



Eurobanking 2010

Incremental Risk Charge

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Agenda

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- Requirements
- Constant Risk
- Model Overview
- Short-term PDs
- Liquidity Horizon
- Migration Risk
- Correlation
- Final Remarks

Introduction

BISII regulations prescribe augmented trading book capital by 1/1/2011:

$$\text{RC} = \underbrace{3 * \text{VaR}(99\%, 10\text{day})}_{\text{current RC}} + \underbrace{\text{IRC} + 3 * \text{stressVaR}(99\%, 10\text{day}) + \text{securitisation risk}}_{\text{additional RC}}$$

- IRC: risks in the trading books that are beyond the VaR, i.e.: default/migration
 - IRC is the Incremental Risk Charge
 - VaR does not necessarily include default or extreme migrations
 - Should be covered as part of IRC
- stressVaR: VaR based on stressed period, e.g. 07/08 scenario
- securitisation risk: defined by IRB risk weights
- ICAAP (Jan 2010)
 - IRC for Economic Capital
 - Based on the same methodological framework
 - Possibly different input parameters

Introduction

Regulations

- Principle based: no strict rules (next slide)
- Definitive BISII principles were released in July 2009.
- Final CRD regulation to be based on Quantitative Impact Study (QIS).
- BISII principles generally leading for European (CRD) and national regulations (WFT in Netherlands).

Timelines

- Use test to be run over 6-months period starting from 1 July 2010.
- Formal validation by DNB (Dutch Central Bank) expected to take place in Q4 2010.
- IRC expected to be effective as of 1 Jan 2011.

Ongoing exchange

- DNB (Dutch Central Bank)
- NVB (Dutch Association of Banks)
- Several large international banks
- Joint Association (ISDA, IIF, LIBA)

Requirements and Interpretation



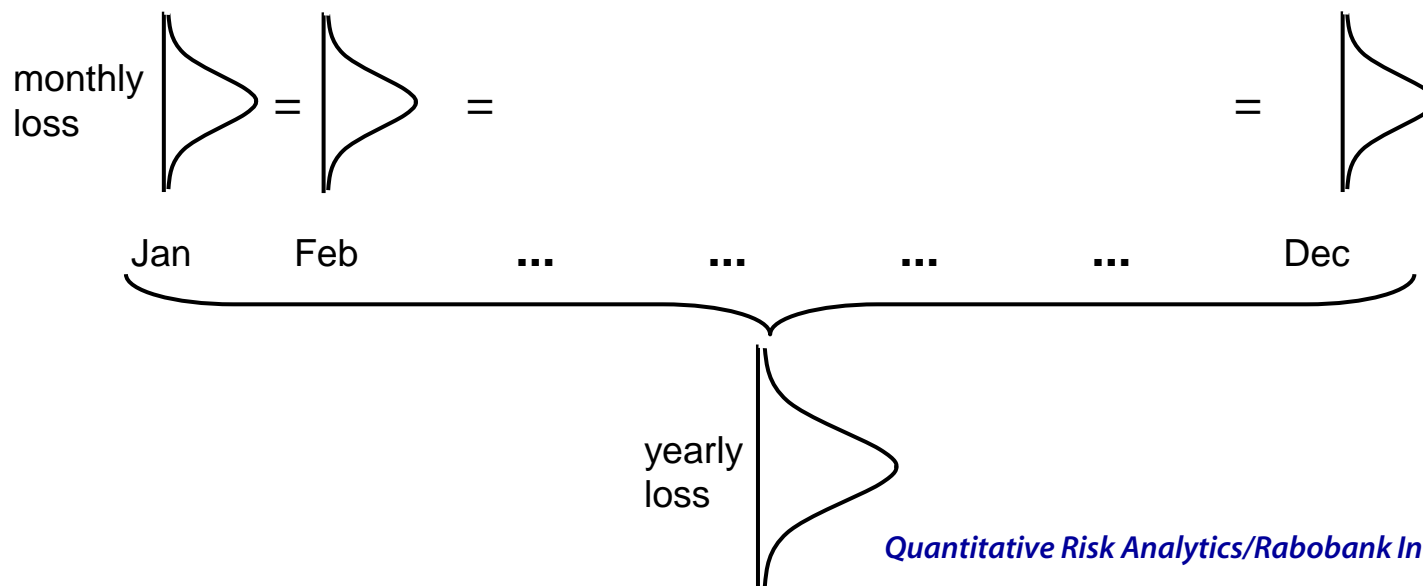
Requirement	Interpretation
Captures: Default risk Migration risk	<i>Jump-to-Default Rating Migration</i>
Consistency banking book (IRB approach)	<i>PD, LGD and EAD framework / capitalisation for 1 year at 99.9% percentile</i>
Constant risk assumption	<i>Roll over of risk distribution of the liquidity horizon throughout 1 year (next slide).</i>
Reflects: Name concentration Market concentration	<i>Liquidity horizon reflects market concentration; additional capital charge for name concentration.</i>
Captures basis risk	<i>Difference between instruments and their hedges regarding recoveries / default definitions / default probabilities.</i>
Sensitivity analyses	Sensitivity analyses for all parameters
Validation by independent department	IRC methodology validated by RMVM

