Agenda

- **Credits: Product factory**
- **Key components of Basel II -> impact on business, what is the role of Credits, methods used**
- **Examples: risk / capital ratios of a bank**

Ekonomika a řízení bank – ESF MU

CREDITS

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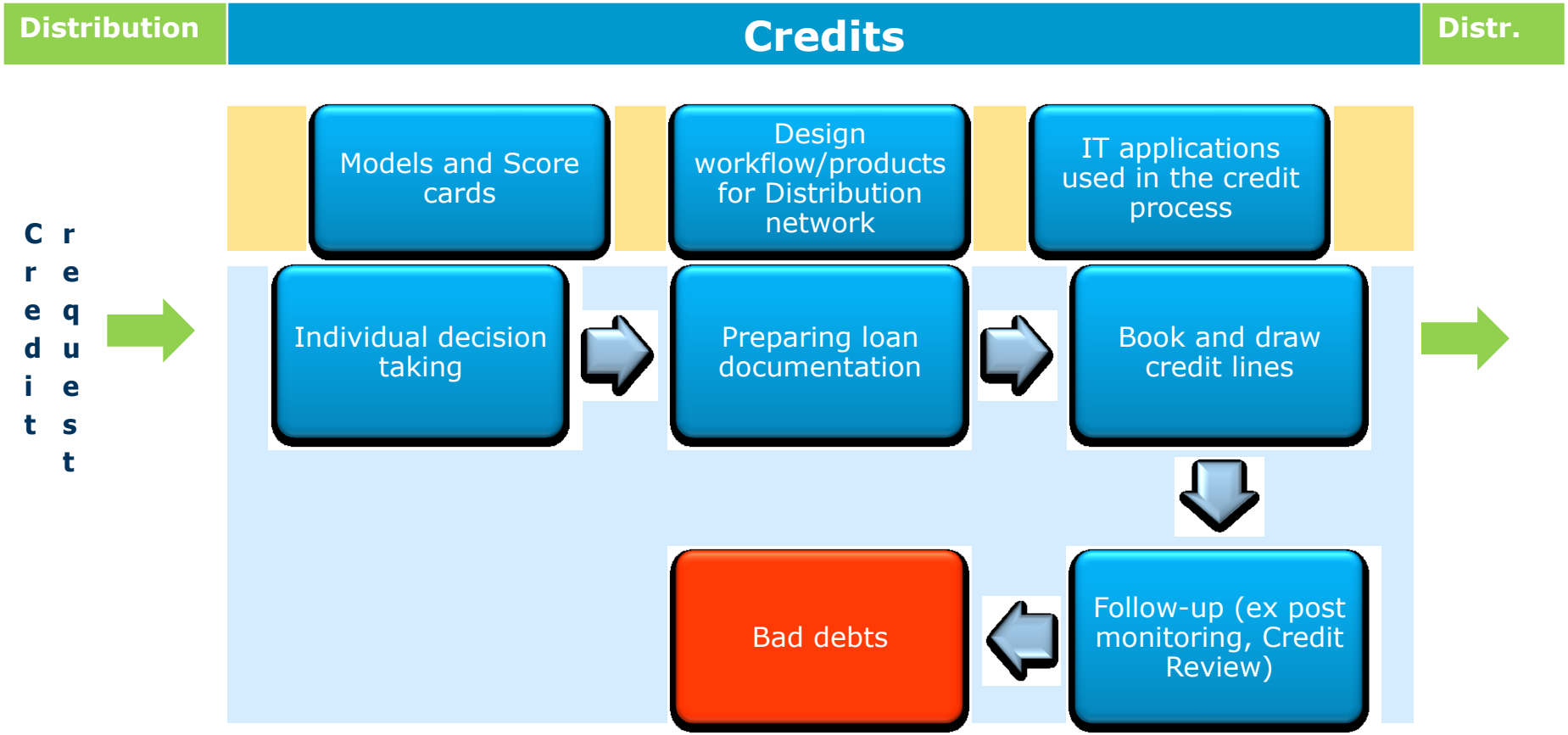
ČSOB

What does Credits manage?

