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GO FOR GROWTH

$ Swapnote®

LIFFE Administration and Management
Cannon Bridge House . 1 Cousin Lane . London EC4R 3XX . United Kingdom
tel +44 (0)20 7623 0444 fax +44 (0)20 7588 3624
web www.liffe.com
Registered in England no 1591809

Contents

1 Foreword

The growth in both the size and the influence of the interest rate swap markets is now widely acknowledged in Europe, the US, and the world in general. The need for an accurate exchange traded derivative instrument referenced against the swap (inter-bank) curve is now overwhelming.

In March 2001 Euronext.liffe introduced its revolutionary € Swapnote® futures contracts into the euro denominated interest rate markets with great success. A US dollar denominated suite of Swapnote® products is now being introduced. The $ Swapnote® suite of futures contracts will complement and enhance these € Swapnote® contracts, providing US$ customers with the same capital and credit efficient trading of inter-bank exposures, as has been available in Europe now for more than a year.

Euronext.liffe's customers will now be able to trade swap exposures in both euros and dollars. Euronext.liffe is the only exchange in the world to offer this multi-currency capability.

Euronext.liffe promotes the Swapnote® suite of products in association with ICAP Plc, the world's leading swap broker.

For further information about € Swapnote® and $ Swapnote® please email swaps@liffe.com or swapnote@g-icap.com, or visit www.liffe.com or www.icap.com.

ICAP

Euronext, LIFFE and Euronext.liffe

Euronext was formed by the merger of the Amsterdam, Brussels and Paris cash and derivatives exchanges in September 2000. The Euronext Group has since grown further, adding BVLP (the Portuguese cash and derivatives exchange) and LIFFE (The London International Financial Futures and Options Exchange). The derivatives businesses of Euronext and LIFFE are being combined under the Euronext.liffe umbrella with the transfer of Euronext's derivatives products to LIFFE CONNECT™, the most sophisticated electronic derivatives trading platform in the world.

In this brochure:

- "Euronext.liffe" refers to the combined derivatives operations of Euronext and LIFFE, comprising the Euronext derivatives markets in Amsterdam, Brussels, Paris and Lisbon, and the LIFFE market in London; and
- the "LIFFE market" refers to the market which is administered by LIFFE Administration and Management under UK law and which forms part of Euronext.liffe.

2 Introduction to $ Swapnote®

Euronext.liffe has developed the Swapnote® suite of products in response to growing customer demand for a product that more accurately reflects many of the interest rate exposures to which they are subject.

The swap curve, effectively a statement of the interest rates charged between banks for deposits over various time periods, has over time become central to the determination of the prices of a wide range of corporate, agency and other non-government debt securities, as well as for the rapidly expanding credit derivatives market. The swap curve is ideal for this purpose as it is based on universally accepted standards for interest rate calculations. In fact, the swap curve has become the benchmark for many, if not the majority of interest rate markets.

In the United States, supply and demand imbalances, primarily resulting from recent large budget surpluses, have led to a break down in the long established relationship between the swap (ie inter-bank) yield curve and the Treasury bond yield curve. As a result the swap curve is beginning to assume benchmark status and is becoming the value and pricing reference point for the whole spectrum of US $ denominated fixed income securities.

Against this background the relevance of Euronext.liffe's $ Swapnote® futures contracts to today's capital markets is unquestionable.

$ Swapnote® – key benefits

Market participants using futures contracts referenced against the government bond curves to hedge their credit and inter-bank exposures are subject to significant basis risk. A futures contract referenced to the swap (inter-bank) curve provides a far more effective hedging mechanism with considerably reduced basis risk.

The $ Swapnote® contracts (two, five and ten-year maturities, referenced off the swap curve), address this point and offer the following benefits to market participants:

- the ability to match/hedge credit exposures with a derivative instrument that closely correlates with that exposure
- the ability to hedge accurately swap book exposures
- comprehensive coverage of the swap curve, from two-year maturity through to the ten-year sector of the curve
- the avoidance of convexity, optionality and potential squeeze/special problems that can be associated with government bond contracts under certain market conditions
- regulatory capital efficiencies associated with all exchange traded contracts that are centrally cleared
- the removal of counterparty credit risk limitations that occur in cash swaps
- the removal of long term administrative liabilities arising from cash flow maintenance
- trades exclusively on LIFFE CONNECT™, Euronext.liffe's state-of-the-art electronic trading platform, offering unrivalled execution speed, functionality and flexibility
- liquidity is not split between 'floor' and 'screen'

In addition to the above benefits, $ Swapnote® will provide a new range of trading and arbitrage opportunities. In particular, for the first time traders will be able to take a $ swap/€ swap spread position in the futures markets with the added advantage of margin offset.

LIFFE CONNECT™

The LIFFE market is a fully electronic derivatives exchange. All Swapnote® contracts trade on the LIFFE CONNECT™ trading platform.

First introduced in 1998, LIFFE CONNECT™ is the most advanced derivatives trading technology in the world. The benefits of trading using the LIFFE CONNECT™ trading system are many, and include:

- greater price transparency, including visibility of the entire order book
- greater control of order flow
- the ability to use computer software to control trading activity
- improved risk management through greater control of pricing software and the superior information flow of trading activity
- the ability to transact complex strategies in a single trade
- the ability to transact contingent orders in different markets without execution risk

LIFFE market members can access LIFFE CONNECT™ markets directly. Non-member customers can use order routing technology via LIFFE market members to access the markets.

More information about LIFFE CONNECT™ and how to access it can be found in Appendix 3 of this brochure or at www.liffe.com.

3 Market background

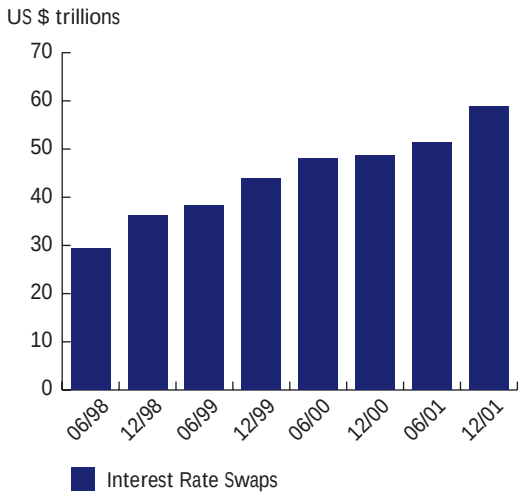
The world's financial markets are continually evolving. In the United States, supply and demand imbalances, primarily resulting from recent large budget surpluses, have lead to a breakdown in the long established relationship between the swap (ie inter-bank) yield curve and the Treasury bond yield curve as government debt issuance has reduced. As a result, the swap curve is beginning to assume benchmark status, and is becoming the value and pricing reference point for the whole spectrum of US$ denominated fixed income securities.

A reflection of this shift can be seen in the outstanding value of the global interest rate swap market, which exceeded $59 trillion at the end of 2001, an increase of over 100% since 1998.

Since their initial development in the early 1980s, interest rate swaps have experienced significant growth in their outstanding value, traded notional amounts and sophistication. Figure 1 illustrates this growth from 1998 to 2001.