Constant Risk

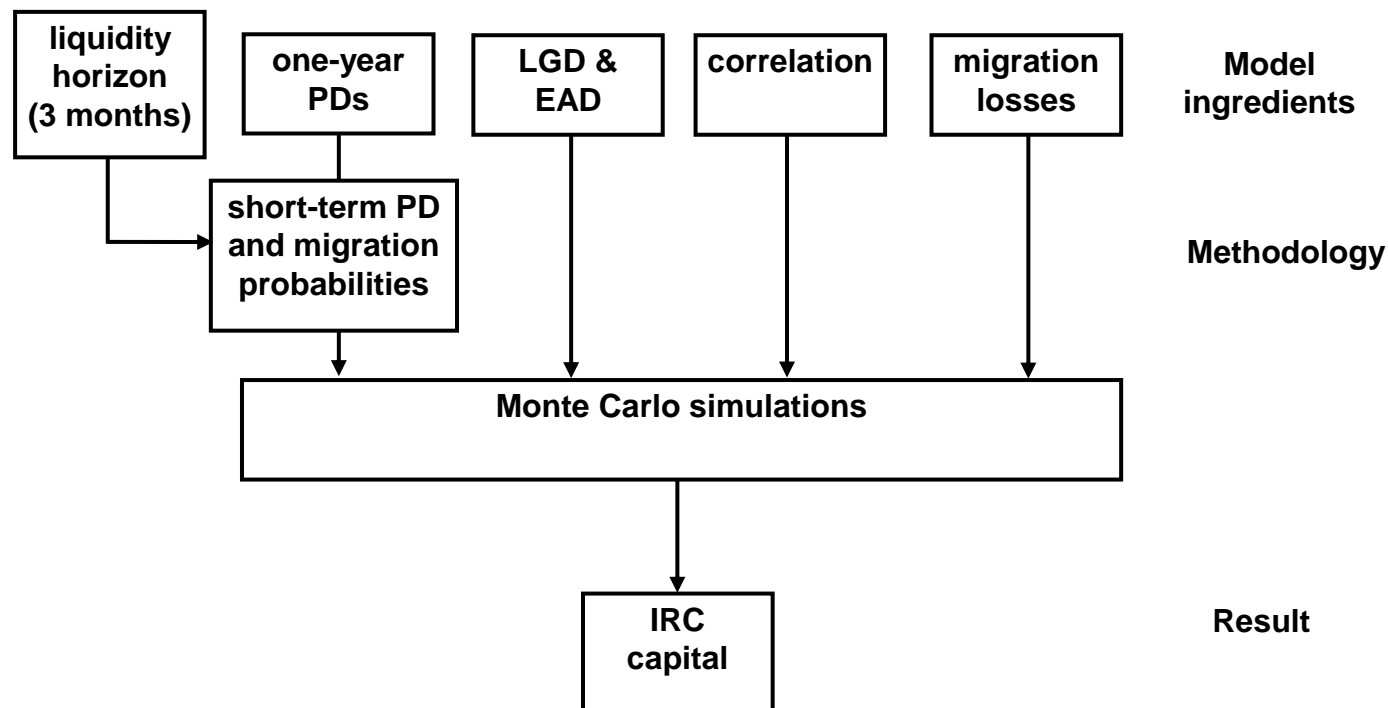
- Important difference between banking book and trading book:
 - Banking book: positions are held **to maturity**.
 - Trading book: positions are continuously bought and sold **before their maturity**.
- Therefore, it would be inappropriate to base credit risk on 1-year PDs.
- Solution: Regulator allows to use the **short-term** PDs that correspond to the time we are vulnerable to credit events, i.e. the liquidity horizon.
- Still, the capital horizon is one year.
- Solution: Regulator introduced the constant risk assumption.

