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

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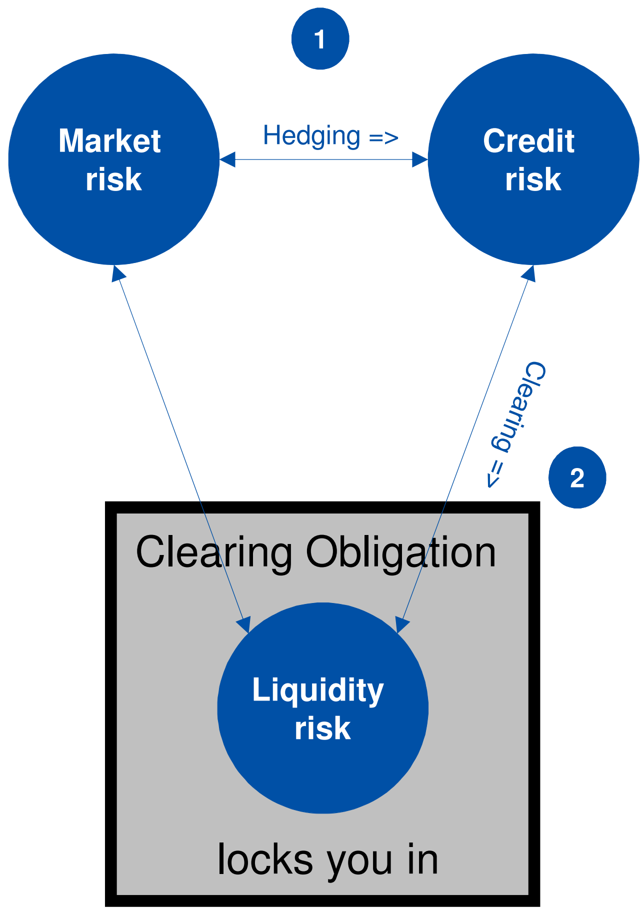
Disclaimer:
The views expressed herein are my own and do not necessarily reflect those of the RWE Group

The energy to lead

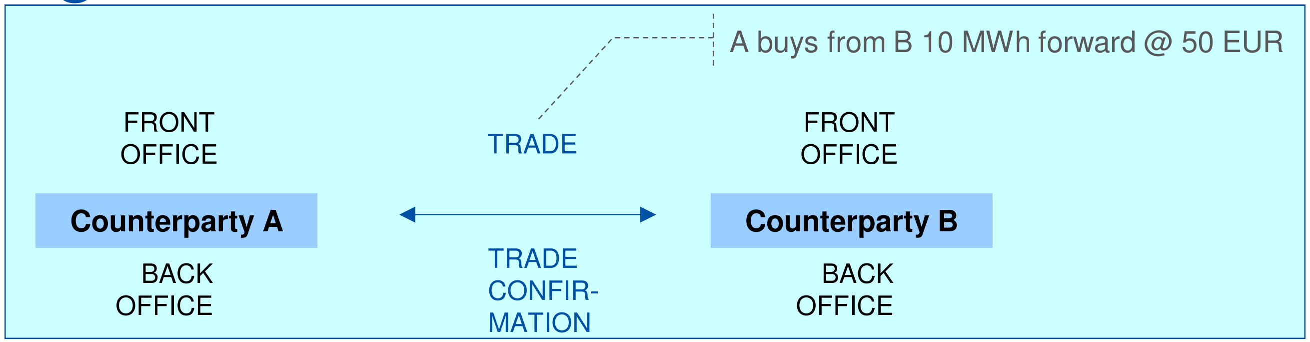
RWE Supply & Trading, Frank Lehrbass

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 ...