Figure 1: Total notional size of interest rate swaps market

(Source: Bank for International Settlements)



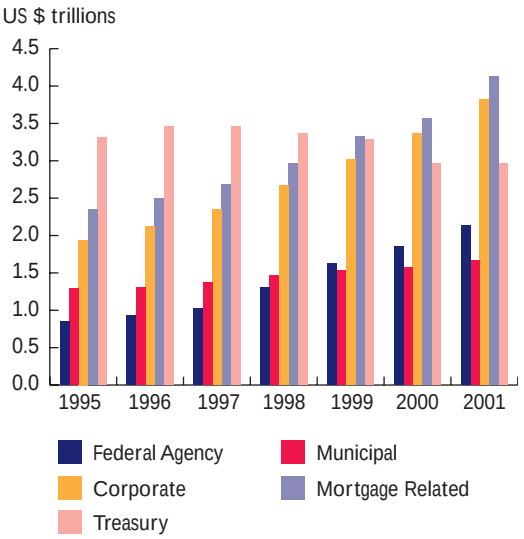
By December 2001 the outstanding value of US$ denominated interest rate swaps had reached $19 trillion, over five times the total value of the outstanding debt securities of the US Federal Government ($3.32 trillion), which has been in decline since 1996.

Growth in non-government issuance

Another trend over recent years has been the growth in the corporate and non-government sectors of the bond market. Figure 2 shows how the total amount of corporate, agency and mortgage-related bonds has grown substantially over the past few years whereas, simultaneously, the value of Federal Government bonds outstanding has steadily declined.

Figure 2: Value of US$ bonds outstanding by sector

(Source: The Bond Market Association)



Despite these pronounced structural changes, the continuing lack of an accurate and liquid hedging mechanism relating to the non-government sector, has resulted in the use of government bond futures and eurodollar futures to hedge corporate and non-government exposures as well as many OTC derivative positions. Such trades are exposed to often unacceptable levels of basis risk or convexity risk.

The extent of this basis risk is illustrated in figures 3 and 4 where the degree of correlation between ten-year swaps and Agency and AAA corporate issues, relative to that of the ten-year Treasury issue is evident.

Figure 3: Ten-Year US$ Swap, Treasury, Agency and AAA corporate yields

(Source: Bloomberg)

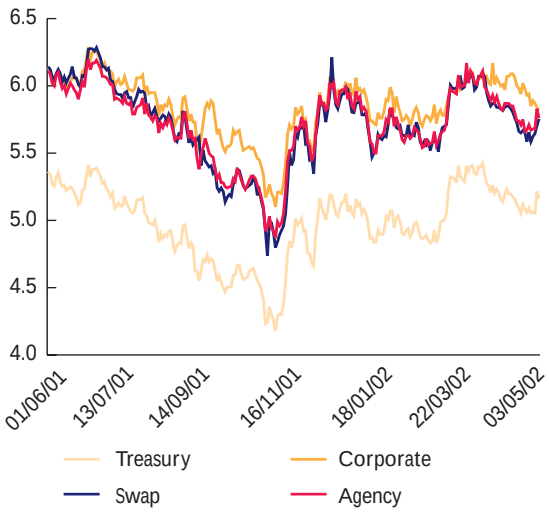


Figure 4: Historical yield spread Ten-Year US$ Swap vs Ten-Year Treasury Bond

(Source: Bloomberg)

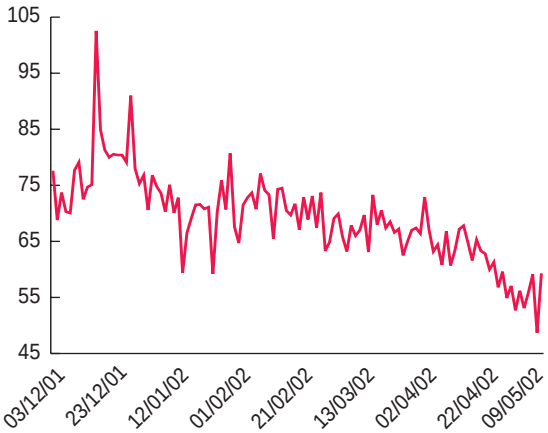


Figure 4 particularly demonstrates the volatile nature of the government bond-swap spread, the "credit" spread.

The $ Swapnote® alternative

Euronext.liffe's $ Swapnote® contracts provide the alternative to these hedging and pricing risks. The price of the $ Swapnote® future is directly referenced to the swap yield curve. This ensures a better correlation of yield movements, with an equivalent reduction in risk when using $ Swapnote®, as opposed to government bonds, to hedge against instruments that are more closely related to the inter-bank swap curve (as shown in Figure 3 above).

4 Trading examples

The following two examples demonstrate the potential benefit of using $ Swapnote® over other more traditional instruments.

Example 1: Using $ Swapnote® contracts to hedge corporate bonds

Given the strong correlation between corporate bonds and the swap curve, Euronext.liffe's $ Swapnote® contracts provide an ideal hedging instrument for those active in the corporate bond markets.

As an example of the relative benefits of using $ Swapnote®, consider the following comparison of hedging a holding of Alcoa Inc.6% 15 Jan 2012 bond with both the Ten-Year $ Swapnote® future and the Ten-Year Treasury Note future.

On 18 March 2002, a corporate bond trader is long $50 million of the Alcoa Inc. 6% 15 Jan 2012 bond. The current price of the bond is 98.406, with a basis point value of 7.20. The trader believes yields are going to rise in the short term and so looks to hedge his position. Over the next five days the price of the bond falls to 97.545, reflecting a rise in the yield to maturity of approximately 12 basis points, and a loss on the total holding equal to $430,500.

Hedging with $ Swapnote® futures

On 18 March, the June 2002 Ten-Year $ Swapnote® future is priced at 99.22. The contract has a basis point value of 7.37. Had the trader hedged the position with $ Swapnote® futures he would have needed to sell (50,000,000/100,000) x (7.20/7.37) = 488 $ Swapnote® contracts.

Five days later, the $ Swapnote® future is priced at 98.46. The profit from the $ Swapnote® futures trade is (76 x 488 x $10) = $370,880.

This gives a hedge effectiveness of 86%.

Hedging with Treasury Note Futures

On 18 March, the June 2002 Ten-Year US Treasury Note Future is priced at 103 $^{9}/_{32}$. The contract has a basis point value of 7.72. Had the trader hedged the Alcoa Inc. bond position with Treasury Note Futures he would have needed to sell (50,000,000/100,000) x (7.20/7.72) = 466 contracts.

Five days later, the Treasury Note future is priced at 102 $^{11.5}/_{32}$, a change in price of $^{20.5}/_{32}$. The profit from the Treasury Note futures trade is (20.5 x 466 x $31.25) = £298,531.

This gives a hedge effectiveness of 69%.

In this example, hedging with the Ten-Year US Treasury Note future would result in an aggregate loss of $131,969, whereas a hedge using the Ten-Year $ Swapnote® future would result in a much smaller loss of $59,620.

Example 2: Using $ Swapnote® to create a synthetic credit spread

The $ Swapnote futures provide the opportunity to take a view on the credit spread relationship between the government bond curve and the inter-bank curve – usually referred to as the "TED" spread. Specific views can be taken at the two, five and ten-year points on the curve.

The chart below shows the yield relationship between the Ten-Year $ Swapnote® contract and the Ten-Year US Treasury Note contract for the period between 1 March and 30 April 2002.

