Transactions in off-exchange warrants may involve greater risk than dealing in exchange-traded warrants because there is no exchange market through which to liquidate your position, or to assess the value of the warrant or the exposure to risk. Bid and offer prices need not be quoted, and even where they are, they will be established by dealers in these instruments and consequently it may be difficult to establish what is a fair price.
Your firm must make it clear to you if you are entering into an off-exchange transaction and advise you of any risks involved.

3. Futures

Transactions in futures involve the obligation to make, or to take, delivery of the underlying asset of the contract at a future date, or in some cases to settle the position with cash. They carry a high degree of risk. The ‘gearing’ or ‘leverage’ often obtainable in futures trading means that a small deposit or down payment can lead to large losses as well as gains. It also means that a relatively small movement can lead to a proportionately much larger movement in the value of your instruments, and this can work against you as well as for you. Futures transactions have a contingent liability, and you should be aware of the implications of this, in particular the margining requirements, which are set out in paragraph 8.

4. Options

There are many different types of options with different characteristics subject to the following conditions.

Buying options

Buying options involves less risk than selling options because, if the price of the underlying asset moves against you, you can simply allow the option to lapse. The maximum loss is limited to the premium, plus any commission or other transaction charges. However, if you buy a call option on a futures contract and you later exercise the option, you will acquire the future. This will expose you to the risk described under ‘futures’ and ‘contingent liability investment transactions’.

Writing options

If you write an option, the risk involved is considerably greater than buying options. You may be liable for margin to maintain your position and a loss may be sustained well in excess of the premium received. By writing an option, you accept a legal obligation to purchase or sell the underlying asset if the option is exercised against you, however far the market price has moved away from the exercise price. If you already own the underlying asset which you have contracted to sell (when the options will be known as ‘covered call options’) the risk is reduced. If you do not own the underlying asset (‘uncovered call options’) the risk can be unlimited. Only experienced persons should contemplate writing uncovered options, and then only after securing full details of the applicable conditions and potential risk exposure.

Traditional options

Certain London Stock Exchange member firms under special exchange rules write a particular type of option called a ‘traditional option’. These may involve greater risk than other options. Two-way prices are not usually quoted and there is no exchange market on which to close out an open position or to effect an equal and opposite transaction to reverse an open position. It may be difficult to assess its value or for the seller of such an option to manage his exposure to risk.

Certain options markets operate on a margined basis, under which buyers do not pay the full premium on their option at the time they purchase it. In this situation you may subsequently be called upon to pay margin on the option up to the level of your premium. If you fail to do so as required, your position may be closed or liquidated in the same way as a futures position.
5. **Contracts for Differences**

Futures and options contracts can also be referred to as contracts of differences. These can be options and futures on the FTSE 100 index or any other index, as well as currency and interest rate swaps. However, unlike other futures and options, these contracts can only be settled in cash. Investing in a contract for differences carries the same risks as investing in a future or an option and you should be aware of these as set out in paragraphs 3 and 4 respectively. Transactions in contracts for differences may also have a contingent liability and you should be aware of the implications of this as set out in paragraph 8.

6. **Off-Exchange Transactions in Derivatives**

It may not always be apparent whether or not a particular derivative is arranged on-exchange or in an off-exchange derivative transaction. Your firm must make it clear to you if you are entering into an off-exchange derivative transaction.

While some off-exchange markets are highly liquid, transactions in off-exchange or 'non-transferable' derivatives may involve greater risk than investing in on-exchange derivatives, because there is no exchange market on which to close out an open position. It may be impossible to liquidate an existing position, to assess the value of the position arising from an off-exchange transaction or to assess the exposure to risk. Bid prices and offer prices need not be quoted, and, even where they are, they will be established by dealers in these instruments and consequently it may be difficult to establish what is a fair price.

7. **Foreign Markets**

Foreign markets will involve different risks from the UK markets. In some cases the risks will be greater. On request, your firm must provide an explanation of the relevant risks and protections (if any) which will operate in any foreign markets, including the extent to which it will accept liability for any default of a foreign firm through whom it deals. The potential for profit or loss from transactions on foreign markets or in foreign-denominated contracts will be affected by fluctuations in foreign exchange rates.

8. **Contingent Liability Investment Transactions**

Contingent liability investment transactions, which are margined, require you to make a series of payments against the purchase price, instead of paying the whole purchase price immediately.

If you trade in futures contracts for differences or sell options, you may sustain a total loss of the margin you deposit with your firm to establish or maintain a position. If the market moves against you, you may be called upon to pay substantial additional margin at short notice to maintain the position. If you fail to do so within the time required, your position may be liquidated at a loss and you will be responsible for the resulting deficit. Even if a transaction is not margined, it may still carry an obligation to make further payments in certain circumstances over and above any amount paid when you entered the contract.

Save as specifically provided by the regulatory authority, your firm may only carry out margined or contingent liability transactions with or for you if they are traded on or under the rules of a recognised or designated investment exchange. Contingent liability investment transactions which are not so traded may expose you to substantially greater risks.
9. **Limited Liability Transactions**

Before entering into a limited liability transaction, you should obtain from your firm or the firm with whom you are dealing a formal written statement confirming that the extent of your loss liability on each transaction will be limited to an amount agreed by you before you enter into the transaction.

The amount you can lose in limited liability transactions will be less than in other margined transactions, which have no predetermined loss limit. Nevertheless, even though the extent of loss will be subject to the agreed limit, in a relatively short time whilst your loss may be limited the risk of sustaining a total loss to the amount agreed is substantial.

10. **Collateral**

If you deposit collateral as security with your firm, the way in which it will be treated will vary according to the type of transaction and where it is traded. There could be significant differences in the treatment of your collateral, depending on whether you are trading on a recognised or designated investment exchange, with the rules of that exchange (and the associated clearing house) applying, or trading off-exchange. Deposited collateral may lose its identity as your property once dealings on your behalf are undertaken. Even if your dealings should ultimately prove profitable, you may not even get back the same assets which you deposited, and may have to accept payments in cash. You should ascertain from your firm how your collateral will be dealt with.

11. **Commissions**

Before you begin to trade, you should obtain details of all commissions and other charges for which you will be liable. If any charges are not expressed in money terms (but, for example, as a percentage of contract value), you should obtain a clear and written explanation, including appropriate examples, to establish what such charges are likely to mean in specific money terms. In the case of futures, when commission is charged as a percentage, it will normally be as a percentage of the total contract value, and not simply as a percentage of your initial payment.

12. **Suspensions of Trading**

Under certain trading conditions it may be difficult or impossible to liquidate a position. This may occur, for example, at times of rapid price movement if the price rises or falls in one trading session to such an extent that, under the rules of the relevant exchange, trading is suspended or restricted. Placing a stop-loss order will not necessarily limit your losses to the intended amounts, because market conditions may make it impossible to execute such an order at the stipulated price.

13. **Clearing House Protections**

On many exchanges, the performance of a transaction by your firm (or third party with whom he is dealing on your behalf) is ‘guaranteed’ by the exchange or clearing house. However, this guarantee is unlikely in most circumstances to cover you, the customer, and may not protect you if your firm or another party defaults on its obligations to you. On request, your firm must explain any protection provided to you under the clearing guarantee applicable to any on-exchange derivatives in which you are dealing. There is no clearing house for traditional options, nor normally for off-exchange instruments which are not traded under the rules of a recognised or designated investment exchange.
14. **Insolvency**

Your firm’s insolvency or default, or that of any other brokers involved with your transaction, may lead to positions being liquidated or closed out without your consent. In certain circumstances, you may not get back the actual assets which you lodged as collateral and you may have to accept any available payments in cash. On request, your firm must provide an explanation of the extent to which it will accept liability for any insolvency of, or default by, other firms involved with your transactions.

[name of firm]

[on duplicate for signature by private customer]

I/We have read and understood the risk warning set out above.

Date

[Signature of the customer]

[Signature of joint account holder]

Note to firms

Paragraphs 1-10 may be deleted when they relate to particular kinds of business which will not be carried out for the customer.

This notice may be incorporated as part of a two-way customer agreement, but the customer must sign separately that he has read and understood the risk warnings.
APPENDIX 3

EURONEXT DERIVATIVES MARKETS

CORPORATE ACTION NOTICE

London Market Notice No: CA/2011/122/Lo

ISSUE DATE: 6 April 2011
EFFECTIVE DATE: 18 July 2011

Flexible Individual Equity Option Contracts (201F) WNQ, WNJ, WNX
Flexible Universal Stock Futures Contract (66F) WNY, WNZ

PARMALAT SPA

BONUS ISSUE

This notice is issued pursuant to the Corporate Actions Policy for Euronext Derivatives Markets which is available on the NYSE Euronext website at www.nyx.com/lifferules. It requires the immediate attention of Members’ staff involved with the trading and settlement of equity products on these markets. Members should ensure that clients are made aware of the arrangements detailed in this Notice.

• Please Note: this Notice replaces CA/2001/078/Lo.
1. Background: Parmalat SpA (‘Parmalat’) announced a bonus issue whereby shareholders shall receive one additional Parmalat share for every 20 shares held.
2. ISIN TNT: IT0003826473
3. Effective Date: Members are advised that the effective date has been postponed to 18 July 2011.
4. Conditions: The bonus issue is subject to shareholder approval at the Annual General Meeting to be held on 25, 27 and 28 June 2011.
5. Contract Adjustments:
   • Ratio Method
   • Ratio: 0.95238.

Options:
   • Lot Size: The lot size will be divided by the ratio. The lot size will be specified in the Final Notice.
   • Exercise Prices: The exercise prices will be multiplied by the ratio.
Futures:

- **Lot Size:** The lot size will be divided by the ratio. The lot size will be specified in the Final Notice.
- **Variation Margin:** Daily Settlement Prices on 15 July 2011 shall be multiplied by the ratio to generate references prices for the purpose of variation margin calculations at the close of business on 18 July 2011.

6. **Further Maturities:** These will have the standard lot size.

For further information in relation to this Notice, Members should contact:

**NYSE Liffe:**

Quality of Derivative Markets +31 (0) 20 550 4296 Corporateactionsteam@nyx.com

**NYSE Liffe Clearing:**

Business Operations +44 (0) 20 7379 2656 nyselifeclearing@nyx.com
CORPORATE ACTION NOTICE

London Market
ISSUE DATE: 17 June 2011
EFFECTIVE DATE: 20 June 2011

Flexible Individual Equity Option Contracts (201F) EVJ, EVQ, EVX
Flexible Universal Stock Futures Contract (66F) EVY, EVZ

BANCA MONTE DEI PASCHI DI SIENA SPA

This notice is issued pursuant to the Corporate Actions Policy for Euronext Derivatives Markets which is available on the NYSE Euronext website at www.nyx.com/liffemar. It requires the immediate attention of Members’ staff involved with the trading and settlement of equity products on these markets. Members should ensure that clients are made aware of the arrangements detailed in this Notice.

1. **Background:** Banca Monte dei Paschi di Siena SpA (‘MPS’) has announced a rights issue, whereby shareholders will be entitled to purchase 18 new shares for every 256 MPS shares held, at a subscription price of €0.446 per share.

2. **ISIN TNT:** IT0001334587

3. **Effective Date:** 20 June 2011.

4. **Contract Adjustements:**
   - **Ratio Method:** For the avoidance of doubt, the contracts shall only be adjusted insofar that the entitlement has positive value.
   - **Cum event price:** MPS reference price on Borsa Italiana on 17 June 2011.

   \[
   \text{Value of the entitlement} = \frac{\text{Cum event price} - €0.446}{25/18 + 1} 
   \]

   \[
   \text{Ratio} = \frac{\text{Cum event price} - \text{Value of the entitlement per share}}{\text{Cum event price}} 
   \]

**Options:**
- **Lot Size:** The lot size will be divided by the ratio. The lot size will be specified in the Final Notice.
- **Exercise Prices:** The exercise prices will be multiplied by the ratio. The exercise prices will be specified in the Final Notice.
Futures:

- **Lot Size:** The lot size will be divided by the ratio. The lot size will be specified in the Final Notice.
- **Variation Margin:** Daily Settlement Prices on 17 June 2011 shall be multiplied by the ratio to generate references prices for the purpose of variation margin calculations at the close of business on 20 June 2011.

6. **Further Maturities:** These will have the standard lot size.

For further information in relation to this Notice, Members should contact:

**NYSE Liffe:**

Quality of Derivative Markets  +31 (0) 20 550 4296  Corporateactionsteam@nyx.com

NYSE Liffe Clearing:

Business Operations  +44 (0) 20 7379 2656  nyseliffeclearing@nyx.com
APPENDIX 4

NYMEX DELIVERY PROCEDURES FOR WEST TEXAS INTERMEDIATE DOMESTIC SWEET CRUDE OIL

The provisions of these rules shall apply to West Texas Intermediate domestic sweet crude oil as defined by TEPPCO’s domestic sweet common stream designation for crude oil listed on the Exchange for future delivery in Midland, Texas.

Definition of Crude Oil

For the purpose of this Contract, ‘Crude Oil’ shall mean: A mixture of hydrocarbons that exists in a liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Crude oil as used herein refers to the direct liquid production from oil wells, or a blend of such, in its natural form, not having been enhanced or altered in any manner or by any process that would result in misrepresentation of its true value for adaptability to refining as whole Crude Petroleum.

Contract Unit

The contract unit shall be 1,000 US barrels (42,000 US gallons). Except for delivery made by book-out, in-tank transfer, or in-line transfer pursuant to rule 505.14(B), a tolerance of two percent (2%) above or below (1020 US Barrels or 980 US Barrels) the contract unit is permitted. All volumes shall be determined at 60 degrees Fahrenheit.

Delivery Months

Posting of transactions shall be conducted contracts providing for delivery in such months as shall be determined by the Board of Directors.

Prices and Fluctuations

The minimum price fluctuation shall be $.01 (1 cent) per barrel. There shall be no maximum price fluctuation.

Posting of Transactions

Posting of transactions in the current delivery month shall cease on the third business day prior to the twenty-fifth calendar day of the month preceding the delivery month. If the twenty-fifth calendar day of the month is a non-business day, posting of transactions shall cease on the third business day prior to the last business day preceding the twenty-fifth calendar day.

Grade and Quality

Crude oil meeting all of the following specifications and designations shall be deliverable in satisfaction of futures contract delivery obligations under this rule:

a. Stream Designation: Light Sweet crude oil must conform to the quality specifications of TEPPCO’s Domestic Sweet Common Stream designation;
Appendices

b. Sulfur: 0.40% or less by weight as determined by the accepted ASTM Standard;
c. Gravity: Not less than 37 degrees API, nor more than 42 degrees API as determined by the accepted ASTM Standard;
d. Viscosity: Maximum 100 Saybolt Universal Seconds at 100 degrees Fahrenheit as measured by the accepted ASTM Standard;
e. Reid Vapor Pressure: Less than 8.6 pounds per square inch at 100 degrees Fahrenheit from April through September, and not to exceed 9.6 pounds per square inch at any time, as determined by the accepted ASTM Standard;
f. Sediment, water and other impurities: Less than 1% as determined by the accepted ASTM Standard;
g. Pour Point: Not to exceed 35 degrees Fahrenheit from October through March, and not to exceed 55 degrees Fahrenheit at any time, as determined by the accepted ASTM Standard;

All quality specifications and testing procedures shall be in accordance with the standard operating procedures used by the pipeline.

Delivery

a. Delivery shall be made FOB at any pipeline or storage facility in Midland, Texas, with pipeline access to TEPPCO Crude Pipeline LP storage. Delivery shall be made in accordance with all applicable Federal executive orders and all applicable Federal, State and local laws and regulations.

For the purposes of this Rule, the term FOB shall mean a delivery in which the seller: (1) provides crude oil to the point of connection between seller’s incoming and buyer’s outgoing pipeline or storage facility which is free of all liens, encumbrances, unpaid taxes, fees and other charges; and (2) retains title to and bears the risk of loss for the product to the point of connection between the buyer’s outgoing and the seller’s incoming pipeline or storage facility.

b. At buyer’s option, such delivery shall be made by any of the following methods:
   1. By interfacility transfer (“pumpover”) into a designated pipeline or storage facility with access to seller’s incoming pipeline or storage facility. In the event of the buyer’s election to take delivery by pumpover to TEPPCO from seller’s delivery facility, the seller bears the pumpover charges applicable from seller’s delivery facility to TEPPCO;
   2. By in-line transfer, or by in-tank transfer of title to the buyer without physical movement of product, if the facility used by the seller allows such transfer.

Delivery Procedures

a. RESPONSIBILITIES OF CLEARING MEMBERS HAVING OPEN LONG POSITIONS (BUYERS)
   1. Notice of Intention to Accept
      Exchange Clearing Members having open long positions shall give the Clearing House a Notice of Intention to Accept delivery by 3:00 PM on the first business day after the final day of posting of transactions. The Notice of Intention to Accept in the form prescribed by the Exchange, which shall be properly completed and signed, shall indicate the name(s) of the buyer’s customer(s), the number of contracts to be accepted, the buyer’s preference of crude oil by origin and such additional information as may be required by the Exchange. The indication of a preference by a buyer does not assure that the buyer actually will receive that preference.
2. Delivery Instructions
   On the first business day following Notice Day, the buyer shall give to the seller, with a copy to the Exchange, properly completed and signed Delivery Instructions in the form prescribed by the Exchange, which shall include the following information:
   a. Name of seller;
   b. Tender Number;
   c. Name of the seller’s designated crude stream specified in the Notice of Intention to Deliver;
   d. Name of incoming pipeline or storage facility specified in the Notice of Intention to Deliver;
   e. Number of contracts;
   f. Method of delivery (which must conform to the normal capabilities of the facility named in the Notice of Intention to Deliver with respect to the manner of delivery and the quantity to be delivered);
   g. Name of the outgoing pipeline or storage facility with access to the incoming pipeline or storage facility designated in the Notice of Intention to Deliver (buyer must confirm access with the incoming pipeline or storage facility designated in the Notice of Intention to Deliver);
   h. For inter-facility transfers, name of receiving facility with access to the facility designated in the Notice of Intention to Deliver; and
   i. Such additional information as may be required by the Exchange.

b. RESPONSIBILITIES OF CLEARING MEMBERS HAVING OPEN SHORT POSITIONS (SELLERS)
   1. Notice of Intention to Deliver
      Exchange Clearing Members having open short positions shall give the Clearing House a Notice of Intention to Deliver by 3:00 PM the first business day after the final day of posting of transactions. The Notice of Intention to Deliver in the form prescribed by the Exchange, which shall be properly completed and signed, shall indicate the names of the seller’s customers, the number of contracts to be delivered and the designated crude stream. The seller shall designate qualified pipeline or storage facility, and shall also provide such additional information as may be required by the Exchange.
   2. Scheduling Notice
      As soon as possible following determination of scheduling, but not later than the last business day of the month preceding the delivery month, the seller shall give the buyer a Scheduling Notice in the form prescribed by the Exchange stating delivery time, with a copy to the Exchange.

c. AMENDMENT OF DELIVERY INSTRUCTIONS
   The foregoing notwithstanding, at any time prior to the last business day of the month, the buyer and the seller may, by mutual agreement, elect to change the delivery terms with respect to: (1) Method of delivery. Timing of delivery.
   3. Type and/or quality of crude oil to be delivered.
   4. Designation of buyer’s and/or seller’s facility
      Any such change must be made on the form prescribed by the Exchange. Any changes made with respect to the foregoing must be made in conformance with all contract requirements and specifications.

d. SETTLEMENT PRICE
   The last settlement price shall be the basis for delivery.
e. **NOTICE DAY**
   The Clearing House shall allocate Delivery Notices and Notices of Intention to Accept by matching size of positions and considering the type of crude oil by origin to the extent possible. The Clearing House shall pass copies of the notices to the respective Clearing Members on the morning of the next business day. The day the notices are passed to the Clearing Members shall be referred to as the Notice Day. The Notice Day shall be the second business day after the final trade date.

f. **NON-TRANSFERABLE**
   The Clearing Member who receives a Delivery Notice or a Notice of Intention to Accept from the Clearing House shall be deemed to have agreed to accept or deliver product. Delivery Notices or Notices of Intention to Accept are not transferable.

**Timing of Delivery**

a. Delivery shall take place no earlier than the first calendar day of the delivery month and no later than the last calendar day of the delivery month.

b. It is the short’s obligation to ensure that its crude oil receipts are available to begin flowing ratably by the first day of the delivery month, in accord with generally accepted pipeline scheduling practices.

c. Transfer of title - The seller shall give the buyer a pipeline ticket, any other quantitative certificates and all appropriate documents upon receipt of payment. The seller shall provide preliminary confirmation of title transfer at the time of delivery by fax, electronic message, or other appropriate form of documentation.

**Delivery Margins and Payment**

a. For purposes of this Rule 505.17,

1. ‘Payment Date’ shall mean the twentieth day of the month following the delivery month or if such date is a Saturday or an Exchange or New York bank holiday other than Monday, payment shall be made on the preceding day which is not an Exchange or New York bank holiday. If such day is a Sunday or an Exchange or New York bank holiday which occurs on a Monday, payment shall be made on the next day which is not an Exchange or New York bank holiday;

2. ‘Long’ shall mean the customer of a long clearing member or the long clearing member if such clearing member is acting for its own account.

3. ‘Short’ shall mean the customer of a short clearing member or the short clearing member if such member is acting for its own account.

b. On the third business day following the last trade date, the long clearing member shall obtain from the long, if any, margin equal to the full value of the product to be delivered. Such margin shall consist of cash, securities issued by the United States Treasury Department maturing within ten (10) years from the date of deposit and guaranteed as to principal and interest by the United States Government or a letter of credit. Any Treasury securities so deposited shall be valued at ninety percent (90%) of the par value of such instruments. Any letter of credit so deposited shall be in a form approved by the Exchange, shall be issued or confirmed by an Exchange-approved original margin depository, and shall be drawn in favour of the Exchange.

c. The short clearing member shall obtain from the short, if any, margin in an amount fixed, from time to time, by the Board.

d. The long clearing member and the short clearing member shall deposit with the Clearing House margins in such amounts and in such form as required by the Exchange. Such margins, which shall not be greater than the margins charged to the longs and the shorts, shall be returned on the business day following notification to the Exchange that delivery and payment have been completed.
Appendices

e. Not later than 12:00 o’clock noon on the third business day prior to the payment date, the short shall advise, by fax or electronic message, the short clearing member of the name and address of the bank, and the name of the account to which payment shall be made. The short clearing member shall advise the long clearing member who shall advise the long. On the payment date, the long shall pay the short contract value, as defined in Rule 505.21 (A)(4), by federal funds wire transfer to the account of the short at the bank nominated by the short. Not later than 12:00 noon (NY time) the long shall advise, by fax or electronic message, the long clearing member of the federal funds wire transfer number and the name of the sending bank. The long clearing member shall advise, by fax or electronic message, the short clearing member who shall similarly advise the short.

f. Not later than the business day following the payment date, the short, if any, shall advise the short clearing member of receipt of payment. The short clearing member shall deliver a notice of payment to the long clearing member with a copy to the Clearing House not later than the business day following the payment date. Upon receipt of such notice, the delivery shall be complete.

g. Any payment made on payment date shall be based on volume actually delivered determined at sixty degrees (60) Fahrenheit. If quantitative results are unavailable prior to the time established in the Rules for payment of the product, a pro-forma payment based on 1,000 U.S. barrels per contract shall be made. Payment adjustments based on the actual quantity transferred shall be completed by 12:00 noon on the fifth business day after initial payment.

h. In the event that the short clearing member receives notification that payment has not been received, it shall advise the Exchange in writing. On the following business day, unless the long or long clearing member has advised the Exchange in writing that the short failed to deliver, the Exchange shall liquidate the margins held and, when the liquidation is complete, shall pay the short clearing member which shall pay its customer, if any. If the long or the long clearing member has advised the Exchange in writing that the short failed to deliver, the matter shall be referred to the Delivery Committee for resolution.

Validity of Documents

The Exchange makes no representation respecting the authenticity, validity or accuracy of any inspection certificate, Notice of Intention to Deliver, Notice of Intention to Accept, check or any document or instrument delivered pursuant to these rules.

Inspection

a. Inspection of the product shall be conducted in accordance with pipeline practices.

b. A buyer or seller may appoint an inspection company to inspect the quality of product delivered. The buyer or seller who requests inspection shall notify the seller or buyer that such inspection will take place. The buyer or seller who requests inspection will pay the costs of the inspection.
APPENDIX 5

NYSE Liffe’s Corporate Actions Policy

Issued: 1 January 2012
Effective: 1 January 2012

Version 7.0
1. INTRODUCTION

1.1 This Policy Document details the policy of NYSE Euronext Derivative Markets (‘NYSE Liffe’) in relation to the Corporate Actions. It is issued pursuant to, and should be read in conjunction with, the terms of the relevant formal Contract Specifications and Trading Procedures.

1.2 This Policy Document explains NYSE Liffe’s policy in relation to Corporate Actions in respect of:
   a. Option Contracts (as defined in Section 2.1); and
   b. Futures Contracts (as defined in Section 2.1).

1.3 This Policy Document is structured as follows:
   a. Section 2 defines terms used throughout this Policy Document;
   b. Section 3 provides background information;
   c. Section 4 describes NYSE Liffe’s policies and conventions in respect of Corporate Actions;
   d. Section 5 outlines the methodology to be used to formulate adjustments in respect of Option Contracts and Futures Contracts; and
   e. the Appendices provide further information on the calculation of Fair Value and Equalisation Payments for Option Contracts and Futures Contracts.