- **Traditionally (and still in many banks), Credits = decision taking**
- **However, CSOB Credits act as full scope embeded product provider (without its own shadow P/L !). What does it mean to be "end-to-end" product factory?**



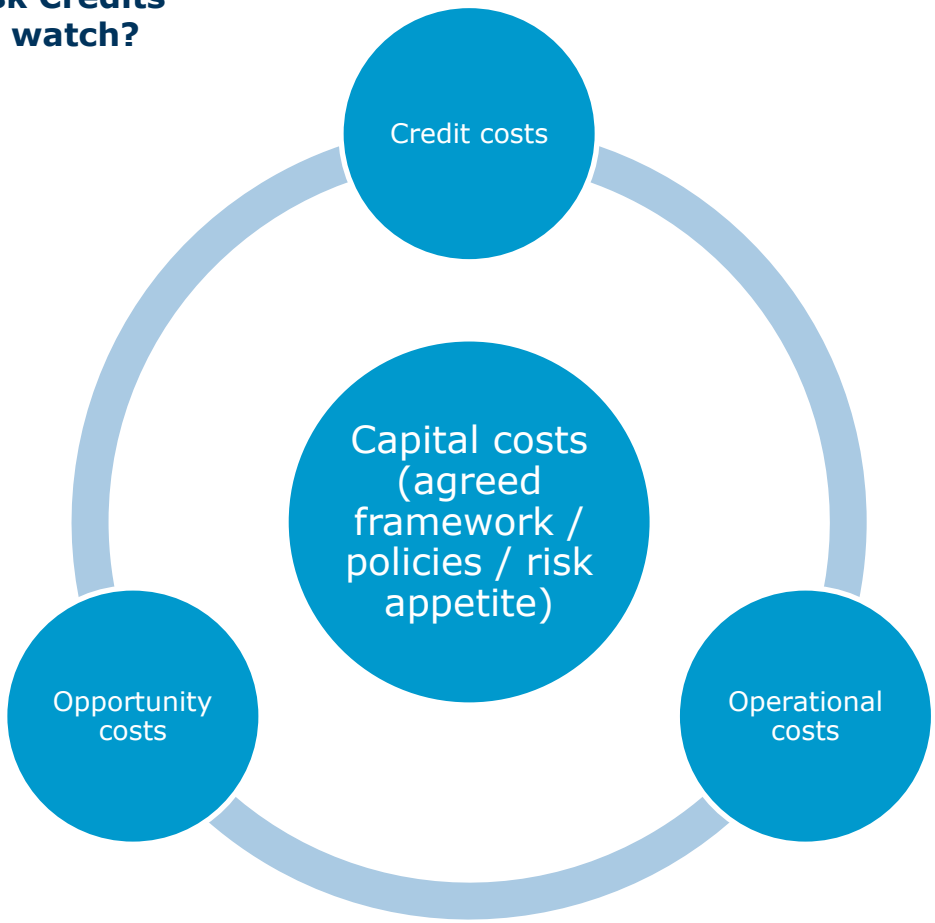
Scope of Credits in CSOB Group lending

Amounts in CZK bln	31/12/2009	31/12/2010	Role of Credits
Group lending	**407.9**	**413.7**	
Retail/SME segment			
- Mortgages	135.6	144.9	Models, process
- Building savings loans	65.8	71.9	
- Consumer finance	17.4	18.2	Applications, some models
- SME loans	66.9	62.9	**End-to-end**
- Leasing	29.2	23.3	Decision taking, newly models
Corporate segment			
- Corporate loans	84.2	76.5	**End-to-end**
- Factoring	3.7	3.6	Decision taking
Head office	0.5	0.5	
Other (a.o. Banks)	4.5	11.8	**End-to-end**

In the last 5 years, CSOB has grown from mainly a Corporate bank to predominantly RET/SME bank.

Credits: Balancing act

What type of costs/risk Credits manage or have to watch?