Trading a standard derivative OTC and how it will change



... at delivery market @ 52

CF_{ED}*	(52.00 – 50.00) x 10 =	+ 20.00
Total	**P&L =**	**+ 20.00**

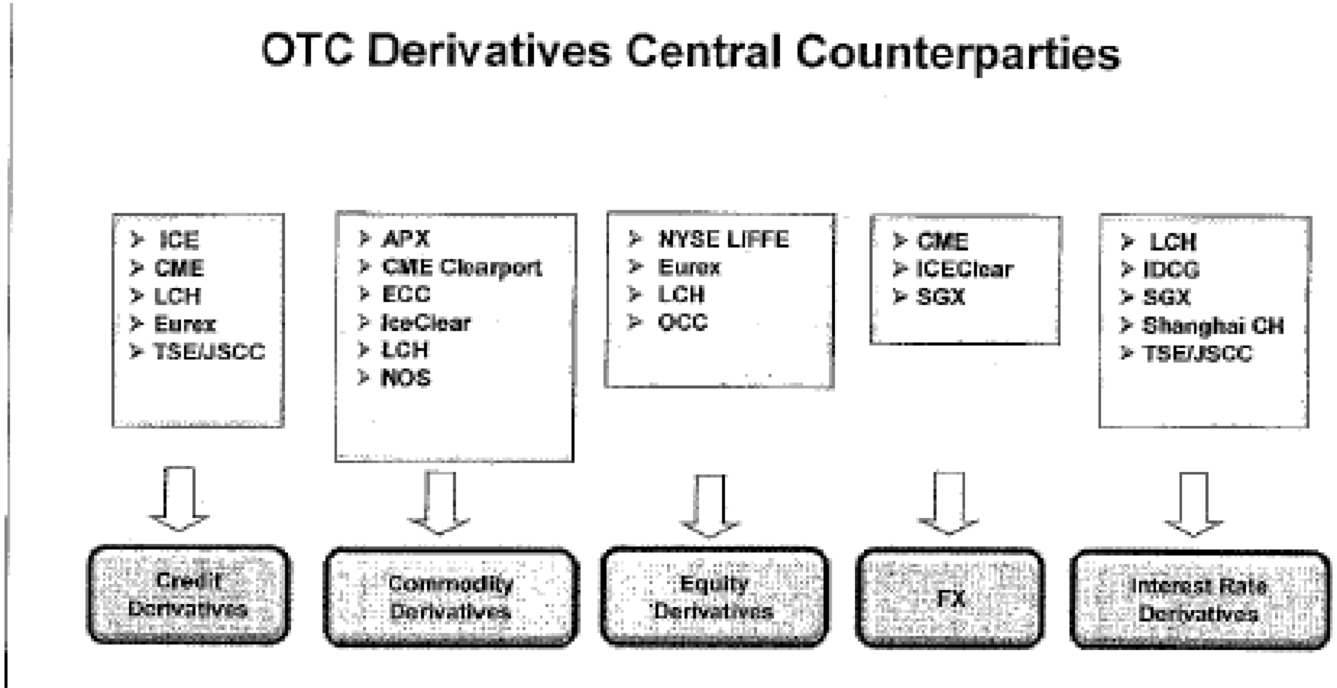
"All standardized OTC derivative contracts should be traded on exchanges or electronic platforms ... and cleared through central counterparties (CCP)" (G20 Leaders, Sep 2009)

"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



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- 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)

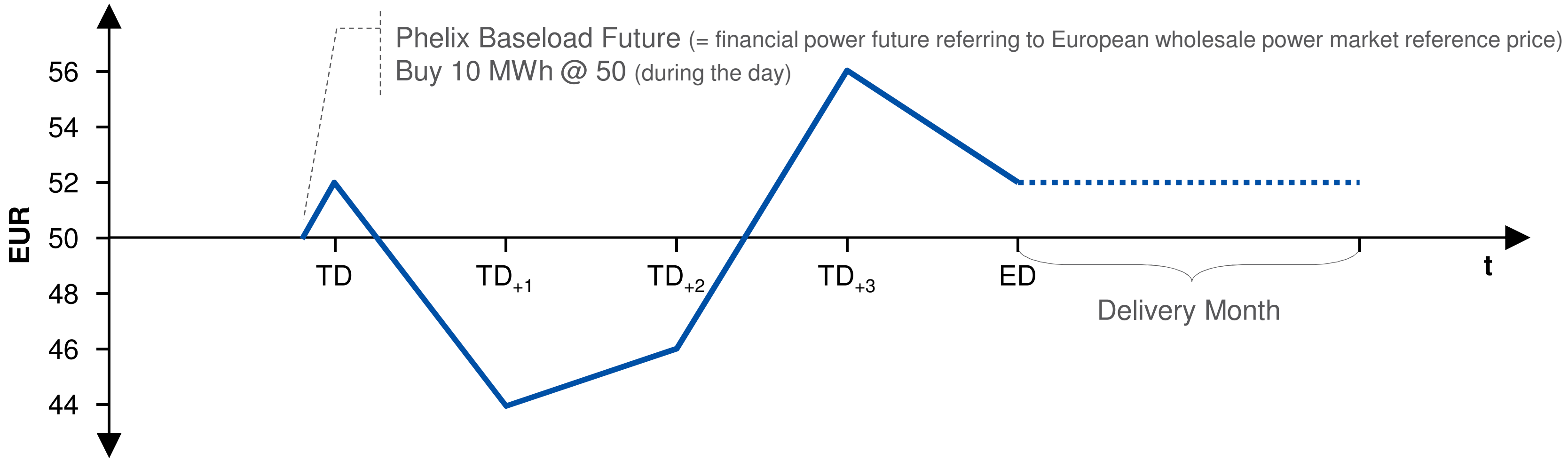
$VM_{TD} = (CP_{TD} – TP) \times Position$ or $VM_{TD+1} = (CP_{TD+1} – CP_{TD}) \times Position$