2. DEFINITIONS

The following provisions apply to, or should be noted in connection with, the interpretation of this Policy Document:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment Ratio</td>
<td>means the ratio that will be multiplied by the Daily Settlement Prices and/or Exercise Prices, and by which Lot Sizes will be divided, in order to adjust contract terms to cater for a Corporate Action</td>
</tr>
<tr>
<td>Amsterdam Option Contracts</td>
<td>means Option Contracts that are listed on Euronext Amsterdam</td>
</tr>
<tr>
<td>Brussels Option Contracts</td>
<td>means Option Contracts that are listed on Euronext Brussels</td>
</tr>
<tr>
<td>Corporate Action Notice</td>
<td>means a Notice issued to the market containing information concerning contract adjustments</td>
</tr>
<tr>
<td>Corporate Action</td>
<td>means a. a cash and/or scrip dividend, a bonus or scrip issue, a rights issue, a share split, subdivision or consolidation, a demerger or any other event affecting or giving rise to a right or entitlement attaching or accruing to the shares of, or ownership of shares in, a company, or</td>
</tr>
</tbody>
</table>

Appendices
### Appendices

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. a takeover, merger or any arrangement, transaction or series of transactions which will or may result in the acquisition by any person or persons or any associated person or persons of a substantial proportion of the shares of a company; or</td>
<td></td>
</tr>
<tr>
<td>c. any other event which, in the opinion of NYSE Liffe, necessitates an amendment to be made to terms of an Option Contract and/or Futures Contract in respect of the shares of a company</td>
<td></td>
</tr>
<tr>
<td><strong>Cum entitlement</strong></td>
<td>means, in respect of a share, with a right, before a date determined and published from time to time by the Relevant Stock Exchange, to any Relevant Entitlement relating thereto</td>
</tr>
<tr>
<td><strong>Daily Settlement Price</strong></td>
<td>means the price calculated and published by NYSE Liffe and which is used by the Clearing House to perform daily margin calculations</td>
</tr>
<tr>
<td><strong>Delivery Buyer</strong></td>
<td>means the person who is obliged to take delivery of one lot pursuant to the exercise or assignment of an option</td>
</tr>
<tr>
<td><strong>Delivery Seller</strong></td>
<td>means the person who is obliged to make delivery of one lot pursuant to the exercise or assignment of an option</td>
</tr>
<tr>
<td><strong>EDSP</strong></td>
<td>means the Exchange Delivery Settlement Price, as defined in the relevant Contract Specifications</td>
</tr>
<tr>
<td><strong>Ex-entitlement</strong></td>
<td>means, in respect of a share, without the entitlement, on or after a date determined and published from time to time by the Relevant Stock Exchange, to any Relevant Entitlement relating thereto</td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td>means to use the right one has as the holder of an option</td>
</tr>
<tr>
<td><strong>Fair Value</strong></td>
<td>means the price calculated by NYSE Liffe when Options Contracts and/or Futures Contracts are closed out for a cash amount, after a merger takeover</td>
</tr>
<tr>
<td><strong>Futures Contracts</strong></td>
<td>means collectively the term for Futures Contracts (cash settlement and physical delivery) on individual shares or futures based on Indices</td>
</tr>
<tr>
<td><strong>Last Trading Day</strong></td>
<td>means the last market day on which a contract is available for trading</td>
</tr>
<tr>
<td><strong>London Contract</strong></td>
<td>means Options Contracts and Futures Contracts that are listed on LIFFE Administration &amp; Management</td>
</tr>
<tr>
<td><strong>Lot Size</strong></td>
<td>means the number of underlying shares or baskets of shares of one Options Contracts or Futures Contracts, or multiplier in case of futures based on indices</td>
</tr>
<tr>
<td><strong>Minimum Price Movement</strong></td>
<td>means the tick size of a contract, as defined in the relevant Contract Specifications or Trading Procedures</td>
</tr>
<tr>
<td><strong>NYSE Liffe</strong></td>
<td>means, as the context requires, one or all of the following Relevant Euronext Market Undertakings where Options Contracts and Futures Contracts are made available for trading, including Amsterdam, Brussels, Lisbon, London and Paris</td>
</tr>
<tr>
<td><strong>Open Interest</strong></td>
<td>means the number of positions held at the close of any one business day</td>
</tr>
<tr>
<td><strong>Option Contracts</strong></td>
<td>means Option Contracts (cash settlement &amp; physical delivery), listed on NYSE Liffe, on individual shares</td>
</tr>
<tr>
<td><strong>Package Method</strong></td>
<td>means a method of adjusting contract specifications for existing contracts to cater for Corporate Actions, in which the original underlying deliverable is substituted by a package of other shares or deliverable security</td>
</tr>
<tr>
<td><strong>Paris Option Contracts</strong></td>
<td>means Option Contracts that are listed on Euronext Paris, including both the contracts that have a Standard Lot Size of 10 underlying shares and contracts that have Standard Lot Size of 100 underlying shares</td>
</tr>
<tr>
<td><strong>Policy Document</strong></td>
<td>means this document</td>
</tr>
<tr>
<td><strong>Ratio Method</strong></td>
<td>means a method of adjusting contract specifications for existing contracts to cater for Corporate Actions, where the relationships between the contract before and after the event is altered using a ratio specified by NYSE Liffe</td>
</tr>
<tr>
<td><strong>Reference Price</strong></td>
<td>means the price specified by NYSE Liffe and which shall be used as a reference price to determine the adjustments to be made further to a Corporate Action</td>
</tr>
<tr>
<td><strong>Relevant Entitlement</strong></td>
<td>means any one or more of a cash dividend, scrip dividend, bonus issue, scrip issue, rights issue, or any other right or entitlement, attaching or accruing to, or otherwise affecting, from time to time, a share or ownership of a share</td>
</tr>
<tr>
<td><strong>Relevant Stock Exchange</strong></td>
<td>means the primary stock exchange on which such shares are available for trading</td>
</tr>
</tbody>
</table>
Appendices

| Shares | means, as the context requires, the relevant security, depositary receipt or other such instrument which is the subject of the underlying of the relevant contract |
| Standard Lot Size | means the number of underlying shares in a contract, other than an O-class contract, or multiplier in case of futures based on indices, as specified in the relevant Contract Specifications |
| Trading Code | means the code under which the contract or class of contracts is trading on LIFFE CONNECT® |
| Underlying Currency Unit | means the currency of denomination of the underlying deliverable which is the subject of a lot |

3. **BACKGROUND**

3.1 The publication of this Policy Document is intended to minimise uncertainty over the method of contract adjustment to be adopted by NYSE Liffe when a company announces a Corporate Action and, consequently, to limit any unanticipated effect on contract prices when NYSE Liffe thereafter announces its specific intentions on the contracts adjustment.

3.2 NYSE Liffe envisages that, in most situations, contracts will be adjusted in accordance with this Policy Document. However, it should be noted that in certain circumstances this may not be possible or appropriate, and NYSE Liffe retains the right to determine how contracts should be adjusted (if at all).

3.3 NYSE Liffe will issue one or more Corporate Action Notices in respect of each Corporate Action where adjustments to an Option Contract or Futures Contract is required or expected under the terms of this Policy Document.

4. **POLICY AND CONVENTIONS**

4.1 **Application of Adjustments**

The methodology detailed in this Policy Document is based on the principle that, when the shares underlying an Option Contract (which has not been exercised) or a Futures Contract become ex entitlement, contracts on such shares should be amended to reflect in economic terms (as far as practicable) a holding equivalent to the ex entitlement shares and the Relevant Entitlement, and may be effected as follows:

- by altering the exercise prices of Option Contracts, creating Reference Prices for use as the basis for the determination of variation margin flow for Futures Contracts; and the Lot Size of the respective contracts; or
- by substituting the underlying shares in a proportion determined by the ex entitlement holding with the new underlying shares; or
- by settling (closing) Option Contracts and Futures Contracts at their respective Fair Value.
Where the timing of a Corporate Action requires an adjustment to be made to Option Contracts or Futures Contracts prior to authorisation from shareholders, regulatory bodies or any such party that has power to disqualify the Corporate Action, such adjustments will be made in order to maintain the contract’s relationship with the underlying shares. Adjustments made in the above manner are irrevocable, irrespective of whether approval is or is not obtained.

4.2 Adjustment of Lot Size
For Flexible Contracts, only the lot size of series/maturities with open interest will be adjusted. For standard Universal Stock Futures Contracts, the lot size of all delivery months up to and including the furthest delivery month with open interest shall be adjusted by being divided by the ratio. For standard Individual Equity Option Contracts, the lot size of all expiry months up to and including the furthest maturity with open interest shall be adjusted by being divided by the ratio.

4.3 Rounding
Where application of the Ratio Method results in an adjusted exercise price that is not equal to an eligible exercise price in accordance with the relevant contract terms and/or trading procedures the exercise price will be rounded to the nearest eligible exercise price, and in the event that the unrounded exercise price is exactly halfway between two eligible exercise prices, then it shall be rounded up to the next eligible exercise price.

When the Ratio Method is applied, the resultant Reference Price will be rounded to the nearest increment of the Minimum Price Movement, or to such number of decimal places determined and advised by NYSE Liffe, and in the event that the unrounded Reference Price is exactly halfway between two Reference Prices, then it shall be rounded up to the next eligible Reference Price.

Where the application of the Ratio Method results in a Lot Size which is not equal to an increment of one share, the adjusted Lot Size will be rounded, to the nearest whole share, and in the event that the unrounded Lot Size is exactly halfway between two eligible Lot Sizes, then it shall be rounded up to the next eligible Lot Size.

4.4 O-Class Option Contracts
With respect to Amsterdam Option Contracts and Brussels Option Contracts, where application of the Ratio Method results in a Lot Size that is greater than the Standard Lot Size, NYSE Liffe will introduce an additional contract that will contain those shares which are in excess of the Standard Lot Size (the O-class). Apart from the different Lot Size, the O-class will have the same specifications as the adjusted original contract. Therefore, option holders will still hold existing contracts with a Standard Lot Size and receive one additional contract for every existing contract held, that will contain shares in excess of the Standard Lot Size. The additional contracts introduced will be designated with a Trading Code that usually has an ‘O’ placed at the end of the Trading Code (hence ‘O-class’), and where this is not possible, with another letter.

If application of the Ratio Method results in a Lot Size that is less than the Standard Lot Size, NYSE Liffe will change the Trading Code of the contract, to become an O-class. At NYSE Liffe’s discretion, contracts with the same expiry months as the affected contracts may be introduced at a Standard Lot Size, and will be designated with the original Trading Codes as the existing contract prior to adjustment.
New strike prices and expiry months will only be introduced for contracts having a Standard Lot Size.

4.5 **Equalisation Payments**
For Paris Option Contracts, an equalisation payment will be made to neutralise the error observed due to rounding of the contract or to the maintenance of the contract size as mentioned in Section 5.1.

The equalisation payment amount will be determined by NYSE Liffe and its transfer between clearing members arranged by LCH.Clearnet.

4.6 **Notification of Corporate Actions**
NYSE Liffe will inform participants of Corporate Actions via publication of a Corporate Action Notice. A Corporate Action Notice will be published in respect of a Corporate Action when information made public by the company gives sufficient certainty of that company’s intention to effect a Corporate Action. A Corporate Action Notice will detail the adjustment methodology NYSE Liffe intends to apply, and the subsequent application of such adjustment, ceteris paribus.

Where necessary, at the close of business on the last day that a company’s shares are trading cum entitlement, NYSE Liffe will publish a Corporate Action Notice confirming adjustments made to Option Contracts or Futures Contracts.

5. **ADJUSTMENTS METHODOLOGIES**

Where adjustments to the terms of a contract are required under the terms of this Policy to cater for a Corporate Action, NYSE Liffe shall use either of the Ratio Method or the Package Method, or substitute the underlying shares of a contract.

In cases where it is inappropriate or impossible to adjust contracts in line with the below methodologies, or in cases where the Corporate Action is an event other than those listed in Section 6 of this Policy Document, NYSE Liffe will have regard, as far as practicable, to the principle detailed in paragraph 4.1 above in determining the appropriate adjustment.

5.1 **Ratio Method**
Where the Ratio Method is used to make adjustments to Option Contracts and Futures Contracts, NYSE Liffe will disclose the adjustment ratio if known or the equation necessary to calculate the ratio. The following conventions will apply for an application of the Ratio Method:

- The adjustment ratio shall be calculated by dividing the ex-entitlement holding (or value thereof) by the cum-entitlement holding (or value thereof), such that:

\[
\text{Adjustment Ratio} = \frac{\text{Ex-entitlement holding}}{\text{Cum-entitlement holding}}
\]

- The adjustment ratio will be rounded, using normal mathematical rounding conventions, to five decimal places.

- Application of the adjustment ratio with respect to exercise prices, the creation of References Prices, and Lot Sizes will be made with the rounded adjustment ratio.
For **Options Contracts** the ratio is used to alter the Lot Size (by dividing the lot size by the ratio) and the exercise price of each series (by multiplying the exercise price by the ratio). On exercise, Delivery Sellers are required to deliver the adjusted number of ex-entitlement shares in return for a consideration of the adjusted exercise price multiplied by the adjusted Lot Size.

Equalisation payments will be made for all **Paris Options Contracts** to neutralise the error observed due to rounding of the contract (see Section 4.5).

In the case of **Futures Contracts**, the ratio is used to alter the Lot Size (by dividing the Lot Size by the ratio) and to create the Reference Price of each contract (by multiplying the previous business day’s Daily Settlement Price by the ratio).

For **Amsterdam Option Contracts** and **Brussels Option Contracts** where application of the Ratio Method results in a Lot Size that is greater than the Standard Lot Size, an additional contract will be introduced which contains the shares which are in excess of the Standard Lot Size (the O-class, see Section 4.4).

### 5.2 Package Method

The Package Method entails substituting the underlying shares in a contract with a package of the ex entitlement shares and the proportionate number of entitlements.

In the case of **physical delivery Option Contracts**, on exercise, Delivery Sellers are required to deliver the ex-entitlement shares and the proportionate number of entitlements in consideration for the exercise price multiplied by the Lot Size. Fractions of shares will be settled in cash. No adjustment will be made to the lot size or exercise prices. Amsterdam Option Contracts and Brussels Option Contracts will be renamed to become an O-class.

In the case of **cash settlement Option Contracts** on exercise, the EDSP will be determined by aggregating the components which form the package. Daily Settlement Prices will not be adjusted to create Reference Prices and no adjustment will be made to the lot size or to the Trading Code.

In the case of **cash settlement Futures Contracts**, Delivery Sellers are required to deliver the number of ex-entitlement shares they have contracted to sell together with the proportionate number of entitlements. Fractions of shares will be settled in cash. Daily Settlement Prices will not be adjusted to create References Prices and no adjustment will be made to the lot size or to the Trading Code.

In all cases, no new delivery months will be introduced where the Package Method has been applied.

Where an underlying share in a created package is itself subject to a corporate action for which the ratio method is applicable, NYSE Liffe may adjust the number of the relevant shares in the package. No adjustment will be made to the lot size or exercise prices.
6. CORPORATE ACTION TYPES

The following section details the adjustment methodology NYSE Liffe will apply to Option Contracts and Futures Contracts to determine what adjustments (if any) will be applied to cater for the following Corporate Actions:

- bonus issues;
- stock splits and reverse stock splits;
- subdivision or consolidation of share capital;
- rights issues and open offers;
- special dividends;
- demergers;
- liquidation;
- mergers and takeovers;
- share repurchases.

As noted, NYSE Liffe retains the right to determine how any particular Corporate Action will be reflected in contract adjustments. However, as a general rule, the following provides details of the methodology applied to cater for the above Corporate Actions.

In cases in which not all shareholders are entitled to the Relevant Entitlement, NYSE Liffe will decide on a case-by-case basis whether an adjustment needs to be made. In doing so, NYSE Liffe will have regard, as far as practicable, to the principle detailed in paragraph 4.1.

6.1 Bonus Issues, Stock Splits, Reverse Stock Splits and Subdivisions or Consolidations of Share Capital

The Ratio Method will be used to adjust Option Contracts and Futures Contracts to cater for a bonus issue, stock split, reverse stock split, subdivision or consolidation of share capital.

The ratio shall be constructed as follows:

\[
\text{Adjustment Ratio} = \frac{(P - E) \times \left(\frac{O}{N}\right)}{P}
\]

Where:

- \( P \) = The official closing price\(^1\) of the cum-entitlement share on the Relevant Stock Exchange
- \( E \) = Value of the entitlement per share
- \( O \) = Cum amount of shares (old)
- \( N \) = Ex amount of shares (new)

For bonus issues, stock splits and reverse stock splits, \( P \) and \( E \) are irrelevant. Therefore the formula for the adjustment ratio for bonus issues, stock splits and reverse stock splits simply reads:

\[
\text{Adjustment Ratio} = \frac{O}{N}
\]

\(^1\) Or such other price as defined in the relevant Corporate Action Notice.
For the Amsterdam, Brussels, Lisbon and Paris Markets where the ratio results in a Lot Size divisible by the standard Lot Size to an exact integer, the open interest shall be adjusted rather than the Lot Size in order to maintain the equivalent economic exposure pre- and post-event. For the London Market the Lot Size will be adjusted rather than the open interest.

6.2 Rights Issues and Open Offers
The Ratio Method will be used to adjust Option and Futures Contracts to cater for rights issues and open offers. The adjustment ratio will be calculated by creating a ratio of the theoretical ex-entitlement share price to the cum-entitlement share price.

For the avoidance of doubt, NYSE Liffe will make adjustments to Option Contracts and Futures Contracts where the entitlement issue creates an exclusive entitlement to existing shareholders, irrespective of the tradability of the entitlement. NYSE Liffe will interpret a rights issue or an open offer to shareholders as a Corporate Action that creates an exclusive entitlement to shareholders, insofar that the entitlement has positive value.

Calculation of the value of the entitlement and the adjustment ratio for a straightforward issue are as follows:

\[
E = \frac{P - d - S}{h} \left( \frac{r}{r + x} \right)
\]

Where:

- \( E \) = Theoretical value of an entitlement
- \( P \) = The official closing date price\(^1\) of the cum-entitlement share on the Relevant Stock Exchange
- \( S \) = Subscription price of one new share
- \( d \) = Dividend to which new shareholders are not entitled
- \( h \) = Number of existing shares specified as eligible for the entitlement
- \( r \) = Number of new shares specified as the entitlement
- \( x \) = 1

Adjustment Ratio

\[
\text{Adjustment Ratio} = \frac{P - E}{P}
\]

The ratio will be applied to exercise prices of each series and Daily Settlement Prices are described in Section 5.1 of this Policy, at the close of business on the last business day that the company’s shares are trading cum-entitlement.

Where an entitlement issue entitles shareholders to take up securities that are not pari passu in all respects to those shares which derived the entitlement, or will not immediately convert into those shares, NYSE Liffe may determine the value of the entitlement by means of a members’ survey. The survey will be conducted on the last business day that the company’s shares are trading cum-entitlement.

\(^1\) Or such other price as defined in the relevant Corporate Action Notice.
It should be noted that where a market auction facility is available on the Relevant Stock Exchange, NYSE Liffe may, at its discretion, use the closing price of the rights from the market auction on the last cum-entitlement trading day to determine a theoretical ex-entitlement share price.

NYSE Liffe will have regard, where possible, to any adjustment or valuation methodology applied to any index which the underlying share may be a constituent of, to cater for the event.

6.3 Dividends
In the case of cash, stock or scrip dividends, Option Contracts and Futures Contracts will only be adjusted if these dividends are special. NYSE Liffe will use the following criteria for deciding whether a dividend should be considered to be a special dividend:

a. the declaration by a company of a dividend additional to those dividends declared as part of the company’s normal result and dividend reporting cycle; merely an adjustment to the timing of the declaration of a company’s expected dividend would not be considered as a special dividend circumstance; or

b. the identification of an element of a dividend paid in line with a company’s normal results and dividend reporting cycle as an element that is unambiguously additional to the company’s normal payment.

For the purpose of clarification, NYSE Liffe will not make adjustment for the following situations:

1. payment of ordinary dividends, irrespective of how they are financed;
2. the issue of redeemable shares or any other entitlement in lieu of an ordinary dividend; or
3. an unexpected increase or decrease, resumption or cessation, or change in frequency to an ordinary dividend.

The Ratio Method will be used in making adjustments to Option Contracts and Futures Contracts to cater for special dividends, and shall be calculated as follows:

\[
\text{Adjustment Ratio} = \frac{P - Od - Ed}{P - Od}
\]

Where:

\( P \) = The official closing price of the cum-entitlement share on the Relevant Stock Exchange
\( Od \) = Any ordinary dividend amount per share, to be paid to the shareholders as published by the issuer which has the same ex-date as E
\( Ed \) = The special dividend amount per share to be paid to the shareholders as published by the issuer

6.4 Demergers
The Package Method will be used to cater for demergers where shares of the demerged company can be delivered and settled in the domestic market of the shares of the original company; and those shares are either:
a. traded on an exchange designated by NYSE Liffe; or
b. included in the traded-but-not-listed segment of NYSE Euronext Group.

1 Or such other price as defined in the relevant Corporate Action Notice.

If the shares of a demerged company cannot be delivered and settled in the domestic market of the shares of the original company, and do not satisfy either of conditions (a) or (b) above, then the Ratio Method will be applied to Option Contracts and Futures Contracts.

The adjustment ratio will be calculated as follows:

\[
\text{Adjustment Ratio} = \frac{(\text{Cum-entitlement share price} - \text{Value of demerged company per share})}{\text{Cum-entitlement share price}}
\]

In the case that a demerger results in the creation of two or more companies, shares of those demerged companies will be subject to the above conditions, such that if the shares of each demerged company cannot be delivered and settled in the domestic market of the shares of the original company, and do not satisfy either of conditions (a) or (b) above, then the Ratio Method will be applied to shares of those demerged companies, in their respective proportions.

In determining the value of a demerged company’s shares for the purpose of applying the Ratio Method, NYSE Liffe may conduct a members’ survey on the last date which the company’s shares are trading cum-entitlement. However, on or prior to this date, if the value of the shares in the demerged company can be determined from market trading on any facility operated by the Relevant Stock Exchange, then this value will be used in place of a members’ survey.

If the demerged company is already traded on an exchange designated by NYSE Liffe, NYSE Liffe may adjust the contracts in accordance with the ratio method.

6.5 Liquidation
When a company is delisted from its Relevant Stock Exchange as a consequence, amongst other things, of liquidation or bankruptcy Option Contracts and Futures Contracts will be settled according to their intrinsic value.

Where the underlying shares in question are suspended from trading but still transferable through the relevant settlement system, trading, exercise, and settlement in the Option Contracts may still be allowed.

6.6 Mergers and Takeovers
To cater for a merger or takeover, NYSE Liffe will use the structure of the headline offer (offer consideration) to determine what adjustment methodology to apply to Option Contracts and Futures Contracts.

The Ratio Method will be applied where the offer consideration is composed purely of shares in another company, and those shares which form the headline offer can be delivered and settled in the domestic market of the shares of the company being acquired; and such shares are either:
Appendices

a. traded on an exchange designated by NYSE Liffe; or
b. included in the traded-but-not-listed segment of NYSE Euronext Group.

In applying the Ratio Method to substitute the underlying value of the Option Contracts and/or Futures Contracts the ratio will be calculated as follows:

\[
\text{Adjustment Ratio} = \frac{x}{y}
\]

where \( y \) is equal to the number of shares offered under the headline offer for every \( x \) shares held in the underlying company. This ratio will be applied as described in Section 5.1 of this Policy, such that the underlying shares of the contract will be substituted in the same proportion as determined by the headline offer, for the shares that form the offer consideration. Use of the Ratio Method will ensure Daily Settlement Prices and exercise prices are adjusted in line with the level of the new underlying shares.

If those shares which form the offer consideration cannot be delivered and settled in the domestic market of the shares of the company being acquired; and such shares do not satisfy either of conditions (a) or (b) above, then Option Contracts and Futures Contracts will be settled at their theoretical Fair Value (as described in Appendix 1 of this section).

Where the offer consideration is composed purely of cash, Option Contracts and Stock Futures Contracts will be settled at their theoretical Fair Value (as described in Appendix 1 of this section).

Where the offer is composed of both shares and cash, and if the share element cannot be delivered and settled in the domestic market of the shares of the company being acquired, and does not satisfy either of conditions (a) or (b) above, then all Option Contracts and Futures Contracts will be settled at their theoretical Fair Value. If the share element can be delivered and settled in the domestic market of the shares of the company being applied, such that the resulting contracts would become contracts purely on the share element. In this case the ratio will be based on the share price of the company issuing the bid.

Generally NYSE Liffe will seek to use the official closing price of the shares on the market where the company has its primary listing. However, in cases where the company issuing the bid has its primary listing in a different time zone than the target company, NYSE Liffe may use an official closing/opening price established on a secondary venue, use a VWAP calculation or use the EDSP calculation. Lastly, if the price of the share of the company issuing the bid is not available or cannot be determined at an appropriate time, NYSE Liffe reserves the right to calculate the ratio on the basis of the share price of the target company.

In the circumstance that the cash element represents over 67% of the total offer consideration, Option Contracts and Stock Futures Contracts will be settled at their theoretical Fair Value (as described in Appendix 1 of this section), and the Ratio Method will not be applied. For the avoidance of doubt, once NYSE Liffe has determined the proportion of cash and made such announcement as to the type of adjustment methodology, the methodology will not then be changed simply due to share price movements affecting the proportion of cash.
Adjustment Ratio = \frac{(Pt - C) \times O}{N} \times \frac{1}{Pt}

Pt = C + (N \times S)

Where:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt</td>
<td>Theoretical value of one share of the target company</td>
</tr>
<tr>
<td>N</td>
<td>Number of shares of the offeror received per share of the target company</td>
</tr>
<tr>
<td>O</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Cash element of the offer per share held</td>
</tr>
<tr>
<td>S</td>
<td>Cum-event share price of the company that is issuing the offer (being the offeror)</td>
</tr>
</tbody>
</table>

Adjustments to Options and Futures Contracts will be made when a relevant offer is made effective. To determine whether the relevant offer is effective, a threshold of the majority of the outstanding shares (50% + 1) shall be used.

In the cases of Tender Offers, whereby the relevant offer is a mandatory offer by law, NYSE Liffe will use a threshold of 75% of the outstanding shares to determine whether the relevant offer is effective.

### 6.7 Share Repurchases

NYSE Liffe will generally treat instances where a company repurchases its own shares in the market as a non-adjustable event. However, on occasions where a company makes an offer for its own shares at a premium to the prevailing market price, and where shareholders have equal opportunity to participate in the offer, NYSE Liffe may, where practical, deem the share repurchases as an adjustable event.

### 6.8 Delisting

Where a company is delisted from its Relevant Stock Exchange on request of the relevant company and, as a consequence, the underlying Share is no longer deliverable on an exchange designated by NYSE Liffe, NYSE Liffe shall use the Fair Value method to settle Option Contracts and Futures Contracts as described in Appendix 1 of this section.

### 6.9 Special Circumstances

If the underlying Share of the options and/or futures is no longer tradable and/or deliverable due to circumstances not described in the Corporate Actions Policy, NYSE Liffe will decide on a case-by-case basis what the consequences for the options and/or futures will be, and will inform the regulator of the relevant NYSE Euronext Undertaking on which the options and/or futures are traded before issuing a Corporate Action Notice.

### 7. SPECIAL PRODUCTS LISTED ON NYSE LIFFE MARKETS

#### 7.1 Index Future

In the event that an Index contains only one single stock and this stock will be removed from the Index without being replaced by another stock or if this single stock is subject to a takeover or delisting, NYSE Liffe will settle the Future against the theoretical Fair Value and in accordance with Appendix 1 of this section.
In the event that an Index contains only a single stock which becomes subject to a Liquidation, NYSE Liffe will settle the Index Future according to the intrinsic value. In this case, the last known price of the relevant Index shall be taken into account to calculate the theoretical settlement of this Future.

**APPENDIX 1**

Options and Futures contracts are settled at their fair values, after the offer has been declared effective.

**A 1.1 Option Contracts**
For the purpose of settling Option Contracts at fair value, NYSE Liffe will use the Cox-Ross-Rubenstein option valuation model.

NYSE Liffe reserves the right, in special circumstances, to consult a panel of market parties and independent experts instead of using the fair value method described above.

**Determination of implied volatility**
The option valuation model takes several factors into account, including the volatility of the option, interest and future dividends. For the purpose of settling Options Contracts at fair value, NYSE Liffe will use an average implied volatility based on the settlement prices of the relevant Options series over a ten trading day period preceding the announcement of the takeover bid.

For each day of the ten day period an implied volatility is determined for each series based on:

- The settlement price of each series.
- The underlying share price at the time of the settlement price calculation.

Subsequently, the average of each series implied volatility over the ten day period is calculated, excluding the lowest and the highest implied volatility observation of that series over the ten day period.

Once determined, these implied volatilities are fixed until the moment of settlement, regardless of any changes in the price of the underlying share in the intervening period.

If during the course of a takeover the offerer increases the offer consideration or makes any other change to the respective offer (such as extending the acceptance period), new implied volatilities will not be calculated. In addition, should a counterbid be launched by another company whilst a bid is still active (ie, has not expired or been withdrawn), then the implied volatilities, calculated as described above and in relation to the initial bid, will be used if the counter bid should be declared effective.

**Calculation of fair value**
The Cox-Ross-Rubenstein binomial model is used to calculate the fair value of an option. This method sets up a matrix of possible underlying prices during the lifetime of the option, based on a given starting price.

**Step 1:** Adjustment of the underlying value to take account of future dividends.
Before a matrix of underlying prices can be constructed, the starting price has to be adjusted to take account of dividends that will be paid out during the lifetime of the option. This is done by subtracting the discounted cash value of all the expected dividends over the lifetime of the option from the starting price.

1 For the purpose of this policy, a bid is deemed to be announced as soon as a firm price has been mentioned by the company issuing the bid. This could be an intended bid.

2 If the settlement price of any series of lower than the lowest possible theoretical price of that series, then the implied volatility will be based on the lowest possible theoretical price. For the purpose of determining implied volatilities, the lowest possible theoretical price is deemed to be the intrinsic value, corrected to take into account interest and future dividend payments.

3 If an option has been listed for less than ten trading days at the time that the implied volatility is determined, the implied volatility will be calculated on the basis of the days it has been listed. In addition, if the option has been listed for less than seven trading days, the lowest and highest implied volatility will not be excluded.

\[ S = Z - \sum_{i=1}^{m} D_i e^{-rt_i} \]

Where:

- \( D_i \) = Dividends amounts published by Markit Dividends \(^1, 2\) where the ex-date is during the option lifetime
- \( m \) = The number of dividends paid out during the option’s lifetime
- \( r \) = Risk-free interest rate over the option’s lifetime\(^3\)
- \( S \) = Share price, adjusted to take dividends into account
- \( Z \) = Starting price of the share
- \( t_i \) = Time remaining until dividend payment (in years)

Step 2: The underlying value matrix
Once the starting price of the underlying has been adjusted, the matrix can be constructed by dividing up the remaining lifetime of the option into ‘n’ periods. The value of ‘n’ is:

- the number of days remaining in the option’s lifetime if this number is smaller than 100;
- 100 in all other cases.
1 If the information available on Markit Dividends is not sufficient then NYSE Liffe may extrapolate these forecasted dividends. If there is not information on Markit Dividends then NYSE Liffe may use historical dividends and/or forecasted dividends from different information sources and extrapolate these when necessary.