Figure 5: Ten-Year $ Swapnote® vs Ten-Year Treasury Note yield spread, March)
(Source: Bloomberg)

As an example of a TED spread trade, suppose that on 1 April 2002 a trader believes that the spread between the government bond curve and the inter-bank curve will narrow from the current level of 54.8 basis points at ten years maturity. In order to act on this view, the trader buys the higher yielding $ Swapnote® contract and sells the lower yielding Treasury Note future. He does so in a proportion that immunises him from parallel shifts in the curve.

The appropriate hedge ratio is given by the following ratio:

$$\frac{\text{No. \$ Swapnote® contracts}}{\text{No. Treasury Note contracts}} = \frac{\text{Contract Size of Treasury Note}}{\text{Contract Size of \$ Swapnote®}} \times \frac{\text{BPV of Treasury Note}}{\text{BPV of \$ Swapnote®}}$$

Given an inferred BPV (Basis Point Value) of the Ten-Year Treasury Note of 7.67, and a BPV for the Ten-Year $ Swapnote® of 7.29 on 1 April 2002, the proportion of $ Swapnote® to Treasury Note contracts is as follows:

$$\frac{\text{No. \$ Swapnote® contracts}}{\text{No. Treasury Note contracts}} = \frac{100{,}000}{100{,}000} \times \frac{7.67}{7.29} = 1.05$$

The trader decides to buy 105 $ Swapnote® contracts and sell 100 Treasury Note contracts.

On 8 April, the spread has narrowed to 49.9 basis points. The performance of the trade can be worked out as follows:

- **$ Swapnote® Leg:**
  1 April 2002 Buy 105 lots @ 98.40
  8 April 2002 Sell 105 lots @ 100.16

  Profit per lot
  = (100.16 – 98.40) x 100 = 176 price ticks
  = 176 x $10
  = $1,760

  Total profit
  = $1,760 x 105
  = $184,800

- **Treasury Note Leg:**
  1 April 2002 Sell 100 lots @ 102 $^{15}/_{32}$
  8 April 2002 Buy 100 lots @ 104 $^{9}/_{32}$

  Profit per lot
  = (104 $^{9}/_{32}$ – 102 $^{15}/_{32}$) x 32 = 49 price ticks
  = –49 – $31.25
  = –$1,531.25

  Total profit
  = –$1,531.25 x 100
  = –$153,125

  Net profit for the trade
  = $184,800 – $153,125
  =$31,675

5 Pricing of the $ Swapnote® contract

The $ Swapnote® contract uses an innovative yet simple model to create a standardised exchange-traded futures contract with the price sensitivity of an interest rate swap. The $ Swapnote® contract is essentially the fixed rate side of a forward starting swap contract that cash settles on the start/effective date of the underlying swap.

The innovative nature of the contract is further demonstrated in that the contract can also be regarded as a cash settled bond futures contract with a single notional bond in the deliverable basket.

Notional fixed rates

Each contract has a series of notional cash flows underlying it, comprising a fixed rate element, together with a principal repayment, such that it replicates a notional bond.

The fixed rate level is set at 6% with semi-annual compounding for each of the contracts, thereby facilitating spread trading between government bond futures contracts and $ Swapnote® contracts with related maturity.

Pricing at expiry

Up to expiry of the contract, the price of the $ Swapnote® contract will reflect underlying supply and demand. At expiry, the price is fixed by the Exchange using the Exchange Delivery Settlement Price (EDSP) algorithm.

The EDSP is the sum of the discounted notional cash flows, each of which has been given a present value using zero coupon discount factors derived from the ISDA Swap Rates fixings and BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings[1] at 11.00hrs New York time on the last trading day

For these purposes, the zero coupon discount factors are calculated using a "boot-strapping" technique.

All cash flow payment dates are defined as semi-anniversary dates of the effective date, being the third Wednesday in the delivery month (the "IMM" date). However, should any of these dates fall on a non-working day, the notional cash flow will be assumed to be paid on the next working day and the notional coupon will be adjusted to reflect this.

Appendix 1 lists Frequently Asked Questions and their answers concerning the swaps market and bootstrapping.

Appendix 2 provides a detailed worked example for the settlement of the Ten-Year $ Swapnote® contract.

[1] The British Banker's Association have agreed to sponsor a special set of dollar fixings at 11.00hrs New York time in association with Euronext.liffe. These BBA-LIFFE 11am New York Time Quarterly Dollar London Inter-bank fixings are set four times a year on $ Swapnote® expiration days only and in addition to their traditional 11.00hrs London time BBA LIBOR fixings.

Exchange Delivery Settlement Price algorithm

The $ Swapnote® contract represents a notional 6% coupon note with semi-annual compounding coupon payment dates that follow the *modified following day* convention used in the swap market, and whose price reflects the interest rate condition prevailing in the fixed rate side of the swap market. On expiration the contract is priced off of the interest rate swap coupon fixings supplied at 11.00hrs New York time by ISDA, the International Swaps and Derivatives Association. These rates can be used together with the BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings to calculate the present value of the notional underlying $ Swapnote®. This present value is the EDSP.

On the last trading day, the calculation of the EDSP is just a matter of using the appropriate present value factors to discount the notional cash flows as defined in the contract specifications. There needs to be a present value (discount) factor for each of the semi-annual notional cash flows. The EDSP can then be calculated using the following equation:

$$EDSP = 100 * d_{2m} + 6 * \sum_{i=1}^{2m} A_i d_i$$

Where:

"*m*" is the maturity of the $ Swapnote® contract in years (two, five or ten).
"A_i" are called the "accrual factors" between the notional cash flows. Each "Ai" is defined to be the number of days between the dates of the "*i-1*th" and the "*i*th" notional cash flows – calculated on a 30/360 day count basis – and divided by 360.
"d_i" are the discount factors (also called present value factors) needed to price the "*i*th" notional cash flow.

Unless the notional cash flows have been adjusted for a non-working day, the accrual factor representing the fraction of the year between them will be 0.5, and the notional coupon accrued will therefore be 3%. Both the accrual and discount factors are rounded to the eighth decimal place in the above equation.

Calculating the present value factors

The EDSP equation requires the discount factors to be already known. In this section the process by which they are calculated using a bootstrapping technique is described.

The correct application of bootstrapping is based on the availability of coupon bearing instruments of known coupons and prices (eg 100%) at a series of maturities.

The ISDA swap coupon rates (ie fixings) form just such a sequence except that they do not provide the "price" of the fixed rate side of the swap which is needed for the calculation of the discount factors. However, when a swap deal is struck the floating rate side must be of opposite and equal value to its fixed rate side at the time of trading[2]. As the three month British Bankers' Association dollar LIBOR fixing is the benchmark floating rate index used for the floating side of dollar swaps and BBA LIBOR is set at 11:00 hours London time, after this time the floating part of the swap (and therefore the fixed side) can change in "price". In fact the value of both sides of the swap (whilst remaining offsetting) begin to reflect prevailing three month London Inter-bank dollar deposit rate. Note also that the floating rate side of any dollar swap trading after 11:00 hours London time will have the same value regardless of maturity.

On expiration day by 11:00 hours in New York when the ISDA swap rates fixings are compiled, the value of each offsetting side of the swap could be significantly away from par (ie 100.00%).

