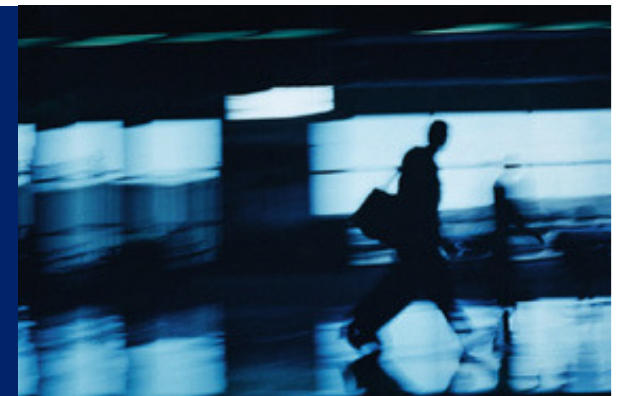


Economic Capital and Steering

Strategic targets and instruments

d-fine Frankfurt, June 19th, 2007



Group wide strategic targets: Management agenda



Strict capital and risk discipline: Management agenda

Target of the risk & capital management of a bank is to **assign adequate capital** to those transactions, which continuously provide **earnings exceeding capital costs**.

This way each transaction supports the increases of shareholders' value

Detlef Bindert, Group Treasurer
Deutsche Bank AG, in Gabler 2004

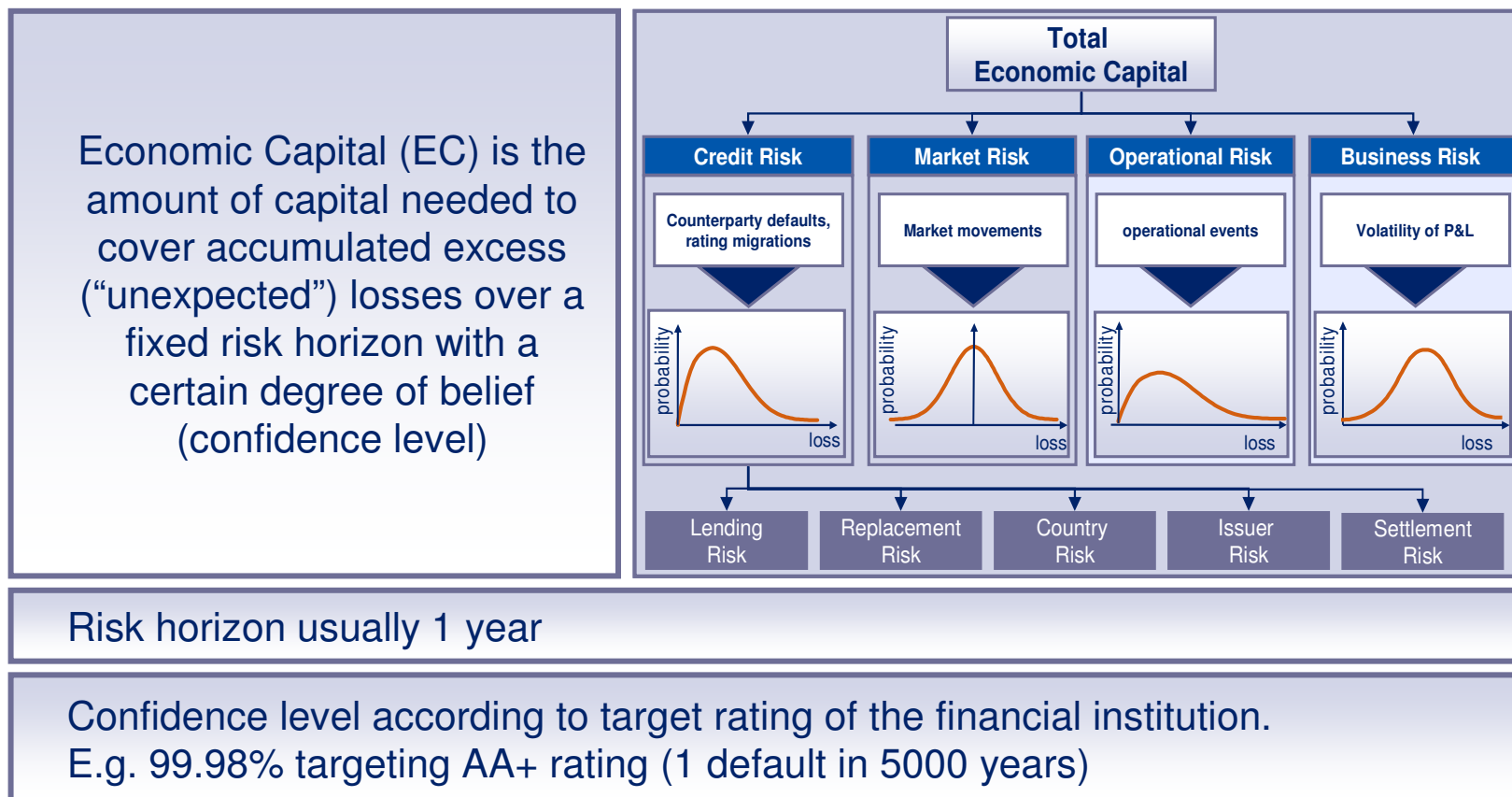
Which instruments are needed ?