Nature of units within Credits

Operations

- Modeling
- Advice & Underwriting
- Credit Administration
- Bad Debts

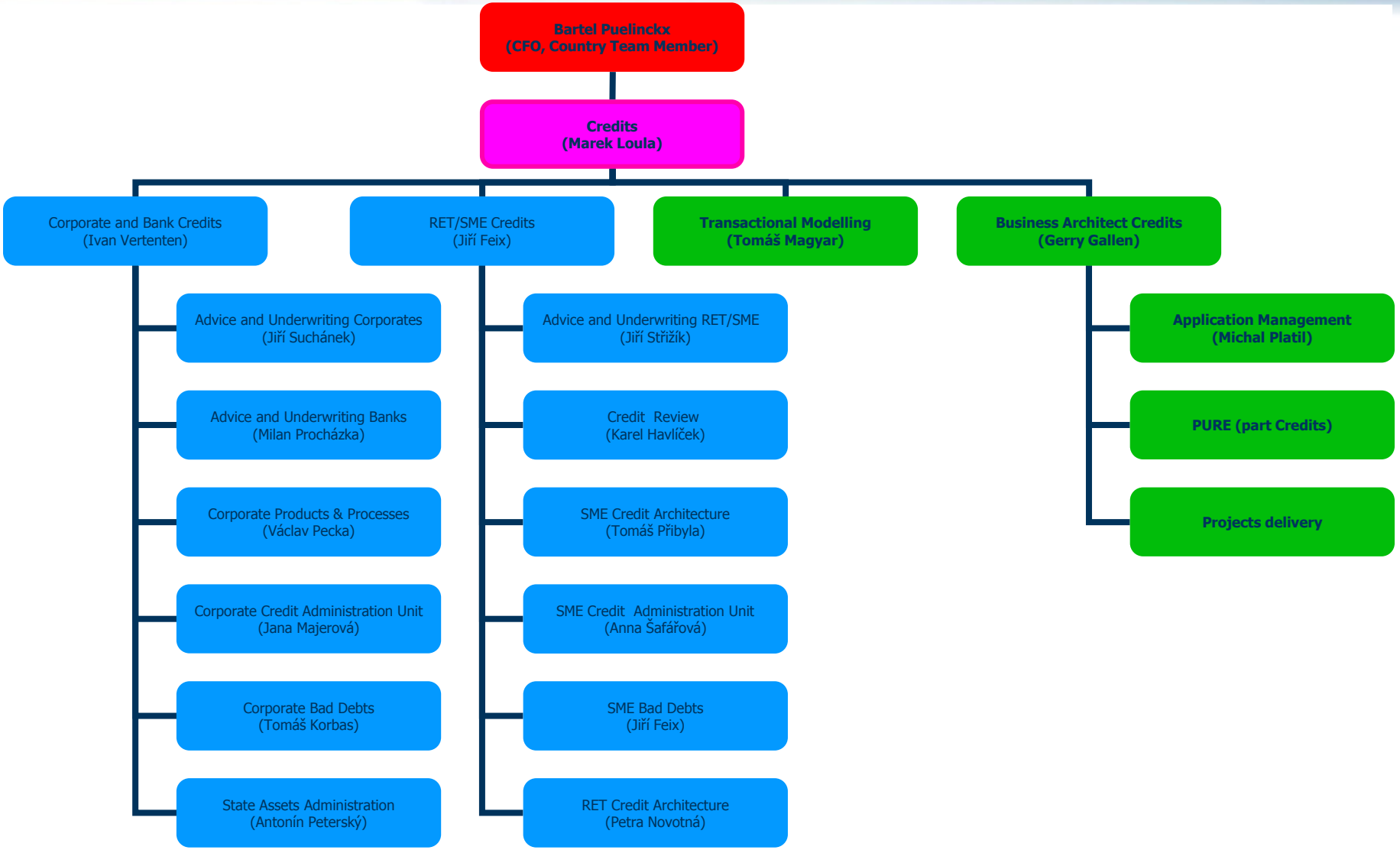
Management / Support

- Management of Products and Processes
- Business Architect function (link to ICT) + Application management
- Credit Review

Split within Credits between CORP and RET/ SME

Shared across Credits

How are Credits organized in CSOB?



Difference beween Corporate and SME lending?