[2] See Appendix 1 for an explanation of how a swap works

The swap fixings then no longer necessarily imply a "par curve" so before attempting bootstrapping the floating side (and therefore the fixed side) of the swap must be revalued. We therefore define the revaluation ratio required for bootstrapping, *V*, by using the following equation:

$$V = \frac{(1+a_{3M}L_{3M})}{(1+a_{3M}B_{3M})}$$

where, "a_{3M}" is a three month accrual factor calculated on an Actual/360 day count basis, "L_{3M}" is standard three month BBA US Dollar LIBOR, and "B_{3M}" is the BBA-LIFFE US Dollar London Inter-bank Quarterly Fixing.[3]

Having calculated the "price" of the fixed rate side of the swaps, the bootstrapping process can begin. However, a six month ISDA fixing is not available; therefore, the first discount factor "d_1" is calculated by using directly the six month BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings B_{6M} as a proxy. This can be shown as:

$$d_1 = \frac{1}{(1+a_{6M}B_{6M})}$$

where, "a_{6M} " is a six month accrual factor calculated on an Actual/360 day count basis.

Bootstrapping is the process by which we use the discount factors we already know and add the information contained in the next ISDA swap rate fixing to generate the next factor(s). The process is repeated using each ISDA swap rate fixing one at a time to work our way along the present value factor curve. For example we know that the total value, V, of all the coupons of the one year ISDA swap, C_2, is:

$$V = d_1A_1C_2 + d_2(1+A_2C_2)$$

where, "d_2" is the unknown one year discount factor and "d_1" is known and as given above. This identity can be inverted to solve for the unknown factor

$$d_2 = \frac{(V - d_1A_1C_2)}{(1+A_2C_2)}$$

Similarly,

$$d_3 = \frac{(V - d_1A_1C_3 - d_2A_2C_3)}{(1+A_3C_3)}$$

where, "C_3" would be the one and a half year ISDA swap fixing if it existed. However, ISDA only supply fixings at annual points.

Because ISDA Swap fixings are not available at semi-annual intervals, Euronext.liffe approximates the missing rate using linear interpolation in the appropriate way. Thus for odd number "i" above we define

$$C_i = \frac{(A_iC_{i+1} + A_{i+1}C_{i-1})}{(A_i+A_{i+1})}$$

where, "C_i" is rounded to 3 decimal places. Extensive testing by Euronext.liffe against more sophisticated algorithms has shown that this approximation is very accurate for the EDSP calculation.

All subsequent discount factors may now be bootstrapped in the normal way ie

$$d_i = \frac{(V - C_i \sum_{j=1}^{i-1} A_jd_j)}{(1+A_iC_i)}$$

Here, **"i"** is an integer valued in the range **2** through to **2m**, where m is the maturity of the swap. The two to ten-year swap rates are labelled "$\mathbf{C}_i$". The accrual factors labelled "$\mathbf{A}_i$" and "V" are as defined above.

[3] The British Banker's Association have agreed to sponsor a special set of dollar fixings at 11.00hrs New York time in association with Euronext.liffe. These BBA-LIFFE 11:00 hours New York Time Quarterly Dollar London Interbank fixings are set four times a year on Swapnote® expiration days only and in addition to their traditional 11.00hrs London time BBA LIBOR fixings.

Fair pricing prior to expiry

At any point in time prior to expiry, the price discovery process and daily settlement prices (DSPs) are established by the market.

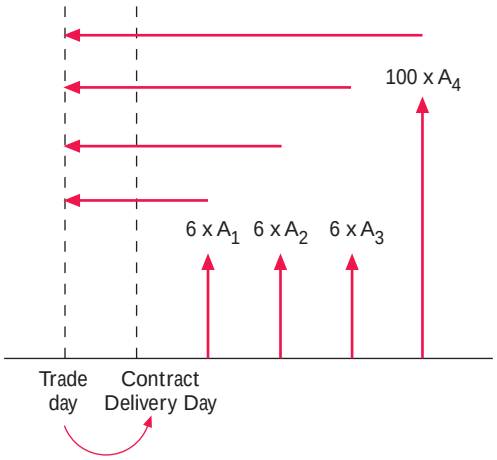
However, a theoretical arbitrage-free fair price can be calculated at any time in the same way as the EDSP ie the relevant discount factors need to be calculated and input into the EDSP formula. Note: ahead of expiration the discount factors required will be "forward value" factors which value the notional $ Swapnote® contract not to today's trade value date, but to the contract value day for the relevant futures expiry.

These "forward values" could be obtained directly if the forward swap rates were fully observable, however, as most information from the swap market is presented in the form of spot rates, a two stage process is required to generate these if the fair price to expiry is to be calculated on a trade date that does not coincide with the notional cash flow dates.

The fair price is the sum of the present values of the notional $ Swapnote® cash flows valued to the trade day value date, which is then forward valued (equivalent to financing the position) to the contract value date[4].

If the discount factors derived from the current swap rates prevailing on the trade date do not coincide with the notional cash flow dates, an interpolation of either the rates or the discount factors will be required. As such, the fair price will depend on which interpolation methodology has been adopted.

Figure 7: The arbitrage-free pricing of a Two-Year, 6% $ Swapnote®: notional cash flows are "present valued" to the contract trade date, summed and financed to delivery



[4] See Appendix 1

6 Contract specifications

The specifications of these contracts may change from time to time. For the most up to date information, please see www.liffe.com.

Two-Year $ Swapnote®	
Unit of Trading[5]	$200,000 notional principal amount with 6.0% notional fixed rate
Maturities[6]	Notional principal amount due two years from the delivery day
Delivery Months	March, June, September and December such that the nearest two delivery months are always available for trading
Quotation	Per $100 nominal value
Minimum Price Movement (Tick Size and Value)	0.005 ($10)
Last Trading Day	11:00 New York time Two business days prior to the delivery day
Delivery Day	Third Wednesday of the delivery month
Trading Hours	07:00 - 20:00

Trading Platform:

- LIFFE CONNECT™ Trading Host for Futures and Options.
- Algorithm: Central order book applies a pro-rata trading algorithm, but with priority given to the first order at the best price subject to a minimum order volume and limited to a maximum volume cap.
- Wholesale Trading Facilities: Asset Allocation, Block Trading, Basis Trading.

Exchange Delivery Settlement Price (EDSP): The EDSP is the present value, as of the delivery day, of the notional principal amount and the notional coupons. The discounting of the cash flows is performed using discount factors constructed, on the last trading day, from the ISDA Dollar Swap Rate Fixings, the BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings and the three month BBA US Dollar LIBOR Fixing. The ISDA Benchmark Dollar LIBOR Swap Rate fixings are compiled daily at 11:00 New York time and displayed on the Reuters page "ISDAFIX1". The BBA-LIFFE US Dollar London Inter-bank Quarterly fixings are compiled quarterly at 11:00 New York time and displayed on the Moneyline-Telerate page "3850". The BBA US Dollar LIBOR fixings are compiled daily at 11:00 London time and displayed on the Bloomberg page "BBAM 1". Where the EDSP is not an exact multiple of 0.005, it will be rounded to the nearest 0.005, or where the EDSP is an exact uneven multiple of 0.0025, to the nearest higher 0.005 (eg an EDSP of 101.7275 becomes 101.730).

Contract Standard: Cash settlement based on the Exchange Delivery Settlement Price.

[5] The contract is cash settled; notional principals and notional coupons do not actually occur.

[6] The maturity of a $ Swapnote® futures contract is defined as the time from the delivery month to the maturity of the last notional cash flow.

