



БАНКОВСКАЯ ГРУППА



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ДЕВОН-КРЕДИТ

О расчете требований на капитал и адаптации Продвинутого подхода Базель-2

The capital requirements, adaptation IRB approach of Basel-2 to manage credit risk in Russian bank

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Risk management | exhibition conference

МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ
"МЕЖДУНАРОДНЫЙ ОПЫТ РИСК-МЕНЕДЖМЕНТА
И ОСОБЕННОСТИ РАЗВИВАЮЩИХСЯ РЫНКОВ"

МЕЖДУНАРОДНАЯ ВЫСТАВКА
"УСЛУГИ И ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ
ПО УПРАВЛЕНИЮ ФИНАНСОВЫМИ РИСКАМИ"

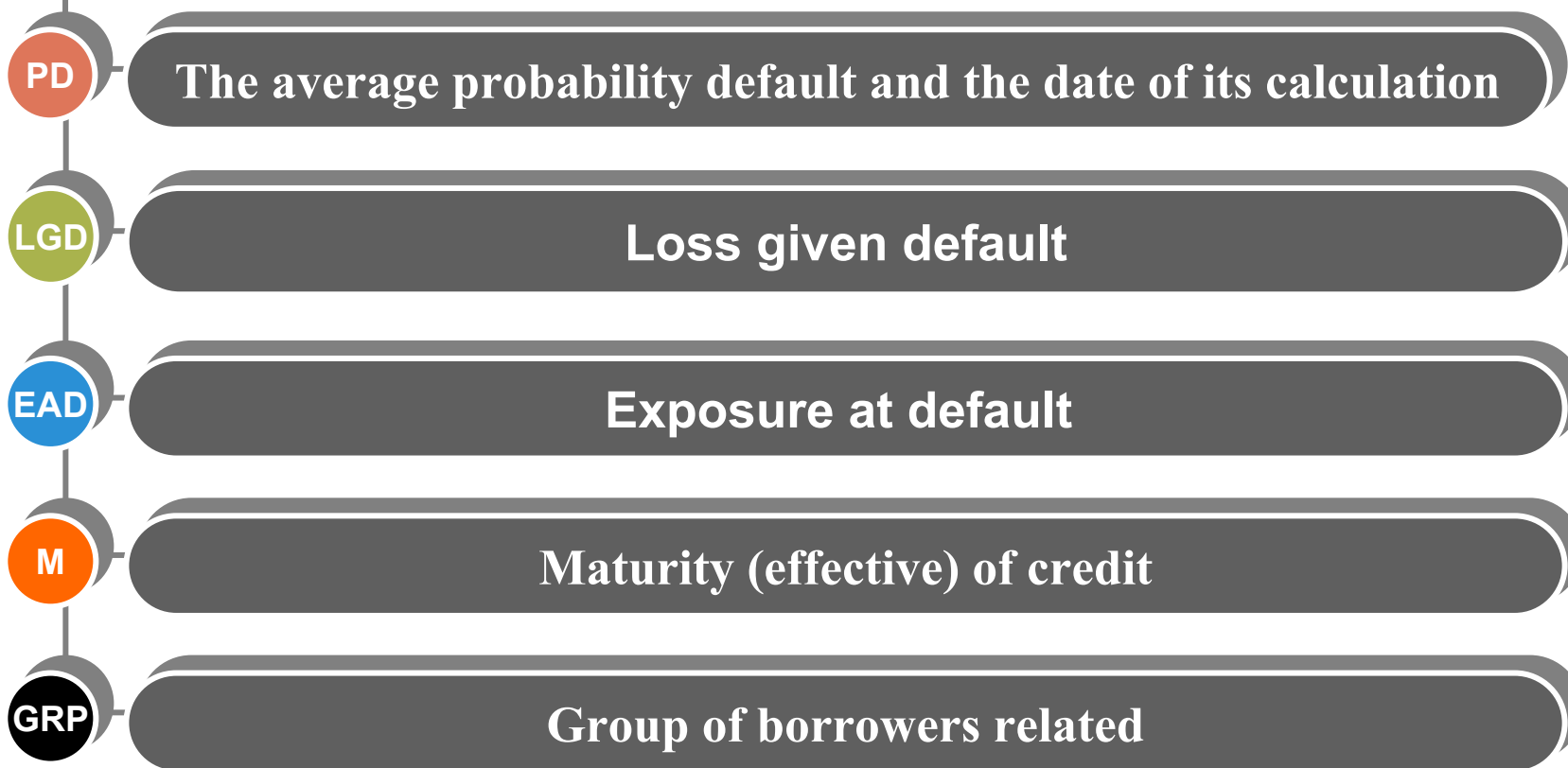
18-19 июня 2007

Россия, Москва

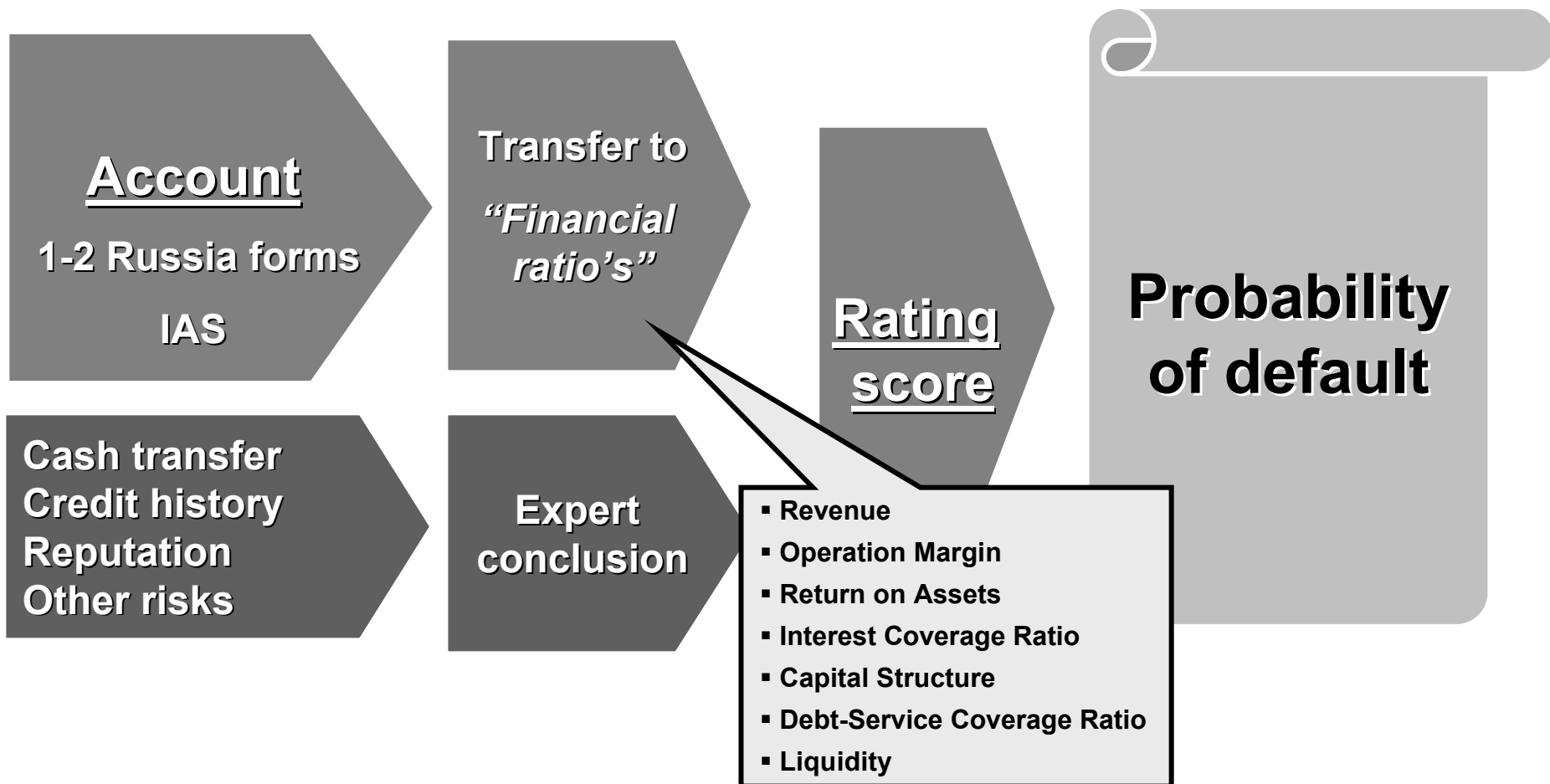
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Basic risk-parameters of credit