To meet this target the bank needs the development and implementation of

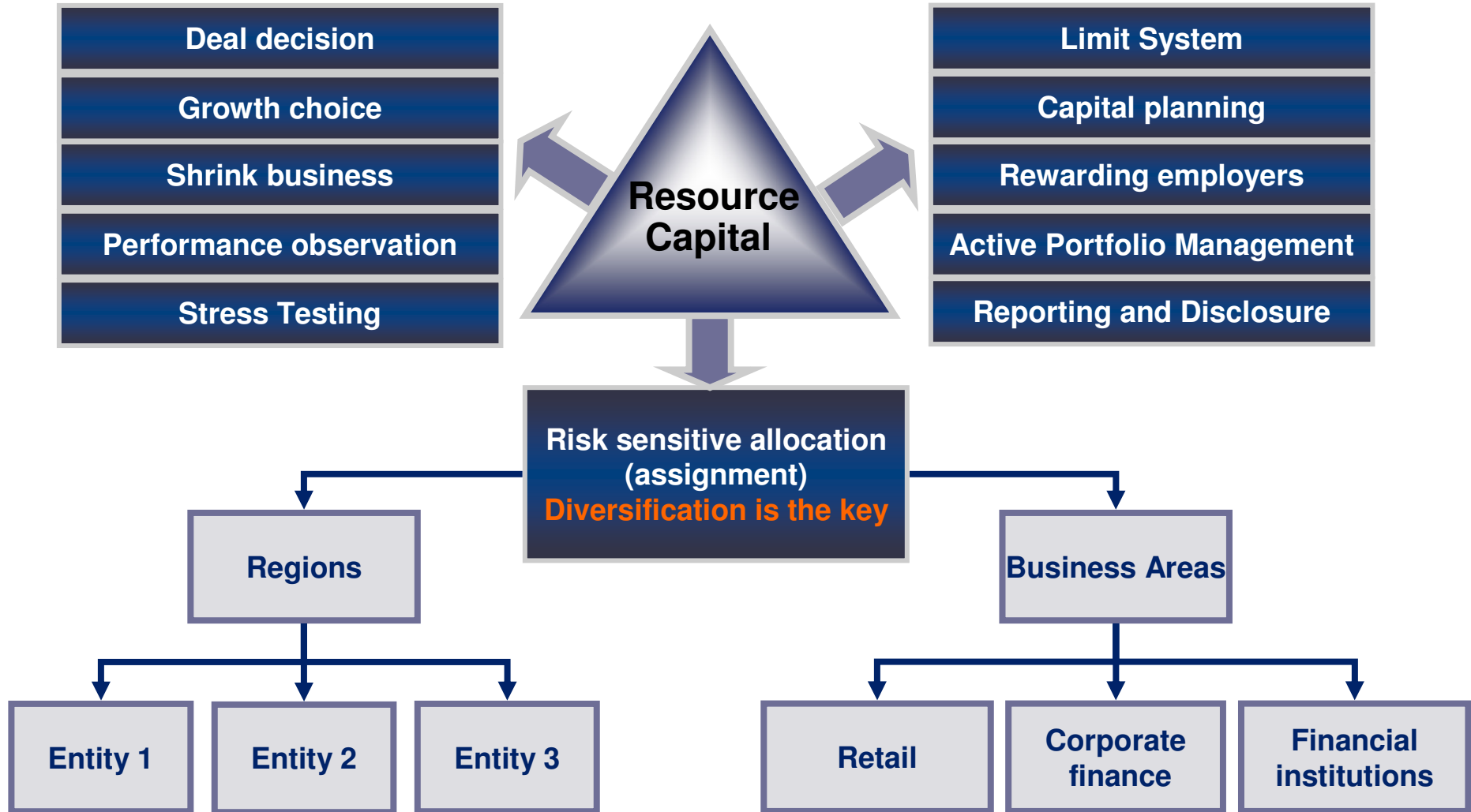
- a portfolio model for group wide capital assessment
- risk sensitive capital allocation techniques to transaction level
- group wide integration and allocation of capital for different risk types
- RAROC pricing tool (forward looking steering/backward looking measurement)
- capital planning tool for management of pro-cyclical Basel II Tier 1 capital
- further tools for Active Portfolio-Management