	Corporate lending	SME lending
Speed	Generally medium importance, but ad-hoc ultra speed required	Important for small SME (use of score cards) **EXAMPLE**
Risk / Return	Crucial, also at the level of each client. Sensitive on change of models **EXAMPLE** (PD, LGD => RAROC)	Relevant on product groups / level of sub segments
Automated workflow	Nice to have. Only some elements have to be automated.	Critical success factor (expectations, costs, follow up of risk) **EXAMPLE**
Need for (high) delegations to business	Important element in KBC / ČSOB environment (front line responsibility for the risk, reaction time)	Very similar to Corp

Example: Risk / Return
Key elements of Basel II, Impact on business

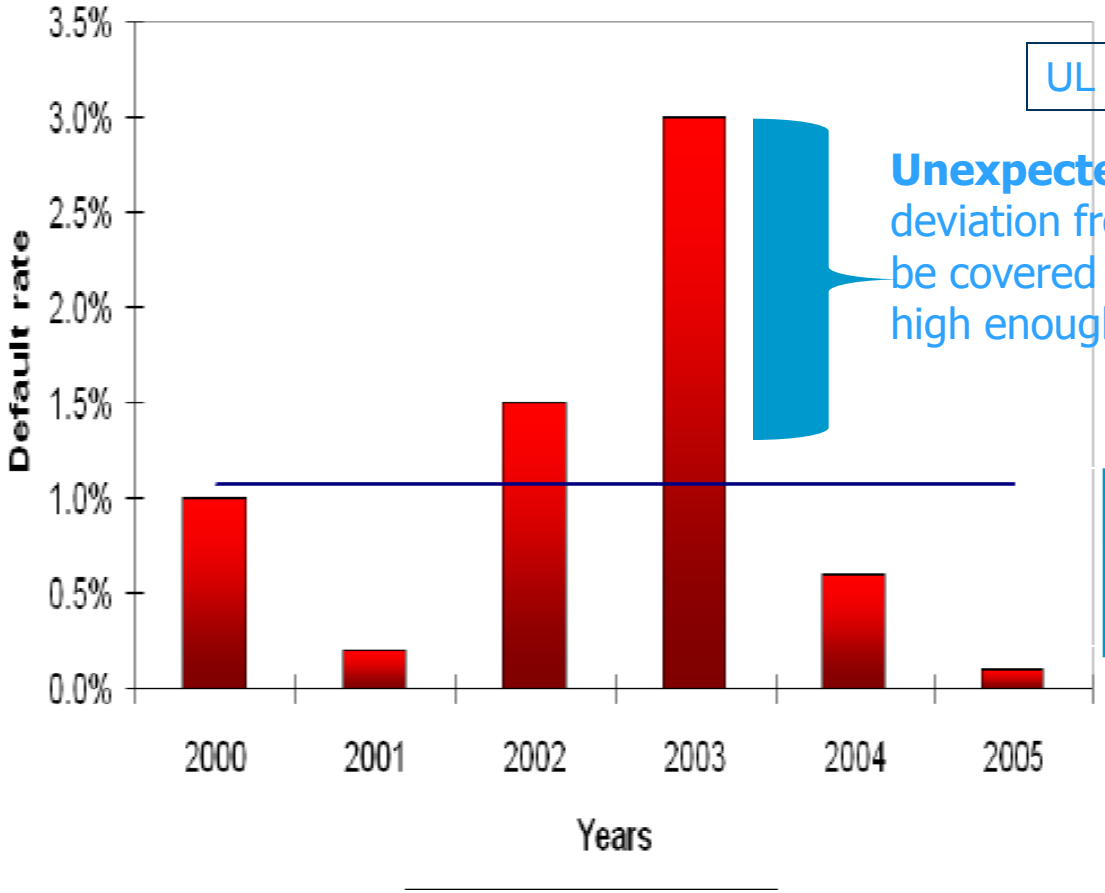
Concept of Basel II

- Applied as of 2008, replacing previous Basel I (valid mostly as of 1993)
- In the Czech Republic: Regulation of CNB No. 123/2007
- The idea is to protect bank clients and the bank itself from unexpected events and potential losses
- Basel II enables the shift of the responsibility from the local regulators towards the commercial banks after fulfillment of certain predefined criteria

Impact on Business

- Counterparty risk assessment and measurement of key risk parameters
- Enables to steer business based on risk drivers
- Infuences approval process and delegation levels
- Enables precise definition of business strategies and “cherry-picking”

Concept of Expected & Unexpected loss



UL = f (PD,Maturity,Size) x LGD x EAD

Unexpected loss (UL) – estimated deviation from expected losses. Should be covered by available capital with high enough certainty (99,9%)

Expected loss (EL) – average loss expected to be realized on the credit portfolio. In theory, it should be close to credit provisions and covered by pricing (margin).