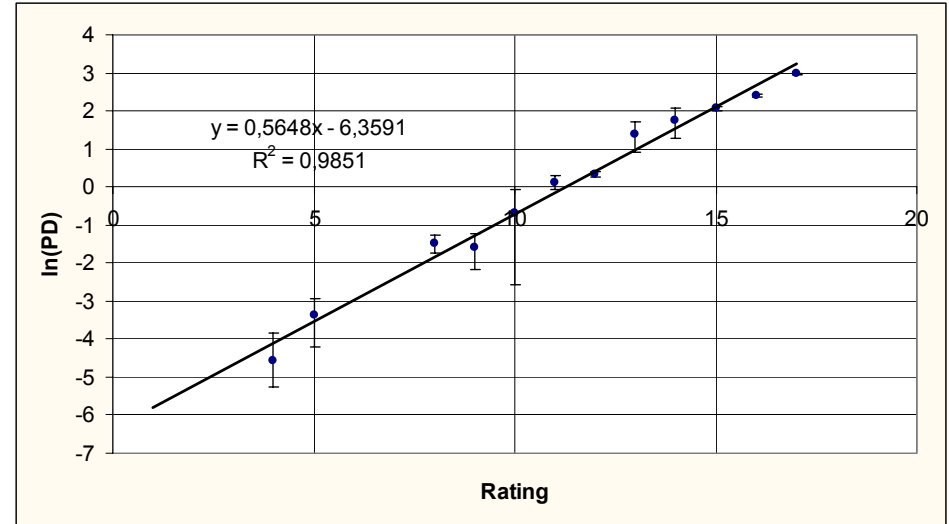


Annual default probability



PD calibration principles

S&P Rating	Moody's Equivalent	Default Probability (Subsequent year)
AAA	Aaa	0.01%
AA	Aa3/A1	0.03%
A	A2/A3	0.11%
BBB	Baa2	0.30%
BB	Ba1/Ba2	0.81%
B	Ba3/B1	2.21%
CCC	B2/B3	6.00%
CC	B3/Caa	11.68%
C	Caa/Ca	16.29%



$$PD = \frac{1}{1 + e^{a \cdot R + b}} \quad R - \text{Internal Rating}$$

Simplest model LGD, EAD

- B1 – high liquidity collateral (I , (II) category 254-П)
- Gross EAD=CCF (Limit-DEBT)+DEBT
- Net EAD=max(Gross EAD -B1,0)
- B2 – restricted liquidity collateral, Guarantees
 - ✓ K=1. Cover the debt
 - ✓ K=2. Cover the part
 - ✓ K=3. Absent