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

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

Source: Daveluy (2013)

Variation Margin – Schematic Example



TD	VM = (52.00 – 50.00) x 10 =	+ 20.00	Receive 20.00
TD_{+1}	VM = (44.00 – 52.00) x 10 =	– 80.00	Pay 80.00
TD_{+2}	VM = (46.00 – 44.00) x 10 =	+ 20.00	Receive 20.00
TD_{+3}	VM = (56.00 – 46.00) x 10 =	+ 100.00	Receive 100.00
ED	VM = (52.00 – 56.00) x 10 =	– 40.00	Pay 40.00
Total	**P&L = Σ(VM) =**	**+ 20.00**	**Receive 20.00**

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

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Variation Margin – Second Thoughts (1/2)

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Total	**P&L = Σ(VM) =**	**+ 20.00**	**Receive 20.00**

> 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)

TD	VM = (52.00 – 50.00) x 10 =	+ 20.00	Receive 20.00
TD_{+1}	VM = (44.00 – 52.00) x 10 =	– 80.00	Pay 80.00
TD_{+2}	VM = (46.00 – 44.00) x 10 =	+ 20.00	Receive 20.00
TD_{+3}	VM = (56.00 – 46.00) x 10 =	+ 100.00	Receive 100.00
ED	VM = (52.00 – 56.00) x 10 =	– 40.00	Pay 40.00
Total	**P&L = Σ(VM) =**	**+ 20.00**	**Receive 20.00**

> Consequence

– BUT you have to submit to the above payment stream

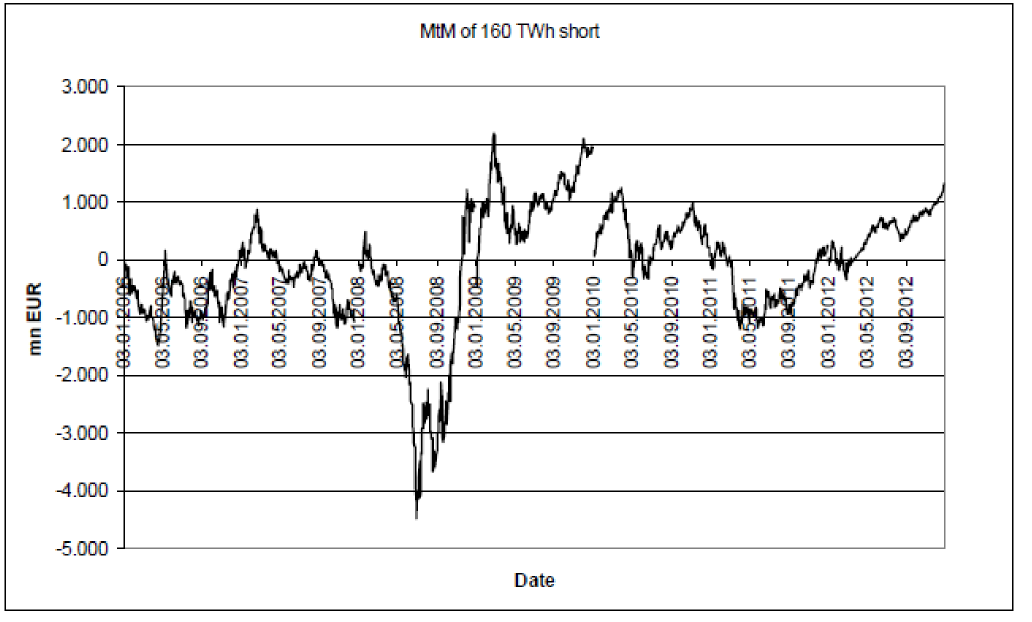
– In case your MtM gets negative, your Treasury has to deliver cash

– “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



Obviously the MtM of the hedging position is quite volatile, which is no surprise in light of the preceeding 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 — needed elsewhere ...
2. Issuance of Commercial Paper (CP) — related to 4, tricky per se
3. Usage of uncommitted lines
4. Usage of committed lines — Reliability put in doubt by Basel

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!