EL = PD x LGD x EAD

Counterparty Risk: Probability of Default (PD)

- The counterparty risk is the risk that a customer will default. The PD is a result of a statistical measurement in which the past history of the portfolio of an institution is translated into the probability that clients out of the healthy portfolio will default in the coming year.

- The counterparty risk is determined by:
  - The **financial status of a counterpart**
    - Repayment capacity/ Cash flow
    - Wealth/ Balance sheet strength
    - Indebtedness/ leverage
    - Etc..
  - The **non financial status of a counterpart**
    - Retail: marital status, education level, number of phones, fixed address, color of the car, anything…
    - Non retail: market position, management quality, succession arrangements, etc…

- It is important to understand that the PD methodology has some drawbacks:
  - the PD's used are so-called "point in time" (PIT). In other words, it describes the probability of default based on past behavior, not taking into account current or future changes in the external or internal environment. Within the group, the need for "forward looking PIT PD's" and "Through the cycle PD's" are being investigated. It is likely that we will have more PD's in the future, used for different purposes.
  - the PD's are based on "outdated" input. In the retail segment, this input is still relatively recent, as PD's are calculated on a monthly basis, based on behavioral characteristics. However, in COR and SME, the input data (mainly financial) are between 1 and 2 years old.
  - In principle, the PD's should in an ex-post exercise, resemble the provisions (did what we predict come true?). Besides the above mentioned elements, granularity is an additional problem for COR and larger SME's.

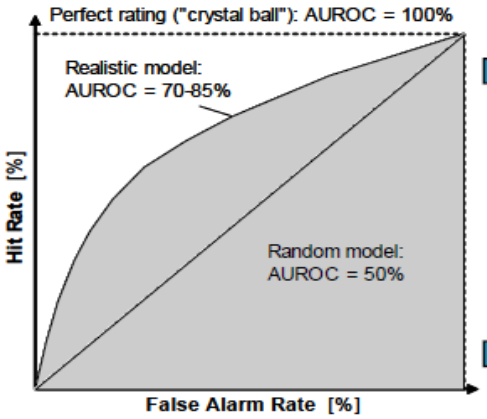
- Despite the drawbacks of the methodology, PD's are still the best available tool for distinguishing the credit quality of a portfolio in terms of default.

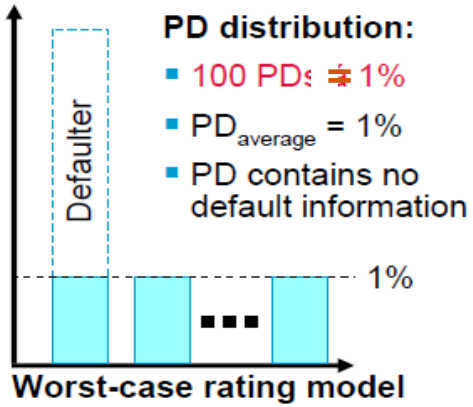
Counterparty Credit risk measurements

Counterparty credit risk measurement – competitive advantage through sophisticated rating systems (illustrative example)

Example:

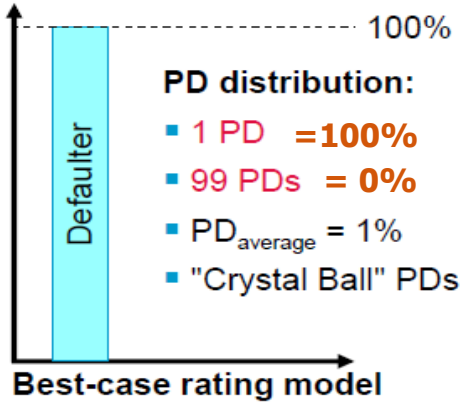
- 100 obligors
- $PD_{average}$ = 100 bps