Notional Series of Cash Flows: The underlying notional cash flows consist of a series of fixed notional coupons and a notional principal at maturity, the dates of which occur at six month intervals. The day of the month of each notional cash flow is the same day of the month as the delivery day if it is a working day. Should such a semi-anniversary of the delivery day fall on a non-working day, the notional cash flow date will be the next working day, following the modified business day convention.

The notional principal amount always falls on the second full anniversary of the contract delivery day (or first working day thereafter), giving each delivery month the price sensitivity of a two-year swap or, equivalently, a two-year bond priced off and correlated with the swap curve.

Unless otherwise indicated, all times are London times.

Five-Year $ Swapnote®	
Unit of Trading[7]	$100,000 notional principal amount with 6.0% notional fixed rate
Maturities[8]	Notional principal amount due five years from the delivery day
Delivery Months	March, June, September and December such that the nearest two delivery months are always available for trading
Quotation	Per $100 nominal value
Minimum Price Movement (Tick Size and Value)	0.01 ($10)
Last Trading Day	11:00 New York time Two business days prior to the delivery day
Delivery Day	Third Wednesday of the delivery month
Trading Hours	07:00 - 20:00

Trading Platform:

- LIFFE CONNECT™ Trading Host for Futures and Options.
- Algorithm: Central order book applies a pro-rata trading algorithm, but with priority given to the first order at the best price subject to a minimum order volume and limited to a maximum volume cap.
- Wholesale Trading Facilities: Asset Allocation, Block Trading, Basis Trading.

Exchange Delivery Settlement Price (EDSP): The EDSP is the present value, as of the delivery day, of the notional principal amount and the notional coupons. The discounting of the cash flows is performed using discount factors constructed, on the last trading day, from the ISDA Dollar Swap Rate Fixings, the BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings and the three month BBA US Dollar LIBOR Fixing. The ISDA Benchmark Dollar LIBOR Swap Rate fixings are compiled daily at 11:00 New York time and displayed on the Reuters page "ISDAFIX1". The BBA-LIFFE US Dollar London Inter-bank Quarterly fixings are compiled quarterly at 11:00 New York time and displayed on the Moneyline-Telerate page "3850". The BBA US Dollar LIBOR fixings are compiled daily at 11:00 London time and displayed on the Bloomberg page "BBAM 1". Where the EDSP is not an exact multiple of 0.01, it will be rounded to the nearest 0.01, or where the EDSP is an exact uneven multiple of 0.005, to the nearest higher 0.01 (eg an EDSP of 101.7275 becomes 101.730).

Contract Standard: Cash settlement based on the Exchange Delivery Settlement Price.

Notional Series of Cash Flows: The underlying notional cash flows consist of a series of fixed notional coupons and a notional principal at maturity, the dates of which occur at six month intervals. The day of the month of each notional cash flow is the same day of the month as the delivery day if it is a working day. Should such a semi-anniversary of the delivery day fall on a non-working day, the notional cash flow date will be the next working day, following the modified business day convention.

[7] The contract is cash settled; notional principals and notional coupons do not actually occur.

[8] The maturity of a $ Swapnote® futures contract is defined as the time from the delivery month to the maturity of the last notional cash flow.

The notional principal amount always falls on the fifth full anniversary of the contract delivery day (or first working day thereafter), giving each delivery month the price sensitivity of a five-year swap or, equivalently, a five-year bond priced off and correlated with the swap curve.

Unless otherwise indicated, all times are London times.

Ten-Year $ Swapnote®	
Unit of Trading[9]	$100,000 notional principal amount with 6.0% notional fixed rate
Maturities[10]	Notional principal amount due ten years from the delivery day
Delivery Months	March, June, September and December such that the nearest two delivery months are always available for trading
Quotation	Per $100 nominal value
Minimum Price Movement (Tick Size and Value)	0.02 ($20)
Last Trading Day	11:00 New York time Two business days prior to the delivery day
Delivery Day	Third Wednesday of the delivery month
Trading Hours	07:00 - 20:00

Trading Platform:

- LIFFE CONNECT™ Trading Host for Futures and Options.
- Algorithm: Central order book applies a pro-rata trading algorithm, but with priority given to the first order at the best price subject to a minimum order volume and limited to a maximum volume cap.
- Wholesale Trading Facilities: Asset Allocation, Block Trading, Basis Trading.

Exchange Delivery Settlement Price (EDSP): The EDSP is the present value, as of the delivery day, of the notional principal amount and the notional coupons. The discounting of the cash flows is performed using discount factors constructed, on the last trading day, from the ISDA Dollar Swap Rate Fixings, the BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings and the three month BBA US Dollar LIBOR Fixing. The ISDA Benchmark Dollar LIBOR Swap Rate fixings are compiled daily at 11:00 New York time and displayed on the Reuters page "ISDAFIX1". The BBA-LIFFE US Dollar London Inter-bank Quarterly fixings are compiled quarterly at 11:00 New York time and displayed on the Moneyline-Telerate page "3850". The BBA US Dollar LIBOR fixings are compiled daily at 11:00 London time and displayed on the Bloomberg page "BBAM 1". Where the EDSP is not an exact multiple of 0.02, it will be rounded to the nearest 0.02, or where the EDSP is an exact uneven multiple of 0.01, to the nearest higher 0.02 (eg an EDSP of 101.73 becomes 101.74[11]).

Contract Standard: Cash settlement based on the Exchange Delivery Settlement Price.

Notional Series of Cash Flows: The underlying notional cash flows consist of a series of fixed notional coupons and a notional principal at maturity, the dates of which occur at six month intervals. The day of the month of each notional cash flow is the same day of the month as the delivery day if it is a working day. Should such a semi-anniversary of the delivery day fall on a non-working day, the notional cash flow date will be the next working day, following the modified business day convention.

[9] The contract is cash settled; notional principals and notional coupons do not actually occur.

[10] The maturity of a $ Swapnote® futures contract is defined as the time from the delivery month to the maturity of the last notional cash flow.

[11] See www.liffe.com for the latest rounding convention.

The notional principal amount always falls on the tenth full anniversary of the contract delivery day (or first working day thereafter), giving each delivery month the price sensitivity of a ten-year swap or, equivalently, a ten-year bond priced off and correlated with the swap curve.

Unless otherwise indicated, all times are London times.

7 Quote Vendor Codes

Two-Year $ Swapnote®	
LIFFE LMF Code	USW
Bloomberg Financial Markets	UZA<cmdty>CT<go>
Bridge Station	GB@USW
CMS	LH
CQG	USW
Global Systems Topic	USW/F.LI*
Reuters	FSW:<F3>
Track	USW
Five-Year $ Swapnote®	
LIFFE LMF Code	USO
Bloomberg Financial Markets	UCA<cmdty>CT<go>
Bridge Station	GB@USO
CMS	LI
CQG	USO
Global Systems Topic	USO/F.LI*
Reuters	FSO:<F3>
Track	USO
Ten-Year $ Swapnote®	
LIFFE LMF Code	USP
Bloomberg Financial Markets	UIA<cmdty>CT<go>
Bridge Station	GB@USP
CMS	LJ
CQG	USP
Global Systems Topic	USP/F.LI*
Reuters	FSP:<F3>
Track	USP

Appendix 1: Frequently asked questions

Q: What is a swap?
A: A swap is an agreement between two counterparties to exchange a series of cash flows over time, based upon agreed terms.

