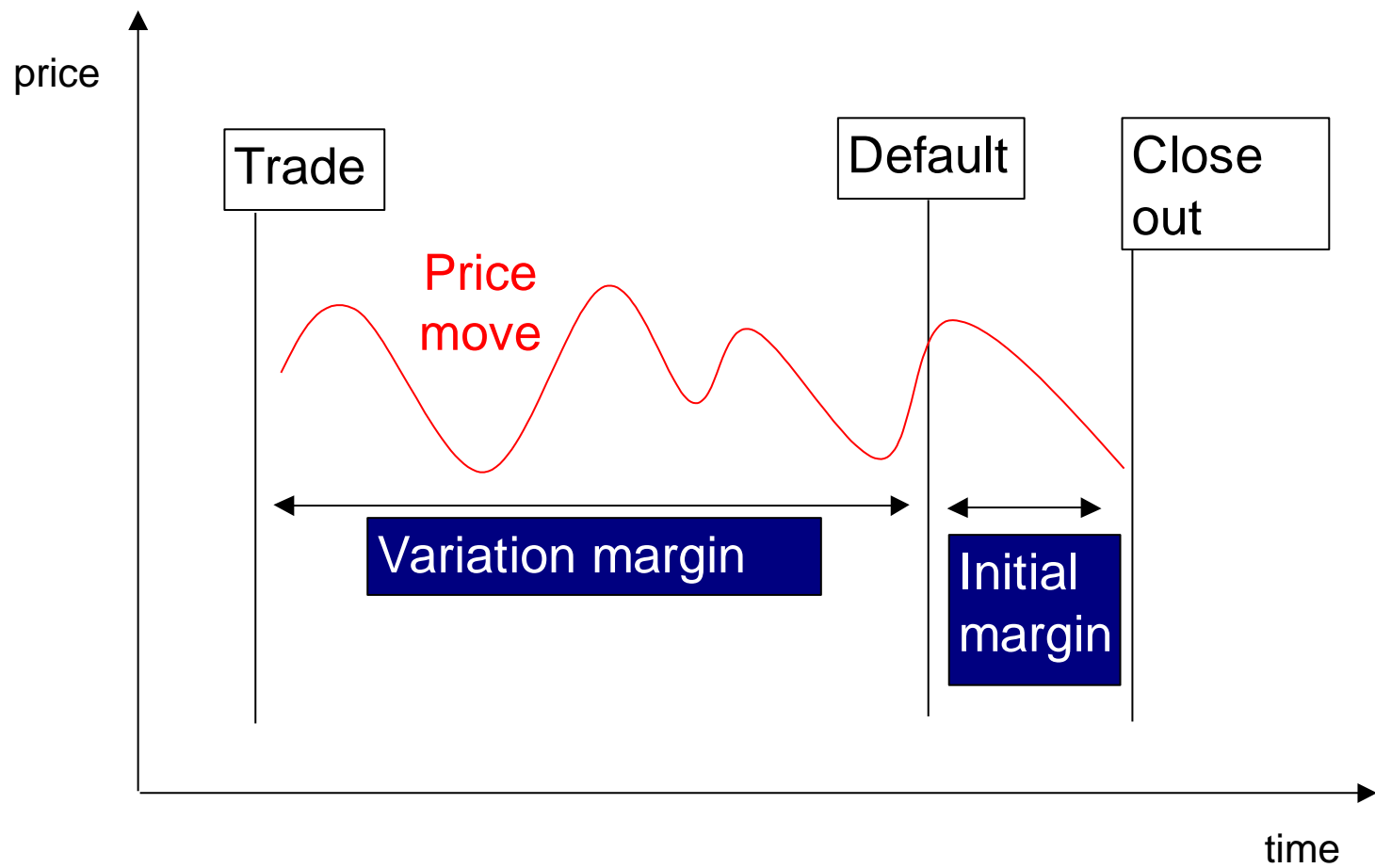


# LCH.Clearnet Ltd – Variation Margin

## Purpose (1)

- To ensure that LCH.Clearnet Ltd only faces market risk in the event of the default of one of its clearing members, it needs to ensure that market risk ahead of that default event is fully covered (i.e to keep LCH.Clearnet's risk current)
- Variation margin, which is a daily collect/pay in cash or collateral, covers this risk by accounting for the change in price since the previous day
- Variation margin cannot take account of price moves after a default event since the defaulting member is, by definition, not in a position to pay variation margin
- Instead initial margin – previously deposited by the defaulting member – covers that risk

# Purpose (2)



## Purpose (3)

- Variation margin is therefore:
  - A daily movement to reflect the price change since the previous day;
  - This movement can either be in cash or a credit to the account of the member who has made a “profit”
  - It can act as a daily reset to the value of the underlying contract (known as “settlement to market”) or, in the case of LME, Freight Wet contracts, EquityClear and RepoClear, can refer back to the original trade price (known as contingent variation margin)
- Crucially it needs to reflect the market price of the underlying contract, specifically the price that LCH.Clearnet Ltd would receive in a default; as a result, the underlying valuation is akin to a P&L or mark-to-market calculation