2 The data provided by Markit is on ‘as if’ basis and neither Markit, its affiliates nor any other person or entity that has participated in any respect in the development or collection of the data makes any warranty, express or implied, as to accuracy, timeliness or completeness of the data or as to the results to be attained from the use of the data. There are no express or implied terms or merchantability or fitness for a particular purpose or use, and no reliance shall be placed upon any warranty, guaranty or representation made by Markit, its affiliates or any data provider. The data shall not be used, copied, redistributed or transferred without the appropriate licence from Markit.

3 For the purpose of the Fair Value Method, Interest Rates from the source defined in the relevant Corporate Action Notice shall be used. The interest rate for the relevant expiry date shall be determined by linear interpolation of the two nearest relevant available Interest Rates.

The following formula is used to calculate the simulated prices used in the matrix:

\[ u = e^{\frac{\sigma \sqrt{t}}{n}} \]

Where:

- \( \sigma \) = implied volatility of the option
- \( t \) = remaining lifetime of the option
- \( n \) = number of periods into which the option’s lifetime is divided
- \( u \) = relative upward price movement in the binomial model

**Step 3: Calculation of underlying prices**

For every junction in the matrix an upward price movement and a downward price movement can be simulated by either multiplying or dividing the price at the junction by ‘u’. The result of this sum should then be added to the cash value of the future dividends at that point in time. This simulated price is then used for the next step in the simulation, and the process repeated until the entire matrix has been filled with underlying prices.

**Step 4: Determination of the value of the option at expiry**

The value of the option at expiry can be calculated as follows, using the simulated price matrix.

\[ c = \text{maximum}(S - X, 0) \]
\[ p = \text{maximum}(X - S, 0) \]

Where:

- \( c \) = value of the call
- \( S \) = simulated price of the underlying
- \( X \) = strike price of the option
- \( p \) = value of the put

**Step 5: Probability of a price increase or decrease**

The matrix can also be used to calculate the probability of a price increase or decrease, using the following formula.

\[ K = \frac{(e^{\frac{X}{n}} - \frac{1}{u})}{(u - \frac{1}{u})} \]
Where:

\[ K = \text{probability of a price increase} \]

The probability of a price decrease \((L)\) is then \(1 - K\).

**Step 6: Calculation of option prices**

The option values at expiry can be used to recalculate the option price matrix in the other direction. This is done by calculating the option price at each junction on the basis of the two preceding prices (one corresponding to the higher price and one to the lower).

The option value that corresponds to the higher price is multiplied by ‘\(K\)’, the option value for the lower price is multiplied by ‘\(L\)’ and the two amounts are added together. The result is multiplied by the previously calculated value to calculate its cash value at that moment in time as follows:

\[ C = (K \times A + L \times B) \times e^{-r \frac{t}{n}} \]

**Early exercise (this only applies to American Style options; the below adjustments for early exercise are not made for European Style options)**

Finally, it is possible to determine the advisability of exercising of the option ahead of expiry at each junction in the matrix. If the value calculated for an option at a given junction is less than the intrinsic value of the option, it may be advisable to exercise the option. In this case, the intrinsic value of the option should be used for further calculations.

Step 6 is repeated until the final value of the option has been calculated.

The calculation (steps 1 to 6) is then repeated using a value of ‘\(n-1\)’, and the average of the two calculations.

**A 1.2 Calculation of the Theoretical Value for Futures**

NYSE Liffe will use the following model for the purpose of settling Futures Contracts at theoretical value.

**Step 1: Adjustment of the price of the underlying security for further dividend flow**

For futures, the price of the underlying security has to be adjusted for future dividends paid out during the remaining life time of the Futures Contract. Futures dividends will be determined by Markit.
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\[ D^* = \sum_{i=1}^{n} D_i e^{-rt_i} \]

Where:

\( D_i \) = Dividends that are ex-entitlement in period \( i \)
\( D^* \) = Present value of the future dividends during the remaining life of the Futures Contract
\( r \) = Risk-free interest rate for the remaining life of the futures
\( t_i \) = The time to payment of a dividend divided by 365
\( n \) = Total number of all dividends payable in period \( i \) during the remaining life of the Futures Contract

Step 2: Calculation of the futures price

\[ F = (S - D^*) e^{r(T-t)} \]

Where:

\( F \) = The futures price
\( S \) = The share price (being the cash bid)
\( T-t \) = The remaining life of the Futures Contract
\( r \) = Risk-free interest rate for the remaining life of the Futures Contract
\( D^* \) = Present value of the future dividends during the remaining life of the Futures Contract

A 1.3 Calculation of the Theoretical Fair Value for Index Futures

NYSE Liffe will use the following model for the purpose of settling Index Futures Contracts at theoretical value Fair Value.

Step 1: Adjustment of the price of the underlying security for future dividend flow

For futures, the price of the underlying security has to be adjusted for future dividends paid out during the remaining life time of the Futures Contract. Future dividends will be determined by Markit Dividends and will be converted into Index points.

\[ D^* = \sum_{i=1}^{n} D_i e^{-rt_i} \]

Where:

\( D_i \) = Dividends that are ex-entitlement in period \( i \)
\( D^* \) = Present value of the future dividends during the remaining life of the Futures Contract
\( r \) = Risk-free interest rate for the remaining life of the Futures Contract, expressed, for example, as 0.03 for 3%
\( t_i \) = The time to payment of a dividend divided by 365
\( n \) = Total number of all dividends payable in period \( i \) during the remaining life of the Futures Contract
Step 2: Calculation of the futures price

\[ F = (S - D^*) e^{r(T - t)} \]

Where:

- \( F \) = The futures price
- \( S \) = The last known price of the Index
- \( T - t \) = The remaining life of the Futures Contract, expressed in years
- \( r \) = Risk-free interest rate for the remaining life of the Futures Contract, expressed, for example, as 0.03 for 3%\(^1\)
- \( D^* \) = Present value of the future dividends during the remaining life of the Futures Contract

\(^1\) For the purpose of the Fair Value Method, Interest Rates from the source defined in the relevant Corporate Action Notice shall be used. The interest rate for the relevant expiry date shall be determined by linear interpolation of the two nearest relevant available Interest Rates.

### APPENDIX 2

#### A 2.1 Equalisation Payment and the Ratio Method

In the case that an equalisation payment is made necessary under this Policy Document, the Ratio Method will be applied in the following manner (as described in Section 5.1).

1. The exercise prices (\( K \)) will be multiplied by the ratio to create the adjusted exercise prices, rounded to two decimal places (\( K_1 \)) as described in Section 4.2.
2. The Lot Size (\( Q \)) will be divided by the ratio to create the new Lot Size (\( Q_1 \)) which will be rounded to the nearest whole share (\( Q_2 \)) as described in Section 4.2.

#### A 2.2 Equalisation Payment Calculation

1. The settlement price of the modified series (\( c \)) must be equal to the ratio (\( R \)) multiplied by the settlement price of the unadjusted series.
2. The theoretical position has to be preserved post an adjustment, such that:

\[ Q_1 \times K_1 = Q \times K \]

However, as the new Lot Size is rounded to the nearest whole share (\( Q_2 \)), this relationship will not always hold true, so that, where rounding has occurred:

\[ Q_2 \times K_1 \neq Q \times K \]

The variation (\( V \)) of a position (expressed as a percentage) is thus:

\[ V = \frac{(Q_2 \times R) - Q}{Q} \]

3. The equalisation payment (\( S \)) for each series is calculated as follows:

\[ S = c \times V \times Q \]
Appendices

Where:

\[ c = \text{Series settlement price of the previous day} \]
\[ V = \text{The Variation of a position (expressed as a percentage)} \]
\[ Q = \text{The Lot Size before the corporate action} \]

4. If \( S < 0 \), then option holders will receive \( S \). If \( S > 0 \), then option sellers will receive \( S \).

Disclaimer

The **NYSE Euronext Derivatives Markets (NYSE Liffe)** comprise the markets for derivatives operated by Euronext Amsterdam, Euronext Brussels, Euronext Lisbon, Euronext Paris and LIFFE Administration and Management, referred to respectively as the Amsterdam, Brussels, Lisbon, Paris and London markets. Euronext is part of the NYSE Euronext group. Whilst all reasonable care has been taken to ensure that this document is accurate and not misleading, neither NYSE Euronext nor any of its group companies shall be liable (except to the extent required by law) for the use of information howsoever arising. NYSE Euronext expressly disclaims all warranties, expressed or implied, as to the accuracy of any of the content provided, or as to the fitness of the information for any purpose.
LIFFE CONNECT & EUREX

An Overview

LIFFE CONNECT® can be accessed electronically from the world’s major financial centres.

Users have considerable flexibility and choice of networks, including:

- Direct access via the LIFFE CONNECT® Network, Euronext.liffe’s own international network (regulatory restrictions may prevent or condition access in some jurisdictions).
- Access through services offered by Value-Added Network (VAN) partners.
- Access through services offered by an Application Service Provider (ASP).
- Light access via a Virtual Private Network (VPN) connection over the Internet.
- Light access via a 128k leased line (Amsterdam only).
- Access via a member’s own network.

To fully access all products on Euronext.liffe, members will require a 2Mb connection.

Euronext.liffe recognises that customer requirements vary markedly and therefore LIFFE CONNECT® does not impose particular trading software on users. Users may choose to buy trading software from any of the independent software vendors (ISVs) that have built trading systems to the Application Program Interface (API).

Alternatively, many firms choose to build their own trading software and interface it to the market.

It is also possible to access LIFFE CONNECT® through order routing services provided by member firms as well as through members providing access to independent traders from trading bureaux.

Trading on LIFFE CONNECT® takes place by submitting an order, via a trading application (front-end software), into the LIFFE CONNECT® central order book.

Having received the orders, the LIFFE CONNECT® Trading Host then matches them in the central order book (this is an electronic representation of the market place) where the criteria for determining trade priority is dependent on the contract being traded.

A trader has the ability to revise orders and orders may be withdrawn at any time, either individually or as a block.

Both the customer and the market as a whole are protected in their dealings with a member of Euronext.liffe in a variety of ways:

- LCH.Clearnet is the clearing house for all Euronext.liffe business. Its primary role is to act as central counterparty for all trades executed on LIFFE CONNECT® futures and options markets.
• Once a trade is registered, LCH.Clearnet becomes the central counterparty to the buying and selling clearing members. As central counterparty, LCH.Clearnet ensures the financial performance of registered trades through to delivery.

• Euronext.liffe Market Services (ELMS) is the exchange’s facility for ensuring that a fair and orderly market is maintained at all times, and that the trading rules and procedures are properly implemented and adhered to.

• It is the customers’ daily point of contact with the Exchange and ELMS has a team of specialist staff each dealing with a specific product area. These staff are responsible for dealing with any immediate queries, either trading or technical, associated with their specialist product area.

• To assist staff, a number of complex systems have been developed which monitor the market continuously throughout the trading day. These alert ELMS staff to any market activity which appears to be unrepresentative of the current market and allow them to set levels outside which trading cannot take place.

• ELMS is also responsible for the publication of settlement prices for all futures and options contracts traded on LIFFE CONNECT®.

Plain text:

**Clearing and settlement of trades on LIFFE CONNECT therefore takes place via LCH.Clearnet.**

After a trade has been executed on LIFFE CONNECT®, trade details are fed from the relevant Trading Engine into the Trade Registration System (TRS) (for the London market only) and Clearing 21® (for all other NYSE Liffe markets, ie, Amsterdam, Brussels, Lisbon and Paris) in real-time throughout the trading day.

TRS is the London market’s administration system that allows complete post-trade processing by members’ back office departments. TRS provides various facilities, including the allocation and registration of trades. Trades are then passed through to the Clearing Processing System (CPS).

CPS extends the functions of TRS by providing position maintenance and clearing functions, enabling customers to co-ordinate their trading, settlement, margining and risk management within one system. All trades executed in the London market will match instantly in TRS and will be cleared by LCH.Clearnet.

Clearing 21® is the clearing system for all other Euronext.liffe markets. Clearing 21® is an open architecture clearing system, providing dialogue between the members’ internal computer systems and LCH.Clearnet. It is a real-time operation which enables market participants to better manage their positions and risks with detailed position keeping. This allows for balancing between unit accounts in the position keepers’ books and those managed by LCH.Clearnet.

Source: Euronext
Eurex Market Model

The core element of the Eurex Market Model is the central order book, into which all orders and quotes are entered during the trading day.

The only purchase and sale transactions that do not go through the central order book are OTC transactions (where the price is agreed off-exchange and then recorded at Eurex Clearing AG for clearing and settlement purposes), as well as clearing and settlement-related transactions like option exercises/assignments and notifications/allocations against positions in Fixed Income Futures.

When orders and quotes are entered into the central order book, they are sorted by type, price and entry time. Market orders are always given the highest priority for matching purposes. Limit orders and quotes are sorted together; there is no special consideration given to market maker quotes.

Orders and quotes in the central order book are anonymous: A trader never knows the opposite side on a trade executed through the exchange. Eurex Clearing AG is always the counterparty. Orders and quotes at a given price level are aggregated, although the number of orders and quotes making up the total remains unknown. Participants only see the specific details of their own orders.

For all products, the best bid and ask prices, as well as their respective aggregated bid and offer sizes (also known as the ‘inside market’), are always available in real time. In many cases, these bid and ask prices are derived synthetically. For liquid futures, the depth of the order book is updated dynamically for the ten best price levels, with sizes, on both sides. For less liquid futures, as well as all option contracts, market depth can be accessed as a ‘snapshot’, meaning the data does not continue to update in real time after the initial capture.

Most products at Eurex follow the matching principle known as price/time priority. This is not true for Money Market Futures (also known in some markets as STIR (Short Term Interest Rate) futures), which follow pro rata matching. Although order matching in the Trading Period will follow either price/time priority or pro rata matching, a different process, called the auction principle, is used to determine the opening price of products traded at Eurex.

Several types of orders may be used at Eurex. Market orders, limit orders (both restricted and unrestricted), stops and combination (or spread) orders are available to participants.
Appendices

Summary of Order Types

<table>
<thead>
<tr>
<th>Order Types</th>
<th>Options</th>
<th>Strategies</th>
<th>Futures</th>
<th>Future Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted Limit Order (IOC)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Unrestricted Limit Order</td>
<td>No</td>
<td>No</td>
<td>Yes*</td>
<td>No</td>
</tr>
<tr>
<td>(closing auction) only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFD (Good-for-Day)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>GTC (Good-till-Cancelled)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>GTD (Good-till-Date)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Market Order</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stop Order</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*not available for Single Stock Futures

Eurex provides several position accounts where a transaction may be kept until it is closed out. There are three types of accounts:

- Agent account;
- Proprietary accounts;
- Market Maker accounts.

Every order entered into the Eurex® system must be associated with one of these account types.

Agent and Proprietary accounts are kept on a gross basis. If a trader buys and sells identical contracts, he will have both a long position and a short position in the same account, unless the second trade is designated as a closing transaction. If an offsetting transaction is not marked as a closing transaction during entry, the designation can be adjusted later. If this is not done in a timely fashion, additional fees will be charged by Eurex.

Market Maker accounts are kept on a net basis.

<table>
<thead>
<tr>
<th>Account Codes</th>
<th>Account Type</th>
<th>Activity</th>
<th>Net v. Gross</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Agent</td>
<td>Clients only</td>
<td>Gross</td>
</tr>
<tr>
<td>G1</td>
<td>Pre-designated Give-up</td>
<td>Without the member ID of the receiving Clearing Member</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Designated Give-up</td>
<td>With the member ID of receiving Clearing Member</td>
<td></td>
</tr>
<tr>
<td>P1, P2</td>
<td>Proprietary</td>
<td>Own account</td>
<td>Gross</td>
</tr>
<tr>
<td>M1, M2</td>
<td>Market Maker</td>
<td>Quotes</td>
<td>Netto</td>
</tr>
</tbody>
</table>

Source: EUREX
APPENDIX 7

Regulation of Derivatives – Conduct of Business Sourcebook (COBS)

The conduct of business requirements applying to firms with effect from 13 April 2013 is listed below and replaces the previous Conduct of Business Rules (COB) published by the former UK regulator, the FSA. According to the FCA, COBS was developed to deliver three key aims. Although it covers broadly the same material as the old COB sourcebook, it:

- is in line with the FCAs more outcomes-focused approach to regulation;
- simplifies the conduct of business regime;
- implements MiFID (and continues to implement other European directive provisions).

<table>
<thead>
<tr>
<th>Reference code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COBS 1</td>
<td>Application</td>
</tr>
<tr>
<td>COBS 2</td>
<td>Conduct of business obligations</td>
</tr>
<tr>
<td>COBS 3</td>
<td>Client categorisation</td>
</tr>
<tr>
<td>COBS 4</td>
<td>Communicating with clients, including financial promotions</td>
</tr>
<tr>
<td>COBS 5</td>
<td>Distance communications</td>
</tr>
<tr>
<td>COBS 6</td>
<td>Information about the firm, its services and remuneration</td>
</tr>
<tr>
<td>COBS 7</td>
<td>Insurance mediation</td>
</tr>
<tr>
<td>COBS 8</td>
<td>Client agreements</td>
</tr>
<tr>
<td>COBS 9</td>
<td>Suitability (including basic advice)</td>
</tr>
<tr>
<td>COBS 10</td>
<td>Appropriateness (for non-advised services)</td>
</tr>
<tr>
<td>COBS 11</td>
<td>Dealing and managing</td>
</tr>
<tr>
<td></td>
<td>Investment research</td>
</tr>
<tr>
<td>COBS 13</td>
<td>Preparing product information</td>
</tr>
<tr>
<td>COBS 14</td>
<td>Providing product information to clients</td>
</tr>
<tr>
<td>COBS 15</td>
<td>Cancellation</td>
</tr>
<tr>
<td>COBS 16</td>
<td>Reporting information to clients</td>
</tr>
<tr>
<td>COBS 17</td>
<td>Claims handling for long-term care insurance</td>
</tr>
<tr>
<td>COBS 18</td>
<td>Specialist regimes</td>
</tr>
<tr>
<td>COBS 19</td>
<td>Pensions supplementary provisions</td>
</tr>
<tr>
<td>COBS 20</td>
<td>With-profits</td>
</tr>
<tr>
<td>COBS 21</td>
<td>Permitted links</td>
</tr>
<tr>
<td>COBS transchedule</td>
<td>Transitional provisions and schedules</td>
</tr>
</tbody>
</table>

CISI

Exchange-Traded Derivatives
Appendices

Candidates should access the following useful links to gain more insight into COBS.

The FCA Conduct of Business Sourcebook can be found in the FCA Handbook
www.fshandbook.info/FS/html/FCA/

In respect of Exchange Traded Commodities (ETCs)

In respect of Client Classification
media.fshandbook.info/Legislation/2012/2012_65.pdf
APPENDIX 8

Give-Up Agreements

UNIFORM BROKERAGE EXECUTION SERVICES ("GIVE-UP") AGREEMENT: TRADER VERSION

CAUTION: THIS AGREEMENT IS DESIGNED AS A BASIC DOCUMENT FOR MARKET PARTICIPANTS ENGAGING IN ‘GIVE-UP’ TRANSACTIONS. IT IS NOT INTENDED TO SERVE AS AN ALL ENCOMPASSING DOCUMENT FOR USE BY PARTIES UNDER ALL CIRCUMSTANCES. PARTIES SHOULD CAREFULLY CONSIDER THE FULL SCOPE OF REGULATORY (INCLUDING EXCHANGE) AND COMMERCIAL TERMS THAT MAY BE APPLICABLE TO THEIR PARTICULAR CIRCUMSTANCES AND MAY ELECT TO ENTER INTO MORE DETAILED CUSTOMER AGREEMENTS AT THE OUTSET OR DURING THE COURSE OF THEIR RELATIONSHIP.

Agreement made this __________ day __________ 200_ by and among

__________________________________________ ('Executing Broker').

__________________________________________ ('Clearing Broker').

__________________________________________ ('Trader on its own behalf and, if authorised, on behalf of Customer').

__________________________________________ ('Customer' if 'Trader' is not authorised to sign on behalf of 'Customer').

1. All transactions executed or cleared hereunder shall be subject to applicable laws, governmental, regulatory, self-regulatory, exchange or clearing house rules and the customs and usages of the exchange or clearing house on which they are executed and cleared, as in force from time to time ("Applicable Law"). All disputes relating to transactions executed or cleared under this Agreement shall be governed by and settled pursuant to Applicable Law and shall be subject to the jurisdiction of the exchange (and, if applicable, its clearing house) upon which the dispute arises. The parties to this Agreement shall perform their respective obligations and exercise their respective rights under this Agreement (including, but not limited to, rejecting a Customer order, calling a Customer for margin or providing any notice specified herein) using commercial reasonable judgement, in a commercially reasonable manner under the circumstances, and consistent with Applicable Law.

2. Customer Authorises Executing Broker to execute order for Customer as transmitted by Trader to Executing Broker. Executing Broker reserves the right to reject an order that Trader may transmit to Executing Broker for execution and shall promptly notify Trader of such rejection. Clearing Broker may, upon prior notice to Executing Broker and Trader, place limits or conditions on the positions it will accept for give-up for Customer’s account. In the event this Agreement is executed on behalf of Customer by Trader. Trader hereby represents and warrants that Trader is expressly authorised by Customer to enter into this Agreement on Customer’s behalf, and that this authorisation will remain effective unless Customer or Trader provides prior written notice to Executing Broker and Clearing House.
3. Unless otherwise agreed in writing, each of the parties authorises Executing Broker and Clearing Broker to use the services of one or more other persons or entities in connection with their obligations under this Agreement, provided, however, that Executing Broker and Clearing Broker remain responsible to Customer for the performance (or failure of performance) of their respective obligations and responsibilities under this Agreement.

4. Trader will be responsible for accurate placement of orders with Executing Broker. Executing Broker, and not Clearing Broker, will be responsible for determining that all orders are placed or authorised by Trader. Additionally, Executing Broker will: (a) upon placement of the order by Trader, confirm the terms of the order with Trader if customary and practicable; (b) be responsible for the accurate execution of all orders: (c) confirm the execution of such orders to Trader as soon as is practicable thereafter, and: (d) transmit such executed orders to Clearing Broker as soon as practicable, but in no event later than the period mandated by Applicable Law. Subject to Section 2 herein, Clearing Broker shall be responsible for clearing all executed orders transmitted to Clearing Broker. Unless otherwise provided by Applicable Law, none of Executing Broker, Clearing Broker or Trader shall be responsible or liable for losses or damages resulting from: (x) error, negligence or misconduct of Customer and/or exchange or clearing house: (y) failure of transmission or communication facilities: or (z) any other cause or causes beyond their control.

5. Executing Broker will, where applicable, bill commissions for executing trades, as elected in Section 12 below, on a monthly basis. Trader or Clearing Broker, as elected in Section 12 below, shall be responsible for verifying billing and making payment. Clearing Broker will, where applicable, pay floor brokerage fees, as well as any exchange or clearing house fees, incurred for all transactions executed by Executing Broker for and on behalf of Customer and subsequently accepted by Clearing Broker.

6. In the event that Trader disputes or denies knowledge of any transaction confirmed by Trader, Clearing Broker or Executing Broker shall be authorised to liquidate or otherwise offset the disputed position. Where applicable, prior notice such liquidation or offset shall be provided to the other parties to this Agreement.

7. In the event that Clearing Broker does not, for any reason, accept a trade transmitted to it by Executing Broker, Clearing Broker shall promptly notify Trader and Executing Broker of such non-acceptance, and Executing Broker, or its designated clearing broker if applicable, shall at its option be entitled:
   a. to close out Customer’s trade by such sale, purchase, disposal or other cancellation transaction as Executing Broker may determine, whether on the market, by private contract or any other appropriate method. Executing Broker shall promptly notify Trader of such close out. Any balance resulting from such close out shall be promptly settled between Executing Broker and Customer; or
   b. to transfer Customer’s trades to another clearing broker as instructed by Customer or Trader; or
   c. to clear Customer’s trade in accordance with the following terms:
      i. customer shall be fully liable for any and all obligations arising out of or related to transactions entered into or carried out in Customer’s account by Executing Broker, including but not limited to: 1) debit balances, 2) exchange or clearing house fees, and 3) brokerage, commissions and applicable fees charged by Executing Broker;
      ii. executing Broker shall have the right to call Customer for margin in such amounts, in such form, by such time and in such manner as may be required by Executing Broker. If Customer fails to meet such margin call within such specified time, or if Executing Broker, in its discretion, otherwise deems it appropriate for Executing Broker’s protection, Executing Broker may close out Customer’s trade pursuant to sub-paragraph (a) above; and
      iii. customer acknowledges that Customer’s trades may be subject to exercise or delivery assignments, where applicable.
8. Customer acknowledges that all notices and disclosures that are provided by Clearing Broker to Customer (or Customer’s representative) pursuant to Applicable Law, will be deemed, for purposes of Section 7 of this Agreement, as if received by Customer from Executing Broker as well as from Clearing Broker. Clearing Broker represents, warrants and covenants to Executing Broker that it has provided, and will provide, all required notices and disclosures and Customer (or Customer’s representative).

9. This Agreement may be terminated by any of the parties hereto upon prior written notice to the other parties. Any such termination shall have no effect upon any party’s rights and obligations arising out of transactions executed prior to such termination.

10. This Agreement shall be exclusively governed by, and construed in accordance with, the laws of _______________ without regard to principles of choice of law.

11. This Agreement shall not amend or vary any clearing agreement between clearing Broker and Customer or Executing Broker and Customer. In the event of a conflict between this Agreement and such other agreement with respect to the clearing or carrying of Customer’s trades, such other clearing agreement shall control with respect thereto.

12. Executing Broker will, where applicable, bill commission in the amount of _____________ per contract per half turn to:

[ ] Customer  [ ] Clearing Broker  [ ] Trader

Customer’s Name or Account Number:

________________________________________

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed and delivered by their respective authorised officers as of the date set forth above.

________________________________________

[Name of Trader; on its own behalf, and unless Customer [Name of Clearing Broker] signs below; as Customer’s authorised agent]

By: _________________________________

________________________________________

[Print Name and Title]

By: _________________________________

________________________________________

[Print Name and Title]

If Trader is not authorised to sign on behalf of Customer, [Name of Executing Broker]

Customer hereby consents to be bound by this Agreement.

[Name of Customer] _________________________________

By: _________________________________

________________________________________

[Print Name and Title]
International Brokerage Execution (‘Give-Up’) Agreement

CAUTION: THIS AGREEMENT IS DESIGNED AS A BASIC DOCUMENT FOR MARKET PARTICIPANTS ENGAGING IN ‘GIVE-UP’ TRANSACTIONS. IT IS NOT INTENDED TO SERVE AS AN ALL ENCOMPASSING DOCUMENT FOR USE BY PARTIES UNDER ALL CIRCUMSTANCES. PARTIES SHOULD CAREFULLY CONSIDER THE FULL SCOPE OF REGULATORY (INCLUDING EXCHANGE) AND COMMERCIAL TERMS THAT MAY BE APPLICABLE TO THEIR PARTICULAR CIRCUMSTANCES AND MAY ELECT TO ENTER INTO MORE DETAILED CUSTOMER AGREEMENTS AT THE OUTSET OR DURING THE COURSE OF THEIR RELATIONSHIP.