Q: What is an interest rate swap (IRS)?
A: Interest rate swaps are the most common form of swap, whereby one counterparty agrees to pay a fixed rate of interest and receive a floating rate based on a notional principle amount while the other counterparty pays floating to receive fixed. No principal changes hands. The floating rate is usually defined against BBA LIBOR for US $ denominated swaps whilst the fixed rate is negotiated between the dealers.

Q: How are interest rate swaps quoted?
A: IRSs are quoted in terms of the fixed rate, known in the market as the swap rate. IRSs can be quoted in any maturity and are most liquid at annual reference points ie one-year, two-year etc on the swap curve. Away from these annual points, the market becomes less efficient and transparent.

Q: What is the ISDA fixing?
A: The International Swaps and Derivatives Association is the global trade association representing leading participants in the privately negotiated derivatives industry, a business which includes interest rate, currency, commodity, credit and equity swaps, as well as related products such as caps, collars, floors and swaptions. Most swaps are created under ISDA documentation. The US $ ISDA fixing is compiled at 11:00 am New York time from the panel banks' quotes of swap rates at the liquid annual points and is published daily on Reuters page ISDAFIX1.

Q: How does the IRS market relate to the bond market?
A: A swap trade can be thought of as a simultaneous sale/purchase of a fixed rate bond against a purchase/sale of a floating rate bond. An important insight is to realise that as no immediate transfer of funds occurs when a swaps deal is struck so the floating rate bond must be of opposite and equal value to the fixed rate bond at time of trading. Since newly issued floating rate bonds will have a value very close to par[12] (ie 100.00%) the swap rates quoted by market makers represent roughly the coupons required by the market for newly issued fixed rate bonds to be valued at par. Thus swap rates are indicators of the coupons where banks can issue new bonds. As a result of this, the yield spread to swaps has become a commonly used concept in both the primary issuance and secondary bond markets. In other words swap rates have become benchmarks for bonds.

Q: How accurate is the linear interpolation technique Euronext.liffe has adopted?
A: Extensive testing by Euronext.liffe against more sophisticated algorithms has shown that this approximation is very accurate for the EDSP calculation. In particular linear interpolation was tested against an advanced bootstrapping methodology which calculated (at each iteration) two discount factors from each additional swap rate point using the constraint that the discount factor curve should be extended smoothly. The results using linear interpolation were largely identical.

[12] This is only true if the floating rate index is appropriate to the credit of the bond as in this case - LIBOR and the IRS market are both interbank credits.

Q: To calculate the true fair theoretical value when trading ahead of expiration, don't I need to calculate forward swap rates at the annual points first and then linearly interpolate?

A: If you had annual forward swap rates available then this interpolation would be the right way to go. Although in pure theory the fair theoretical price when calculated from spot swap rates should also calculate the annual forward swap rates and interpolate semi-annual points as an intermediate step, this is not really necessary. In fact there is no need to calculate in such a complicated way because the linear interpolation approach can be shown to be so accurate. Thus one can go directly from present value factors applied to all notional $ Swapnote® cash flows calculated directly from the spot swap rates without loss of accuracy, before forward valuing to the contract value date.

Appendix 2: Example $ Swapnote® EDSP calculation

The EDSP is the sum of the discounted notional cash flows, each of which has been present valued, to the delivery day[13] using zero coupon discount factors derived from the ISDA Swap Rates Fixings and BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings, which are compiled daily at 11.00 hours New York time and displayed on Reuters page "ISDAFIX1" and Moneyline-Telerate page "3850" respectively. In the example below real historical swap and deposit fixings rates have been used[14].

Term	Deposit Rates (%)
3M BBA LIBOR fix	2.01000
3M BBA-LIFFE fix	2.01000
6M BBA-LIFFE fix	2.28000

Term	Swap Rates (%)
1Y ISDA fix	2.950
2Y ISDA fix	4.042
3Y ISDA fix	4.661
4Y ISDA fix	5.055
5Y ISDA fix	5.328
6Y ISDA fix	5.541
7Y ISDA fix	5.693
8Y ISDA fix	5.810
9Y ISDA fix	5.910
10Y ISDA fix	5.989

The underlying notional cash flows consist of a series of fixed notional coupons occurring at six monthly intervals and a notional principal at maturity. The day of the month of each notional cash flow is the same day of the month as the delivery day if it is a working day. Should such a semi-anniversary of the delivery day fall on a non-working day, the notional cash flow date will be the next working day, following the modified business day convention.

Notional Coupon Payment Delivery Date: March 2002

Cash Flow Number	Date	Day of week
1	20-Sep-02	Friday
2	20-Mar-03	Thursday
3	22-Sep-03	Monday
4	22-Mar-04	Monday
5	20-Sep-04	Monday
6	21-Mar-05	Monday
7	20-Sep-05	Tuesday
8	20-Mar-06	Monday
9	20-Sep-06	Wednesday
10	20-Mar-07	Tuesday
11	20-Sep-07	Thursday
12	20-Mar-08	Thursday
13	22-Sep-08	Monday
14	20-Mar-09	Friday
15	21-Sep-09	Monday
16	22-Mar-10	Monday
17	20-Sep-10	Monday
18	21-Mar-11	Monday
19	20-Sep-11	Tuesday
20	20-Mar-12	Tuesday

[13] Delivery day: third Wednesday of the delivery month. In this example (Mar02), 20 March 2002 (two business days after the last trading day).

[14] N.B. The British Banker's Association have agreed to sponsor a special set of dollar fixings at 11.00hrs New York time in association with Euronext.liffe. These BBA-LIFFE 11:00 hours New York Time Quarterly Dollar London Inter-bank fixings are set four times a year on last trading days only and were introduced on 18 March 2002.

The EDSP is calculated on the last trading day from the swap rate fixings in accordance with the following equation:

$$EDSP = 100 * d_{2m} + 6 * \sum_{i=1}^{2m} A_i d_i$$

Where:

The index "***m***" is the maturity of the Swapnote® contract in years (two, five or ten). Subscripts take values up to 2*m* because notional cash flows are semi-annual.

The term "A_i" represents the accrual factor between the notional cash flows. "A_i" is defined to be the number of days between the dates of the "$i-1^{th}$" and the "i^{th}" notional cash flows – calculated on a 30/360 day count basis – and divided by 360. Unless the date of one of two successive notional cash flows has been adjusted for a non-working day, the

"Following" Maturity	Day of "Following" Maturity	Accrual Factor (30/360)
20-Mar-02		
20-Sep-02	Friday	0.50000000
20-Mar-03	Thursday	0.50000000
22-Sep-03	Monday	0.50555556 ← 182/360
22-Mar-04	Monday	0.50000000
20-Sep-04	Monday	0.49444444
21-Mar-05	Monday	0.50277778
20-Sep-05	Tuesday	0.49722222 ← 179/360
20-Mar-06	Monday	0.50000000
20-Sep-06	Wednesday	0.50000000
20-Mar-07	Tuesday	0.50000000
20-Sep-07	Thursday	0.50000000
20-Mar-08	Thursday	0.50000000
22-Sep-08	Monday	0.50555556
20-Mar-09	Friday	0.49444444
21-Sep-09	Monday	0.50277778
22-Mar-10	Monday	0.50277778
20-Sep-10	Monday	0.49444444
21-Mar-11	Monday	0.50277778
20-Sep-11	Tuesday	0.49722222
20-Mar-12	Tuesday	0.50000000

accrual factor representing the fraction of the year between them will be exactly 0.5.