Basel standard approach for blank credits LGD=45%

$$\text{LGD}=45\%+\text{CORRECTION}(K,PD)$$

IRB Approach basic conception

$$Z = \sqrt{R} \cdot Y + \sqrt{1 - R} \cdot \xi$$

Assets value factor

Correlation

Common

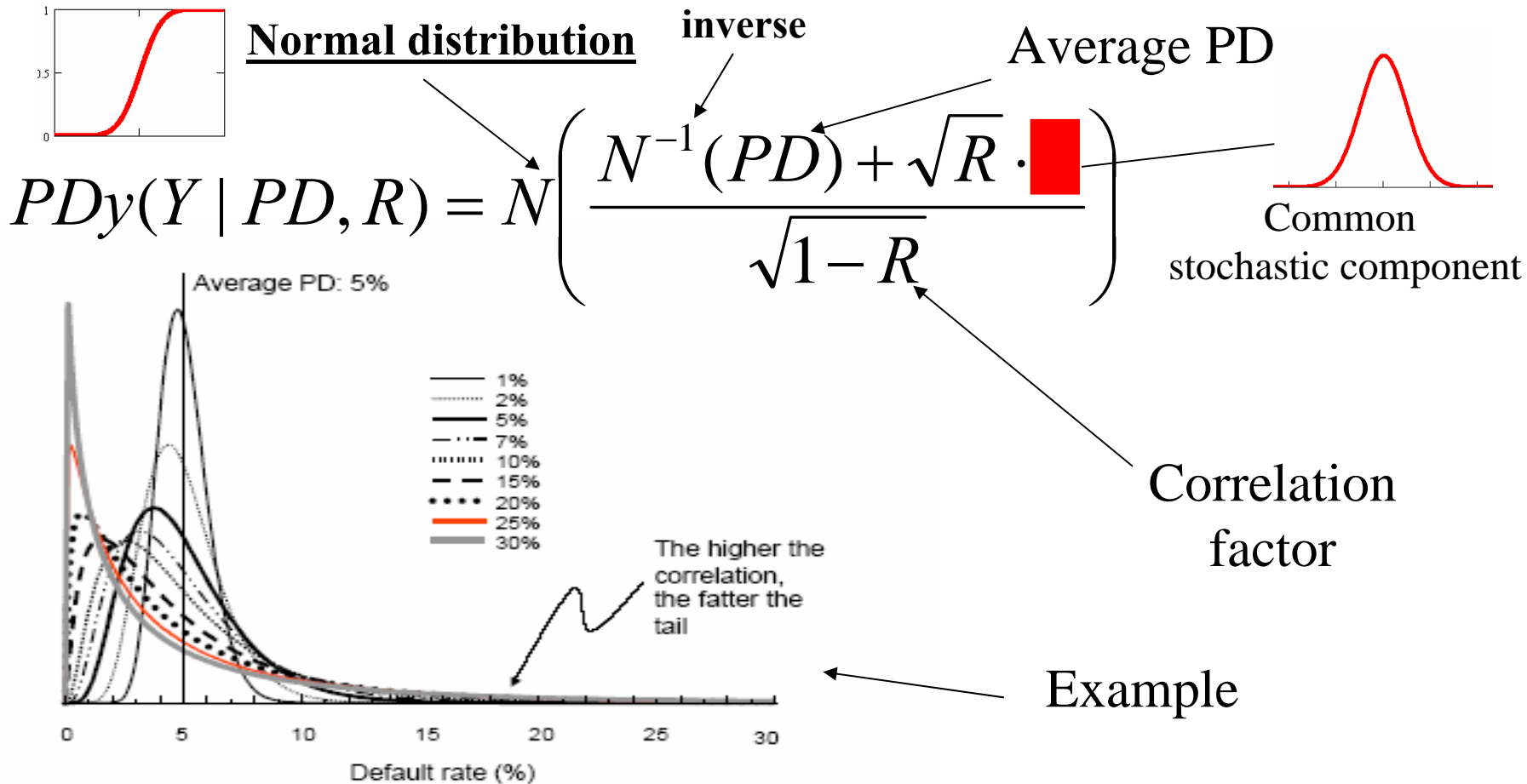
Individual
stochastic
component

factor stochastic component

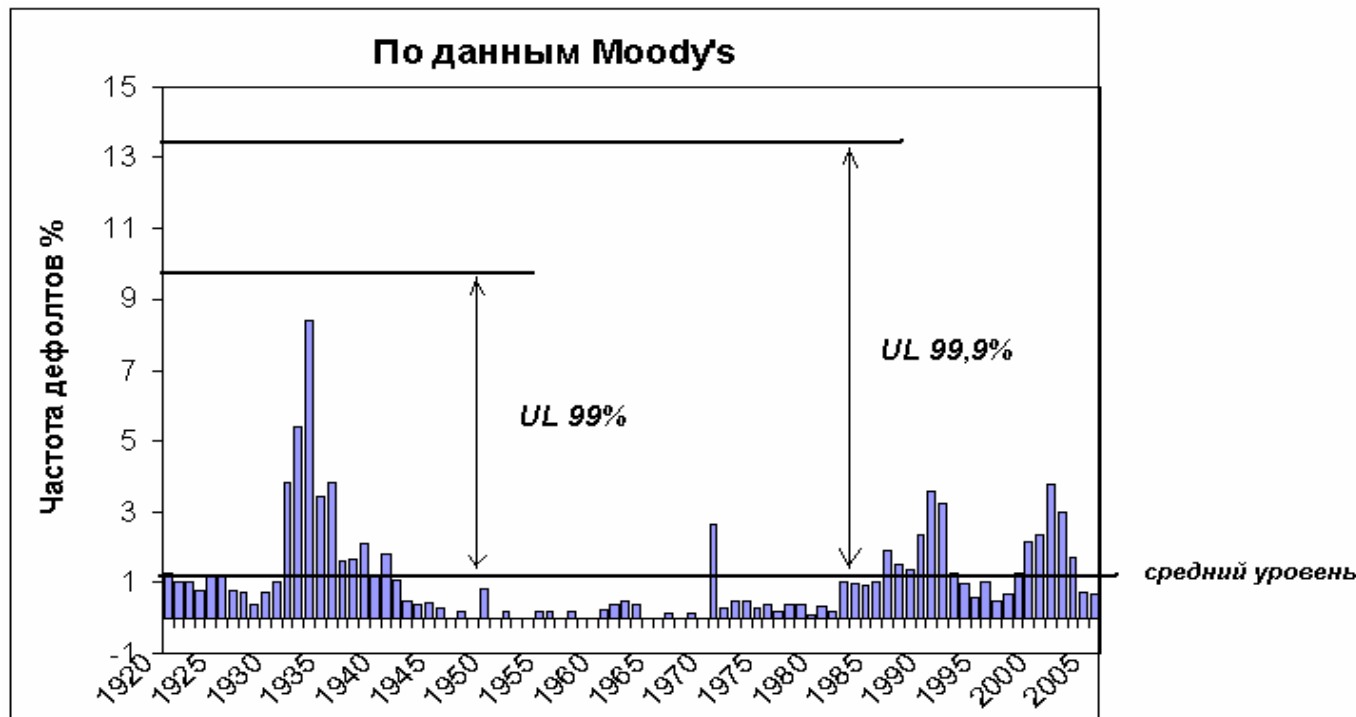
Asset Correlation $(Z_i, Z_j) = R$

PD=Probability of $Z < D$ -level

Conditional PD



Correlation effect and Unexpected Loss



UL can be explained as unpredictable jumping annual default frequency under the influence of stochastic common factor Y . Correlation parameter R defines the amplitude of UL.

The calculating of capital requirements for Basel-2 IRB Approach