Agreement made this __________ day__________20XX by and among

________________________________________ (“Executing Broker”).

________________________________________ (“Clearing Broker”).

________________________________________ (“Customer”).

1. All transactions executed or cleared hereunder shall be subject to applicable laws, governmental, regulatory, self-regulatory, exchange or clearing house rules and the customs and usages of the exchange or clearing house on which they are executed and cleared, as in force from time to time (“Applicable Law”). All disputes relating to transactions executed or cleared under this Agreement shall be governed by and settled pursuant to Applicable Law and shall be subject to the jurisdiction of the exchange (and, if applicable, its clearing house) upon which this depute arises. The parties to this Agreement shall perform their respective obligations and exercise their respective rights under this Agreement (including, but not limited to, rejecting a Customer order, calling a Customer for margin or providing any notice specified herein) using commercially reasonable judgement, in a commercially reasonable manner under the circumstances, and consistent with Applicable Law.

2. Customer authorises Executing Broker to execute orders for Customer as transmitted by Customer to Executing Broker. Executing Broker reserves the right to reject an order that Customer may transmit to Executing Broker for execution and shall promptly notify Customer of any such rejection. Clearing Broker may, upon prior notice to Executing Broker and Customer, place limits or conditions on the positions it will accept for give-up for Customer’s account.

3. Unless otherwise agreed in writing, each of the parties authorises Executing Broker and Clearing Broker to use the services of one or more persons or entities in connection with their obligations under this Agreement, provided, however, that Executing Broker and Clearing Broker remain responsible to Customer for the performance (or failure of performance) of their respective obligations and responsibilities under this Agreement.

4. Customer will be responsible for accurate placement of orders with Executing Broker. Executing Broker, and not Clearing Broker, will be responsible for determining that all orders are placed or authorised by Customer. Additionally, Executing Broker will: (a) upon placement of the order by Customer, confirm the terms of the order with Customer if customary and practicable: (b) be responsible for the accurate execution of all such orders: (c) confirm the execution of such orders to Customer as soon as is practicable thereafter, and: (d) transmit such executed orders to Clearing Broker as soon as practicable, but in no event later than the period mandated by Applicable Law. Subject to Section 2 herein, Clearing Broker shall be responsible for clearing all executed orders transmitted to Clearing Broker. Unless otherwise provided by Applicable Law, neither Executing Broker nor Clearing Broker shall be responsible or liable for losses or damages resulting from: (x) error, negligence or misconduct of Customer and/or exchange or clearing house: (y) failure of transmission or communication facilities: or (z) any other cause or causes beyond their control.
5. Executing Broker will, where applicable, bill commissions for executing trades, as elected in Section 12 below, on a monthly basis. Customer or Clearing Broker, as elected in Section 12 below, shall be responsible for verifying billing and making payment. Clearing Broker will, where applicable, pay floor brokerage fees, as well as exchange or clearing house fees, incurred for all transactions executed by Executing Broker for and on behalf of Customer and subsequently accepted by Clearing Broker.

6. In the event that Customer disputes or denies knowledge of any transaction confirmed by Customer, Clearing Broker or Executing Broker shall be authorised to liquidate or otherwise offset the disputed position. Where practicable, prior notice of such liquidation or offset shall be provided to the other parties to this Agreement.

7. In the event that Clearing Broker does not, for any reason, accept trade transmitted to it by Executing Broker, Clearing Broker shall promptly notify Customer and Executing Broker of such non-acceptance, and Executing Broker, or its designated clearing broker if applicable, shall at its option be entitled:
   a. to close out Customer’s trade by such sale, purchase, disposal or other cancellation transaction as Executing Broker may determine, whether on the market, by private contract or any other appropriate method. Executing Broker shall promptly notify Customer of such close out. Any balance resulting from such close out shall be promptly settled between Executing Broker and Customer; or
   b. to transfer Customer’s trades to another clearing broker as instructed by Customer; or
   c. to clear Customer’s trade in accordance with the following terms:
      i  Customer shall be fully liable for any and all obligations arising out of or related to transactions entered into or carried out in Customer’s account by Executing Broker, including but not limited to: 1) debit balances, 2) exchange or clearing house fees, and 3) brokerage, commissions and applicable fees charged by Executing Broker;
      ii  Executing Broker shall have the right to call Customer for margin in such amounts, in such form, by time and in such manner as may be required by Executing Broker. If Customer fails to meet such margin call within such specified time, or if Executing Broker, in its discretion, otherwise deems it appropriate for Executing Broker’s protection, Executing Broker may close out Customer’s trade pursuant to sub-paragraph (a) above;
      iii  Customer acknowledges that Customer’s trades may be subject to exercise or delivery assignments, where applicable.

8. Customer acknowledges that all notices and disclosures that are provided by Clearing Broker to Customer (or Customer’s representative) pursuant to Applicable Law, will be deemed, for purposes of Section 7 of this Agreement, as if received by Customer from Executing Broker as well as from Clearing Broker. Clearing Broker represents, warrants and covenants to Executing Broker that it has provided, and will provide, all required notices and disclosures to Customer (or Customer’s representative).

9. This Agreement may be terminated by any of the parties hereto upon prior written notice to the other parties. Any such termination shall have no effect upon any party’s rights and obligations arising out of transactions executed prior to such termination.

10. This Agreement shall be exclusively governed by, and construed in accordance with, the laws of ___ without regard to principles of choice of law.
11. This Agreement shall not amend or vary any clearing agreement between Clearing Broker and Customer or Executing Broker and Customer. In the event of a conflict between this Agreement and such other clearing agreement with respect to the clearing or carrying of Customer’s trades, such other clearing agreement with control with respect thereto.

12. Executing Broker will, where applicable, bill commission in the amount of __________ per contract per half turn to:
   [ ] Customer  [ ] Clearing Broker

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed and delivered by their respective authorised officers as of the date set forth above.

[Name of Customer]
By: __________________________________________
[Print Name and Title]

[Name of Clearing Broker]
By: __________________________________________
[Print Name and Title]

[Executing Broker]
By: __________________________________________
[Print Name and Title]
APPENDIX 9

Euronext Derivatives Markets

London Notice No. 3216

Issue Date: 6 November 2009
Effective Date: 23 November 2009

Short and Medium Gilt Contracts (Exchange Contracts No. 99 and No. 100)

List of Deliverable Gilt: March 2010 and June 2010 Delivery Months

Executive Summary

This Notice advises Members of the List of Deliverable Gilts for the March 2010 and June 2010 delivery months of the Short and Medium Gilt Futures Contracts.

1. London Notice No. 3213, issued on 5 November 2009, informed Members of the launch of Short and Medium Gilt Futures Contracts, to be made available for trading on LIFFE CONNECT® on and from Monday 23 November 2009.

2. By virtue of Term 3.01 of the Contract Terms, the Board is required in respect of each delivery month of each Gilt Futures Contract, to publish on or before the tenth business day prior to the First Notice Day, a List of Deliverable Gilts which will constitute Deliverable Gilts capable of being included in a valid Seller’s Delivery Notice.

3. The March 2010 and June 2010 delivery months of the Short and Medium Gilt Futures will become available for trading on 23 November 2009. The First Notice Day of the March 2010 delivery month is 25 February 2010 and the First Notice Day of the June 2010 delivery month is 27 May 2010. For the guidance of Members and their clients, an initial list of Deliverable Gilts for the March 2010 and June 2010 delivery months accompanies this Notice.

For further information in relation to this Notice, Members should contact:

Fixed Income Derivatives +44 (0)20 7379 2222 bonds@liffe.com
### INITIAL LIST OF DELIVERABLE GILTS

**SHORT GILT CONTRACT (6% COUPON) — PRICE FACTORS AND ACCRUED INTEREST**

**DEVELORY MONTH: MARCH 2010**

<table>
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<tr>
<th>GILT ISIN CODE</th>
<th>COUPON</th>
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**Key:**
- *International Securities Identification Number

- **Price Factor:** price factor expressed as a fraction of par.
- **Daily Accrued:** accrued interest per day on £100,000 face value.
- **Initial Accrued:** accrued interest on £100,000 face value as of the last day of the month prior to the delivery month.
- **Delivery Days:** - = non business day.

**Invoicing Amount:** \((1000 \times \text{EDSP} \times \text{Price Factor}) + \text{Initial Accrued} + (\text{Daily Accrued} \times \text{Delivery Day in Month})\)

* Gilts issued subsequent to publication of this initial list and until ten business days prior to the First Notice Day that meet the contract standard will potentially be included in the final List of Deliverable Gilts.

*Issue Date: 6 November 2009*
### Exchange-Traded Derivatives

**INITIAL LIST OF DELIVERABLE GILTS**

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**Key:**
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- Delivery Days: - = non-business day.
- Invoicing Amount: $(1000 \times \text{EDSP} \times \text{Price Factor} + \text{Initial Accrued} + \text{Daily Accrued} \times \text{Delivery Day in Month})$

Gilts issued subsequent to publication of this initial list and until ten business days prior to the First Notice Day that meet the contract standard will potentially be included in the final List of Deliverable Gilts.

Issue Date: 6 November 2009

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**Note:**
- EDSP = Exchange-quoted Discounted Spot Price of the gilt.
- First Notice Day = Delivery Day - 12 days.
- Gilts included in the final list of deliverable Gilts.

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**EXCHANGE-TRADED GILTS**

### MARCH 2010

**DELIVERY MONTH: MARCH 2010**

**INITIAL LIST OF DELIVERABLE GILTS**
## INITIAL LIST OF DELIVERABLE GILTS

**SHORT GILT CONTRACT (6% COUPON) — PRICE FACTORS AND ACCRUED INTEREST**

**DELIVERY MONTH: JUNE 2010**

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<th>GILT ISIN CODE</th>
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**Key:**  
*International Securities Identification Number*

Price Factor: price factor expressed as a fraction of par.  
Daily Accrued: accrued interest per day on £100,000 face value.  
Initial Accrued: accrued interest on £100,000 face value as of the last day of the month prior to the delivery month.  
Delivery Days: - = non business day.

**Invoicing Amount:** (1000 x EDSP x Price Factor) + Initial Accrued + (Daily Accrued x Delivery Day in Month)

Gilts issued subsequent to publication of this initial list and until ten business days prior to the First Notice Day that meet the contract standard will potentially be included in the final List of Deliverable Gilts.

Issue Date: 6 November 2009
### Exchange-Traded Derivatives

**INITIAL LIST OF DELIVERABLE GILTS**

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**Key:**
- ISIN* Code: International Securities Identification Number
- COUPON: Coupon rate of the bond
- REDEMPTION DATE: Redemption date of the bond
- PRICE FACTOR: Price factor expressed as a fraction of par
- DAILY ACCRUED: Accrued interest per day on £100,000 face value
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**Issue Date:** 6 November 2009

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**Appendices**

**Exchange-Traded Derivatives**

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**Issue Date:** 6 November 2009
APPENDIX 10

CRD IV

Brussels, 20 July 2011
SEC(2011) 950 final

COMMISSION STAFF WORKING PAPER
EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

Accompanying the document
Proposal for a
REGULATION OF THE EUROPEAN PARLIAMENT AND THE COUNCIL
on prudential requirements for credit institutions and investment firms

{COM(2011) 452 final}

{SEC(2011) 949 final}
1. BACKGROUND

The extent of the financial crisis has exposed unacceptable risks pertaining to the current regulation of financial institutions. According to the IMF estimates, crisis-related losses incurred by European banks between 2007 and 2010 are close to €1 trillion or 8% of the EU GDP.

In order to restore stability in the banking sector and ensure that credit continues to flow to the real economy, both the EU and its Member States adopted a broad range of unprecedented measures with the taxpayer ultimately footing the related bill. In this context, by October 2010 the European Commission (Commission) has approved €4.6 trillion of state aid measures to financial institutions of which more than €2 trillion were effectively used in 2008 and 2009.

The level of fiscal support provided to banks needs to be matched with a robust reform addressing the regulatory shortcomings exposed during the crisis. In this regard, the Commission already proposed a number of amendments to bank regulation in October 2008 (CRD I II) and July 2009 (CRD III). The legislative package that this report accompanies contains globally developed and agreed elements of bank capital and liquidity standards known as Basel III. The Commission services actively participated in the process of their development on behalf of all EU Member States. The package is extended to include a proposal for harmonisation of other provisions of CRD with a view to deepening the Single Market and strengthening the effectiveness of supervision. This report pertains only to the assessment of impacts of the measures described below.

2. STAKEHOLDER CONSULTATION

Throughout the project the Commission services have participated in the work of international forums, particularly the Basel Committee on Banking Supervision (BCBS) that was in charge of development of new policy measures in the areas of liquidity and counterparty credit risk management, definition of regulatory capital and pro-cyclicality. The European Banking Committee and the Committee of European Banking Supervisors (CEBS) have been extensively involved and consulted throughout the project.

To support the analysis of impacts of this legislative package on the EU banking industry, the CEBS conducted a quantitative impact study. 246 banks from 21 member countries of the CEBS participated in the study, including 50 Group 1 banks and 196 Group 2 banks, together representing some 70% of the consolidated EU banking sector in terms of capital. CEBS also provided technical advice to the Commission in the area of harmonisation of national options and discretions.

The Commission services organised a public hearing in April 2010 and conducted four public consultations in 2009–11 on the policy measures comprised by the legislative package.

Responses to the consultations constitute an important source of data and stakeholder views as regards the impacts and effectiveness of potential measures. In addition, the Commission services conducted separate extensive consultations with the industry, including the Group of Experts in Banking Issues, various EU banking industry associations and individual banks.

2. Group 1 banks are those that have Tier 1 capital in excess of €3 billion, are well diversified, and are internationally active. All other banks are considered Group 2 banks.
3. PROBLEM DEFINITION

3.1 Management of Liquidity Risk

The global financial crisis has brought to light shortcomings in the current liquidity risk management of institutions, including stress testing exercises and asset and liability maturity mismatches. More specifically, existing liquidity risk management practices were shown to be inadequate in fully grasping risks linked to originate-to-distribute securitisation, use of complex financial instruments and reliance on wholesale funding with short term maturity instruments. Assumptions pertaining to asset market liquidity and interaction between market liquidity and funding liquidity turned out to have been erroneous, while behavioural aspects of financial institutions also played an immense role in the course of the crisis. These factors contributed to a demise of several financial institutions and strongly undermined the health of many others, threatening the financial stability and necessitating unprecedented levels of public sector and central bank liquidity support. Between September and December 2008, ECB loans to the euro area credit institutions increased by some 70% to over €800 billion.

While a number of Member States currently impose some form of quantitative regulatory standard for liquidity, no harmonised sufficiently explicit regulatory treatment on the appropriate levels of short-term and long-term liquidity exists at the EU level. Diversity in current national standards hampers communication between supervisory authorities and imposes additional reporting costs on cross-border institutions.

3.2 Definition of Capital

The EU banking system entered the crisis with capital of insufficient quantity and quality. More specifically, certain capital instruments and, particularly, hybrid capital instruments (hybrids), did not meet expectations of markets and regulators with regard to their loss absorption, permanence and flexibility of payments capacity on a going-concern basis. In fact, compliance of hybrids with the above three criteria in the EU was enforced by the Commission policy of ‘burden sharing’, when assessing national bank recapitalisation measures.

Also, the list of adjustments to regulatory capital proved to be incomplete as a number of balance sheet items such as minority interests and deferred tax assets, whose loss absorption potential is less certain on a going-concern basis in times of stress, have been effectively removed by market participants from capital ratios reported by institutions. Differences in application of regulatory adjustments across Member States obstructed comparability and reliability of Tier 1 capital measure. As a result, reported Tier 1 capital ratios were not reflective of institutions’ capacity to absorb mounting losses. This necessitated governments to provide support to the banking sector in many countries and on a massive scale.

4. Bear Systems, Lehman Brothers, Northern Rock, HBOS, Bradford and Bingley.
5. Hybrids are securities that contain features of both equity and debt.
6. The instrument must be available to absorb losses, both on a going-concern basis and in liquidation, and to provide support for depositors’ funds if necessary.
7. The instrument must be permanently available so that there is no doubt that it can support depositors and other creditors in times of stress.
8. The instrument must contain features permitting the non-cumulative deferral of cancellation of payment of coupons or dividends in times of stress.
3.3 Counterparty Credit Risk

The crisis revealed a number of shortcomings in the current regulatory treatment of counterparty credit risk arising from derivatives, repo and securities financing activities. It showed that the existing provisions did not ensure appropriate management and adequate capitalisation of this type of risk. The current rules also did not provide sufficient incentives to move bilaterally cleared OTC derivative contracts to multilateral clearing through central counterparties.

3.4 Pro-Cyclicality of Lending

Pro-cyclical effects are defined as those which tend to follow the direction of and amplify the economic cycle. The cyclical nature of bank lending has a number of interconnected sources that include both market and regulatory failures.

One feature of current risk-based minimum capital requirements is that they vary over the economic cycle. Provided that credit institutions and investment firms could meet them, there is no explicit regulatory constraint on the amount of risk they can take on and hence on their leverage. The lack of such constraint and irresponsiveness of capital requirements to the build-up of risk at the macro level led to an accumulation of financial imbalances which precipitated steep credit-related losses and, once the economic cycle turned, prompted a damaging de-leveraging spiral.

3.5 Options, Discretions and Minimum Harmonisation

In 2000, seven banking directives were replaced by the Consolidated Banking Directive. This directive was recast in 2006 with the CRD, while introducing the Basel II framework in the EU. As a result, CRD provisions include a significant number of options and discretions. CRD is also a ‘minimum harmonisation’ directive which means that Member States may add stricter prudential rules, which gives rise to practice known as ‘gold-plating’.

As a result, there is a high level of divergence in how the rules are implemented by MSs and subsequently applied by the national supervisory authorities which is particularly burdensome for firms operating cross-border. It also gives rise to the lack of legal clarity and an uneven playing field.

9. The risk that the counterparty to a transaction could default before the final settlement of the transaction cash flows.

10. In a repo (repurchase agreement) contract, the borrower agrees to sell a security to a lender and to buy the same security from the same lender at a fixed price at some later date.

11. While the rationale behind a repo contract is borrowing or lending of cash, in securities financing, the purpose is to temporarily obtain a security for other purposes such as covering short positions.

12. An entity that interposes itself between counterparties to contracts traded within one or more financial markets, becoming the buyer to every seller and the seller to every buyer.

13. A choice given to competent authorities or MSs on how to comply with a given provision, selecting from a range of alternatives.

14. A choice given to competent authorities or MSs as to whether apply a given provision.
4. **OBJECTIVES**

The overarching goal of this initiative is to ensure that the effectiveness of bank capital and liquidity regulation in the EU is strengthened and its adverse impacts on confidence in banks and pro-cyclicality of the financial system are contained, while maintaining the competitive position of the EU banking industry. This translates into the following four general policy objectives to:

- enhance the financial stability;
- enhance safeguarding of depositors’ interests;
- ensure international competitiveness of the EU banking sector;
- reduce pro-cyclicality of the financial system.

5. **POLICY OPTIONS: ANALYSIS AND COMPARISON**

Altogether, 27 policy options have been assessed and compared with a view to addressing the various issues identified. This section presents expected impacts of policy measures in each area as well as cumulative impacts of the entire proposal.

5.1 **Liquidity Risk**

To improve short-term resilience of the liquidity risk profile of financial institutions, a Liquidity Coverage Ratio (LCR) will be introduced from 2015, after an observation period and a review to apply any necessary refinements to both its composition and calibration and to check for any undesired impacts on the industry, financial markets and the economy. Based on the LCR definition included in Basel III, compliance with this requirement in the EU in the long run will produce net annual GDP benefits in the range of 0.1% to 0.5%, due to a reduction in the expected frequency of systemic crises.

To address funding problems arising from asset-liability maturity mismatch, the Commission considers introducing a Net Stable Funding Ration (NSFR). Before deciding on its final calibration and moving it to a minimum standard as 2018, extensive monitoring of the NSFR and its implications will be conducted.

5.2 **Definition of Capital**

The proposals tighten criteria for eligibility of capital instruments for the different layers of regulatory capital and make extensive revisions to the application of regulatory adjustments. For Group 1 banks, revised regulatory adjustments reduce eligible common equity Tier 1 (CET1) capital by 42% and that of Group 2 banks by 33%. These reductions are driven by adjustments for good will, material investments in other financial institutions and deferred tax assets.

The new CET1 and Tier 1 minimum requirements will be implemented gradually from 2013 and by 2015 will reach 4.5% and 6%, respectively. Revisions to regulatory adjustments will be introduced in 2014–19. Grandfathering provisions for capital instruments that no longer meet the new eligibility requirements are also foreseen.

5.3 **Counterparty Credit Risk**

Requirements for management and capitalisation of the counterparty credit risk will be strengthened. The proposals will also enhance incentives for clearing over-the-counter instruments through central counterparties. These proposals are expected to affect mostly the largest EU banks.
The review of the treatment of counterparty credit risk, and in particular putting in place higher own funds requirements for bilateral derivative contracts in order to reflect the higher risk that such contracts pose to the financial system, forms an integral part of the Commission’s efforts to ensure efficient, safe and sound derivatives markets. It complements the Commission’s other regulatory initiatives in this area, in particular the proposed Regulation on OTC derivatives, central counterparties and trade repositories, adopted by the Commission on 15 September 2010.

5.4 Countercyclical Policy Measures

Proposals for capital buffers comprise a capital conservation buffer and a countercyclical capital buffer. The (CET10) capital conservation buffer of 2.5% of risk-weighted assets (RWAs) is aimed at ensuring banks’ capacity to absorb losses in stressed periods that may span a number of years. Banks will be expected to build up such capital in good economic times. Those banks that fall below the buffer target will face constraints on discretionary distributions of earnings (ie, dividend payments) until the target is reached.

The countercyclical capital buffer is intended to achieve the broader macro-prudential goal of protecting the banking sector and the real economy from the system-wide risks stemming from the boom-bust evolution in aggregate credit growth. It will be applied by adjusting the size of the buffer range established by the conservation buffer by an additional 2.5%.

In order to limit an excessive build-up of leverage on credit institutions’ and investment firms’ balance sheets and thus help contain the cyclicity of lending, the Commission also proposes to introduce, as an element of the supervisory review, a non-risk based leverage ratio. Implications of the ratio will be monitored prior to it possibly becoming a generally binding requirement on 1 January 2018.

5.5 Single Rule Book

The proposals harmonise divergent national supervisory approaches by removing options and discretions. Some specific areas, where gold-plating is driven by risk assessment considerations, market or product specifications and Member States legal framework, remain exempted.

5.6 Cumulative Impact of the Package

To supplement their own assessment of the impact of Basel III, the Commission reviewed a number of studies prepared by both public and private sectors.

This package and CRD III together are estimated to increase the RWAs of Group 1 banks by 24.5% and the RWAs of Group 2 banks by a modest 4.1%. The extent of CET1 shortfall to meet the new minimum requirement and the conservation buffer, based on the EU bank capital levels in 2009 is estimated to be immaterial by 2013, at €84 billion by 2015 and €460 billion by 2019, equivalent to 2.9% of the banking sector’s RWAs.

15. Of this figure, €37 billion (measured in Tier 1 capital) is attributable to CRD III proposal.
To give banks time to retain more of their profits, improve operational efficiency, issue new equity and take other necessary steps to adjust, the new capital requirements entail an eight-year transition period. Based on analyses of the Basel Committee, the ECB, and the Commission services, transition to stronger capital and liquidity standards will have only a limited impact on the aggregate output.

In terms of long-term economic impact, analysis conducted by the Basel Committee found clear net long-term economic benefits in Basel III. This analysis implies net economic benefits of an annual increase in the EU GDP in the range of 0.3%–2%. They stem from a reduction in the expected frequency of future systemic crises and are optimised when CET1 is calibrated in the range of 6% to 9%.

Another model developed by the Commission and academics found that the proposals will reduce the probability of a systemic banking crisis in seven Member States within the range of 29% to 89% when banks recapitalise to a total capital ratio of at least 10.5%.

In addition, analysis of the Basel Committee showed that higher capital, including the countercyclical capital buffer, and liquidity requirements should also reduce the amplitude of normal business cycles. This is particularly relevant to SMEs who are dependent on bank financing throughout the economic cycle.

6. MONITORING AND EVALUATION

Measuring the progress of reaching specific policy objectives will be aided by the working groups of the Basel Committee and the European Banking Authority (EBA), that monitor the dynamics of bank capital positions, globally and in the EU, respectively. Special arrangements will be put in place by the EBA to ensure that necessary data for monitoring of leverage ratio and the new liquidity requirements are collected to allow for the finalisation of these policy measures in due time.
Financial Conduct Authority

Capital Requirements Directive

<table>
<thead>
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<th>Name</th>
<th>Number</th>
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<tr>
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<td><a href="http://www.fca.org.uk/about/what/international/basel">http://www.fca.org.uk/about/what/international/basel</a></td>
</tr>
</tbody>
</table>

Status

The CRD was formally adopted on 14 June 2006 and subsequently published in the Official Journal (L177/201) on 30 June 2006. It has since been amended a number of times.

CRD II

This amendment of the CRD was, in part, a response to the recommendations of the G–7 Financial Stability Forum (FSF) and the market crisis. The content of CRD II covered (i) large exposures, (ii) hybrid capital instruments, (iii) supervisory arrangements (colleges), (iv) liquidity risk management, (v) securitisation, (vi) the waivers for banks organised in networks and (vi) adjustments to certain technical provisions.

The final text was published in the Official Journal on 17 November 2009, and was implemented on 31 December 2010.

CRD III

Consistent with the parallel work undertaken by the Basel Committee on Banking Standards (BCBS or ‘Basel’), the Commission consulted and issued proposals, in July 2009, on amendments to the trading book (stressed VaR, incremental risk charge), re-securitisation, remuneration, and Basel 1 floors as part of the CRD III package. Further technical amendments also arose from the on-going work of the CRD-TG. After going through the Council, the compromise text went to the European Parliament. The final text was published in the Official Journal on 14 December 2010, and was implemented on 31 December 2011¹.

CRD IV

The latest set of amendments, CRD IV, sets out to implement the Basel III agreement and build on the lessons learnt from the recent crisis.

¹ Some elements of CRD3 were implemented earlier in 2011.
The Commission’s legislative proposal was published on 20 July 2011, consisting of two separate legislative instruments; a Regulation (CRR) and a Directive (CRDIV). Most of the reformed Pillar 1 requirements for calculating capital requirements and resources are set out in the Regulation and will be directly applicable to all co-operation and information sharing, enhanced Pillar 2 and Pillar 3, as well as for the Basel capital buffers.


The original proposed deadline of 1 January 2013 for entry into force of the draft EU legislation to update the framework for capital requirements, known as CRD IV, has now passed. No alternative date has yet been communicated by the EU institutions.

**UK implementation details**

The CRD has been implemented in the UK. The (2008) CRD II amendments package was transposed on 31 October 2010 and was implemented on 31 December 2010. The CRD III amendments were published on 14 December 2010, with differing implementation deadlines; parts of CRD III, relating to the extension of the floors, remuneration principles and several technical adjustments, became effective on 1 January 2011; the changes in the market risk framework and on (re)securitisations entered into force on 31 December 2011.

Change to the FCA and the PRA rules will be required to implement the CRD IV Directive changes, and rules may need to be removed or modified if they conflict with the Regulation.

The FCA and the PRA public material will follow in 2013, subject to finalisation of the text and the implementation deadline.

**External**

The FCA is working closely with HMT and the Bank of England.

**Background to Directive**

The original Basel Accord was agreed in 1988 by the Basel Committee on Banking Supervision and implemented in the EC by the Banking Consolidation Directive (BCD) (200/12/EC) and the Capital Adequacy Directive (CAD) 93/6/EEC. Basel II updated the existing Basel framework and the CRD amended the BCD & CAD for EU implementation. Basel III seeks to introduce major strengthening in response to the turmoil experienced in the banking markets.
Appendices

### Purpose of Directive

The first CRD incorporated revised forms of both the Capital Adequacy Directive and the Banking Consolidation Directive. It implemented the revised Basel capital adequacy framework (Basel II) and applied it to all credit institutions – essentially banks, buildings societies and some investment firms.

The aim of the CRD is to reduce the probability of consumer loss or market disruption as a result of prudential failure. It does this by seeking to ensure that the financial resources held by a firm are commensurate with the risks associated with its business profile and control environment. The various amendments packages from the Commission attempt to strengthen the prudential framework for individual institutions and provide responses to financial stability concerns that arose during the banking crisis.

### Key provisions

The CRD framework consists of three ‘pillars’.

**Pillar 1** – sets out the minimum capital requirements that firms are required to meet for credit, market and operational risk.