The term "d_i" indicates the zero coupon discount factor calculated from the swap rate fixings applicable for the period between the delivery day and the "i^{th}" notional cash flow. The zero coupon discount factors are constructed from the ISDA Benchmark Swap Rates Fixings and BBA-LIFFE US Dollar London Inter-bank Quarterly Fixings available on the last trading day. The discount factors are rounded to the eighth decimal place.

The first discount factor (d_1) is calculated using the following:

$$d_1 = \frac{1}{(1+a_{6M}B_{6M})}$$

Where the term a_{6M} is a six month accrual factor calculated on an Actual/360 day count basis and B_{6M} is the BBA-LIFFE six month Quarterly Fixing.

For bootstrapping, the value of the floating rate side of the swap (V) is calculated using:

$$V = \frac{(1+a_{3M}L_{3M})}{(1+a_{3M}B_{3M})}$$

Where the term, "L_{3M}" is the morning three month Libor fixing, a_{3M} is a three month accrual factor calculated on the Actual/360 day count basis and "B_{3M}" is the BBA–LIFFE US Dollar London Inter-bank Quarterly Fixing.

In this example[15] there are 92 days in the period from 20-Mar-02 to 20-Jun-02 (a Thursday) so the V is calculated as follows:

$$V = \frac{1+(92/360 \times 0.0201000)}{1+(92/360 \times 0.0201000)} = 1.00000000$$

Because ISDA Swap fixings are not available at semi-annual intervals, Euronext.liffe approximates the missing rate using linear interpolation in the appropriate way. Thus for odd number "i" above we define

$$C_i = \frac{(A_iC_{i+1} + A_{i+1}C_{i-1})}{(A_i+A_{i+1})}$$

Where, "C_i" is rounded to 3 decimal places. For example C_3 is given by:

$$C_3 = \frac{(0.50000000 \times 4.042 + 0.50555556 \times 2.950)}{(0.50000000 + 0.50555556)} = 3.499$$

Having substituted all the missing rates in a similar way all subsequent present value factors may now be bootstrapped in the normal way.

$$d_i = \frac{V - C_i \sum_{j=1}^{i-1} A_j d_j}{1+A_iC_i}$$

Note that in this instance, "C" is represented in percentage terms, i.e. $C_1 = 0.02950$

In this example there are 184 days in the period from 20-Mar-02 to 20-Sep-02 so the d_1 is calculated as follows:

$$d_1 = \frac{1}{1 + (184/360 \times 0.02280000)} = 0.98848090$$

[15] In this case there happened to be no movement in three month rates between the two fixings. However in principle the EDSP is quite sensitive to this factor.

Other discount factors are as follows:

$$d_2 = \frac{1.00000000 - 0.02950 \times 0.98848090 \times 0.50000000}{(1 + 0.50000000 \times 0.02950)} = 0.97109624$$

$$d_3 = \frac{1.00000000 - 0.03499 \times (0.98848090 \times 0.50000000 + 0.97109624 \times 0.50000000)}{(1 + 0.50555556 \times 0.03499)} = 0.94893119$$

Subsequent discount factors "d_i" are "bootstrapped" by using preceding zero coupon discount factors to remove swap coupons occurring before the last year of the swap term.

The following tables summarise the full calculation of the example EDSP.

Expiry Delivery Date: 20-Mar-02 V = 1.00000000

Coupon Number	Rate	"Following Maturity"	Day of "Following Maturity"	Accrual Factor (30/360)	Zero Coupon Discount Factor	Notional Cash Flows	Adjusted Cash Flows	Discounted Cash Flows
1	2.28000	20-Sep-02	Friday	0.50000000	0.98848090	3	3.000	2.965
2	2.950	20-Mar-03	Thursday	0.50000000	0.97109624	3	3.000	2.913
3	3.499	22-Sep-03	Monday	0.50555556	0.94893119	3	3.033	2.878
4	4.042	22-Mar-04	Monday	0.50000000	0.92236496	3	3.000	2.767
5	4.349	20-Sep-04	Monday	0.49444444	0.89717606	3	2.967	2.662
6	4.661	21-Mar-05	Monday	0.50277778	0.86942489	3	3.017	2.623
7	4.857	20-Sep-05	Tuesday	0.49722222	0.84356198	3	2.983	2.517
8	5.055	20-Mar-06	Monday	0.50000000	0.81654643	3	3.000	2.450
9	5.192	20-Sep-06	Wednesday	0.50000000	0.79103912	3	3.000	2.373
10	5.328	20-Mar-07	Tuesday	0.50000000	0.76518114	3	3.000	2.296
11	5.435	20-Sep-07	Thursday	0.50000000	0.74034646	3	3.000	2.221
12	5.541	20-Mar-08	Thursday	0.50000000	0.71546054	3	3.000	2.146
13	5.618	22-Sep-08	Monday	0.50555556	0.69185629	3	3.033	2.099
14	5.693	20-Mar-09	Friday	0.49444444	0.66891353	3	2.967	1.984
15	5.752	21-Sep-09	Monday	0.50277778	0.64677761	3	3.017	1.951
16	5.810	22-Mar-10	Monday	0.50277778	0.62495996	3	3.017	1.885
17	5.860	20-Sep-10	Monday	0.49444444	0.60422533	3	2.967	1.793
18	5.910	21-Mar-11	Monday	0.50277778	0.58350990	3	3.017	1.760
19	5.949	20-Sep-11	Tuesday	0.49722222	0.56407626	3	2.983	1.683
20	5.989	20-Mar-12	Tuesday	0.50000000	0.54483024	103	103.000	56.118
							EDSP	**100.08**

Appendix 3: LIFFE CONNECT™

Euronext.liffe's $ Swapnote® contracts can be traded either through LIFFE's central markets or through LIFFE's Wholesale Trading Facilities, developed in recognition of the fact that markets need to provide guaranteed execution to support specific trading strategies.

Overview

LIFFE CONNECT™ is now acknowledged to be the world's leading electronic derivatives trading system and the only one that has proven itself capable of trading high volumes of complex short term interest rate products. In keeping with other electronic trading platforms, LIFFE CONNECT™ is an anonymous, order-driven system, where traders are unaware of their actual counterparty both pre and post trade.

The design of LIFFE CONNECT™ is based upon an open architecture system using an Application Program Interface (API), which incorporates the use of front-end trading solutions, developed by Independent Software Vendors (ISVs) or in-house by users of the LIFFE market. This allows users to purchase or build trading and/or viewing applications (software) to meet their specific trading needs. This design simplifies the trading process and trading infrastructure. It also offers users the potential to integrate their front/back office trading, settlement, risk-management and order routing systems, as well as allowing users to trade derivatives and cash markets on the same screen.

LIFFE CONNECT™ provides the world's most advanced and complete electronic trading environment, offering unrivalled flexibility to the customer.

Access to LIFFE CONNECT™

LIFFE CONNECT™ can be accessed electronically from the world's major financial centres. Traders wishing to access LIFFE CONNECT™ can do so via one of the many front-end trading applications which have been developed by ISVs. These applications are personalised trading screens that link the user to the LIFFE market via a chosen network.