Take implementation of Basel II standards as a solid basis

Economic Capital and risk types

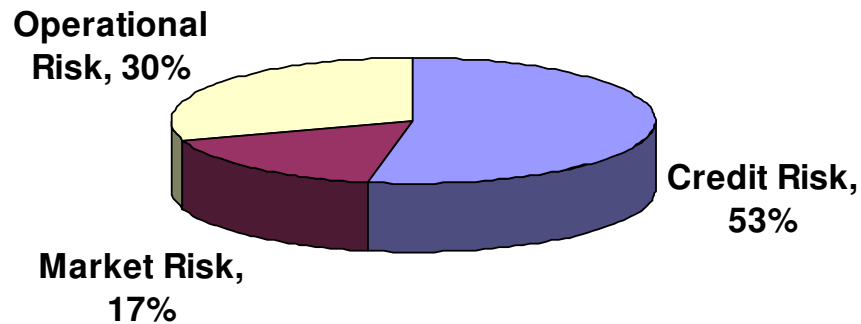


Benefits of an economic steering approach



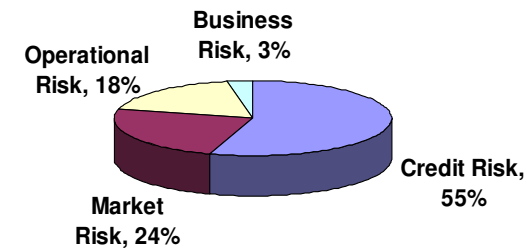
Economic Capital of industry and peers

Industry 2002

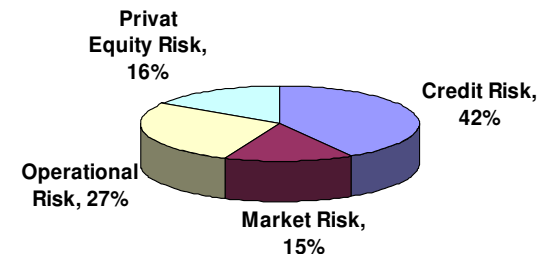


Source: BBA, ISDA, RMA Operational Risk Study

DB Annual Report 2005