Constant Risk

- Regulator allows constant risk assumption:
 - Determine the liquidity horizon.
 - Refresh portfolio after each liquidity horizon.
 - Capitalize for 1 year by *roll over*.
- Example: 1-month liquidity horizon
 - Monthly loss distribution is identical for each month.
 - Yearly loss distribution by sampling:
 - draw 12 times a monthly loss
 - sum up to yearly loss
 - repeat many times



Model Overview



- As a result of constant risk, we can use **short-term PD and short-term migration probabilities**.

Short-Term PDs

Framework: Markovity or Non-Markovity



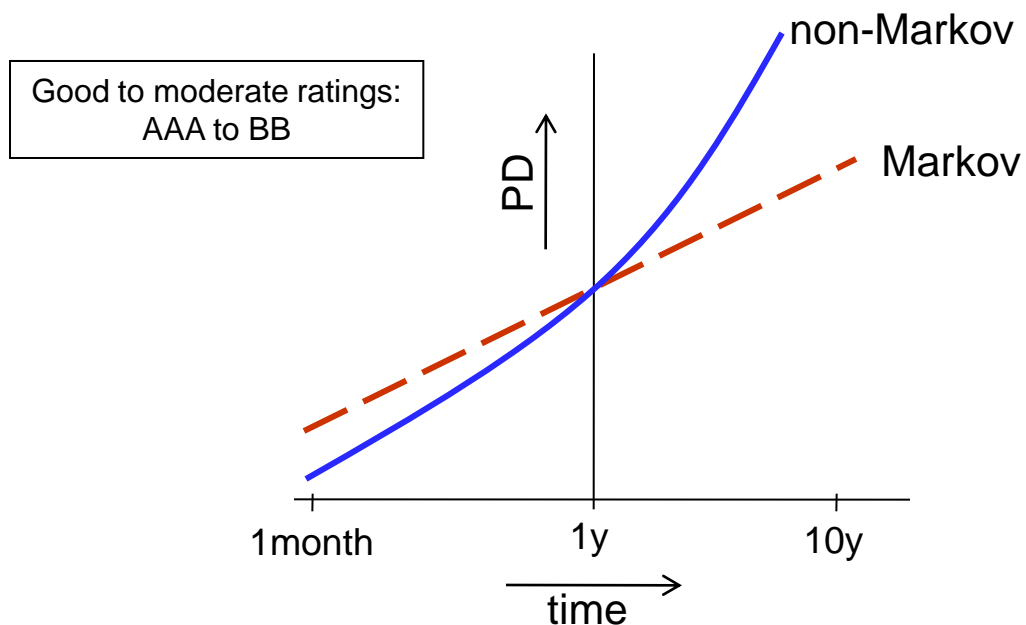
- PD term structure based on either *Markovity* or *Non-Markovity*.
- Choice comes down to the question:
*Does the issuer's rating **history** affect the future Probability of Default?*
- No: Markovity
 - The current rating fully reflects the future PD.
 - PD term-structure can be obtained by raising migration matrix to some power.
- Yes: Non-Markovity
 - E.g., an issuer that has recently been downgraded has a higher probability to be downgraded further, and hence an increased PD.
 - Opposite effect might be expected for upgrades.
 - Companies can keep their upward/downward momentum as a result of e.g. good/bad management.
 - PD term-structure can be obtained by e.g. interpolating function.

Short-Term PDs

Framework: Markovity or Non-Markovity

PD term structure based on either *Markovity* or *Non-Markovity*:

- Term-structure:
 - Markov PD term-structure is more or less linear.
 - Non-Markov PD progresses generally faster.
- As a result:
 - Larger long-term PD under non-Markovity than under Markovity.
 - Smaller short-term PD under non-Markovity than under Markovity.
- For bad ratings the opposite might be perceived.