PD distribution:

- 100 PDs ≠ 1%
- $PD_{average}$ = 1%
- PD contains no default information



PD distribution:

- 1 PD =100%
- 99 PDs = 0%
- $PD_{average}$ = 1%
- "Crystal Ball" PDs

General „Rule of Thumb“

- Improving the predictive power of a rating system
  - allows for reduced PDs for good credit quality assets and
  - implies higher PDs for bad credit quality assets
- Therefore, good rating systems reduce adverse selection and support a competitive advantage

Product risk: Exposure at default (EAD)

- Not all products are drawn to the full extent at the moment of default => some are less risky than others
- Product Categories:
  - Cash out: ST loans, LT loans
  - Off Balance sheet: Guarantees, Promises
  - PRF limits: FX, IR instruments (Forwards, swaps, options,…)
- Product nature
  - Drawn/ undrawn
  - Committed and uncommitted
- All these elements lead to a different "weighing" of the nominal volume of a product. The nominal multiplied with the weighted factor equals the exposure at default. This is a measure of the risk inherent in the product sold. The issue dealt with here is to what amount will a loan be drawn at the moment of default. This depends not only on the behavior of the customer, but also on the behavior of the lender. E.g.: a ST loan limit might be frozen at the level of the outstanding in case of a breach of covenants.
- The exposure at default thus reduces the amount of risk by applying a Credit Conversion Factor (ccf) to the nominal amount. In other words, the EAD is usually smaller than the nominal amount of the loan. For LT investment loans, the CCF will be closed to 1, but for ST loans or guarantees, they are closer to 0.7-05.
- The EAD is prescribed by the regulator under foundation, but dependant on the modeling results (i.e. the historical behavior) under Advanced

Collateral Value: Loss given default (LGD)

- The loss in case of a default (or LGD) is the difference between the exposure at default and the collateral value. It is the inverse ratio of a recovery rate.
- LGD can be calculated based on recovery rates of a specific collateral only or a combination of these recovery rates and other factors. KBC works in general with a "segmentation" approach, i.e. an LGD linked to the traits of the specific collateral only.
- Next to recovery value, also the cost of recovery plays a role.
- In Basel II Foundation and Standard, these values are prescribed by the Regulator. In Advanced, they are the result of historical recovery rates.
- 2 types of LGD are generally calculated:
  - LGD unsecured: this is the LGD in case an exposure is unsecured. Under Basel II Foundation, this is fixed at 45%.
  - LGD secured: this is the LGD that is linked to a particular type of security, and thus differs.
- In order to apply an LGD percentage, a collateral must first be declared "eligible" by the local regulator. If the collateral is deemed to be not eligible, the exposure needs to be treated as unsecured.

Implications towards pricing

- **Credit Pricing**
  - Definition of minimal required profitability (RAROC) – transactional as well as relationship
  - Composition of RAROC:

$$\text{RAROC} = \frac{(\text{Income} - \text{OP.costs} - \text{EL}) * (1\text{-tax\%})}{\text{Regulatory capital (RCap)}} + \text{YORE}$$

- **What influences RAROC:**
  - Margin, Fees – the higher the better the transactional RAROC will be
  - Ancillary business (other than credit related income – FX, fees from payments etc.) – influences relationship RAROC
  - PD of the borrower – the better the PD, the lower the EL and RCap, the better the RAROC
  - Collateral – the more collateral provided, the lower the EL, the better the RAROC
  - Type of product – the less committed nature of the specific product čím méně závazný produkt, the lower the EL, the better the RAROC
  - Maturity – the shorter the deal, the smaller the unexpected loss (= capital function), the better the RAROC
  - YORE – income from reinvested capital (ALM)

Implications towards pricing

Impact of PD on regulatory capital

PD 5

PD	1,18%
LGD	45%
EAD	100
Asset class	Corporate
Maturity (in years)	1
Size adjustment (in milion Euro)	40