## Exchange traded products – Valuation

- For products where an exchange is involved (including LIFFE, LME, EDX, LSE and SWX Europe), the exchange closing price is used to calculate variation margin
- The exchange closing price (“daily settlement price”) is set using an averaging calculation which ensures that the price is timely compared to the close of trading; where trading is illiquid the exchange normally also applies oversight and/or a quotation process to ensure the price is representative
- Nonetheless, LCH.Clearnet Ltd has the right within its rules to override that exchange closing price if it does not regard it as truly representative

# Exchange traded products – variation margin (1)

- ☉ With the exception of LME, Freight Wet contracts, LIFFE's equity options and EquityClear (LSE and SWX Europe), all contracts are variation margined in cash in the currency of the contract using the formula:
  - ☉  $\text{Variation Margin} = (\text{today's closing price} - \text{yesterday's closing price}) \times \text{number of contracts} \times \text{contract size}$
  - ☉ Where, on the day of trade, yesterday's closing price = trade price
- ☉ Cash is therefore collected from the member who has made a “loss” and paid to the member who has made a “profit”

# Exchange traded products – variation margin (2)

## ○ Example:

○ Member ABC buys 10 futures from Member XYZ at £100 per unit for delivery in December; this is novated by LCH.Clearnet Ltd resulting in it being the buyer to Member XYZ and the seller to Member ABC

## ○ Day 1:

○ Dec closing price = £100.50 pb  
○ Variation Margin =  $£(100.50 - 100) \text{ pb} * + 10 * 1,000$   
= £5,000 loss paid by XYZ to LCH.Clearnet Ltd and £5,000 profit paid by LCH.Clearnet Ltd to ABC

## ○ Day 2:

○ Dec closing price = £100.20 pb  
○ Variation Margin =  $£(100.20 - 100.50) \text{ pb} * + 10 * 1,000$   
= £3,000 loss paid by ABC to LCH.Clearnet Ltd and £3,000 loss paid by LCH.Clearnet Ltd to XYZ

## Exchange traded products – variation margin (3)

- On the other markets, there are the following differences:
  - The calculation always references the original trade price rather than yesterday's price; this is often referred to as “contingent” variation margining;
  - On the LME, the resultant value is discounted back to today using a set of discount factors (making it a Net Present Value (“NPV”) calculation);
  - “Profits” are then credited rather than paid in cash;
  - The resultant credit can then be used to offset initial margin liabilities on the same exchange.

# OTC Markets - Valuation

- LCH.Clearnet Ltd's standard on valuation is therefore that:
  - The price should be representative of the trading in the underlying contract;
  - It should therefore be an average price;
  - This average should be intelligent in two senses:
    - It should exclude obviously erroneous “off-market” trades;
    - It should average only trades which are timely relative to the time at which the price is taken
  - The broader valuation should reflect all market risk factors (i.e. in the case of SwapClear, yield curve moves, and in the case of RepoClear, repo rates as well as bond price)

## RepoClear – valuation

- The valuation of cash bonds and repos (including reverse repos) uses a formula to take account of these factors:
  - Dirty bond price (i.e. including accrued interest on the bond coupon);
  - Cash leg value;
  - Current repo rate;
  - Accrued interest on the repo rate on the trade;
  - The relevant discount factor(s) (to provide a NPV);
  - For cash bonds, the coupon amounts over the life of the trade.
- Prices, repo rates and discount factors are all subject to intelligent averaging, system validation checks (on timeliness and price level), and, where necessary, escalation to LCH.Clearnet Ltd's Risk Management department

## RepoClear – variation margin

- The valuation described on the previous slide is done on a trade-by-trade basis
- It is then netted to give one NPV per currency per member
- This required NPV is then compared to the previous day's NPV to give a variation margin amount each day
- This variation margin amount is then called and paid in exactly the same way as for exchange traded derivatives

## SwapClear – valuation

- LCH.Clearnet Ltd marks all swaps positions to market daily using its zero coupon yield curves: the changes in the yield curves are reflected in the discount factors used to NPV the cash flows
- Curve construction is market standard in terms of its use of instruments, exponential interpolation and bootstrapping to estimate discount factors, and cubic splining to estimate the yields for all other points on the curve once the discount factors have been converted into zero coupon rates
- All inputs (in terms of money market, futures and swap rates) are subject to averaging, validation checks and escalation

## SwapClear – variation margin

- The valuation described on the previous slide is done on a trade-by-trade basis
- It is then netted to give one NPV per currency per member
- This required NPV is then compared to the previous day's NPV to give a variation margin amount each day
- This variation margin amount is then called and paid in exactly the same way as for exchange traded derivatives

# Contact points at LCH.Clearnet Ltd

🕒 For further information on LCH.Clearnet Ltd's variation margining please contact one of the following:

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