Source: Lehrbass (2013b)

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

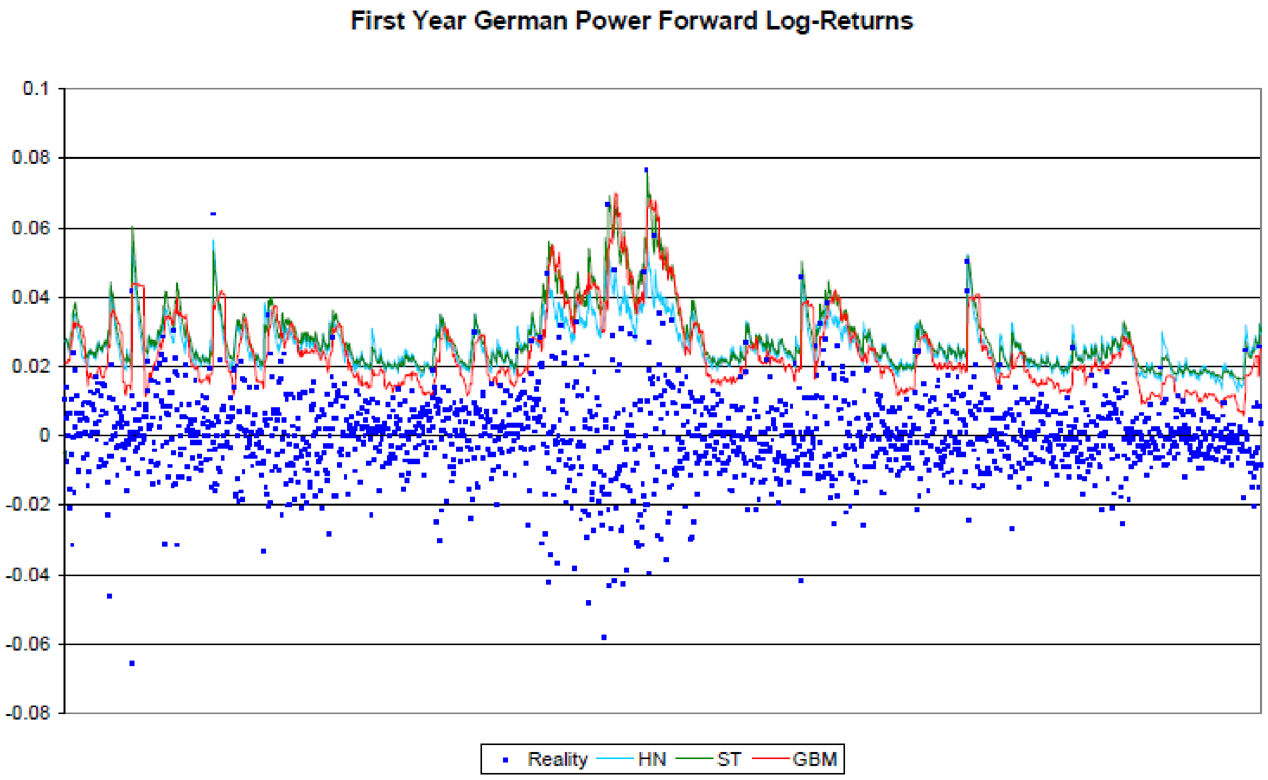
8 – Reconsider your hedging activities

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)



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

	Exccedance Percentages		
Model	**HN**	**ST**	**GBM**
In-sample	1.46%	1.16%	2.10%
Out-of-sample	0.38%	0.75%	1.88%

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[17] with a traditional Geometric Brownian Motion (GBM) model, which uses a daily updated volatility calculated on the preceeding twenty business days. Among practicioners twenty days is considered to be the minimum sample size for volatility estimation[18].

Source: Lehrbass (2013b)