**Pillar 2** – requires firms and supervisors to take a view on whether a firm needs to hold additional capital against risks not adequately covered in Pillar 1 and to take action accordingly.

**Pillar 3** – requires firms to publish certain details of their risks, capital and risk management, in order to improve market discipline.

All firms were required to adopt the CRD (based on the Basel II framework) from 1 January 2007. At that point firms had to apply Pillars 2 and 3 but had a number of options relating to Pillar 1; for operational risk they could choose either the basic indicator or the standardised approach; with respect to credit risk, they could choose between the standardised approach, the Foundation Internal Ratings Based Approach and the Retail Internal Ratings Based Approach. In addition, firms could opt to move straight to the revised standardised approach for credit risk under the Basel II/CRD or remain on Basel I until 1 January 2008. From this date, the Basel I method became invalid, and all firms had to apply one of the standardised, the foundation or the advanced Internal Ratings Based Approaches for credit risk, and one of the Basic Indicator Approach, the Standardised Approach or the Advanced Measurement Approach for operational risk.

The (2008 or CRD II) amendments to the CRD included: (i) large exposures; (ii) hybrid capital instruments; (iii) supervisory arrangements (colleges); (iv) liquidity risk management; (v) securitisations; (vi) the waivers for banks organised in networks; and (vii) adjustments to certain technical provisions.

The CRD III amendments to the CRD include (i) trading book; (ii) resecuritisation; (iii) remuneration; (iv) pillar 2; (v) pillar 3 and (vi) adjustments to certain technical provisions.

The CRD IV amendments package is currently being negotiated. It includes: (i) liquidity standards; (ii) definition of capital; (iii) leverage ratio; (iv) capital buffers; (v) counterparty credit risk; and (vi) creating a Single Rule Book for banking (including the removal of national options and discretions and maximum harmonisation).
### Consultation

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<tr>
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<th>Consulting details</th>
<th>Deadline</th>
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### Original Table

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<th>Achieved/[Planned]</th>
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### CRD IV

#### Formulation of proposal
- Commission’s draft proposal: 21 July 2011

### COREPER

- Council working group meetings: November 2011 – Ongoing [at January 2012]
- Council decision: [End-Summer 2012]

### General conditions for political agreement

#### Parliament’s opinion on common position (first and final reading)
- Plenary vote: [ ]
- Council: [ ]
- Agreement on adoption (informal adoption): [ ]

### Approval

- Publication in the Official Journal: 30 June 2006
- (Finalising level 2 measures): None
- UK Authorities’ implementation: 1 January 2013
- Industry implementation: Same as authorities’ implementation date

### Commentary

#### CRD II amendments (2008):
- Transposition date: 31 October 2010
- Implementation date: 31 December 2010

#### CRD III amendments (2009):
- Transposition date: 31 December 2011
- Implementation date: 31 December 2011

#### CRD IV dates
- Implementation by 1 January 2013, with some changes phased in over the following years.
## EU institution’s meetings

<table>
<thead>
<tr>
<th>EU institution</th>
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<th>Date</th>
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<tbody>
<tr>
<td>Council</td>
<td>CRDIV Working Group Discussions commence</td>
<td>November 2011 – ongoing</td>
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## Internal contacts

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<tr>
<th>PRA Lead</th>
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<th>GCD Lead</th>
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<tr>
<td>Russell Jackson</td>
<td>Ed Forshaw</td>
<td>Carlos Echave</td>
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<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Paul Rich</td>
<td></td>
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</tbody>
</table>
CBOE BINARY OPTIONS

Description:
CBOE Binary Options are contracts that have an ‘all-or-nothing’ payout depending on the settlement price of the underlying broad-based index relative to the strike price of the binary option.

Binary Call Options are either 1. a fixed cash settlement amount, if the underlying index settles at or above the strike price at expiration; or 2. nothing at all, if the underlying index settles below the strike price at expiration. Binary Put Options pay either 1. a fixed cash settlement amount, if the underlying index settles below the strike price at expiration; or 2. nothing at all, if the underlying index settles at or above the strike price at expiration.

Underlying:
S&P 500 Index (S&P)

Symbols:
BSZ

Multiplier:
$100

Strike Price Intervals:
Strike prices may be listed with a minimum interval of 5 points.

Strike (Exercise) Prices:
In-, at- and out-of-the-money strike prices are initially listed. New strikes may be added as the underlying index moves up or down and upon request.

Premium Quotation:
Bids or offers will be expressed in pennies, and will range from 0.00 to 1.00. The total value of S&P 500 Binary Options will be the bid/offer multiplied by the contract multiplier. The minimum tick for S&P 500 Binary Options will be 0.01 ($1.00).

Expiration Date:
Generally, the Saturday following the third Friday of the expiration month.

Expiration Months:
Initially, only three (3) consecutive near-term contract months will be listed.
Exercise Style:
European – S&P 500 Binary Options may be exercised only on the last business day prior to expiration. Writers are subject to assignment only at expiration. Automatic exercise for S&P 500 Binary Call Options occurs if the exercise-settlement value of the S&P 500 Index equals or exceeds the S&P 500 Binary Call Options strike price.

Last Trading Day:
The business day (usually a Thursday) preceding the day on which the exercise-settlement value for S&P 500 Binary Options is calculated.

Settlement Value:
The exercise-settlement value for S&P 500 Binary Options will be the same as the exercise-settlement value (‘SET’) for S&P 500 Index Options. SET is calculated using the opening reported sales price in the primary market of each component stock on the last business day (usually a Friday) before the expiration date.

The exercise-settlement amount for S&P 500 Binary Call Options will be 1. $100, if SET is equal to or greater than the S&P 500 Binary Call Option strike price; or 2. $0, if SET is less than the S&P 500 Binary Call Option strike price.

Position Limits:
The position limit for S&P 500 Binary Options is 1,500,000 contracts on the same side of the market.

Margin:
Purchases of S&P 500 Binary Options must be paid for in full. Customer margin for uncovered writers is the difference between the fixed cash settlement amount and the proceeds received from the sale of the S&P 500 Binary Option.

Trading Hours:
8.30am to 3.15pm Central Time (Chicago time).
APPENDIX 12

EEX PRODUCT BROCHURE
EU EMISSION ALLOWANCES

Datum/Date: 14.03.11
Ort/Place: Leipzig
Dokumentversion/Document Release: 0003A

PRELIMINARY REMARKS

This document is an introduction to trading in EU emission allowances (EUA) on the European Energy Exchange, hereafter referred to as EEX. Its aim is to provide information on trading in EU emission allowances on the EEX Spot and Derivatives Market to potential trading participants. EEX hereby points out that this document is subject to change. The provisions in the Exchange Rules, the EEX Trading Conditions, the Contract Specifications, the OTC Clearing Conditions, the Examination Regulations and the Clearing Conditions of European Commodity Clearing AG (ECC) shall be applicable. Moreover, EEX reserves the right to amend this document at any time without providing explicit information with regard to this.

EMISSIONS TRADING ON THE EEX SPOT MARKET

Introduction regarding Spot Contracts

On EEX, spot contracts regarding EU emission allowances for greenhouse gases can be traded. Specifically, these are EU emission allowances which are allocated to the operators of plants emitting greenhouse gases by the EU member states on the basis of so-called national allocation plans or which are sold on the exchange via banks. One EU emission allowance (or EUA) grants the owner of a plant in an EU member state the right to emit one tonne of CO2 or CO2 equivalent during the so-called second EU commitment period (2008–12). Other greenhouse gases, such as, eg, methane, are also included in the EU emission allowances. They are converted into CO2 equivalents according to their impact on the greenhouse effect. According to the EU emission legislation, EU emission allowances can be transferred.
Appendices

On the EEX Spot Market both exchange trading in EU emission allowances and the registration of transactions concluded off the exchange for OTC clearing are possible. Detailed information on OTC clearing is provided in the brochure *Introduction to Exchange Trading on EEX*.

**Contract Specifications for Spot Contracts on EU Emission Allowances**

**Second trading in EU emission allowances in continuous trading**

<table>
<thead>
<tr>
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<th>Description</th>
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</table>

**Contract volume and quotation**

Spot contracts in EU emission allowances have a contract volume of 1 EUA and are traded in EUR per EUA with two digits after the decimal point. The minimum price change amounts to EUR 0.01 per EUA.

**Purchase of EU emission allowances**

Upon the payment of the purchase price the buyer of an EEX spot contract acquires the corresponding shares in the total stock of EUA carried in the account of EEX AG at the register authority.

At any time, however, at the latest by 31 March of the year following the end of a commitment period, every co-owner of the total stock of EUA in the register account of ECC AG is entitled to request ECC AG to transfer its EUA to an account specified by the trading participant at a suitable national register on the ECC AG business day following such request.

**Sale of EU emission allowances**

On the delivery day, the seller of an EEX spot contract regarding EUA transfers its corresponding shares in the total stock which is carried in the account of ECC AG kept at the register authority.

Sales are only permissible provided the seller has a sufficient stock of EU emission allowances in its internal delivery account at ECC. In the event that short sales which are inadmissible in this way are carried out, EEX reserves the right to have such position closed out on a compulsory basis upon a request by the clearing house ECC.

**Fulfilment**

Fulfilment is effected by means of the transfer of the EUA within the internal asset accounts of the trading participants and by means of the change in the share in the total stock of the account of ECC AG kept in trust at the register authority which is associated with such transfer.
Primary allocation of EU emission allowances in the auction

This auction is a primary market auction for European emission allowances (EUA) in Germany on behalf of the Federal Ministry for the Environment which is carried out by the European Energy Exchange.

On the Spot Market, 300,000 certificates are auctioned off on the Xetra trading system every week from January to October. From November 2010 the entire weekly volume of 870,000 certificates is auctioned off on the Spot Market.

Products

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<tr>
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</table>

Contract volume and quotation

Spot contracts on EU emission allowances have a contract volume of 1 EUA and are traded in EUR per EUA with two digits after the decimal point. The minimum price change amounts to EUR per 0.01 per EUA.

Black box auction

The auction is carried out as a black box auction. This means that, during the auction, neither an indicative auction price nor an indicative auction quantity is displayed.

The orders entered into the trading system are subject to the price-time priority in their execution. This means that those orders which have a better execution price are executed first and that, if the price is the same, those orders which were entered into the system at an earlier time are carried out first.

Auction time period

The call phase takes place on Tuesdays between 09:00am and 11:00am CET. The auction is carried out at 11:00am CET. The results are published at approx 11:01am CET.

The exact auction dates are provided in the auction calendar attached. The auction calendar is provided on the website of the European Energy Exchange at the following link: eex.com/en/Product Fees/EUA Primary Market Auction.

Procedure for the determination of the daily settlement price

On the EEX Derivatives Market a settlement price is established on every exchange trading day. The settlement price is established after the end of trading on every exchange trading day. The order book situation at the end of the trading day concerned is decisive for the determination of the settlement price.

The principles and parameters to be applied with regard to this are described separately in the documentation Procedure for the Determination of Settlement Prices at eex.com/de/Downloads/Documentation/Concepts_and_Descriptions.
Carbon Index (Carbix)

The Carbix is a Spot Market price which is established in an intra-day auction at 10:30am on every exchange trading day.

Determination

In the auction prices are determined according to the principle of the most executable volume. In the event of a crossed order book, the price at which the biggest possible quantity can be executed with the least possible backlog at the same time is established as the auction price. A crossed order book arises whenever there are matching executable buy and sell orders. In this context, the orders entered into the trading system are subject to the price-time priority in their execution. This means that those orders which have a better execution price are executed first and that, if the price is the same, those orders which are entered into the system at an earlier time are carried out first.

In the event that an auction price cannot be established because there are no matching executable sell or buy orders in the order book, the Carbix corresponds to the mean of the best buy order and the best sell order at the end of the call phase. If there are no orders in the order book at the time of the call phase or if the Carbix cannot be established on the basis of the intra-day auction or the order book situation for other reasons, the Carbix is determined on the basis of a survey among the trading participants.

EMISSIONS TRADING ON THE EEX DERIVATIVES MARKET

Introduction regarding Derivative Contracts

On the EEX Derivatives Market both exchange trading in futures on EU emission allowances and the registration of transactions in futures on EU emission allowances concluded off the exchange for OTC clearing are possible.

The following futures on EU emission allowances can be treated on the EEX Derivative Market:

- European Carbon Futures
- CER Futures

In the case of European Carbon Futures, the buyer and the seller agree upon the conclusion of the transactions that EU emission allowances will be delivered and/or paid in a certain quantity at the price agreed on at a certain time in the future.

In the case of CER Futures, the buyer and the seller agree upon the conclusion of the transaction that Certified Emission Reductions will be delivered and/or paid in a certain quantity at the price agreed on at a certain time in the future. The Certified Emission Reductions correspond to one tonne of carbon dioxide equivalent each.

The product properties are described below.
Contract Specifications for Derivatives Contracts on EU Emission Allowances

Secondary trading in EU emission allowances in continuous trading

The object of the contract of the European Carbon Futures comprises the delivery and/or purchase of EU emission allowances for the five-year period beginning on 1 January 2008 (Second Period European Carbon Futures) and all following periods.

One EU emission allowance confers the right to emit one tonne carbon dioxide or one tonne of carbon dioxide equivalent. Emission reduction units (ERU) and certified emission reductions (CER) do not constitute EU emission allowances.

Products

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<tr>
<th>Ticket symbol</th>
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Contract volume

The contract volume specifies the number of EU emission allowances of the delivery on which a futures contract is based. The contract volume comprises 1,000 EUA.

Quotation

Prices for a futures contract are specified in EUR per EUA with two digits after the decimal point so that the smallest price change in a contract amounts to EUR 10.00 (EUR 0.01 per EUA x 1,000 t CO₂).

Last day trading

The respective last exchange trading in November of the years 2008 through to 2012 constitutes the last trading day for F2PE.

The last trading day for FEUA occurs in mid-December of any given year on the day on which futures on EU emission allowances usually expire on the market. The last trading day for every contract is announced by the Management Board of the Exchange at the latest upon the introduction of the maturity.

Tradeable maturities

In the case of Second Period European Carbon Future (F2PE), futures contracts with maturities in December 2011 and December 2012 can be traded.

The European Carbon Future (FEUA) reaches maturity in December; at maximum five maturities can be traded. The exact number of the tradeable maturities is specified by the Management Board of the Exchange.
Final settlement price

The settlement price on the last day of trading is referred to as the final settlement price.

The final settlement price constitutes the basis for the settlement of the delivery of EU emission allowances upon maturity of a futures contract and is established by EEX. It corresponds to the settlement price of the respective futures contract on the last of trading.

Primary allocation of EU emission allowances in the auction

This auction is a primary market auction for European emission allowances (EUA) in Germany on behalf of the Federal Ministry for the Environment which is carried out by the European Energy Exchange.

On the Derivatives Market, 570,000 certificates are auctioned off on the EUREX trading system every week from January to October.

Products

<table>
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<tr>
<th>Ticket symbol</th>
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Contract volume

The contract volume specifies the number of EU emission allowances of the delivery on which a futures contract is based. The contract volume comprises 1,000 EUA is specified in EUR per EUA with two digits after the decimal point so that the smallest price change for a contract amounts to EUR 10.00 (EUR 0.01 per EUA x 1,000 t CO₂).

On the Derivatives Market, 570,000 tonnes are auctioned off per auction. This is a so-called ‘all-or-nothing’ auction, which means that the total quantity has to be sold in every auction in order to carry out a valid auction. The bid volume amounts to at least 1,000 tonnes or an integer multiple thereof.

Expiry

19 December 2011 is the last trading day for the F2EA DEC11 and 17 December 2012 is the last trading day for F2EA DEC12.

Tradeable maturities

The Future auction contract with the expiry December 2011 is tradable from 1 January 2011 to the end of October and with the expiry December 2012 it is tradable from 1 January 2012 to the end of October.

Black box auction

The auction is carried out as a black box auction. This means that, during the auction, neither an indicative auction price nor an indicative auction quantity is displayed. The orders entered into the trading system are subject to the price-time priority in their execution.
Appendices

Auction time period
The call phase takes place on Wednesday between 01:00pm and 03:00pm CET. The auction is carried out at 01:00pm CET. The results are published at approx 03:01pm CET.

The exact auction dates are provided in the auction calendar attached. The auction calendar is provided on the website of the European Energy Exchange at the following link: eex.com/de/Downloads/Documentation/Concepts_and_Descriptions.

Final settlement price
The settlement price on the last day of trading is referred to as the final settlement price.

The final settlement price constitutes the basis for the settlement of the delivery of EU emission allowances upon maturity of a futures contract and is established by EEX. It corresponds to the settlement price of the respective futures contract on the last day of trading.

Procedure for the determination of the daily settlement price
On the EEX Derivatives Market a settlement price is established on every exchange trading day. The settlement price is established after the end of trading on every exchange trading day. The order book situation at the end of the trading day concerned is decisive for the determination of the settlement price.

The principles and parameters to be applied with regard to this are described separately in the documentation Procedure for the Documentation of Settlement Prices at: eex.com/de/Downloads/Documentation/Concepts_and_Descriptions.

Contract Specifications for Derivatives Contracts on Certified Emission Reductions
The object of the contract of CER futures is the delivery and/or purchase of certified emission reductions from bilateral projects within the meaning of Art. 12 of the Kyoto Protocol and of the decisions on the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) valid at the respective time of delivery which correspond to one tonne of carbon dioxide equivalent.

Certified emission reductions which were generated from nuclear power projects, from land use and land use change projects as well as reforestation projects (LUCUCF projects) and hydroelectric power projects with a generation capacity of more than 20 MW are exempt from this.

Products

<table>
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<th>Ticket symbol</th>
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<td>A0SYUY</td>
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</table>
Appendices

Contract volume
The contract volume specifies the number of CERs of the delivery on which a futures contract is based. The contract volume comprises 1,000 CER.

Quotation
Prices for a futures contract are specified in EUR per CER with two digits after the decimal point so that the smallest price change for a given contract amounts to EUR 10.00 (EUR 0.01 per CER x 1,000 t CER).

Last day trading
The last day of trading for CER-Futures EarlyDec (FCER) is the respective last exchange trading day in November.

The last trading day for CER-Futures MidDec (F2CR) occurs in mid-December of any given year on the day on which futures on EU emission allowances usually expire on the market. The last trading day for every contract is announced by the Management Board of the Exchange at the latest upon the introduction of the maturity.

Tradeable maturities
A CER-Future reaches maturity in December; at maximum five maturities can be traded. The exact number of tradeable maturities is announced by the Management Board of the Exchange.

Final settlement price
The settlement price on the last day of trading is referred to as the final settlement price.

The final settlement price forms the basis for the settlement of the delivery of CER upon maturity of a futures contract and is established by EEX. It corresponds to the settlement price of the respective futures contract on the last trading day.

Procedure for the determination of the daily settlement price
On the EEX Derivatives Market a settlement price is established on every exchange trading day. The settlement price is established after the end of trading on every exchange trading day. The order book situation at the end of the trading day concerned is decisive for the determination of the settlement price.

The principles and parameters to be applied with regard to this are described separately in the documentation Procedure for the Documentation of Settlement Prices at: eex.com/de/Downloads/Documentation/Concepts_and_Descriptions.
CLEARING AND SETTLEMENT

Clearing structure
ECC accedes to all transactions as the central contractual partner (central counterparty) and, hence, assumes the counterparty risk. The clearing structure consists of the central counterparty ECC and several banks, the clearing members.

In the context of this structure, the trading participants settle their transactions with a clearing member of their choice, while the clearing members in turn settle these transactions with ECC. The trading participants have to deposit securities with their clearing member for liabilities entered into under transactions and the clearing members, in turn, have to deposit these with ECC. This structure safeguards the fulfilment of all transactions.

Settlement

Settlement of Spot and Derivatives Market transactions
Exchange transactions regarding EU emission allowances are settled by transferring the EU emission allowances between the seller and the buyer on internal ECC asset accounts for EU emission allowances and/or CERs and by means of the payment of money from the buyer to the seller.

Exchange transactions regarding EU emission allowances and/or regarding CERs are considered settled physically as soon as ECC has transferred the number of EU emission allowances and/or CERs, which is established for every trading participant as the balance on the basis of all the buy and sell transactions of a given trading participant regarding Spot and Derivatives Market contracts on EU emission allowances, which have reached maturity, for an exchange trading day, between the asset accounts of ECC and of the clearing members. In this case, the clearing members have the function of a recording centre for their trading participants and record this number of EU emission allowances with the trading participants through accounts and/or portfolios agreed on between the clearing member and the trading participant. The EU emission allowances are entered on the settlement day after the conclusion and/or after expiry of the futures contracts.

The exchange transactions are considered settled financially as soon as the amounts of the money which are established as the balance for every trading participant from all purchases and sales from spot contracts and derivatives market contracts which have reached maturity, for one exchange trading day, have been settled between the ECC account at the German Central Bank and the accounts of the clearing members kept at the German Central Bank. These amounts of money are settled between ECC and the clearing members on the settlement day after the conclusion of the transaction or after expiry of the futures contracts.

On every day EEX specifies a settlement price in line with the current market price of a given futures contract, which is specified by ECC, for every futures contract. The change in the value of the futures position which results from the change in the settlement price between the last and the current exchange trading day is credited to the trading participant in cash or debited in cash (Variation Margin). In this context, the value of a futures position is calculated from the product of 'contracts x contract volume x settlement price'.
Internal accounts for EU emission allowances

The stocks of the EU emission allowances and the CERs are kept by so-called national registers. This inventory management also includes the issue of the EU emission allowances and/or CERs as well as their deletion in return for emissions which have taken place. For the purpose of inventory management the national registers establish accounts for plant operators and others. ECC also has such an account at the German register, the German Emissions Trading Authority (DEHSt) at the Federal Environment Agency. In addition to this collective account which is used for fiduciary safekeeping, ECC and the clearing members also keep internal accounts (and/or portfolios) for inventory management of the EU emission allowances kept in the collective account. ECC keeps these accounts for the clearing members, and the clearing members in turn keep these internal accounts (and/or portfolios) for their affiliated trading participants (non-clearing members).

The EU emission allowances and/or CERs are delivered on the settlement day after the conclusion of the transaction, and/or after the last trading day of a futures contract. EU emission allowances and/or CERs, which are entered in the ECC account kept in trust at the German register (DEHSt), are delivered.

Settlement is effected by retransferring the EU emission allowances in the internal stock accounts of ECC and by means of the change in the share in the total stock in the ECC account kept in trust at DEHSt, associated with this.

On the day of the delivery, the buyer of EU emission allowances purchases the corresponding shares in the total stock of the EU emission allowances and/or CERs, which are entered in the ECC account at DEHSt, upon the payment of the purchase price.

On the day of the delivery, the seller of the EU emission allowances transfers his corresponding shares in the total stock entered in the ECC account at DEHSt.

Submission of EU emission allowances and CERs

A trading participant can submit EU emission allowances and CERs into fiduciary safekeeping of ECC by transferring a corresponding number of the respective contracts to the collective account of ECC at DEHSt. EU emission allowances and CERs can also be sold without prior submission; said submission has to be effected by the time of the fulfilment. An adjustment of the inventories is possible at any time.

Return of EU emission allowances and CERs

As a co-owner in the total stock of EU emission allowances in the account of ECC at DEHSt, every trading participant is entitled to request ECC at any time to effect the transfer to any account specified by the trading participant at a suitable national register on the business day following the request (however, at the latest by 31 March 2013 for EU emission allowances for the five-year period beginning on 1 January 2008).

Every co-owner in the total stock of CER in the register account of ECC AG is entitled to request ECC AG at any time to transfer its CER to an account specified by the trading participant at a suitable national register authority on the first business day of ECC AG after the request.
Margins for Transactions on the EEX Spot Market and after the Expiry of the Futures Positions

Initial Margin

The Initial Margin is used to cover intraday risks arising from payment obligations in Spot Market transactions for the delivery of power, natural gas and emission rights. Subject to the assumption of the current market price, the intraday risks correspond to the liquidation losses or liquidation profits of open positions in money for the delivery of commodities, if applicable including sales tax (liabilities and accounts receivable of a clearing member for the payment of money), which result from the Spot Market transactions specified. The intraday risks are highest when the accounts receivable and liabilities of a clearing member for the delivery of power, gas and/or emission allowances from Spot Market transactions fluctuate strongly and the higher they are, the higher the balance of accounts receivable and liabilities is.

The Initial Margin corresponds to the maximum payment obligation of a trading participant to be expected in the future. As a rule, the amount of the initial margin is re-established by ECC on a daily basis at the beginning in line with the changing trading behaviour, ECC uses historical payment obligations as the data basis.

The document ‘ECC margining’ which is published on the website of ECC, contains details and examples regarding the calculation of margins. The Initial Margin can be deposited in cash or in securities by the clearing members.

Delivery Margin

The Delivery Margin for positions in futures on emission allowances which have fallen due is used to cover the risk arising from the claim to delivery on the part of the buyer of emission rights towards ECC as a result of a delivery not fulfilled by the seller.

Every owner of an open net short position in futures of emission rights is obliged to keep the corresponding delivery quantity of emission rights in its internal delivery account before this position reaches maturity. If this is not the case, ECC will request corresponding securities in the form of a delivery margin.

The amount of the risk and, hence, the amount of the delivery margin depends on the number of the missing emission rights and on the current market prices of the emission rights.

ECC charges the delivery margin for emission rights for the first time five business days before maturity of the corresponding contract and this margin is adjusted until the day on which the contract reaches maturity. In case the settlement account of the trading participant is sufficiently covered until the day of maturity under consideration of the subsequent return, the Delivery Margin is released.

The margin credits from the Premium Margin are not taken into account with regard to the Delivery Margin.

The Delivery Margin can be deposited in cash or in securities.
A detailed description on the subject of settlement and clearing is provided in the current ECC Margining Concept.

**Margins for Transactions on the EEX Derivatives Market**

Whenever a position is opened, a trading participant has to deposit basic margins, the so-called Spread Margin and Additional Margin, with its clearing member and the clearing member has to deposit said securities with ECC. On other exchanges, these margins are also called the Initial Margin. They cover the risk of the maximum costs incurred in closing-out all open positions of a trading participant on the next exchange trading day subject to the assumption of the most unfavourable development of prices. The Spread Margin and the Additional Margin are fixed for the entire term of the contract.

ECC determines the amount of the Spread Margin and Additional Margin Parameters.
Appendices

APPENDIX 13

EXCHANGE CONTRACT NO. 315F
IN RESPECT OF OPTION CONTRACT ON EQUITY INDICES
(AMERICAN-STYLE AND EUROPEAN-STYLE EXERCISE)

(A) CONTRACT TERMS
(issue Date: 24 September 2012)

(B) CONTRACT DETAILS SPECIFIED BY THE BOARD
(issue Date: 24 September 2012)

(C) ADMINISTRATIVE PROCEDURES
(issue Date: 18 February 2013)\(^1\)

Expiry Days: March 2013 onwards

FTSE 100 Index
FTSE 250 Index
FTSEurofirst 80 Index
FTSEurofirst 100 Index
AEX Index
BEL 20 Index
CAC 40 Index
PSI 20 Index

\(^1\) Please refer to London Notice No. 3691, issued on 18 February 2013.
Appendices

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THE LONDON INTERNATIONAL FINANCIAL FUTURES AND OPTIONS EXCHANGE

(A) CONTRACT TERMS

1. **Interpretation**

1.01 Save as otherwise specified herein, words and phrases defined in the Rules shall have the same meanings in these terms and in the Administrative Procedures.

1.02 In these terms and the Administrative Procedures:

‘Administrative Procedures’ means all procedures from time to time implemented by the Board pursuant to the Rules for the purposes of this Exchange Contract.

‘business day’ means:

(a) in relation to an Index for which there is a single relevant stock exchange, a market day on which the relevant stock exchange is open for business; and

(b) in relation to an Index for which there is more than one relevant stock exchange, a market day on which a sufficient number of relevant stock exchange are open for business such that there are available current Index input prices for constituent stocks of the Index which, exchange officials have determined in their absolute discretion, taken together represent in aggregate not less than 75% of the market capitalisation of the Index.

‘Buyer’ in respect of a Contract means the person who is entitled under such Contract to exercise the option or options the subject of such Contract (including, except where the context otherwise requires, the Exchange or CSP as buyer under a registered Contract).