JPMC Annual Report 2002

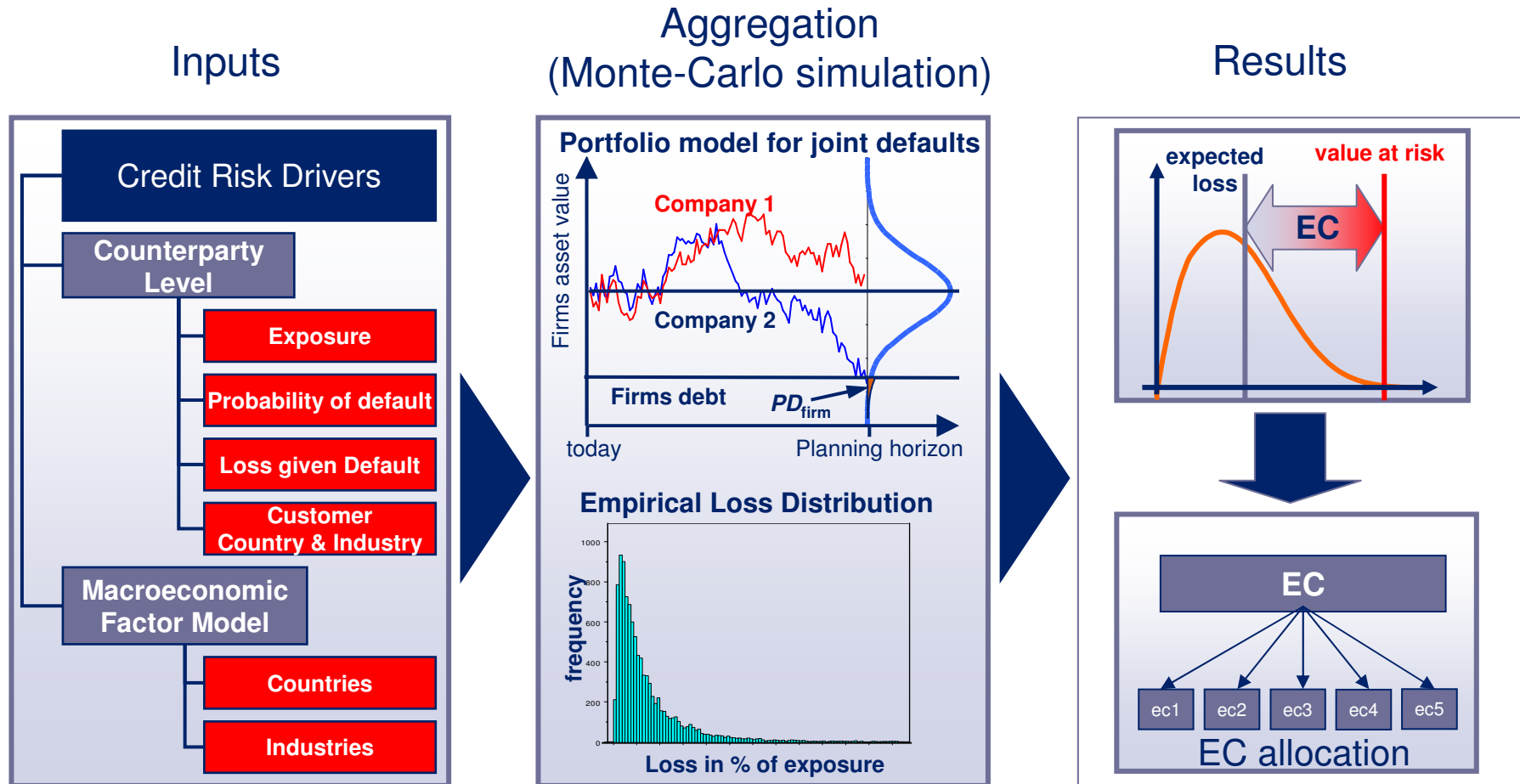


The risk type specific EC distribution

- is not stable over the time
- depends on a banks risk mitigation strategy (CDS, ABS, Active Portfolio management (ACPM))
- exhibits the effects of business acquisitions/sells

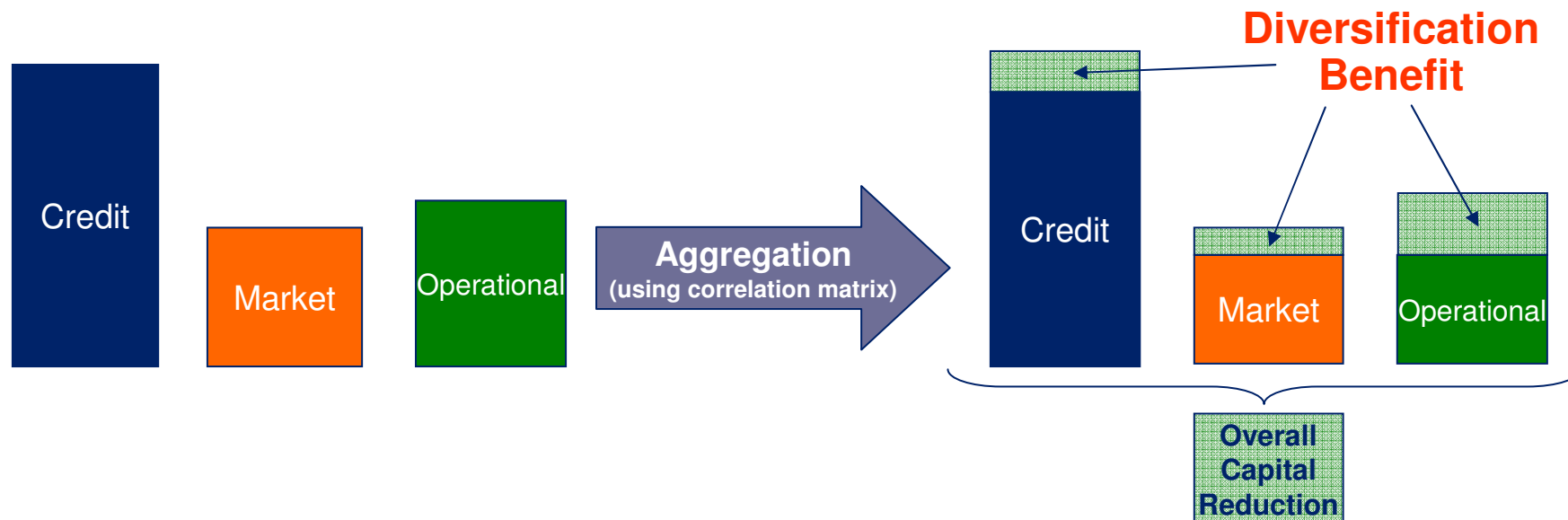
Diversification to consider within Risk types