- Under a given confidential level (99.9%, for example) the worst parameter Y is selected and maximal PD is calculated.
- In condition of **infinitely diversification**, UL (capital requirements) is calculated as excess under Expected Loss with average PD

$$UL = (PD_{y(N^{-1}(0.99), PD, R)} - PD) \cdot EAD \cdot LGD \cdot MatAd$$

MatAd - Full maturity adjustment as function of PD and Smoothed maturity M , *MatAd*=1 in annual horizon

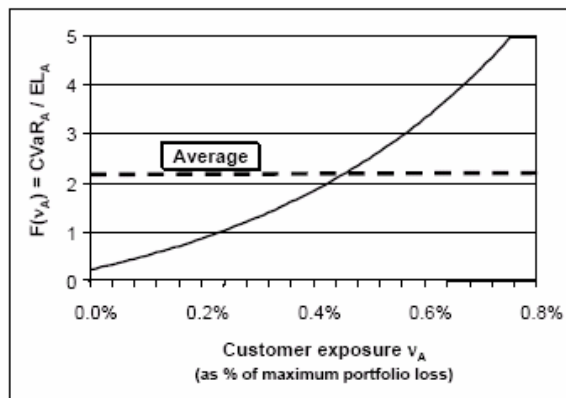
Three questions

- How take into account the restricted diversification of real credit portfolio?
- What is value of correlation parameter R for Russian corporate companies, banks, retail borrowers?
- What is value of confidential level must be enough for Russian bank, which have not high international rating?


