Coping with the Clearing Obligation
- from the Perspective of an Industrial Corporate

Presentation at the 9th Energy & Finance and 4th INREC Conference on October 9-11, 2013 in Essen

Disclaimer:
The views expressed herein are my own and do not necessarily reflect those of the RWE Group
Under the clearing obligation the corporate is cornered at liquidity risk and has to cope with it

- 1) A utility hedges its strategic risk position (long power, short fuels) via OTC – this transforms market into credit risk

- 2) It falls under the clearing obligation and is forced to use a central counterparty – this transforms credit into liquidity risk

- Since the original long power position is not margined it faces a situation like „Metallgesellschaft“ = DANGER!

- No longer can it go back to a more bearable mix between credit and liquidity risk = an option is destroyed!

- **Shareholder value impact:** In the extreme it could stop hedging or switch to bespoke hedging products...

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### Basics

<table>
<thead>
<tr>
<th>Basics</th>
<th>Framework</th>
<th>Complication</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market risk</td>
<td>Hedging ➞</td>
<td>Credit risk</td>
<td>➞ 1) A utility hedges its strategic risk position (long power, short fuels) via OTC – this transforms market into credit risk</td>
</tr>
<tr>
<td>Clearing Obligation</td>
<td>➞ 2</td>
<td>Liquidity risk</td>
<td>➞ 2) It falls under the clearing obligation and is forced to use a central counterparty – this transforms credit into liquidity risk</td>
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**RWE Supply & Trading, Frank Lehrbass**

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"All standardized OTC derivative contracts should be traded on exchanges or electronic platforms ... and cleared through central counterparties (CCP)” (G20 Leaders, Sep 2009)

“According to recent expert judgement ... 100-150 European non-financial corporates (NFC) are expected to come under the clearing obligation. Thereby the corporate’s option to decide on the well-known “Risk Triangle” is extinguished. No longer can a corporate avoid huge liquidity risks at the cost of bearing some credit risk.”

Source: Lehrbass (2013b)

* CF = Cash Flow as seen from A’s perspective assuming that market is 52 EUR/MWh at “Expiry Date” (ED). Classic reading: Counterparty A gets 10 MWh and pays 50 to B. Then she sells 10 MWh immediately at current market at 52 EUR/MWh.
All derivatives are affected, forthcoming many CCP, but eventually few „winners

For the time being we have got only Clearing Houses (CH)

In 2014: Many CH will become Central Counterparties (CCP)

There will also be CCP without an exchange => Daily MtM = daily Mt“Model” as no liquid market around, but rest as in a CCP liaised with an exchange

Thereafter “Winner takes it all” as bigger CCP offer more netting potential etc
Two types of margins: Variation Margin (VM) – 1/2

> Profits and losses,

– result from 

changes in the value

of positions in futures

– are settled in cash on a daily basis

– This daily profit and loss settlement is also referred to as a mark-to-market procedure

– The daily credit or debit resulting from this is called the variation margin and is paid by or paid to the Clearing House (from the Clearing Bank who forward what is required to the Counterparties)

\[
VM_{TD} = (CP_{TD} - TP) \times \text{Position} \quad \text{or} \quad VM_{TD+1} = (CP_{TD+1} - CP_{TD}) \times \text{Position}
\]

Total P&L = \( \Sigma(VM) = (CP_{ED} - TP) \times \text{Position} \)

TD = Trade Date, ED = Expiry Date, CP = Closing Price, TP = Original Trade Price

Source: Daveluy (2013)
Variation Margin – **Schematic Example**

**Phelix Baseload Future** (= financial power future referring to European wholesale power market reference price)

**Buy 10 MWh @ 50** (during the day)

<table>
<thead>
<tr>
<th>Date</th>
<th>Variation Margin (VM)</th>
<th>Result</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD</td>
<td>VM = (52.00 – 50.00) x 10 = + 20.00</td>
<td>Receive 20.00</td>
<td></td>
</tr>
<tr>
<td>TD_{+1}</td>
<td>VM = (44.00 – 52.00) x 10 = – 80.00</td>
<td>Pay 80.00</td>
<td></td>
</tr>
<tr>
<td>TD_{+2}</td>
<td>VM = (46.00 – 44.00) x 10 = + 20.00</td>
<td>Receive 20.00</td>
<td></td>
</tr>
<tr>
<td>TD_{+3}</td>
<td>VM = (56.00 – 46.00) x 10 = + 100.00</td>
<td>Receive 100.00</td>
<td></td>
</tr>
<tr>
<td>ED</td>
<td>VM = (52.00 – 56.00) x 10 = – 40.00</td>
<td>Pay 40.00</td>
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**Total**