Short-Term PDs

Data



The short-term PDs can be determined by means of:

1. Credit approach: Use historical rating migrations/defaults
2. Market approach: Use credit spreads quoted in the market

1. Consideration credit approach:

- Sufficient data
 - AAA does simply not go into default, especially not within short time horizons.
- Update frequency
 - Are ratings sufficiently frequently updated in order to estimate short-term PDs?

Short-Term PDs

Data



2. Considerations market approach:
 - Conversion from risk-neutral to real-world PDs:
 - Any financial product with an uncertain pay-off (amongst a CDS) is priced in a risk-neutral environment.
 - Risk-neutral PD: adjusted PD such that it balances the investors' risk-averseness.
 - Unknown illiquidity premium in spreads.
 - Stability:
 - Recent credit spreads were very volatile. This would lead to undesirably volatile solvency (pro-cyclicality).
 - Transparency:
 - For risk managers it is harder to track down where an IRC increase comes from, as it also depends on the volatile spreads.



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Liquidity Horizon

- Liquidity horizon: “the time required to sell positions or to hedge all material risks covered by the IRC model in a stressed market”.
- BISII regulation do not mention against what price the position should be sold/hedged.
- Further, longer liquidity horizon is expected for:
 - Speculative grade as compared to investment grade,
 - Products where secondary market liquidity is not deep,
 - Market/issuer concentrated positions.
- BIS sets regulatory floor of 3 months on liquidity horizon.
- Practical issues:
 - How to deal with one issuer that has issued several products with different liquidity horizons?
 - How to differentiate with respect to liquidity drivers above when internal liquidity horizons are shorter than 3 months?

Migration Losses

Use differences in generic spread curves between ratings:

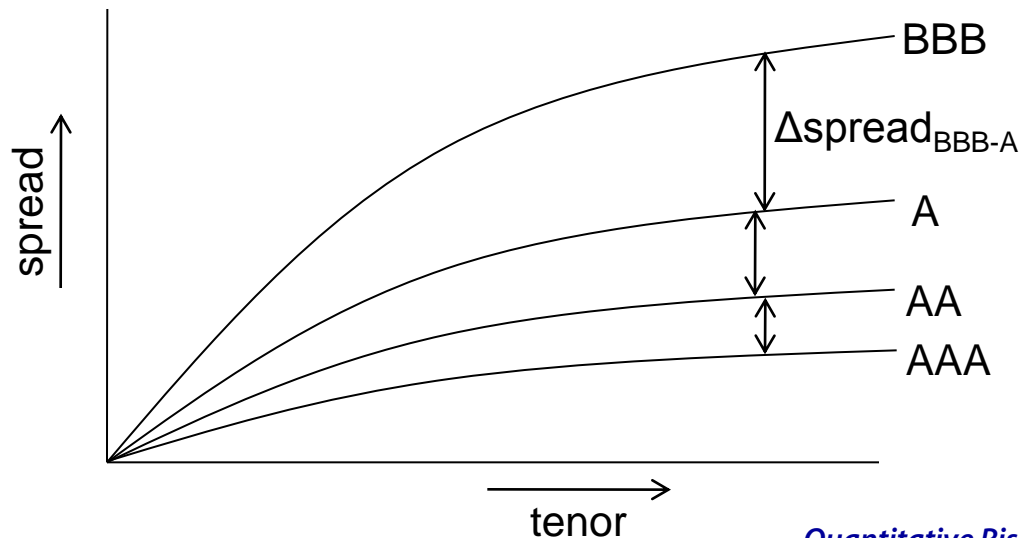
$$PL \approx \text{duration} * \Delta\text{spread} + \frac{1}{2} * \text{convexity} * (\Delta\text{spread})^2$$

Δspread : difference *Through-the-Cycle* generic credit spread

duration: linear price change as a result of 1 bp credit spread change

convexity: captures non-linear price changes

Consideration: Volatility in the credit spreads can lead to volatile solvency (pro-cyclicality)