Penalty-factor for restricted diversification

Merton models and the MVM

Penalty factor curves have exponential shape



Result from a 1-factor model for a sample portfolio

COMMERZBANK 
Zentraler Stab Risikoccontrolling

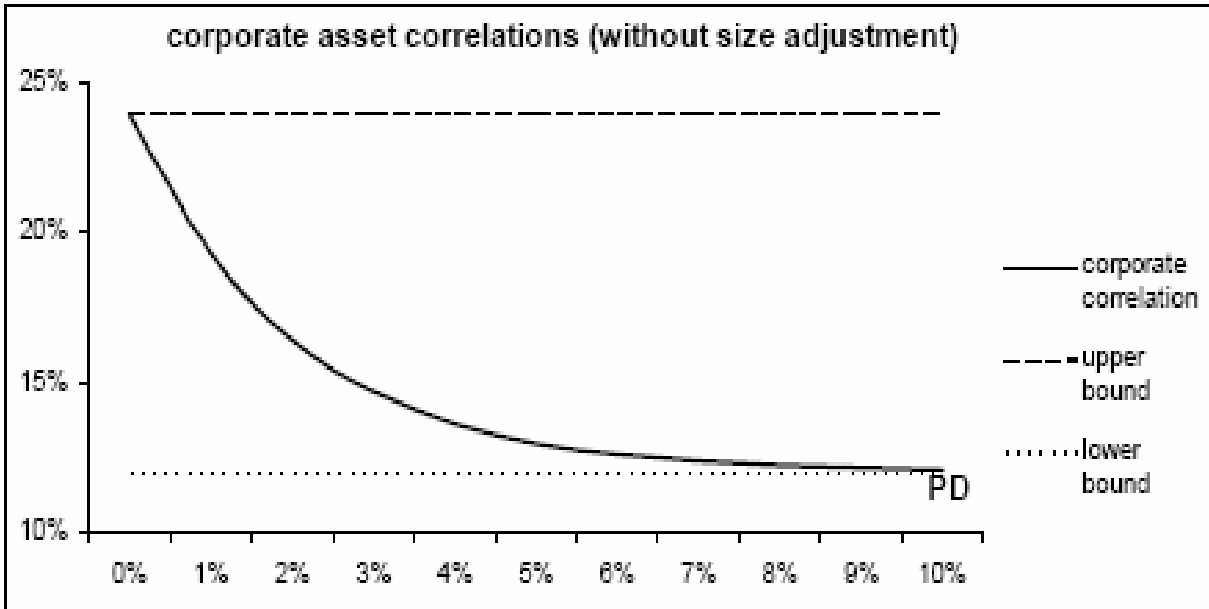
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$$PF = \exp \left(\delta \cdot \frac{\sum_{related\ transactions} EAD}{\sum_{portfolio} EAD} \right)$$

$$UL_{real} = UL_{basel} \cdot PF$$

δ – special coefficient depend on internal portfolio structure

Basel recommendation for correlation parameter R

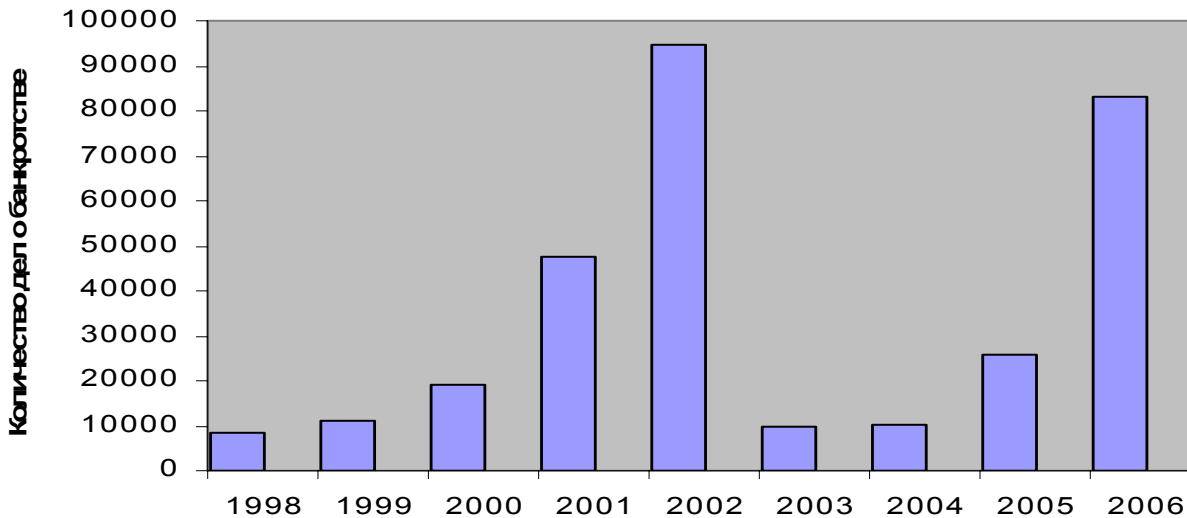


Ипотека: $R=0.15$
Кред.карты: $R=0.04$
Прочие:
 $R=0.03-0.16$
от PD

Own research correlation parameters for Russian equities and bonds with ratings, *dependence on PD did not support.*

Own research of range correlation parameter R for Russia

Данные Высшего Арбитражного Суда



$R=0.08-0.20$

There is reason to believe that the range of correlation parameter R for Russia in conformity with what is recommended by IRB Approach.