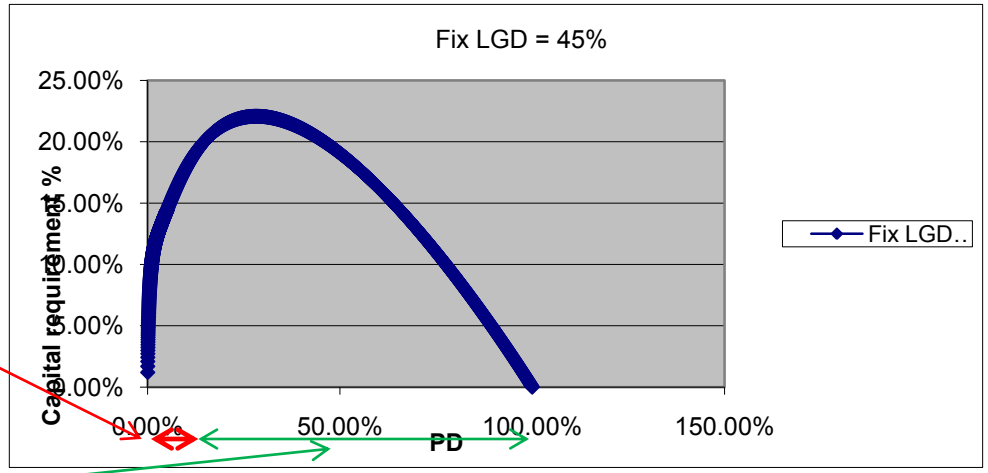
Capital requirement	**6,33**
EL	**0,53**

PD 6

PD	2,26%
LGD	45%
EAD	100
Asset class	Corporate
Maturity (in years)	1
Size adjustment (in milion Euro)	40

Capital requirement	**8,03**
EL	**1,02**

- Relative difference (increase) in Rcap due to one notch downgrade (all other elements being equal) = cca 26%
- Relative difference (increase) in EL due to one notch downgrade (all other elements being equal) = cca 90%
- RCap is highly sensitive on PD changes in the range of KBC masterscale. On contrary, in the range of very high PD the sensitivity diminishes since the Unexpected loss become to be "expected" (high probabilities)



Implications towards pricing

Impact of LGD on regulatory capital

LGD 45% unsecured

PD	1,18%
LGD	45%
EAD	100
Asset class	Corporate
Maturity (in years)	1
Size adjustment (in milion Euro)	40

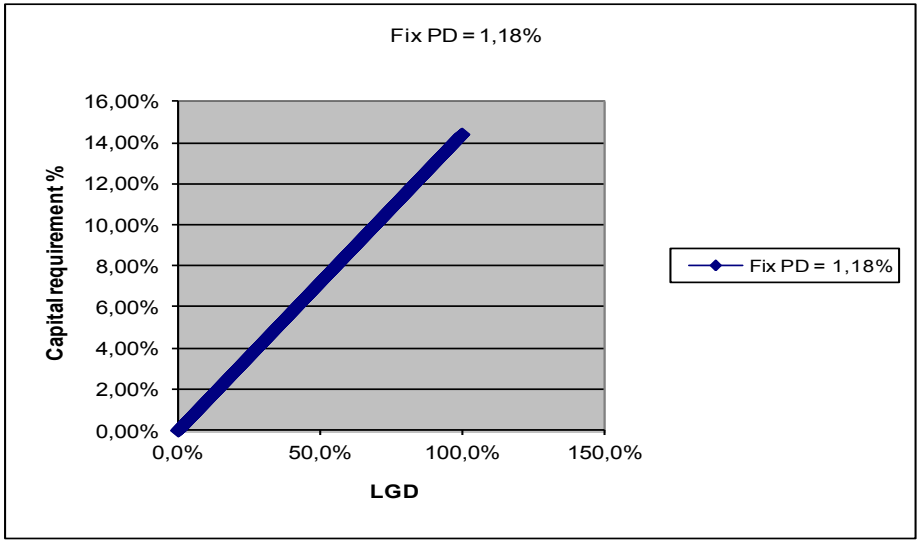
Capital requirement	**6,33**
EL	**0,53**

LGD 35% secured (real estate collateral)

PD	1,18%
LGD	35%
EAD	100
Asset class	Corporate
Maturity (in years)	1
Size adjustment (in milion Euro)	40

Capital requirement	**5,05**
EL	**0,41**

- Relative difference (decrease) in Rcap due to 10% decrese in LGD (all other elements being equal) = 10%
- Relative difference (decrease) in EL due to 10% decrease in LGD (all other elements being equal) = cca 10%
- RCap is highly sensitive on LGD changes. X % relative change in the underlying LGD percentages has a linear impact on the Rcap at the amount of X%.