Users have considerable flexibility and choice of networks including:

- access from London via the LIFFE market's local Exchange Access System (EASy) network
- direct access via Euronext.liffe's international network, built and managed by Radianz, one of the world's leading network operators
- access through services offered by Value Added Network (VAN) providers
- via a member's own network

Non-members of the LIFFE market may also access the market remotely via a number of indirect methods which include:

- an order routing service offered to customers by a LIFFE market member, allowing a customer to enter his orders electronically to a member of the LIFFE market who in turn channels the order immediately onto LIFFE CONNECT™
- trading bureaux, allowing independent traders to trade directly on LIFFE CONNECT™ under the umbrella of a member of the LIFFE market
- a broker with access to the LIFFE market

Trading on LIFFE CONNECT™

Trading on LIFFE CONNECT™ is primarily characterised by two things, the *anonymity* of the market and the *trade priority matching algorithm*. Other key characteristics of LIFFE CONNECT™ include its strategy markets and implied pricing functionality. However, these features are not discussed here.

Anonymity – Trading Anonymity is a key aspect of the LIFFE CONNECT™ market. Unless pre-negotiated, traders in the market will not be aware of whose orders they are viewing or trading against, either before or after a trade.

Trade Priority Matching Algorithm – Trading takes place through the submission of orders, using the member's Trading Application, into the LIFFE CONNECT™ central order book. Orders may be for individual contract months, individual option series, or strategies. Once an order has been submitted, the system then matches orders in the central order book. The criteria for determining trade priority (ie which orders will trade first against each other) is dependent on the contract being traded. The trading host configuration allows the trade matching algorithm to be set on a product by product basis. The criteria used for this configuration will be one of the following:

- Price and time priority
- Price and pro-rata

- **$ Swapnote® Trading Algorithm**
  Euronext.liffe's $ Swapnote® contracts use the price and pro-rata trading algorithm. The € Swapnote® contracts use the price/time trading algorithm. The price and pro-rata trading algorithm has the following characteristics:

  - **Price**: highest bid/lowest offer has priority over other orders in the same contract month/strategy
  - **Pro-rata**: all orders at a price have the same priority; orders are filled in proportion to their volume

  The pro-rata algorithm used for Euronext.liffe's $ Swapnote® futures and options contracts also contains the following variants:

  - **Priority Pro-Rata Algorithm**
    The pro-rata algorithm can be adjusted on a product by product basis so that a specific degree of priority is given to the price maker before pro-rata sharing is applied in respect of any remaining business. This "priority pro-rata algorithm" is closely based on the vanilla pro-rata algorithm described above, however, for each side of the market it allows one order in the book to be assigned a priority "flag". Once a new incoming order has traded against the priority "flagged" order, the pro-rata algorithm will operate in the normal way. The aim of this mechanism is to encourage market participants to improve prices by offering a reward of guaranteed volume, through the priority flagging of orders, in return for the price improvement.

    An order will gain priority status if it betters the current best price in the order book. Only one order in a particular market can have priority status, and as a result priority status is removed from any previous order. In order to gain this priority, the order must satisfy a minimum volume requirement. In addition, priority for this order will be limited by the imposition of a volume cap.

    There will not always be a priority order in the order book. This can occur when the priority order is fully traded, leaving the other orders at the same or at a worse price, or when no orders which exceed the minimum volume requirement have been submitted.

  - **The Minimum Volume threshold**
    The minimum volume requirement level is configurable by contract. If the first order at a new best price has a volume at or above the minimum volume threshold, then it will gain priority status. If such first order does not meet the minimum volume threshold (thus not gaining priority), no subsequent orders joining at that price will gain priority

either, even if they meet the minimum volume threshold. The following example illustrates the minimum volume threshold.

$ Swapnote® has a minimum volume threshold of 51 lots.

The first order submitted to sell 51 lots at the best price (Order A) would gain priority status. A subsequent sell order of whatever size at the same best price (Order B) would not be given trade priority. If a buy order for 60 lots at that price was then submitted to the Trading Host, Order A would be given priority in execution and would be fully traded. Order B would receive the remaining 9 lots from the incoming buy order.

Where an order satisfying the priority requirements is subsequently bettered by an order submitted at an improved price, it will regain its priority once the better order has been executed or withdrawn, providing that the volume of that better order was below the minimum volume threshold. If the volume of the order at the better price was at or above the minimum volume threshold then the original order would lose its priority amongst other orders at that price and would be subject to the simple pro-rata algorithm.

- **The Maximum Volume Cap**
  An order satisfying the priority requirements described above will also be subject to a volume cap which will limit the trading priority of the order up to a maximum level. Once the "priority" volume has traded, any remaining volume will be treated on a pro-rata basis along with all other orders at that price. The following example illustrates the maximum volume cap:

  September 2003 Two-Year $ Swapnote® has a minimum volume threshold of 51 lots and a volume cap of 100 lots.

  A new order to sell 110 lots at a new best price (Order C) will gain trading priority since it satisfies the minimum volume threshold. A second order submitted to sell 40 lots (Order D) at the same price will join the offer but not gain any priority status.

  If a buy order for 80 lots at that price was submitted, 80 lots of Order C would be executed immediately. Priority for a further 20 lots (ie up to the maximum volume cap of 100 lots, including the 80 lots already executed) would be retained by order C. If a buy order for 70 lots at that price is submitted, 20 lots of the remainder of Order C would be executed immediately. However, the remaining 10 lots of Order C and the 40 lots of Order D would be executed on a pro-rata basis against the remaining 50 lots of the buy order, with Order D receiving 40 lots and Order C receiving a further 10 lots.

For $ Swapnote® the minimum volume requirement is currently 51 lots and the maximum volume cap is 100 lots.

If you would like further information on LIFFE CONNECT™, please see www.liffe.com or contact liffeconnect@liffe.com.

Contacts

For more information please contact:

New York
tel: +1 212 482 3000
fax: +1 212 482 1100
email: us.office@liffe.com

Chicago
tel: +1 312 553 4800
fax: +1 312 553 2385
email: us.office@liffe.com

London
tel: +44 (0)20 7379 2222
fax: +44 (0)20 7379 1050
email: swaps@liffe.com

web: www.liffe.com

Euronext, LIFFE and Euronext.liffe

Euronext was formed by the merger of the Amsterdam, Brussels and Paris cash and derivatives exchanges in September 2000. The Euronext Group has since grown further, adding BVLP (the Portuguese cash and derivatives exchange) and LIFFE (The London International Financial Futures and Options Exchange). The derivatives businesses of Euronext and LIFFE are being combined under the Euronext.liffe umbrella with the transfer of Euronext's derivatives products to LIFFE CONNECT™, the most sophisticated electronic derivatives trading platform in the world.

Amsterdam
P.O. Box 19163
1000 GD Amsterdam
The Netherlands
tel +31 (0)20 550 55 55
fax +31 (0)20 550 49 00

Brussels
Palais de la Bourse/Beurspaleis
Place de la Bourse/Beursplein
1000 Brussels
Belgium
tel +32 (0)2 509 12 11
fax +32 (0)2 509 12 12

Lisbon
Rua Soeiro Pereira Gomes
- Edifício da Bolsa
1649-017 Lisbon
Portugal
tel +351 21 790 00 00
fax +351 21 795 20 22

London
Cannon Bridge House
1 Cousin Lane
London EC4R 3XX
United Kingdom
tel +44 (0)20 7623 0444
fax +44 (0)20 7588 3624

Paris
39, rue Cambon
75039 Paris cedex 01
France
tel +33 (0)1 49 27 10 00
fax +33 (0)1 49 27 14 33

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