Our recommendation for parameter R of correlation for Russian borrowers

Borrowers class	Correlation parameter R
Companies with revenue < 1 Bill. dollars.	0.12
Corporate with revenue from 1 to 10 Bill. dollars	0.15
Corporate with revenue > 10 Bill. dollars	0.20
Banks	0.20
Retail borrowers	0.18

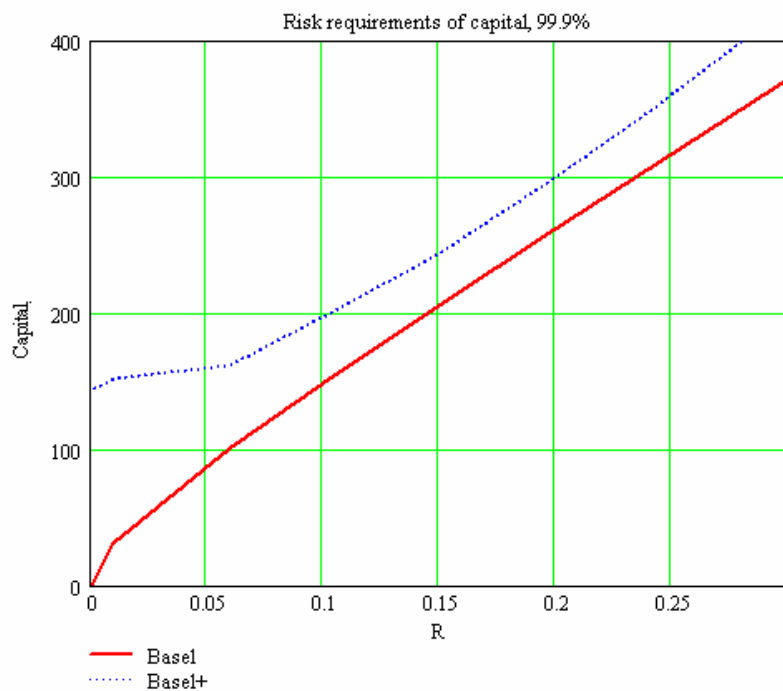
Requirement to confidential level

- Basel requirement
99.9% - very high
- Banco Bilbao
Vizcaya Argentaria
(BBVA)) assessment
for developing
countries

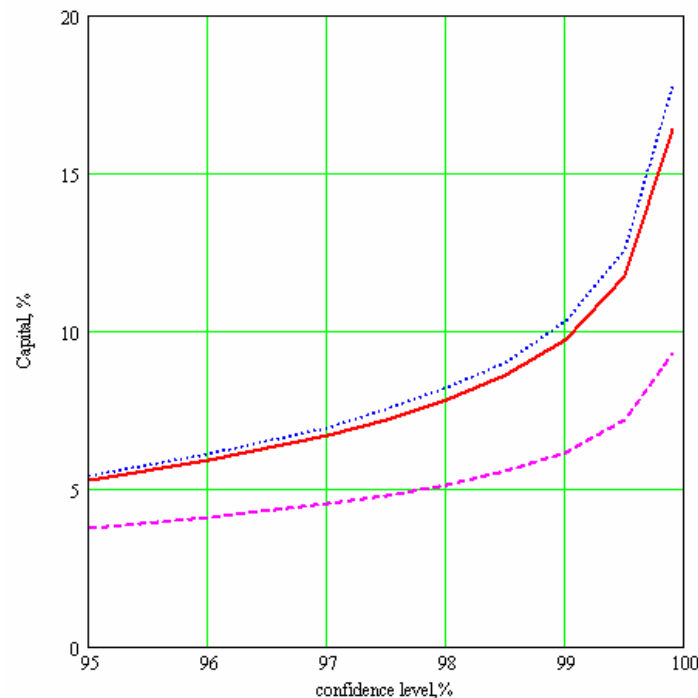
Rating	Confidence level
A- and above	99,90%
BBB+	99,86%
BBB	99,80%
BBB-	99,70%
BB+	99,50%
BB	99,10%
BB-	98,50%
B+	97,50%
B	95,50%
B-	92,50%
CCC+	88,09%

Examples of dependencies for realistic portfolios

Dependency of absolutely capital requirements from parameter of correlation



Dependency of capital requirements from level of confidence



Спасибо за внимание!

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