‘call option’ means an option specified as such in the Contract.

‘Closing Index Value’ means the value of the Index as calculated by the Index Provider at the close of trading on the relevant stock exchange(s).

‘Contract’ means a contract made expressly or impliedly in the terms of this Exchange Contract for the sale and purchase of one or more put options or one or more call options, and ‘registered Contract’ means a contract registered by the Exchange.

‘Conversion Date’ means the date on which the conversion rate for a currency (being the currency of a participating Member State) against the euro is ‘irrevocably fixed’ in accordance with EMU legislation.

‘Daily Delivery Settlement Price’ has the meaning attributed to it in term 8.

‘Daily Reference Value’ means the value by reference to which the Daily Delivery Settlement Price is established.

‘EDSP’ means the Exchange Delivery Settlement Price and has the meaning attributed to it in term 10.

‘EDSP Intra-day Auction’ means the auction for securities in the FTSE 100 Index or FTSE 250 Index, as the case may be, operated by the London Stock Exchange from which the Expiry Value will be calculated.
‘EMU legislation’ means legislative measures of the European Council for the introduction of, changeover to or operation of, a single or unified European currency (whether known as the euro or otherwise) being in part implementation of the third stage of Economic and Monetary Union in the European Union.

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‘€’ denotes the single currency of the European Union introduced to a Member State as the lawful currency of that Member State pursuant to its participation in Economic and Monetary Union in the European Union pursuant to EMU legislation known, at the date of the issue of these terms, as ‘euro’.

‘Exchange Notice of Exercise’ means a notice from the Exchange, in a form from time to time prescribed by the Exchange, confirming to the Seller of an option that the Exchange has exercised an option against a Seller.

‘Exercise Notice’ means a notice in the form prescribe by the Exchange from time to time notifying the Exchange that a Buyer of an option thereby wishes to exercises one or more options against the Exchange.

‘exercise price’ in respect of a Contract means the price agreed as such by the parties to the Contract (being a price permitted by the Exchange to be an exercise price in respect of which a Contract can be made).

‘Expiry Day’ in respect of a Contract means, subject to term 12.01, the day agreed as such by the parties to the Contract (being a business day falling within a period from time to time prescribed by the Board), except that if at any time the day agreed upon is not a business day, the Expiry Day shall be the business day immediately preceding such day.

‘expiry month’ in respect of Exchange Contract No. 129E means a month specified as such by the Board for which a contract in the terms of Exchange Contract No 129E may be made.

‘Expiry Reference Value’ means the value by reference to which the Exchange Delivery Settlement Price is established.

‘Expiry Value’ means, in respect of an Expiry Day on which an EDSP Intra-day Auction is operated, the value of the FTSE 100 Index or FTSE 250 Index, as the case may be, as calculated by FTSE International with reference to the outcome of the EDSP Intra-day Auction.

‘Exchange Contract No. 129E’ means the Exchange’s Option Contract on the FTSE 100 Index (European-Style Exercise), as amended from time to time.

‘FTSE’ Group means FTSE Group.

‘Ground Rules’ means, in the case of an Index compiled by Euronext Amsterdam N.V., the Index ‘Ground Rules of the Series’ or its successor and in the case of an Index compiled by FTSE Group, the ‘Ground Rules for the Management of the Series’ or its successor.

‘Last Trading Day’ in respect of Exchange Contract No. 129E shall have the meaning ascribed to it in such Exchange Contract.

‘Index means the specification in accordance with the Ground Rules of:

(a) a nominated sector of share issuance, as identified in Table 1;
(b) a list of shares in such sector (the ‘continuance shares’); and

(c) the algorithm in accordance with which prices of such constituent shares are combined to generate a single feature which is calculated by the Index Provider (an ‘Index figure’) and published from time to time.

‘Index Provider’ means Euronext Indices B.V or FTSE International as applicable.

‘market day’ means a day on which the market, the CSP and banks in London are open for business.

‘Member State’ means a member of the European Community.

‘£’ denotes the lawful currency of the United Kingdom, known, at the date of the issue of these contract terms, as ‘Sterling’.

‘Premium’ in respect of an option means the amount determined in accordance with term 4.01 to be payable by the Buyer to the Seller as the consideration for the purchase of the option.

‘put option’ means an option specified as such in the Contract.

‘Regulations’ means the General Regulations and Default Rules of the CSP, as may be in force from time to time.

‘relevant stock exchanges’ means, in respect of an Index, the stock exchanges from which the Index Provider obtains prices of the relevant constituent stocks of the Index for the purpose of calculating the Index figure in respect of that Index, and a ‘relevant stock exchange’ is any one of these.

‘Seller’ in respect of a Contract means the person who sells the option or options the subject of such Contract (including, except where the context otherwise requires, the Exchange or CSP as seller under a registered Contract).

‘Settlement Amount’ has the meaning given to it in term 13.01.

‘Settlement Day’ in respect of an option means the day specified as such in Table 1.

‘Table 1’ means the Contract Details specified by the Board for Equity Index Option Contracts.

‘weighting’ means the factor which, when multiplied by the price of a constituent stock expressed in Sterling, euro, or other currency, as the case may be, determines the contribution to the Index figure made by that constituent stock.

1.03 In these terms references to ‘lawful currency’ shall be construed to include units of value of the euro which may be used validly to discharge payment obligations pursuant to the law of – a jurisdiction which has introduced the euro as its lawful current pursuant to EMU legislation and notwithstanding that such units of value of the euro may not at all material times following the Conversion Date constitute legal tender in such jurisdiction.

1.04 Reference to ‘term’ refers to a term hereof and reference to a ‘Rule’ and the ‘Articles’ refer to the Exchange’s Rules and Articles respectively. Save where the context otherwise requires, references herein to the singular include the plural, and vice versa.
References to a person in these terms shall be construed to include references to its successors and its permitted assigns unless the Board otherwise notifies by Notice.

Unless stated otherwise, all times specified in these terms and Administrative Procedures are expressed in London time.

2. Contract Specification

2.01 These terms shall apply to all Contracts.

2.02 Each Contract shall be for one or more put options or one or more call options based on a particular Index for the Expiry Day and at the exercise price agreed. An exercise price shall be expressed in Index points. An exercise price shall be agreed in Index points or shall be determined by agreeing a value expressed as a percentage of an Index figure and, forthwith on the making of the Contract, converting such value into Index points in accordance with procedures from time to time established by the Exchange.

2.03 A contract may not be made in these terms if, at such time, such contract is capable of being made in the terms of Exchange Contract No. 129E.

2.04 A Contract for a put option based on a particular Index shall be replaced by novation by a contract for a put option based on the same Index, and a Contract for a call option based on such Index shall be replaced by novation by a contract for a call option based on that Index, in terms of Exchange Contract No. 129E, between the same parties for the same exercise price and for the expiry month in which the Expiry Day of such Contract falls if:

(a) at any time after making of such Contract, the Expiry Day for such Contract is the Last Trading Day of an expiry month in respect of which a contract in the terms of Exchange Contract No. 129E based on such Index can be made;

(b) the exercise price of such Contract is a price which, in respect of such expiry month, is authorised by the Exchange as an exercise price in respect of which a contract in the terms of Exchange Contract No. 129E for such expiry month based on such Index can be made; and

(c) the Contract is a European-style exercise contract.

Such novation shall take place at the time when Exchange Contract No. 129E for such exercise price and expiry month in respect of the call or put option, as the case may be, based on such Index is first available for trading on the market. Without prejudice to the obligation of the Buyer to pay the Premium when due under a Contract, which shall remain in full force notwithstanding that the Contract is replaced by novation under this term 2.04 prior to the payment thereof, no premium shall be payable under a contract in the terms of Exchange Contract No. 129E which has replaced a Contract by novation.

2.05 If Exchange Contract No. 129E is amended from time to time, a contract in the terms of Exchange contract No. 129E which replaces a Contract pursuant to term 2.04, shall be subject to the terms of Exchange Contract No. 129E as amended from time to time.
3. **Price**

3.01 Bids and offers shall be quoted in Index points or as a percentage of an Index figure. A price shall be expressed in Index points. A price shall be agreed in Index points or shall be determined by agreeing a value expressed as a percentage of an Index figure and, forthwith on the making of the Contract, converting such value to Index points in accordance with procedures from time to time established by the Exchange. Except as specified in the Administrative Procedures in the case of cabinet transactions, a price shall be a whole number multiple of the minimum price fluctuation as provided in Table 1.

3.02 One Index point shall be 1.0 and shall have the value per option as provided in Table 1.

4. **Premium**

4.01 The Premium payable in respect of an option shall be the product of the price of the option in Index points and the value of one Index point as specified in term 3.02 and Table 1.

4.02 The Buyer shall pay the Premium to the CSP on the day and by the time specified for this purpose in the Administrative Procedures and the CSP shall pay the Premium to the Seller on the same day.

5. **Exercise of an Option by a Buyer against the Exchange and Confirmation of Exercise**

5.01 In respect of Option Contracts on Equity Indices (American-Style Exercise), a Buyer may exercise an option against the Exchange on any business day up to and including the Expiry Day of the Contract and shall do so by giving to the Exchange an Exercise Notice in respect of such option by the time specified in the Administrative Procedures and in a manner from time to time prescribed by the Exchange.

5.02 In respect of Option Contracts on Equity Indices (European-Style Exercise), a Buyer may exercise an option against the Exchange only on the Expiry Day of the Contract and shall do so by giving the Exchange an Exercise Notice in respect of such option by the time specified in the Administrative Procedures and in a manner from time to time prescribed by the Exchange.

6. **Exercise by the Exchange against a Seller and Confirmation of Exercise**

6.01 Subject to term 6.02, on the day on which an option is validly exercised by a Buyer in accordance with term 5.01 or 5.02, the Exchange shall select a Seller of an option of the same type and at the same exercise price and for the same Expiry Day by such method of selection as may be specified in the Administrative Procedures and shall exercise that option in a form and manner from time to time prescribed by the Exchange.

6.02 If the Exchange is unable to exercise an option against a Seller in accordance with term 6.01 on the day referred to in such term, the Exchange shall do so as soon as possible thereafter and such option shall be deemed to have been exercised on the day referred to in term 6.01 which, for the purpose of these terms, shall be the day of exercise by the Exchange.

6.03 In respect of each option exercised by the Exchange against a Seller under term 6.01 or term 6.02, the Exchange shall give to the Seller an Exchange Notice of Exercise by the time specified for that purpose in the Administrative Procedures on the market day following the day of exercise of the option and in a manner from time to time prescribed by the Exchange.
7. **Expiry**

7.01 An option in respect of an Expiry Day which has not been exercised in accordance with term, 5 or 6, as applicable, shall expire on the day and at the time specified for that purpose in the Administrative Procedures.

8. **Daily Delivery Settlement Price in respect of Option Contracts on Equity Indices (American-Style Exercise)**

8.01 Subject to term 8.03, a Daily Delivery Settlement Price will be determined by exchange officials on each business day and shall be calculated by reference to the Daily Reference Value specified in Table 1.

8.02 The Daily Delivery Settlement Price shall be calculated by exchange officials as the Daily Reference Value, rounded to the nearest minimum price fluctuation or, where the Daily Reference Price is an exact uneven multiple of one half of the minimum price fluctuation, to the nearest higher minimum price fluctuation.

8.03 Any determination by the Exchange that no Daily Delivery Settlement Price shall be established on a particular market day shall be final and binding for all purposes. Any such determination shall be the subject of a notice posted in the market. Exercise Notices submitted on such market day shall not be valid.

8.04 The Board may from time to time amend the method for and timing of the calculation of the Daily Delivery Settlement Price for any reason determined by the Board and any such changes shall have such effect with regard to existing and/or new Contracts as the Board may determine.

8.05 The Exchange shall publish the Daily Delivery Settlement Price at or by such times as may be specified in the Administrative Procedures. The Daily Delivery Settlement Price shall be final and binding for all purposes.

9. **Expiry Day**

9.01 On the Expiry Day:

(a) trading in Contracts for the relevant Expiry day shall cease at such time as may be specified in the Administrative Procedures; and

(b) the Exchange will determine the EDSP in accordance with term 10.

10. **Exchange Delivery Settlement Price (‘EDSP’)**

10.01 Subject as provided in term 11, the EDSP for Contracts for a particular Expiry Day shall be the Expiry Reference Value specified in Table 1, rounded in accordance with the rounding convention specified in Table 1.

10.03 The Exchange shall publish a provisional EDSP and the final EDSP at or by such times as may be specified in the Administrative Procedures. The final EDSP shall be final and binding for all purposes, notwithstanding the fact that the Index Provider may subsequently recalculate any relevant Index figures.

10.03 The Board may from time to time amend the method for and timing of the calculation of the EDSP for any reason determined by the Board and any such changes shall have such effect with regard to existing and/or new Contracts as the Board may determine.
11. Errors in Index

11.01 If, not later than the time on the Expiry Day specified for that purpose in the Administrative Procedures, any member of the Exchange notifies exchange officials of, or there otherwise comes to the attention of exchange officials, an alleged or apparent error in the Index which is the subject of the Contract due to any alleged or apparent error in the weighting of the price for any constituent stock of the Index first made since the publication of the last closing Index figure calculated by the Index Provider prior to the Expiry Day, then exchange officials shall promptly investigate such alleged or apparent error. If in their opinion an error has been made, the Exchange shall as soon as reasonably practicable publish a correction to the Index and the EDSP shall be calculated using the Expiry Reference Value as so corrected. Save as allowed by term 11.02, no correction to the Index or Expiry Reference Value shall be made in respect of any error notified to exchange officials or coming to their attention after the time so specified in the Administrative Procedures.

11.02 If, in respect of an Index, not later than thirty minutes after the provisional EDSP for a particular Expiry Day is first published, any member of the Exchange notifies exchange officials of, or there otherwise comes to the attention of exchange officials, an alleged or apparent error in the Expiry Reference Value due to any cause whatsoever other than an error in the weighting of the price for any constituent stock of the Index, then exchange officials shall investigate such alleged or apparent error. If in their opinion an error has been made, they shall correct the Expiry Reference Value and determine the EDSP in accordance therewith. No correction of the Expiry Reference Value or re-calculation of the EDSP shall be made in respect of any error notified to exchange officials or coming to their attention after the expiry of such thirty minute period.

11.03 No correction to an Index, Expiry Reference Value or re-calculation of the EDSP shall be made other than as may be allowed for in term 11.01 or term 11.02.

11.04 Neither the Exchange nor exchange officials shall have any liability whatsoever in respect of any decision as to whether or not to correct Index figures or the Expiry Reference Value, or as to the amount of any correction, or as to whether or not to re-calculate the EDSP.


12.01 If, at any time after the close of trading two business days prior to the day which would have been the Expiry Day in respect of a Contract, it becomes known to the Exchange that the day which would have been the Expiry Day no longer satisfies the criteria as a business day, then the business day next following such day shall become the Expiry Day in respect of that Contract and the Exchange shall post a notice in the market to that effect.

12.02 If, after the commencement of trading on the Expiry Day, closure of the market or one or more relevant stock exchanges means that such day no longer satisfies the criteria of a business day or the Index Provider for any reason does not calculate or does not publish or ceases to publish the Index, with the effect that trading in Contracts for that Expiry Day is, in the opinion of exchange officials, substantially prevented or hindered or that there is no Expiry Reference Value from which to calculate the EDSP in accordance with term 10.01, then either:
(a) cessation of trading in Contracts for the current Expiry Day shall be postponed until such later time on that day as exchange officials may in their absolute discretion specify by notice posted in the market, in which case the EDSP shall be determined in accordance with term 10.01 or such method determined by the Board. The provisional and final EDSPs shall be published at such times as exchange officials shall in their discretion determine, always allowing for the thirty minute period referred in the Administrative Procedures; or

(b) if, in the opinion of exchange officials, the course described in paragraph (a) would be impossible, impracticable or for any reason undesirable, they may by notice posted in the market declare that day not to be the Expiry Day and the next following business day, or any later business day chosen by them in their absolute discretion, to be the Expiry Day in its place.

13. Settlement Amount and Payment

13.01 The Settlement Amount in respect of an option exercised under term 5 or term 6, as applicable, shall be:

(a) in the case of a call option, the amount by which the EDSP (if exercised on the Expiry Day) or the Daily Delivery Settlement Price (if exercised on any other day) exceeds the exercise price, or

(b) in the case of a put option, the amount by which the exercise price exceeds in the EDSP (if exercised on the Expiry Day) or the Daily Delivery Settlement Price (if exercised on any other day),

multiplied in each case by the value per option of one Index point as specified in Table 1.

13.02 The Settlement Amount shall be paid by the Seller to the CSP by the time on the Settlement Day specified for this purpose in the Administrative Procedures and the CSP shall pay the Settlement Amount to the Buyer on the same day.

14. Default in Performance

14.01 A Buyer or a Seller other than the Exchange or CSP shall be in default where:

(a) he fails to fulfil his obligations under a Contract by the time and in the manner prescribed in and in accordance with these terms, the Rules and the Administrative Procedures and the Regulations; or

(b) he fails to pay any sum due to the CSP in respect of a registered Contract by the time specified in these terms or in the Administrative Procedures or under the Regulations; or

(c) in the reasonable opinion of the Exchange or CSP he is in default.

14.02 Subject to the default rules of the Exchange and/or CSP, in the event of default by a Buyer or a Seller in respect of a registered Contract, the Board shall forthwith fix a price for invoicing back and each option at issue shall be invoiced back at that price. Such price may at the Board’s absolute discretion take account of any compensation the Board may consider should be paid by either party to the other.
15. **Force Majeure**

15.01 Subject to any steps taken at any time by the Board under emergency powers in the Rules:

(a) a Seller or a Buyer shall be liable to perform his obligations in respect of an option comprised in a Contract by the due time thereof, notwithstanding that he may be or is likely to be prevented from so doing by any event beyond his reasonable control including, without limitation, any act of God, strike, lockout, war, armed conflict, use of force by authority of the United Nations, fire, riot or civil commotion, combination or workmen, act of terrorism, breakdown of machinery, unavailability or restriction of computer or data processing facilities or energy supplies or bank transfer systems; and

(b) in the event of a Buyer being prevented from exercising an option on its Expiry Day – by the time specified in the Administrative Procedures by any event beyond his reasonable control including, without limitation, any of the events specified in term 15.01(a):

(i) the Buyer may give written notice to the Board specifying the Contract or, if more than one, the Contracts in respect of which the Buyer was prevented from exercising an option, the steps taken by the Buyer to exercise the option and the events which prevented him from so doing. Any such notice shall be given to the Board as soon as is practicable after the expiry of an option specified in the notice; and

(ii) if the Board is satisfied that the Buyer took all possible steps in the circumstances prevailing to exercise an option, the Board shall request the Exchange to consider details of one or more Contracts between a Seller and the Exchange which are on the same terms (except as to the parties or the option price) as, and have been matched at the Exchange with, the Contract or Contracts specified in the Buyer’s notice and shall fix a price for invoicing back. Each Contract the subject of the Buyer’s notice and each Contract between the Exchange and a Seller notified to the Board hereunder shall be invoiced back at such price. Such price may at the Board’s absolute discretion take into account the Board’s assessment of the intrinsic value of the options at the expiry thereof.

16. **Articles, Rules, Regulations, etc**

16.01 Every Contract shall be subject to the Articles and the Rules and the Regulations in so far as applicable notwithstanding that either or both of the parties to it may not be members of the Exchange or of the CSP.

16.02 In case of any conflict between the Administrative Procedures and these terms of the Rules, the provisions of these terms and the Rules shall prevail and, in the event of any conflict between these terms and the Rules, the Rules shall prevail.

17. **Arbitration**

17.01 Subject to term 17.02, and to the Rules, any dispute arising from or in relation to a Contract shall be referred to arbitration under the Rules relating to arbitration and arbitration shall be held in accordance with the Rules in force at the time of such reference.

17.02 No dispute arising from or in relation to any invoicing back price fixed by the Board under these terms shall be referred to arbitration under the Rules.
18. **Governing Law**

18.01 Every Contract shall be governed by and construed in accordance with English law.

19. **Non-registered Contracts**

19.01 In respect of a Contract which is not a registered Contract (‘non-registered Contract’) these terms shall be modified by the parties thereto so as to require and allow that a Contract to be registered by the Exchange under the Rules and Regulations is capable of being so registered and to facilitate the performance of obligations or the exercise of rights under such registered Contract in accordance with these terms. Modifications may also be made to the terms of a non-registered contract to permit performance of obligations or the exercise of rights under such non-registered Contract or any other non-registered Contract if, without such modifications, it may not be possible to perform such obligations or to exercise such rights by the applicable times specified in the Administrative Procedures. In particular, but without prejudice to the generality of the foregoing, all references in these terms to payment or dealing between the Buyer and the Seller and the Exchange or CSP shall be modified so as to require a similar payment or dealing directly between the Buyer and the Seller party to such non-registered Contract.

20. **Economic and Monetary Union**

20.01 The Board in its absolute discretion may from time to time vary, substitute or remove any of, or add to, the terms of this Exchange Contract in order to reflect changes to the Index made pursuant to the euro being or becoming the lawful currency of a Member State participating in Economic Monetary Union.

20.02 Any variations, substitution or removal of, or addition to, the terms of this Exchange Contract made pursuant to term 20.01 shall have such effect with regard to existing and/or new Contracts as the Board may determine.

20.03 Any determination by the Board to vary, substitute or remove any of, or add to, the terms of this Exchange Contract pursuant to term 20.01 and 20.02 shall be the subject of a Notice.

21. **Statement in relation to EDSP Price Formation**

21.01 The Exchange draws the following statement to the attention of potential users of its Equity Index Contracts. Members should ensure that their clients are made aware of the statement.

‘Statement in relation to EDSP Price Formation

Potential users of the Equity Index Contracts made available on The London International Financial Futures and Options Exchange should familiarise themselves with the relevant Index compilation and calculation procedures, as well as the contract terms of the Equity Index Contract.'
Price formation leading to the EDSP for the Equity Index Contracts is subject to similar influences to those in the case of many other cash-settled contracts. Trading activity on the relevant stock market(s) during the EDSP Period is likely to be affected by the activity of particular market participants who are seeking to obtain price convergence at the EDSP between offsetting stock and futures positions. Such participants might typically seek to achieve this by unwinding their stock positions during the EDSP Period at prices which they anticipate will contribute to the calculation of Index figures which will, in turn, be used to determine the final EDSP. A consequence of this concentrated activity might be that the final EDSP differs from the Index figures immediately prior to the commencement of the EDSP Period and, if relevant, from the Index figure immediately following that period.

Potential users should, therefore, consider the risks of holding positions into the expiry of the Equity Index Contracts. In particular, they should consider their exposure to potentially unfavourable price movements in the expiry and whether to take steps to neutralise such exposure; for example, taking into account that there may be relatively limited liquidity provision, whether to 'roll' or close positions prior to expiry.'
<table>
<thead>
<tr>
<th>FTSE 100</th>
<th>FTSE 250</th>
<th>FTSEurofirst 80</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exchange Contract Details Specified by the Board for Equity Index Option Contracts (Table 1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Known as Exchange Contract</strong></td>
<td><strong>Expiry Reference Value</strong></td>
<td><strong>Settlement Day</strong></td>
</tr>
<tr>
<td>FTSE 100</td>
<td><strong>First market day after day of exercise</strong></td>
<td><strong>Value of £100 per index point</strong></td>
</tr>
<tr>
<td>FTSE 250</td>
<td><strong>First market day after day of exercise</strong></td>
<td><strong>Value of £10 per index point</strong></td>
</tr>
<tr>
<td>FTSEurofirst 80</td>
<td><strong>First market day after day of exercise</strong></td>
<td><strong>Value of £10 per index point</strong></td>
</tr>
<tr>
<td><strong>Currency specified by the Board</strong></td>
<td><strong>Sterling</strong></td>
<td><strong>Euro</strong></td>
</tr>
<tr>
<td><strong>Contract Size</strong></td>
<td><strong>Valued at £10 per index point</strong></td>
<td><strong>Valued at £10 per index point</strong></td>
</tr>
<tr>
<td><strong>Settlement Day</strong></td>
<td><strong>First market day after day of exercise</strong></td>
<td><strong>First market day after day of exercise</strong></td>
</tr>
<tr>
<td><strong>Minimum Price Fluctuation</strong></td>
<td><strong>0.5 (GBP)</strong></td>
<td><strong>0.5 (GBP)</strong></td>
</tr>
<tr>
<td><strong>Daily Reference Value</strong></td>
<td><strong>Yes</strong></td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>Cabinet Transaction Price</strong></td>
<td><strong>£1</strong></td>
<td><strong>£1</strong></td>
</tr>
<tr>
<td><strong>American-Style Exercise</strong></td>
<td><strong>Not available in relation to options on the FTSE 250 index.</strong></td>
<td><strong>Not available in relation to options on the FTSE 100 index.</strong></td>
</tr>
</tbody>
</table>
### TABLE 1' (continued)

<table>
<thead>
<tr>
<th>Index</th>
<th>FTSEurofirst 100</th>
<th>AEX</th>
<th>BEL 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known as Exchange Contract No.</td>
<td>161F</td>
<td>162F</td>
<td>163F</td>
</tr>
<tr>
<td>Currency specified by the Board</td>
<td>euro</td>
<td>euro</td>
<td>euro</td>
</tr>
<tr>
<td>Contract size</td>
<td>Valued at €10 per index point</td>
<td>Valued at €10 per index point</td>
<td>Valued at €10 per index point</td>
</tr>
<tr>
<td>Settlement Day</td>
<td>First market day after day of exercise</td>
<td>First market day after day of exercise</td>
<td>First market day after day of exercise</td>
</tr>
<tr>
<td>Quotation</td>
<td>Index points (eg, 1000.0)</td>
<td>Index points (eg, 1000.00)</td>
<td>Index points (eg, 1000.00)</td>
</tr>
<tr>
<td>Minimum Price Fluctuation (Value)</td>
<td>0.1 (€1)</td>
<td>0.01 (€1)</td>
<td>0.01 (€0.1)</td>
</tr>
<tr>
<td>Daily Reference Value</td>
<td>Closing Index Value</td>
<td>Closing Index Value</td>
<td>Closing Index Value</td>
</tr>
<tr>
<td>Expiry Reference Value</td>
<td>The Expiry Reference Value shall be the Closing Index Value on the Expiry Day, or the last published index value if the Closing Index Value is not available.</td>
<td>For expiries on all days the Expiry Reference Value shall be the average of 31 Index figures taken at one minute intervals on the Expiry Day, the last of such figures being the calculation made at 15.00 hours and the first being a calculation made not earlier than 14.30 hours.</td>
<td>For expiries on the third Friday of each month the Expiry Reference Value shall be the average of 81 Index figures taken on the Expiry Day, the last of such figures being a calculation made at 15.00 hours and the first being a calculation made not earlier than 14.40 hours. For expiries on all other days, the Expiry Reference Value shall be the Closing Index Value on the Expiry Day, or the last published index value if the Closing Index Value is not available.</td>
</tr>
<tr>
<td>Expiry Reference Value: rounding convention</td>
<td>Rounded to the nearest 0.1 or, where such average is an exact uneven multiple of 0.05, the nearest higher 0.1</td>
<td>Rounded to the nearest 0.1 or, where such average is an exact uneven multiple of 0.05, the nearest higher 0.1</td>
<td>Rounded to the nearest 0.1 or, where such average is an exact uneven multiple of 0.05, the nearest higher 0.1</td>
</tr>
<tr>
<td>Cabinet Transaction Price</td>
<td>€0.50</td>
<td>€0.1</td>
<td>€0.01</td>
</tr>
</tbody>
</table>
### Table 1 (continued)

<table>
<thead>
<tr>
<th>Index</th>
<th>Known as Exchange Contract</th>
<th>Currency specified by the Board</th>
<th>Contract size</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAC 40</td>
<td>Exchange Contract</td>
<td>euro</td>
<td>164F</td>
<td>PSI 20</td>
</tr>
<tr>
<td>FTSEurofirst 80</td>
<td></td>
<td>euro</td>
<td>165F</td>
<td></td>
</tr>
<tr>
<td>FTSEurofirst 100</td>
<td></td>
<td>euro</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>FTSEurofirst 200</td>
<td></td>
<td>euro</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

#### Notes

1. The Expiry Reference Value shall be the Closing Index Value on the Expiry Day, or the last published index value if the Closing Index Value is not available.