P&L = Σ(VM) = + 20.00  |  Receive 20.00

**TD** = Trade Date, **ED** = Expiry Date, **CP** = Closing Price, **TP** = Original Trade Price

Source: Daveluy (2013)

RWE Supply & Trading, Frank Lehrbass
Variation Margin – Second Thoughts (1/2)

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> Sanity check & consequence

- As in an old-style forward purchase @50 EUR/MWh you end up with a profit of EUR 20 at the Expiry Date (look at the underlined prices, the other prices can be “crossed out”)

- In between your MtM is reflected correctly by the cash amounts, eg at TD+1: +20-80 = -60, which is the negative MtM on this day = cash for counterparty B

- Hence, you have a cash-collateralized MtM, BUT ...

TD = Trade Date, ED = Expiry Date, CP = Closing Price, TP = Original Trade Price
Variation Margin – Second Thoughts (2/2)

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> Consequence

- BUT you have to submit to the above payment stream
- In case your MtM gets negative, your Treasury has to deliver cash
- “The name futures price is ... unfortunate from a linguistic point of view.” In fact “you are [not] obliged to deliver [something] ... The only obligation is the payment stream defined above” (Björk, 1998, 300)

TD = Trade Date, ED = Expiry Date, CP = Closing Price, TP = Original Trade Price
Simplified dummy case study

> Dummy corporate sells 160 TWh* in each January & closes eoy

![Graph showing MtM of 160 TWh short](image)

Obviously the MtM of the hedging position is quite volatile, which is no surprise in light of the preceding discussion of the dynamics of the (representative) hedging instrument. The gaps in the curve are due to closing the position at year end and opening a new one on the first business day of January. Of course this is highly artificial as our dummy would never do all hedges in one day for reasons of market liquidity, but we get the big message 28.

Source: Lehrbass (2013b), *160 mn MWh
How can the dummy raise required cash?

Now we ask how our dummy can cope with sudden margin calls – assuming that it applies bank-like risk management thinking. From a treasury perspective the reactive measures might be pondered in the following order:

1. Cash flow from operations
2. Issuance of Commercial Paper (CP)
3. Usage of uncommitted lines
4. Usage of committed lines

As concerns the latter two items the Basel Committee on Banking Supervision (Basel, 2013) expressed some doubt. With respect to the real-life availability of liquidity lines committed by banks it is stated “that .. banks may not be in a position to honor credit facilities, or may decide to incur the legal and reputational risk involved in not honoring the commitment, in order to conserve their own liquidity or reduce their exposure”.

=> The dummy should have an adequate liquidity buffer!
How to cope with the clearing obligation (1/2)

1 – Choose a dynamical model, which performs well under the real-world measure, for forecasting margin at risk and strive for a fully fledged liquidity value at risk model

2 – Have an eye on implied volatilities and political events, because it might be time to recalibrate your model

3 – Have an eye on costs of collateral for interbank lending, because it indicates situations in which your house bank might not be as reliable as you thought

4 – Make sure your house banks (want to) understand your business

5 – Watch out for “hostile” entities, which have understood your business
How to cope with the clearing obligation (2/2)

6 – Be aware that you are regulated nearly like a bank, but do not face a level playing field

7 – Make up your mind on the right mix of hedging counterparties in due course

8 – Reconsider your hedging activities

9 – Reconsider your business model

10 – Do not create new risks through your liquidity buffer

=> We only look at recommendations 1 & 10 in detail
Choose a dynamical model, which performs well under the real-world measure, for forecasting margin at risk (1/2)

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<td>First Year German Power Forward Log-Returns</td>
<td></td>
<td></td>
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Source: Lehrbass (2013b)
Choose a dynamical model, which performs well under the real-world measure, for forecasting margin at risk (2/2)

Since the utility is short only, upmoves are in focus!

Table 1: Comparison of frequencies of exceedance of the 99% quantile forecasts

<table>
<thead>
<tr>
<th></th>
<th>Exceedance Percentages</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>HN</td>
</tr>
<tr>
<td><strong>In-sample</strong></td>
<td>1.46%</td>
</tr>
<tr>
<td><strong>Out-of-sample</strong></td>
<td>0.38%</td>
</tr>
</tbody>
</table>

The sample used for estimation contains 1642 data points (March 2005 to December 2011) and the out-of-sample set has got 266 recordsets (January 2012 up to February 2013).

We now compare 99% quantile forecasts generated by the chosen two models\(^\text{17}\) with a traditional Geometric Brownian Motion (GBM) model, which uses a daily updated volatility calculated on the preceding twenty business days. Among practitioners twenty days is considered to be the minimum sample size for volatility estimation\(^\text{18}\).

Source: Lehrbass (2013b)