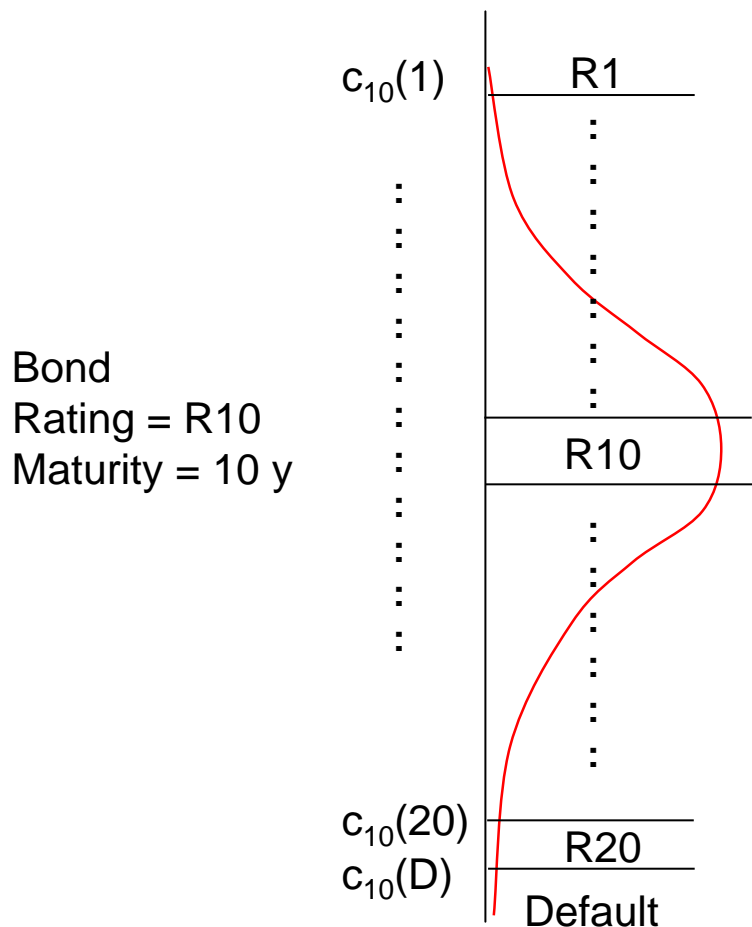




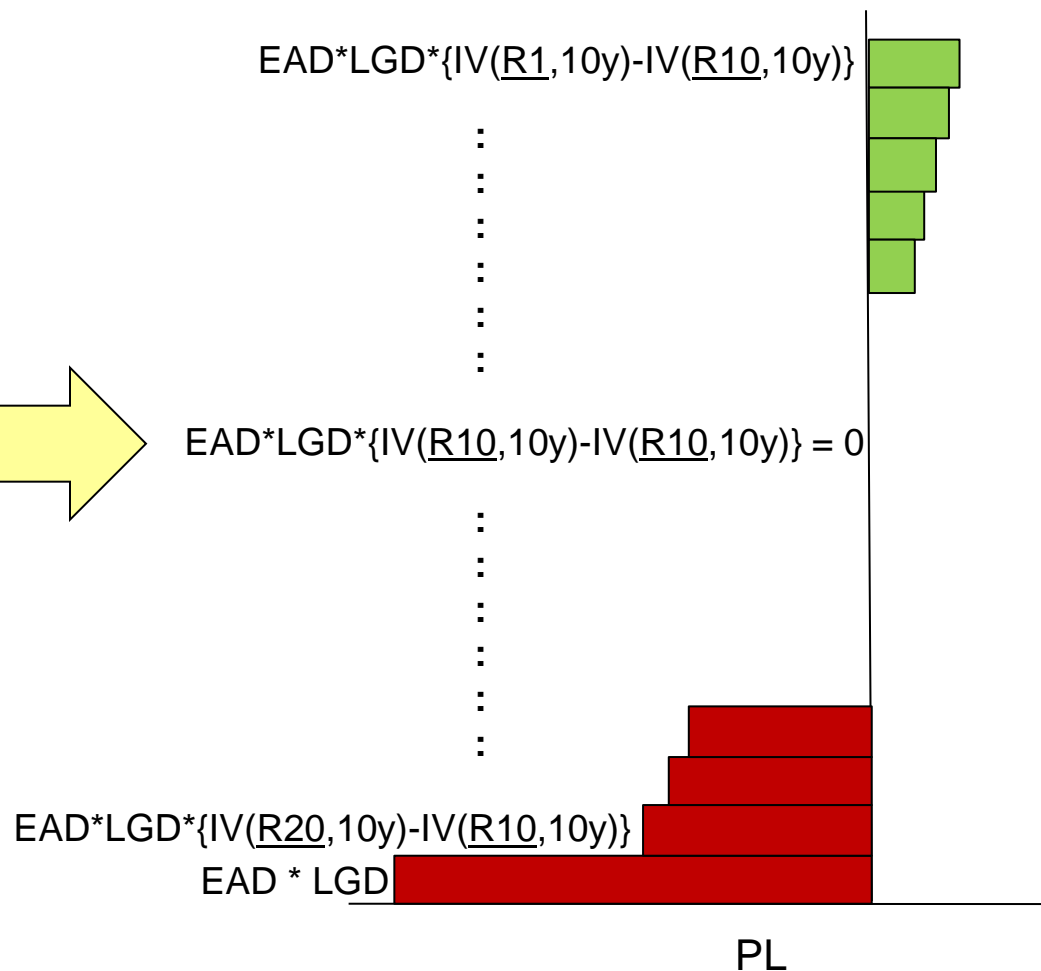
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Migration Risk