2. Rounding convention for the Expiry Reference Value shall be rounded to the nearest 0.1 or, where such Closing Index Value is an exact uneven multiple of 0.05, the nearest higher 0.01.

3. For all expiries in the AEX contract and for expiries on the third Friday of each month for BEL20, CAC40, FTSEurofirst 80, FTSEurofirst 100 and PSI20 contracts, in the event of Special Market Circumstances, the EDSP calculation and publication will correspond with that adopted for these contracts in the NYSE Liffe Amsterdam, Brussels, Paris and Lisbon markets, respectively. Details of the circumstances that constitute Special Market Circumstances and the calculation and publication process that will be adopted for these contracts are specified in Amsterdam Notice 12/22, Brussels Notice 12/11, Paris Notice 12/11 and Lisbon Notice 11/11/12/74, respectively.
(C) ADMINISTRATIVE PROCEDURES FOR EQUITY INDEX OPTION CONTRACTS

**Price**
Except in the case of cabinet transactions, the minimum price fluctuation shall be such amount as specified in Table 1.

**Cabinet transactions**
A Contract may be made at a cabinet transaction price as specified in Table 1 if entered into by one or both parties for the sole purpose of closing out an existing open position.

**On the market day following the day Option Contracts are registered with the Exchange, being a day on which banks in London are open for business**

**By 10.00 hours**
Buyers will pay to the CSP premiums due in respect of options to which they are party.

The CSP will pay Premiums due to Sellers in respect of options to which it is party as Buyer.

**Daily Delivery Settlement Price (American-Style Exercise)**

As soon as reasonably practicable after the close of trading on the relevant stock exchange(s).

The Exchange will publish the Daily Delivery Settlement Price.

**Exercise on any business day prior to the Expiry Day with respect to Option Contracts on Equity Indices (American-Style Exercise) except as specified in a notice posted in the market under term 8.03**

By 18.30 hours
On any business day prior to the Expiry Day, except any day specified in a notice posted in the market under term 8.03, a Buyer may give to the Exchange an Exercise Notice in respect of an option in accordance with term 5.

Exercise Notices received after such time will be rejected.

The Exchange shall select a Seller against whom to exercise options in accordance with term 6 and shall do so on a random basis and against Seller’s gross sold positions as at the close of business on the market on the day on which one or more Buyers have exercised options in accordance with term 5 against the Exchange.
Appendices

**Expiry Day on the third Friday of a month in respect of the AEX Index, BEL 20 Index and CAC 40 Index**

13.45 hours  The last time for notification to exchange officials under term 11.01 of any error or alleged error in the Index due to any error or alleged error in the weighting of the price for any constituent stock of the Index. No correction to the Index shall be made in respect of any such error which is first notified to exchange officials or which first comes to their attention after this time.

The Exchange shall publish any correction to the Index under term 11.01 as soon as reasonably practicable.

15.00 hours  Trading in Contracts for the relevant Expiry Day shall cease.

as soon as reasonably practicable after cessation of trading but not later than 18.00 hours  The Exchange will publish a provisional EDSP.

30 minutes after the publication of the provisional EDSP  The last time for notification of exchange officials of an error or alleged error in the Index of a kind falling to be dealt with under term 11.02.

In any investigation into an alleged or apparent error in the Index in accordance with term 11.02, exchange officials shall have regard, in reaching an opinion as to whether an error has been made, to the Ground Rules in force at the time.

as soon as reasonably practicable after the expiry of the 30 minute period referred to above  The Exchange will publish the final EDSP.

By 18.30 hours  A Buyer may give to the Exchange an Exercise Notice for any option in respect of the current Expiry Day, being an option comprised in a registered Contract or a Contract submitted to the Exchange for registration.

Exercise Notices received after such time will be rejected.

The Exchange shall select a Seller against whom to exercise options in accordance with term 6 and shall do so on a random basis and against Seller’s gross sold positions as at the close of business on the market on the day on which one or more Buyers have exercised options in accordance with term 5 against the Exchange.
Appendices

At 18.30 hours  Any option in respect of the current Expiry Day to which a Buyer other than the Exchange is party and which has not been exercised shall expire.

Expiry Day on the third Friday of a month in respect of the FTSE 100 Index and the FTSE 250 Index, on which an EDSP Intra-day Auction is operated

09.15 hours  The last time for notification to exchange officials under term 11.01 of any error or alleged error in the Index due to any error or alleged error in the weighting of the price for any constituent stock of the Index. No correction to the Index shall be made in respect of any such error which is first notified to exchange officials or which comes to their attention after this time.

The Exchange shall publish any correction to the Index under term 11.01 as soon as reasonably practicable.

As soon as reasonably practicable after exchange officials have concluded that the Expiry Value has been determined  Trading in Contracts for the relevant Expiry Day shall cease.

As soon as reasonably practicable after cessation of the EDSP Intra-day Auction but no later than 15.00 hours  The Exchange will publish a provisional EDSP.

30 minutes after the publication of the provisional EDSP  The last time for notification to exchange officials of an error in the Index of a kind falling to be dealt with under term 11.02.

In any investigation into an alleged or apparent error in the Index in accordance with term 11.02, exchange officials shall have regard, in reaching an opinion as to whether an error has been made, to the Ground Rules for the Management of the UK Series compiled by the FTSE Actuaries Share Indices Steering Committee in force at that time.

The Exchange will publish the final EDSP.
By 18.30 hours A Buyer may give to the Exchange an Exercise Notice for any option in respect of the current Expiry Day, being an option comprised in a registered Contract or a Contract submitted to the Exchange for registration.

Exercise Notices received after such time will be rejected.

The Exchange shall select a Seller against whom to exercise options in accordance with term 6 and shall do so on a random basis and against Seller’s gross sold positions as at the close of business on the market on the day on which one or more Buyers have exercised options in accordance with term 5 against the Exchange.

At 18.30 hours Any option in respect of the current Expiry Day to which a Buyer other than the Exchange is party and which is not been exercised shall expire.

Expiry Day in respect of a FTSEurofirst 80 Index Contract or a FTSEurofirst 100 Index Contract and

Expiry Day for all other Index Options (with the exception of the PSI 20 Index Option Contract) on days other than the third Friday of a month

15.15 hours The last time for notification to exchange officials under term 11.01 of any error or alleged error in the Index due to any error or alleged error in the weighting of the price for any constituent stock of the Index. No correction to the Index shall be made in respect of any such error which is first notified to exchange officials or which comes to their attention after this time.

The Exchange shall publish any correction to the Index under term 11.01 as soon as reasonably practicable.

16.45 hours (FTSEurofirst 80 Index Options and FTSEurofirst 100 Index Options) Trading in Contracts for the relevant Expiry Day shall cease.

16.30 hours (all other Index Options) Trading in Contracts for the relevant Expiry Day shall cease.

As soon as reasonably practicable after cessation of trading

The Exchange will publish a provisional EDSP.

30 minutes after the publication of the provisional EDSP

The last time for notification to exchange officials of an error or alleged error in the Index of a kind falling to be dealt with under term 11.02.

In any investigation into an alleged or apparent error in the Index in accordance with term 11.02, exchange officials shall have regard, in reaching an opinion as to whether an error has been made, to the Ground Rules for the Management of the UK Series compiled by the FTSE Actuaries Share Indices Steering Committee in force at that time.
Appendices

As soon as reasonably practicable after the expiry of the 30 minute period referred to above

By 18.30 hours

The Exchange will publish the final EDSP

A Buyer may give to the Exchange an Exercise Notice for any option in respect of the current Expiry Day, being an option comprised in a registered Contract or a Contract submitted to the Exchange for registration.

Exercise Notices received after such time will be rejected.

The Exchange shall select a Seller against whom to exercise options in accordance with term 6 and shall do so on a random basis and against Sellers’ gross sold positions as at the close of business on the market on the day on which one or more Buyers have exercised options in accordance with term 5 against the Exchange.

At 18.30 hours

Any option in respect of the current Expiry Day to which a Buyer other than the Exchange is party and which has not been exercised shall expire.

**Expiry Day in respect of a PSI 20 Index Option Contract**

15.20 hours

The last time for notification to exchange officials under term 11.01 of any error or alleged error in the Index due to any error or alleged in the weighting of the price for any constituent stock of the Index. No correction to the Index shall be made in respect of any such error which is first notified to exchange officials or which comes to their attention after this time.

The Exchange shall publish any correction to the Index under term 11.01 as soon as reasonably practicable.

16.35 hours

Trading in Contracts for the relevant Expiry Day shall cease.

As soon as reasonably practicable after cessation of trading

30 minutes after the publication of the provisional EDSP

The Exchange will publish a provisional EDSP.

The last time for notification to exchange officials of an error or alleged error in the Index of a kind falling to be dealt with under term 11.02.

In any investigation into an alleged or apparent error in the Index in accordance with term 11.02, exchange officials shall have regard, in reaching an opinion as to whether an error has been made, to the Ground Rules in force at that time.
As soon as reasonably practicable after the expiry of the 30 minute period referred to above

By 18.30 hours

The Exchange will publish the final EDSP.

A Buyer may give the Exchange an Exercise Notice for any option in respect of the current Expiry Day, being an option comprised in a registered Contract or a Contract submitted to the Exchange for registration.

Exercise Notices received after such time will be rejected.

The Exchange shall select a Seller against whom to exercise options in accordance with term 6 and shall do so on a random basis and against Seller’s gross sold positions as at the close of business on the market on the day on which one or more Buyers have exercised options in accordance with term 5 against the Exchange.

At 18.30 hours

Any option in respect of the current Expiry Day to which a Buyer other than the Exchange is party and which has not been exercised shall expire.

The market day following the day of exercise of an option

By 07.00 hours

In respect of an option exercised by the Exchange against a Seller under term 6.01, the Exchange shall give an Exchange Notice of Exercise to the Seller in a manner from time to time prescribed by the Exchange and will inform the Seller of the Settlement Amount due in respect of the option.

By 07.00 hours

The Exchange shall have given notices to Buyers in accordance with term 5.03 confirming which options have been validly exercised by such Buyers.

The market day following the Expiry Day

At 07.00 hours

Any option to which the Exchange is party as Buyer and which has not been exercised shall expire.

Settlement Day

By 10.00 hours

Sellers will pay to the CSP Settlement Amounts due in respect of options to which they are party.

The CSP will pay Settlement Amounts due to Buyers in respect of options to which it is party as Seller.

Issue Date: 18 February 2013
APPENDIX 14

CBOT Corn, Wheat, Rice, Oats, Soybean, Soybean Meal and Soybean Oil Futures Daily Settlement Procedure

Normal daily settlement procedure

CME Group staff determines the daily settlements in CBOT Corn (ZC), Wheat (ZW), Rice (ZR), Oats (ZO), Soybean (ZS), Soybean Meal (ZM), and Soybean Oil (ZL) by incorporating both Floor-based and Globex-based trading activity between 13:59:00 and 14:00:00 Central Time (CT).

Lead month

The designated lead month* is settled according to the following procedure:

Tier 1: The lead month settles to the volume-weighted average price (VWAP) of the outright between 13:59:00 and 14:00:00 Central Time (CT), rounded to the nearest tradable tick. If the VWAP is equidistant between two ticks, then it’s rounded to the tick that is closer to the prior-day’s settlement price.

Tier 2: If there is no VWAP, then the last trade price is checked against the current bid/ask.

a. If the last trade price is outside of the bid/ask spread, then the contract settles to the nearest bid or ask price.

b. If the last trade price is within the bid/ask spread or if a bid/ask is not available, then the contract settles to the last trade price.

Tier 3: If there is no last trade price available, then the prior settle is checked against the current bid/ask.

a. If the prior settle is outside of the bid/ask spread, then the contract settles to the nearest bid or ask price.

b. If the prior settle is within the bid/ask spread or if a bid/ask is not available, then the contract settles to the prior settlement price.

Deferred months

Deferred contract months consist of all non-lead months and settle according to the following procedure:

Tier 1: The implied price of a deferred month is derived using the VWAP of all the calendar spread relationships with the months that precede it, using the other leg’s known settlement price.

Tier 2: In the absence of relevant calendar spread trades, the midpoint of the calendar spreads’ best bid/ask (considering both Floor and Globex market activity) will be used to value the spread. This is provided that the width of the bid/ask is no greater than the pre-defined bid/ask width threshold established for that product (see below).

Tier 3: In the absence of relevant calendar spread markets that meet the bid/ask threshold, the net change of the previous contract month will be applied to determine the contract’s settlement price.
Appendices

**Tier 4:** If a contract is initially settled to the net change of the previous month and there are posted markets at 14:00:00 in one or more calendar spreads in the months that follow that contract, then the settlement price will be adjusted on a subsequent iteration based upon the midpoint of the bid/ask of those calendar spreads, provided they meet the bid/ask threshold.

<table>
<thead>
<tr>
<th>Product</th>
<th>Maximum Spread Bid/Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn (ZC)</td>
<td>12 Ticks</td>
</tr>
<tr>
<td>Wheat (ZW)</td>
<td>20 Ticks</td>
</tr>
<tr>
<td>Rice (ZR)</td>
<td>40 Ticks</td>
</tr>
<tr>
<td>Oats (ZO)</td>
<td>40 Ticks</td>
</tr>
<tr>
<td>Soybeans (ZS)</td>
<td>20 Ticks</td>
</tr>
<tr>
<td>Soybean Meal (ZM)</td>
<td>30 Ticks</td>
</tr>
<tr>
<td>Soybean Oil (ZO)</td>
<td>30 Ticks</td>
</tr>
</tbody>
</table>

* The designated lead month in each product shall be determined by the Exchange, and is generally the most active month, shifting as open interest and volume migrate during the contract lifecycle. Advance notification of changes to the designated lead month will be provided to the marketplace.

If you have any questions, please call the CME Global Command Center at 312456.2391, in Europe at 44.207.623.4708, or Asia at 65-6223-1357.

**Note:** In the event the aforementioned calculations cannot be made or if CME Group staff, in its sole discretion, determines that anomalous activity produces results that are not representative of the fair value of the contract, staff may determine an alternative settlement price.
## CONTRACT SPECIFICATIONS FOR BRITISH POUND OPTIONS

**CME Globex American Style Premium Quoted**

<table>
<thead>
<tr>
<th>Trade Unit</th>
<th>One British pound futures contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settle Method</td>
<td>Delivery</td>
</tr>
<tr>
<td>Point (Tick) Size</td>
<td>1 point = $.0001 per pound sterling = $6.25 per contract</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td></td>
</tr>
<tr>
<td>Strike</td>
<td>8 strikes up &amp; down, and including, the strike nearest the money.</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limits</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td>Regular 0.0001 = $6.25</td>
</tr>
<tr>
<td></td>
<td>Cab 0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>Mon/Thurs 5:00pm–7:15am &amp; 5:00 pm–4:00pm Sun &amp; Hol 5:00 pm–7:15am Mon/Thurs 5:00pm–4:00pm Sun &amp; Hol 3:00pm–4:00pm</td>
</tr>
<tr>
<td>Listed</td>
<td></td>
</tr>
<tr>
<td>Product Codes</td>
<td>Clearing Calls/Puts=BP Ticker Calls=CP Ticker Puts=PP Globex=6B Weekly Expiration Options: Floor Calls=1BC/5BC Puts=1BP/5BP AON=LP Globex 6B1–6B5 (100 Threshold)&amp;</td>
</tr>
<tr>
<td>Minimum Block Size</td>
<td></td>
</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
</tr>
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</table>
### Open Outcry American Style Premium Quoted

<table>
<thead>
<tr>
<th>Trade Unit</th>
<th>One British pound futures contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settle Method</td>
<td>Delivery</td>
</tr>
<tr>
<td>Point (Tick) Size</td>
<td>1 point = $.0001 per pound sterling = $6.25 per contract</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td></td>
</tr>
<tr>
<td>Strike</td>
<td>All listed intervals</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limits</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>0.0001 = $6.25</td>
</tr>
<tr>
<td>Cab</td>
<td>0.0001 = $6.25</td>
</tr>
<tr>
<td>All or None</td>
<td>0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>7:20 am–2:00pm</td>
</tr>
<tr>
<td>Listed</td>
<td></td>
</tr>
<tr>
<td>Product Codes</td>
<td></td>
</tr>
<tr>
<td>Clearing Calls/Puts=BP Ticker Calls=CP Ticker Puts=PP</td>
<td></td>
</tr>
<tr>
<td>Globex=6B Weekly Expiration Options: Floor Calls=1BC/5BC Puts=1BP/5BP AON=LP Globex 6B1–6B5 (100 Threshold)&amp;</td>
<td></td>
</tr>
<tr>
<td>Minimum Block Size</td>
<td></td>
</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
</tr>
</tbody>
</table>

### CME Globex European Style Premium Quoted

<table>
<thead>
<tr>
<th>Trade Unit</th>
<th>One British pound futures contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settle Method</td>
<td>Delivery</td>
</tr>
<tr>
<td>Point (Tick) Size</td>
<td>1 point = $.0001 per pound sterling = $6.25 per contract</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td></td>
</tr>
<tr>
<td>Strike</td>
<td>24 strikes up &amp; down, and including, the strike nearest the money.</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limit</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>0.0001 = $6.25</td>
</tr>
<tr>
<td>Cab</td>
<td>0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>Sun/Fri 3:00pm–4:00pm LTD 9:00am</td>
</tr>
<tr>
<td>Listed</td>
<td></td>
</tr>
<tr>
<td>Product Codes</td>
<td></td>
</tr>
<tr>
<td>Clearing &amp; Open outcry=YP GLOBEX &amp; Ticker=XB Weekly Expiration Options: Open Outcry=1P–5P GLOBEX=XB1–XB5 AON=0P (100 Threshold)&amp;</td>
<td></td>
</tr>
<tr>
<td>Minimum Block Size</td>
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</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
</tr>
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</table>
# Open Outcry European Style Premium Quoted

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
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<td>Point (Tick) Size</td>
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</tr>
<tr>
<td>Strike Price Interval</td>
<td>All listed intervals</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limits</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td>Regular: 0.0001 = $6.25 Cab: 0.0001 = $6.25 All or None: 0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>7:20am–2:00pm (Chicago time), occurs side by side with GLOBEX</td>
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<td>Listed</td>
<td>All listed series</td>
</tr>
<tr>
<td>Product Codes</td>
<td>Clearing &amp; Open outcry = YB GLOBEX &amp; Ticker = XB Weekly Expiration Options: Open Outcry = 1P–5P GLOBEX = XB1–XB5 AON = 0P (100 Threshold)&amp;</td>
</tr>
<tr>
<td>Minimum Block Size</td>
<td></td>
</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
</tr>
</tbody>
</table>

# CME Globex American Style Volatility Quoted

<table>
<thead>
<tr>
<th>Trade Unit</th>
<th>One British pound futures contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settle Method</td>
<td>Delivery</td>
</tr>
<tr>
<td>Point (Tick) Size</td>
<td>0.025 percent of the volatility quote</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td>8 strikes up &amp; down, and including, the strike nearest the money.</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td>8 strikes up &amp; down, and including, the strike nearest the money.</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limits</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td>Regular: 0.0001 = $6.25 Cab: 0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>Mon/Thurs 5:00 pm–7:15 am &amp; 2:00 pm–4:00pm Sun &amp; Hol 5:00 pm–7:15am Mon/Thurs 5:00pm–4:00pm Sun &amp; Hol 3:00pm–4:00pm</td>
</tr>
<tr>
<td>Listed</td>
<td></td>
</tr>
<tr>
<td>Product Codes</td>
<td>Monthly: V6B Weekly Expiration Options: VB(1–5)</td>
</tr>
<tr>
<td>Minimum Block Size</td>
<td></td>
</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
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### CME Globex European Style Volatility Quoted

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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Strike Price Interval</td>
<td></td>
</tr>
<tr>
<td>Strike</td>
<td>0.025 percent of the volatility quote</td>
</tr>
<tr>
<td>Limits/Price Banding</td>
<td>No limit</td>
</tr>
<tr>
<td>Minimum Fluctuation</td>
<td>Regular 0.0001 = $6.25</td>
</tr>
<tr>
<td></td>
<td>Cab 0.0001 = $6.25</td>
</tr>
<tr>
<td>Trading Hours</td>
<td>Sun/Fri 3:00pm–4:00pm LTD 9:00am</td>
</tr>
<tr>
<td>Listed</td>
<td></td>
</tr>
<tr>
<td>Product Codes</td>
<td>Monthly: V6XB</td>
</tr>
<tr>
<td></td>
<td>Weekly Expiration Options: VB(A–E)</td>
</tr>
<tr>
<td>Minimum Block Size</td>
<td></td>
</tr>
<tr>
<td>Product Calendar</td>
<td>Four months in the March cycle and two months not in the March cycle (serial months), plus 4 Weekly Expiration Options.</td>
</tr>
</tbody>
</table>
APPENDIX 16

SUGGESTED FURTHER READING

2. Financial Integrity Recommendations for Futures & Options Markets and Market Participants, The Futures Industry Association Global Task Force on Financial Integrity.
5. Futures Industry Association Magazine (futuresindustry.org)
6. Clearing and Settlement of Derivatives, David Loader (Butterworth Heinemann)
7. Managing Derivatives Risk – Guidelines for End-Users (The Futures and Options Association)
## APPENDIX 17

### USEFUL WEBSITE ADDRESSES

<table>
<thead>
<tr>
<th>Website Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>afma.com</td>
<td>Australian Financial Markets Association</td>
</tr>
<tr>
<td>asx.com.au</td>
<td>Australian Securities Exchange</td>
</tr>
<tr>
<td>bba.org.uk</td>
<td>British Bankers Association</td>
</tr>
<tr>
<td>bis.org</td>
<td>Bank for International Settlement</td>
</tr>
<tr>
<td>cbot.com</td>
<td>Chicago Board of Trade</td>
</tr>
<tr>
<td>cboe.com</td>
<td>Chicago Board Options Exchange</td>
</tr>
<tr>
<td>cftc.com</td>
<td>Commodities Futures Trading Commission</td>
</tr>
<tr>
<td>clearstream.com</td>
<td>Clearstream</td>
</tr>
<tr>
<td>cme.com</td>
<td>Chicago Mercantile Exchange</td>
</tr>
<tr>
<td>cmegroup.com</td>
<td>CME Group</td>
</tr>
<tr>
<td>dce.com.cn</td>
<td>Dalian Commodity Exchange</td>
</tr>
<tr>
<td>dscportfolio.com</td>
<td>DSCPportfolio Ltd</td>
</tr>
<tr>
<td>eurexchange.com</td>
<td>Eurex</td>
</tr>
<tr>
<td>euronext.com</td>
<td>Euronext.liffe</td>
</tr>
<tr>
<td>fca.org.uk</td>
<td>Financial Conduct Authority</td>
</tr>
<tr>
<td>foa.co.uk</td>
<td>Futures and Options Association</td>
</tr>
<tr>
<td>futuresindustry.org</td>
<td>Futures Industry Association</td>
</tr>
<tr>
<td>fsa.go.jp</td>
<td>Financial Services Agency Japan</td>
</tr>
<tr>
<td>hkex.com.hk</td>
<td>Hong Kong Exchanges and Clearing</td>
</tr>
<tr>
<td>theice.com</td>
<td>Intercontinental Exchange Inc/ICE Futures</td>
</tr>
<tr>
<td>iseooptions.com</td>
<td>International Securities Exchange</td>
</tr>
<tr>
<td>eng.krx.co.kr</td>
<td>Korea Stock Exchange</td>
</tr>
<tr>
<td>lchclearnet.com</td>
<td>LCH.Clearnet</td>
</tr>
<tr>
<td>liffe.com</td>
<td>NYSE Liffe (London International Financial Futures &amp; Options Exchange)</td>
</tr>
<tr>
<td>lme.co.uk</td>
<td>London Metal Exchange</td>
</tr>
<tr>
<td>londonstockexchange.com</td>
<td>London Stock Exchange</td>
</tr>
<tr>
<td>nasdaq.com</td>
<td>NASDAQ</td>
</tr>
<tr>
<td>nasdaqomxnordic.com</td>
<td>NASDAQ Nordic</td>
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<tr>
<td>Domain</td>
<td>Description</td>
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<tr>
<td>-----------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>nseindia.com</td>
<td>National Stock Exchange of India</td>
</tr>
<tr>
<td>nymex.com</td>
<td>NYMEX</td>
</tr>
<tr>
<td>nyse.com</td>
<td>New York Stock Exchange</td>
</tr>
<tr>
<td>onechicago.com</td>
<td>OneChicago Exchange</td>
</tr>
<tr>
<td>theocc.com</td>
<td>Options Clearing Corporation</td>
</tr>
<tr>
<td>ose.or.jp</td>
<td>Osaka Securities Exchange</td>
</tr>
<tr>
<td>sec.gov</td>
<td>Securities Exchange Commission</td>
</tr>
<tr>
<td>sgx.com</td>
<td>Singapore Exchanges</td>
</tr>
</tbody>
</table>
MULTIPLE CHOICE QUESTIONS

The following additional questions have been compiled to reflect the examination standard you will experience in your examination as closely as possible. Please note, however, they are not the CISI examination questions themselves.

Choose one answer for each question. When you have completed all questions, refer to the end of this section for the correct answers.