Implications towards pricing

Impact of maturity on regulatory capital

Maturity 1 year

PD	1,18%
LGD	45%
EAD	100
Asset class	Corporate
Maturity (in years)	1
Size adjustment (in milion Euro)	40

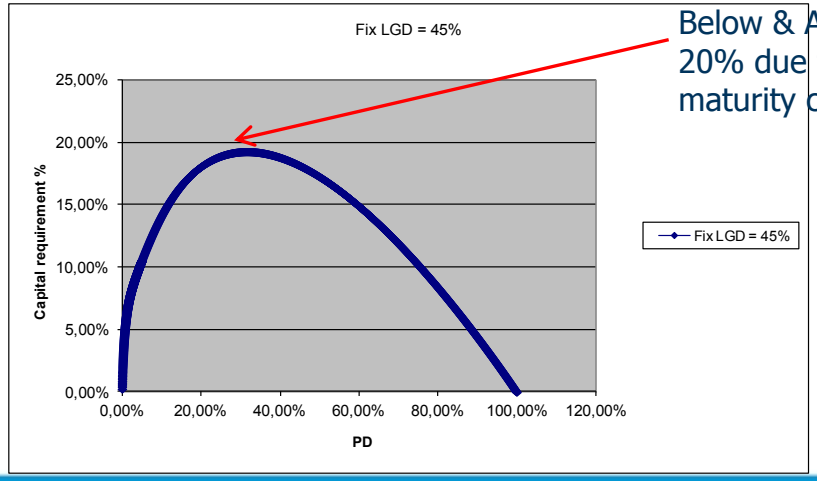
Capital requirement	**6,33**
EL	**0,53**

Maturity 5 years

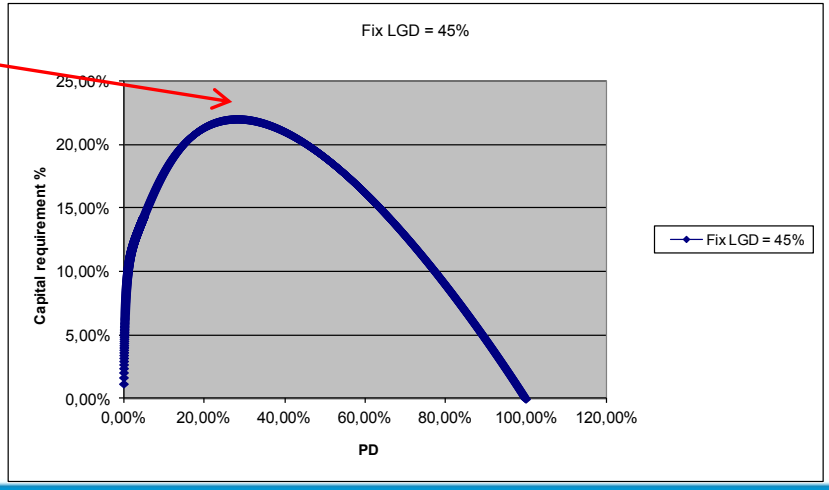
PD	1,18%
LGD	45%
EAD	100
Asset class	Corporate
Maturity (in years)	5
Size adjustment (in milion Euro)	40

Capital requirement	**10,46**
EL	**0,53**

• An increase in the maturity of the deal immediately implies an increase in the required regulatory Capital. The maturity effect is visible up to 5 years. The maturity adjustment increases the angular coefficient of the capital function thus leads to higher capital charges while all other parameters remain stable.



Below & Above 20% due to maturity changes



Thank you

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