simulation



valuation





Correlation

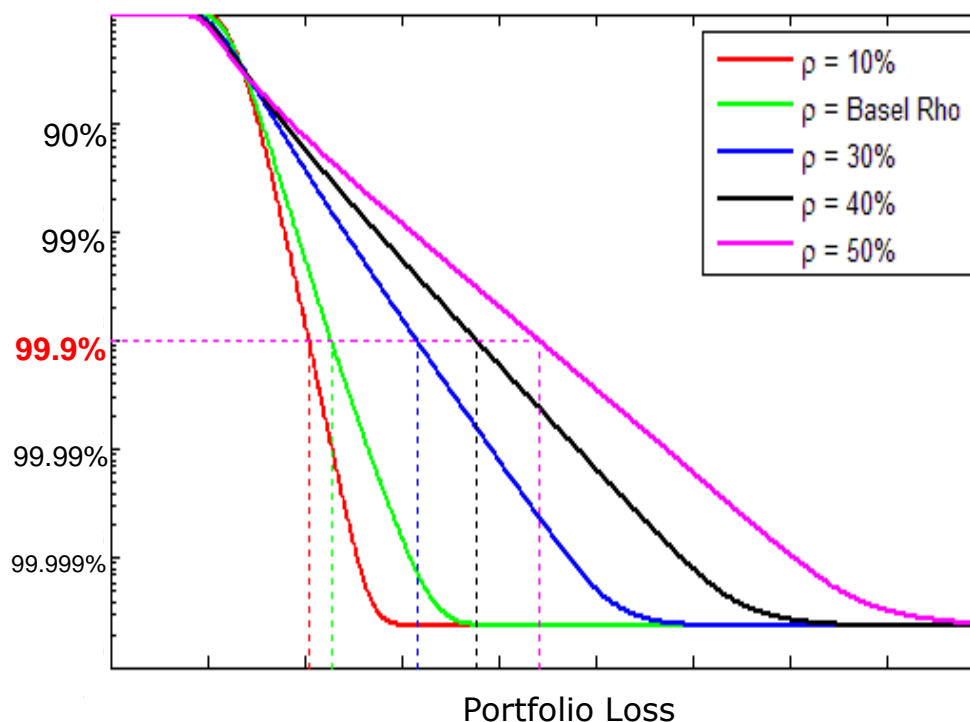
Correlation reflects pair-wise asset movements of issuers in Merton-like model, i.e. defaults/downgrades happen simultaneously.

Considerations:

- Model choice:
 - One-factor model
 - Multi-factor model
 - Other models
- Data to assess correlation:
 - time series of equity prices
 - joint default/migration probabilities
- Further research to correlation ongoing.

Correlation

- We test impact on granular portfolio.
- Conclusion: model in line with expectations; increased correlation, then increased IRC.





Final Remarks

- IRC will lead to significant increase in trading book capital.
- Opportunity to “regulatory arbitrage”
 - Moving positions from trading book to banking book (if approved by national regulator).
- Regulator seems quite conservative with regards to:
 - input parameters (liquidity horizon, netting, etc.),
 - no diversification between banking book and trading book,
 - a lot of double-counting in IRC, VaR and stressVaR.