1. The move from open outcry trading to electronic trading was precipitated by several drivers and is considered to have many benefits. From the derivatives operations point of view which of the following changes was particularly beneficial?
   A. Elimination of mismatched trades
   B. Increased trading capacity
   C. Speed of execution
   D. Remote access to markets

2. Market participants are interested in the fair value of futures contracts. How is this fair value computed?
   A. It is based on the current market price showing on the exchange
   B. It is based on the end-of-day price that is published by the exchange
   C. It takes into account time to maturity and interest rates
   D. It takes into account the open interest in the contract

3. The delta of an option could BEST be described as:
   A. the value of time left to expiry
   B. the calculated value of the underlying for physical delivery
   C. the amount of the option price that reflects interest rates
   D. the sensitivity of the option’s price to changes in the underlying’s price

4. A European-style option has 15 days until its expiry date. Under what circumstances, if any, can it currently be exercised?
   A. It can be exercised on expiry
   B. It can be exercised anytime
   C. It can be exercised against a benchmark when reached
   D. It can be exercised at pre-set times

5. Which of the following positions would an investor hold if they were hedging a portfolio against a fall in value in the market?
   A. Long futures
   B. Long call options
   C. Short put options
   D. Short futures

6. The first notice day is the first day on which:
   A. a new month is introduced for trading
   B. the buyer can notify the exchange of their intention to go to delivery and the delivery details
   C. the seller can notify the exchange of their intention to effect delivery
   D. the exchange notifies the buyers and sellers that they must go to delivery
Multiple Choice Questions

7. Which of the following best describes an out-of-the-money option?
   A. A call option whose exercise price is below the current price of the underlying security
   B. A put option whose exercise price is above the current price of the underlying security
   C. A put option whose exercise price is below the current price of the underlying security
   D. An option whose exercise price is equal to the current price of the underlying security

8. The regulator for equity derivative products in the United States is:
   A. CFTC
   B. BaFIN
   C. SEC
   D. FCA

9. Five short sterling futures are bought at 94.01 on Day 1. The tick size is 0.01 and its value is £12.50. The day 1 settlement price is £94.08. The day 2 settlement price is £93.99. What is the variation margin on day 3?
   A. The same as on day 2
   B. £562.50 loss
   C. £125 profit
   D. £125 loss

10. Which of the following is achieved by utilising global clearing?
    A. It diversifies operational risk
    B. It provides a single source of settlement
    C. All exchange and OTC transactions can be settled
    D. Benchmarking of broker services is easier

11. The Options Clearing Corporation operates clearing facilities for which one of the following exchanges?
    A. ICE Futures
    B. London Metal Exchange
    C. International Securities Exchange
    D. EDX

12. How would the SPAN margin system calculate the margin requirement?
    A. By using a series of prices taken during the trading day
    B. By using risk arrays and offsets across positions
    C. By using the fair value of the contract against the market price
    D. By using deltas, gammas, rho and theta to measure volatility

13. A deep in-the-money call option has a delta of?
    A. Zero
    B. 0.3
    C. 0.5
    D. 1
14. The seller of a put option has which of the following?
   A. The right to buy the underlying
   B. The right to sell the underlying
   C. The obligation to take the delivery of the underlying
   D. The obligation to make delivery of the underlying

15. The way in which a firm deals with client money is governed by regulation and requires the firm to:
   A. segregate client money if requested to by the client, subject to agreement in a signed document
   B. segregate client money from the firm’s money but not from other clients in settlement of obligations
   C. segregate the client money from the firm’s and other clients’ money for settlement of obligations
   D. maintain all money for exchange-traded contracts in an account separate from that used for OTC derivatives

16. An investor wants to hedge a portfolio of shares valued at £40,000 based on the FTSE 100 index, which is currently at 4000 so they sell a future at 4080. The index rises to 4300 and the investor buys back the future at 4320. What is the overall profit or loss for the portfolio?
   A. £600 loss
   B. £2400 loss
   C. £600 profit
   D. £3000 profit

17. Since the market crash of 2008 the regulators have particularly focused their approach through applying regulations and directives that will:
   A. prohibit perceived risky derivative products
   B. create capital requirements to offset possible losses
   C. ensure all derivatives are centrally cleared
   D. enforce limits on positions on all futures and options

18. What does the term underlying refer to?
   A. The asset, instrument or commodity that a derivative is based on
   B. The counterparty to the derivative trade
   C. The exchange on which the derivative is traded
   D. The price of the derivative

19. What type of risk is BEST defined as the risk of financial loss resulting from inadequate or failed internal processes, people and systems, or from external events?
   A. Systemic risk
   B. Credit risk
   C. Operational risk
   D. Market risk

20. The primary difference between naked writing and covered writing is based on whether or not the trader:
   A. uses cash-based collateral
   B. acts on behalf of a third party
   C. settles the transaction early
   D. holds the underlying asset
Multiple Choice Questions

21. What is the EDSP?
   A. The list of deliverable bonds for a bond future
   B. The price factor for a bond deliverable against the bond future
   C. The settlement price for a future going to delivery
   D. The strike price of an option

22. A private client wants to trade derivatives for the first time, but does not want to have any contingent liabilities. Which of the following trades is most suitable?
   A. Buy a call option
   B. Sell a put option
   C. Sell a futures contract
   D. Buy a futures contract

23. If a dealer opens a short position in put options representing 300,000 shares at a strike price of 100p and receives a premium of £20,000, how much cash will they need to have available to settle an assignment of the position?
   A. £300,000
   B. £320,000
   C. £20,000
   D. £280,000

24. During 2011 which sector of derivatives had the largest market share?
   A. Equity indices
   B. Currencies
   C. Individual equities
   D. Interest rates

25. If a call option’s premium is 62p, its strike price is 500p and the underlying share price is 540p, what is the option’s time and volatility value?
   A. Nil
   B. 18p
   C. 22p
   D. 40p

26. A fund manager wants to hedge an equity portfolio and considers using index futures and index options. Which of the following trades would provide a hedge with the prospect of some upside gain?
   A. Sell futures
   B. Buy calls
   C. Sell calls
   D. Buy put

27. What key benefit is obtained by a speculator through the use of gearing?
   A. Greater exposure levels
   B. Greater dividend payments
   C. Less market risk
   D. Less credit risk
28. What does the process of marking to market seek to quantify?
   A. The delivery period
   B. The cost of carry
   C. The variation margin
   D. The tick size

29. Price or conversion factors are used to calculate which one of the following?
   A. The value of the transaction in a different currency
   B. The number of bond futures needed to hedge a bond and position
   C. The value of the accrued interest on delivery
   D. The amount of initial margin per contract for a hedging strategy

30. The outcome of an investor writing a put option is:
   A. a cost and a hedge against falling
   B. an income and a hedge against falling markets
   C. an income and an exposure to falling markets
   D. a cost and an exposure to falling markets

31. Which of the following would result in physical delivery as a result of tendering or exercise?
   A. An equity index option
   B. An interest rate future
   C. An option on a bond future
   D. An equity option

32. An EFP is:
   A. an exchange of physical position for a futures position
   B. a put option on an equity future
   C. an emissions contract
   D. an energy derivative exchange

33. Which of the following is the system used to manage the delivery of an LME copper contract?
   A. LMEsword
   B. SPAN
   C. SWAPCLEAR
   D. TRS

34. If the tick size of a contract is 0.5 and the value is £5, a long position of 500 contracts valued at £5300 the previous close of business and £5295.5 at today's close of business will result in which of the following variation margin amounts?
   A. £22,500 receivable
   B. £11,250 payable
   C. £22,500 payable
   D. £11,250 receivable
Multiple Choice Questions

35. STANS and SPAN are both margining systems that calculate initial margin but a buffer margin would be used in what circumstance?
   A. When market volatility moves significantly during the day
   B. To address the difference in credit rating of clearing members
   C. To manage risk over a predicted event or situation
   D. To manage exposure during delivery months

36. Based on 81 exchanges in the FIA research which global region accounts for the largest percentage of volume of business?
   A. North America
   B. Europe
   C. Latin America
   D. Asia-Pacific

37. Which of the following is incorrect in respect of EMIR?
   A. A move towards common rules for CCPs
   B. All exchange-traded and OTC derivatives must become centrally cleared
   C. Measures to reduce counterparty risk of OTC derivatives
   D. A reporting obligation for OTC derivatives

38. The purpose of CVA is to:
   A. Analyse the possible future risk of a portfolio
   B. Measure the likely loss on a portfolio over a period of time
   C. Calculate the risk of loss taking in to account a counterparty default
   D. Measure the likely loss in the event of a significant market movement

39. Which of the following do clearing house use to manage risk?
   A. The contract specification
   B. The trading mechanism
   C. Initial margin
   D. Market supervision

40. FIFO and LIFO are associated with which of the following?
   A. Exercise and assignment of options
   B. Type of delivery method
   C. Close out of open positions
   D. Exchange for physical

41. Delivery of a bond future is determined by:
   A. Delivery of a bond at the seller’s choice
   B. Delivery of a bond at the buyer’s choice
   C. Delivery of a bond on the exchange’s deliverable bond list
   D. Delivery of a bond on the central bank’s deliverable bond list
42. Derivative exchanges can be trading a variety of products based on several different underlyings or be an exchange that relates to a specific type of underlying. Which of the following is an example of the latter?
A. NYSE Liffe
B. EEX
C. CME
D. HKEx

43. Which ONE of the following would not be considered as a potential operational risk?
A. Reconciliation of positions
B. Volatility in the underlying
C. Segregation of client assets
D. Collateral

44. SPAN, STANS, intra-day and buffer are all terms primarily related to:
A. option trading strategies
B. EU directives
C. margin calls
D. exercise and assignment

45. Which of the following might not be considered a benefit of using a prime broker?
A. Global clearing services
B. Single contact point
C. All positions are held at one broker
D. Margin management

46. In-, out-of- and at-the-money are terms related to:
A. financial futures contracts
B. commodity futures
C. EFPs
D. options

47. A rights issue in a security on which there are traded options may be likely to result in a:
A. suspension by the exchange of the expiry months over the period of the rights
B. suspension by the exchange in trading the options over the period of the rights
C. change by the exchange to the strike price and number of shares per contract
D. change to both strike price and shares per contract as agreed by the option holder

48. On maturity the holder of a long futures position will:
A. let the position be abandoned
B. exercise their right
C. tender for delivery of the underlying
D. be assigned to take delivery of the underlying

49. Asset allocation strategies utilise which ONE of the following?
A. Buy futures and sell futures of the relevant assets
B. Buy puts and sell calls of the relevant assets
C. Buy futures and buy calls of the relevant assets
D. Sell futures and sell futures of the relevant assets
ANSWERS TO MULTIPLE CHOICE QUESTIONS

Q1. Answer: A  Ref: Chapter 5, Section 2.1.1
Electronic dealing systems automatically match trades for detail before the trade can take place so there are no out trades or unmatched trades. In the open outcry market this unmatched scenario is possible.

Q2. Answer: C  Ref: Chapter 2, Section 2.1
Fair value of a future takes into account the time to maturity and interest rates; the cost of carry and this market price of the contract can be at a premium or discount to the FV.

Q3. Answer: D  Ref: Chapter 3, Section 2
Delta relates to the movement of the option price in relation to a move in the price of the underlying. For a call option a delta of one means the option moves in price at the same rate as the underlying.

Q4. Answer: A  Ref: Chapter 3, Section 1.4
A European option can only be exercised on expiry. It cannot be exercised 15 days before expiry.

Q5. Answer: D  Ref: Chapter 4, Section 1.1
A short futures position would offset the portfolio, so that if the underlying fell in price so would the futures position. As it is a short position it would cost less to close out and this profit would offset the loss on the portfolio.

Q6. Answer: C  Ref: Chapter 2, Section 1.2
The short position in futures contracts can tender for delivery on the first notice day of the delivery period.

Q7. Answer: C  Ref: Chapter 3, Section 2.1
A put option gives the holder the right to sell shares at the exercise price. If the share price is higher than the exercise price the option is out-of-the-money and will not be exercised.

Q8 Answer: C  Ref: Chapter 9, Section 2.4
BaFin and the FCA are European regulators whilst the CFTC is the regulator for commodity futures, debt and interest rate products and the SEC regulates equity products.

Q9. Answer: B  Ref: Chapter 7, Section 2.1
The settlement price on day 2 is 9 ticks (93.99 against 94.08) lower than day 1 so using the formula of 5 contracts x 9 ticks x £12.50 per tick we have a loss of £562.50.
Multiple Choice Questions

Q10. Answer: B  Ref: Chapter 8, Section 4.1
A major advantage of global clearing is that all on-exchange trades can be given up to the broker for clearing and settlement, which provides a single source of data in respect of trades, positions, margin calls and settlement amounts.

Q11. Answer: C  Ref: Chapter 6, Section 3.2
The ISE uses the OCC to clear its trades, ICE Europe clears its own trades and the LME and EDX both use LCH.Clearnet.

Q12. Answer: B  Ref: Chapter 7, Section 1.2.1
The use of risk arrays which measure risk changes and offsets, enables the margin to be efficiently calculated on a portfolio of futures and options positions.

Q13. Answer: D  Ref: Chapter 3, Section 2
As seen in the answer to Q3 the delta measures the movement of the option price in relation to the movement of the underlying. The range is from 0 for out-of-the-money options to 1 for in-the-money options.

Q14. Answer: C  Ref: Chapter 3, Section 1.1
A put option gives the buyer the right to sell the shares at the exercise price, so the seller has an obligation to take delivery of the underlying, if the buyer exercises their right.

Q15. Answer: C  Ref: Chapter 9, Section 1.9
Client money must be segregated from both the firms and other client’s money. In other words the client’s money can only be used to settle that client’s obligations. This can be required by regulation even if a client requests non-segregation.

Q16. Answer: B  Ref: Chapter 2, Section 1.2, Chapter 7, Section 2.1
The size, as found in the exchange contract specification, of the FTSE 100 index is £10 x the index so if we sell a future at 4080 and then close it out by buying a future at 4320 we have made a loss of 240 points x £10, a total of £2,400. Alternatively if we use the tick size and value method we have 1 contract x £5 per tick x 480 ticks, a loss of £2,400.

Q17. Answer: B  Ref: Chapter 9, Sections 2.1, 2.2
The requirement to set aside certain levels of capital that will be able to offset losses is a key way in which regulators can balance allowing activity, whilst protecting the market. Other specific regulation, for example, the central clearing of some OTC products and product intervention for some types of derivatives, are also part of the approach.
Q18. Answer: A  Ref: Chapter 1, Section 1.2.1
The term underlying refers to the derivative’s underlying instrument, asset or commodity from which the derivative will derive its value and relates to what will be physically exchanged on delivery of some contracts.

Q19. Answer: C  Ref: Chapter 10, Sections 3.1, 3.2
The BIS Basel Committee defined the term operational risk in the aftermath of the collapse of Barings Bank.

Q20. Answer: D  Ref: Chapter 4, Section 1.2
Naked writing refers to the seller of a call option, who does not hold the underlying that is needed for delivery if the option is exercised.

Q21. Answer: C  Ref: Chapter 8, Section 3.2
EDSP stands for Exchange Settlement Delivery Price and relates to futures contracts that go to delivery on NYSE Liffe.

Q22. Answer: A  Ref: Chapter 3, Section 1.1
The sale of an option and the purchase or sale of futures contracts involve contingent obligations, related to the delivery process and or daily settlement of variation margin, whereas the purchase of a call option gives the buyer a right but not an obligation.

Q23. Answer: A  Ref: Chapter 4, Section 1.1
When an option is exercised, the underlying is exchanged at the strike price, so with a strike price of 100, if the buyer exercises the option they will pay £300,000 for delivery of the shares.

Q24. Answer: A  Ref: Chapter 1, Section 1.2.2
Early derivatives were based on commodities and then in the 1970s financial derivatives were introduced and the range of products expanded greatly along with activity. By 2011 the category of derivatives that had the largest market share was equities.

Q25. Answer: C  Ref: Chapter 3, Section 2.1
The time and intrinsic value of an option is the difference between option premium and the difference between the strike price and the current price of the underlying, so if the strike is 500 and the underlying is 540, a difference of 40p, and the option premium is 62p then the time and volatility value is the difference of 22p.

Q26. Answer: D  Ref: Chapter 3, Section 1.1 and Chapter 4, Section 1.1
The purchase of the put provides protection against a fall, but allows participation in the upside less the cost of the option.
Multiple Choice Questions

Q27. Answer: A Ref: Chapter 4, Section 1.3.1
Gearing is the creation of greater exposure for the same outlay, by using derivatives, than can be obtained by taking a position in the underlying.

Q28. Answer: C Ref: Chapter 10, Section 3.5.1
The calculation of variation margin requires the comparison between the previous price and the official closing price on the exchange so the position is marked to market.

Q29. Answer: B Ref: Chapter 8, Section 3.2.1
Price factors are used so that the number of futures contracts to be used based on the notional bond in the contract specification can be calculated for a particular bond with a different coupon.

Q30. Answer: C Ref: Chapter 4, Section 1.2.3
The term straddle comes from the fact that the exercise price is straddled by the use of a call option and a put option at that exercise price.

Q31. Answer: D Ref: Chapter 3, Section 1.2
Equity options are normally deliverable on exercise whereas index and interest-rate products are cash settled and an option on a future becomes a future position.

Q32. Answer: A Ref: Chapter 5, Section 2.2
The term EFP stands for Exchange for Physical.

Q33. Answer: A Ref: Chapter 8, Section 3.2.4
The LMEsword system is used for delivery of LME copper contracts.

Q34. Answer: C Ref: Chapter 7, Section 2.1.1
500 contracts x 9 ticks x £5 = £22,500. The position is long and the price has fallen so the amount is payable.

Q35. Answer: C Ref: Chapter 7, Section 1.1.4
The clearing house can use intra-day and spot month margins to manage risks as they occur and the buffer margin is a mechanism used when exceptional market situations are expected.

Q36. Answer: D Ref: Chapter 1, Section 1.2.2
The early days of derivatives were dominated by US exchanges trading mainly commodities. By 2011 Asia-Pacific was the global region trading the most actively ahead on North America.
Multiple Choice Questions

Q37. Answer: B Ref: Chapter 9, Section 2.3
EMIR does not have as an objective the clearing of all derivatives, only on-exchange and those OTC derivatives that can be cleared.

Q38. Answer: C Ref: Chapter 10, Section 1.2.2
VaR and other methodology is used to measure risks associated with market exposures whereas the CVA is used to take into account a counterparty default.

Q39. Answer: C Ref: Chapter 7, Section 1.1
Initial margin is a deposit required for all open futures and short option positions and is designed protect the clearing house in the event that a member defaults on an obligation. Broadly speaking it should cover the likeliest biggest movement in value of the position.

Q40. Answer: C Ref: Chapter 8, Section 5.2
Open positions can be closed by an equal and opposite transaction and the broker instructed to close the positions on a firs in first out (FIFO) or last in first out (LIFO) or other acceptable basis.

Q41. Answer: C Ref: Chapter 8, Section 3.3
The only bonds that can be delivered against a futures contract are those on the list of deliverable bonds published by the exchange.

Q42. Answer: B Ref: Chapter 2, Section 1.3
NYSE Liffe, CME and HKEx are derivatives exchanges that cover a broad range of products. EEX is the European Emissions Exchange.

Q43. Answer: B Ref: Chapter 10 Section 3.3
Volatility in the underlying is a market risk whereas the management of reconciliations, collateral and client assets is operational risk.

Q44. Answer: C Ref: Chapter 7 Sections 1.1.2, 1.1.4 and 1.2
These are all relevant to margin calls. SPAN and STANS are systems and intra-day and buffer are specific margin calls that might be made.

Q45. Answer: C Ref: Chapter 8, Section 4.5
The holding of all positions at a single broker has some issues particularly concerning confidentiality of the positions and exposures and also the situation if the clearing broker should fail.

Q46. Answer: D Ref: Chapter 3, Section 2.1
These terms relate to whether an option is above, at or below the strike price compared to the underlying price, ie, a 100 call is in-the-money if the underlying is 150.
Q47. Answer: C Ref: Chapter 8, Section 5.3

Rights issues create new shares at a discounted price and so the exchange will potentially change the strike price and number of shares per contract accordingly, rather than stop trading. Only the exchange can decide on making a change.

Q48. Answer: D Ref: Chapter 2, Section 1.2

The only outcome for a futures position on maturity is that it will go to delivery, so a long futures position will be assigned to take delivery of the underlying or go to cash settlement as per the contract specification.

Q49. Answer: A Ref: Chapter 4, Section 1.4

To change the asset allocation of a portfolio the transactions will be a sale of futures and a purchase of futures of the relevant assets.
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<td>1.2.3</td>
<td>know the reasons for and the factors affecting the trend towards consolidation of exchanges</td>
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<td>1.2.4</td>
<td>know the importance of links between derivative and stock exchanges, using Eurex and NYSE Liffe as examples in terms of:</td>
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<td>• equity futures</td>
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<td>• energy (oil/gas/power/emissions)</td>
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</tbody>
</table>

### 2.2 Basic Principles of Pricing Futures

On completion, the candidate should:

- **2.2.1** understand how futures are priced and what fair value is
- **2.2.2** understand the use of price factors in relation to bond futures
- **2.2.3** understand the relationship between futures and underlying assets and time

### ELEMENT 3 AN INTRODUCTION TO OPTIONS

#### 3.1 Characteristics of Options

On completion, the candidate should:

- **3.1.1** know the definition of an options contract:
  - call or put
  - writer/granter or holder/taker
  - size
  - tick size and value
  - strike price
  - exercise styles and expiry dates
  - methods of settlement

- **3.1.2** understand the underlying products and method of exercise for the following:
  - equity index options
  - equity options
  - interest rate options
  - currency options
  - government bond options
  - commodity options (metals/softs/agricultural)
  - energy options (oil/gas/power/emissions)

- **3.1.3** understand the differences between the following style of options:
  - European
  - American
  - Asian

- **3.1.4** understand the fundamental differences between futures and options contracts

#### 3.2 Basic Principles of Pricing Options

On completion, the candidate should:
### Syllabus Learning Map

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**ELEMENT 4 DERIVATIVE USE**

**4.1 Hedging**

On completion, the candidate should:

**4.1.1** understand the concept of hedging and its use | Section 1.1 |

**4.2 Income Enhancement**

On completion, the candidate should:

**4.2.1** know the difference between covered and naked option writing | Section 1.2 |

**4.2.2** know the risk associated with income enhancement strategies | Section 1.2 |

**4.3 Speculation**

On completion, the candidate should:

**4.3.1** understand the effects of gearing when using derivatives as opposed to the underlying asset(s) | Section 1.3 |

**4.4 Asset Allocation**

On completion, the candidate should:

**4.4.1** understand how derivatives are used by fund managers in asset allocation | Section 1.4 |

**4.5 Arbitrage**

On completion the candidate should:

**4.5.1** understand the concept of arbitrage and its use | Section 1.5 |

**ELEMENT 5 THE ROLE OF A DERIVATIVE EXCHANGE**

**5.1 Structure and Objectives of Exchanges**

On completion, the candidate should:

**5.1.1** understand the role, aims and benefits of derivative exchanges | Section 1 |

**5.1.2** know the primary requirements of a regulated exchange | Section 1 |

**5.2 Trading Mechanisms**

On completion, the candidate should:

**5.2.1** understand electronic and open outcry methods of trading | Section 2.1 |

**5.2.2** understand block, basis, exchange for physical (EFP) and against actuals (AA) trades | Section 2.2 |

**5.2.3** know the reasons and methods for ‘after hours’ trading | Section 2.3 |

**5.3 Market Membership**
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**ELEMENT 7  THE BASICS OF MARGIN**

**7.1  Initial Margin**
On completion, the candidate should:

| 7.1.1 | know the purpose of initial margin | Section 1.1 |
| 7.1.2 | understand the principles of SPAN and STANS margin systems | Section 1.2 |
| 7.1.3 | know the common forms of collateral used to cover initial margin liabilities | Section 1.3 |
| 7.1.4 | be able to calculate basic initial margin on a given position: | Section 4 |
|       | • government bonds                   |            |
|       | • short-term interest rates           |            |
|       | • equity futures                     |            |

**7.2  Variation Margin**
On completion, the candidate should:

| 7.2.1 | know the purpose of variation margin | Section 2 |
| 7.2.2 | be able to calculate variation margin on a given position: | Section 2.1.1 |
|       | • government bonds                   |            |
|       | • short-term interest rates           |            |
|       | • equity futures                     |            |
| 7.2.3 | know the meaning of intra-day, spot and buffer margin calls | Sections 1.1.2–1.1.4 |

**7.3  Default**
On completion, the candidate should:

| 7.3.1 | know the consequence of an inability to cover the margin in relation to the clearing house and the clearing member | Section 3 |
| 7.3.2 | understand the purpose of the clearing house default procedures and guarantee | Section 3 |
| 7.3.3 | understand the responsibility of central counterparties in managing market risk | Section 3 |
| 7.3.4 | understand clearing house fire drills in relation to their: | Section 3 |
|       | • importance                           |            |
|       | • purpose                              |            |
|       | • frequency                            |            |

**ELEMENT 8  CLEARING AND SETTLEMENT**

**8.1  Payment and Receipt (Clearing House and Clearing Member)**
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<td>• equity futures</td>
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<td>• interest rate futures</td>
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<td>• currency futures</td>
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<td>• government bond futures</td>
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<td>• commodity futures (metals/softs/agricultural)</td>
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<tr>
<td>• energy futures (oil/gas/power/emissions)</td>
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<td>8.3.2 understand the following terms with respect to deliveries:</td>
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<td>• assignment</td>
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<td>• Exchange Delivery Settlement Price (EDSP)</td>
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<td>• last trading day</td>
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<td>• notice day</td>
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<td>• price factor</td>
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<td>8.3.3 be able to calculate the invoice amount for both physical delivery and cash settlement</td>
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<td>8.4.3 understand how exchanges and clearing houses handle give ups</td>
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<td>8.4.5 understand the benefits of entering into a prime brokerage relationship</td>
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<td>• segregated client</td>
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<td>• non-segregated client</td>
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<td>• clearing house/exchange</td>
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<td>8.5.2 understand the following position management terms:</td>
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<td>• LIFO</td>
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<td>• close outs</td>
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<td>8.5.3 understand the impact of the following on open positions:</td>
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<td>• EU</td>
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<td>• US</td>
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<td>9.1.2 understand the principal regulators’ approach to regulation:</td>
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<td>• changes of approach in the UK regulatory regime after 1 April 2013</td>
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<td>9.1.3 understand the key objectives and functions of documentation and agreements</td>
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<td>• client classification</td>
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<td>• know your client</td>
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<td>9.1.5 understand the purpose of standard give-up and clearing agreements</td>
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<td>9.2 Other Key Industry Regulation</td>
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<td>9.2.2 understand the implications of forthcoming legislation:</td>
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<td>On completion, the candidate should:</td>
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<td>9.3.1 understand the role and significance of the compliance officer</td>
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<td>9.3.2 understand the importance of controlled functions and clear definitions of staff responsibilities</td>
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<td>On completion, the candidate should:</td>
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<td>10.1.1 know the main characteristics of credit risk and counterparty risk</td>
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<td>10.1.2 understand the main methods for mitigating credit risk</td>
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<td>10.1.3 know the purpose of Potential Future Exposures (PFEs)</td>
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<td>10.1.4 know the purpose of Credit Valuation Adjustments (CVAs)</td>
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<td>10.2 Market Risk</td>
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<td>10.2.1 know the main characteristics of market risk (energy, equities, interest rates, currencies, commodities, volatility, liquidity)</td>
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<td>10.2.2 know the main methods for mitigating market risk</td>
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<td>10.3 Operational Risk</td>
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<td>10.3.1 know the main characteristics of operational risk</td>
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<td>10.3.2 know the BIS definition of operational risk</td>
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<tr>
<td>10.3.3 understand the main methods for mitigating operational risk</td>
<td>Section 3.3</td>
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<td>10.3.4</td>
<td>Section 3.5</td>
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</table>

understand the importance of managing risk in the following operational activities:

- allocation
- position limits
- margining
- collateral
- reconciliation
- close outs
- deliveries
- early exercise of options
EXAMINATION SPECIFICATION

Each examination paper is constructed from a specification that determines the weightings that will be given to each element. The specification is given below.

It is important to note that the numbers quoted may vary slightly from examination to examination as there is some flexibility to ensure that each examination has a consistent level of difficulty. However, the number of questions tested in each element should not change by more than plus or minus 2.

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<td>5</td>
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<td>The Role of the Clearing House</td>
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<tr>
<td><strong>Total</strong></td>
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- UK Legislation and Regulation
- Money Laundering Regulations 2007
- Proceeds of Crime Act 2002
- Terrorist Financing
- Suspicious Activity Reporting
- Money Laundering Reporting Officer
- Sanctions

#### Financial Crime
- What is Financial Crime?
- Insider Dealing and Market Abuse
  - Introduction, Legislation, Offences and Rules
- Money Laundering Legislation, Regulations, Financial Sanctions and Reporting Requirements
- Money Laundering and the Role of the MLRO

#### Information Security and Data Protection
- Information Security: The Key Issues
- The Lessons From High-Profile Cases
- Key Identity Issues: Know Your Customer
- Implementing the Data Protection Act 1998
- The Next Decade: Predictions For The Future

#### UK Bribery Act
- Background to the Act
- The Offences
- What the Offences Cover
- When Has an Offence Been Committed
- The Defences Against Charges of Bribery
- The Penalties

### Compliance
#### Behavioural Finance
- Background to Behavioural Finance
- Biases and Heuristics
- The Regulator’s Perspective
- Implications of Behavioural Finance

#### Conduct Risk
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- Regulatory Powers
- Managing Conduct Risk
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- Practical Application of Conduct Risk

#### Conflicts of Interest
- Introduction
- Examples of Conflicts of Interest
- Examples of Enforcement Action
- Policies and Procedures
- Tools to Manage Conflicts of Interest
- Conflict Management Process
- Good Practice

#### Risk (an overview)
- Definition of Risk
- Key Risk Categories
- Risk Management Process
- Risk Appetite
- Business Continuity
- Fraud and Theft
- Information Security

#### T&C Supervision Essentials
- Who Expects What From Supervisors?
- Techniques for Effective Routine Supervision
- Practical Skills of Guiding and Coaching
- Developing and Assessing New Advisers
- Techniques for Resolving Poor Performance

### Wealth
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- Protecting Client Assets and Client Money
- Ring-Fencing Client Assets and Client Money
- Due Diligence of Custodians
- Reconciliations
- Records and Accounts
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- Investment Management
- Modern Portfolio Theory and Investing Styles
- Direct and Indirect Investments
- Socially Responsible Investment
- Collective Investments
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#### Principles of RDR
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- Professionalism – SPS
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#### Central Clearing
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- The Risks CCPs Mitigate
- The Events of 2007/08
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#### Corporate Actions
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### International
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#### Foreign Account Tax Compliance Act (FATCA)
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- Implementation Timeline

#### Sovereign Wealth Funds
- Definition and History
- The Major SWFs
- Transparency Issues
- The Future
- Sources

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