Example: Correlated defaults in credit risks



Diversification to consider across risk types

- Diversification benefits across different risk types are not reflected if adding up the individual standalone EC
- The aggregation model of loss distributions between credit, market and operational risk takes into consideration correlations between these risk types and results in diversification benefits
- Basel 2 methodology does not consider diversification effects across risk types



Economic Capital and profitability measure RAROC

Risk-based
transaction pricing
Steer the bank
based on
economic profitability

$$\text{RAROC} = \frac{\text{Revenues} - \text{Costs} - \text{EL} + \text{Capital Benefit}}{\text{Contributory EC}} = \text{RAR}$$

$$\text{Economic Profit} = \text{RAR} - \text{Hurdle Rate} \cdot \text{EC}$$

$$\left. \begin{array}{l} > = 0 \text{ enter} \\ < 0 \text{ reject transaction} \end{array} \right\}$$

Hurdle Rate : Minimum return on equity
expected from shareholders

Capital Benefit:

- 1.) Estimate contributory EC
- 2.) Calculate Book Capital = EC * Capital Allocation Factor
- 3.) Investment of Book Capital at Capital Market by Treasury
- 4.) Give back the accrued interest (e.g. 4% of book capital)

RAROC steering (forward looking): Regulatory vs. Economic view

2 customers with **same** Rating but **different industries**

Regulatory view		
	Customer A	Customer B
Industry	Telecommunication	Construction
Customer Rating	A-	A-
PD	0.10%	0.10%
LGD	77.00%	77.00%
Exposure	10,000,000	10,000,000
Margin	0.62%	0.62%
+ Revenue	62,000	62,000
- Administrative Expenses	30,000	30,000
- Product Expenses	10,000	10,000
- Expected Loss	7,700	7,700
+ Capital Benefit @ 4.9%	12,495	12,495
/ Regulatory Capital	255,000	255,000
RaR/Regulatory Capital	10.5%	10.5%
Risk adjusted Return (RaR)	26,795	26,795
Cost of Capital (hurdle rate = 20%)	51,000	51,000
= Economic Profit (€)	-24,205	-24,205

Economic view		
	Customer A	Customer B
Industry	Telecommunication	Construction
Customer Rating	A-	A-
PD	0.10%	0.10%
LGD	77.00%	77.00%
Exposure	10,000,000	10,000,000
Margin	0.62%	0.62%
+ Revenue	62,000	62,000
- Administrative Expenses	30,000	30,000
- Product Expenses	10,000	10,000
- Expected Loss	7,700	7,700
+ Capital Benefit @ 4.9%	2,940	3,920
/ Economic Capital	60,000	80,000
RAROC	28.7%	22.8%
Risk adjusted Return (RaR)	17,240	18,220
Cost of Capital (hurdle rate = 20%)	12,000	16,000
= Economic Profit (€)	5,240	2,220

Risk sensitive allocation of capital can turn non profitable business to a highly profitable. **Here Basel II capital is dumb**

RAROC measurement (backward looking)

Backward-looking profitability measure with respect to a fixed time horizon:

- for performance measurement and accounting
- to support business decisions with up to date results

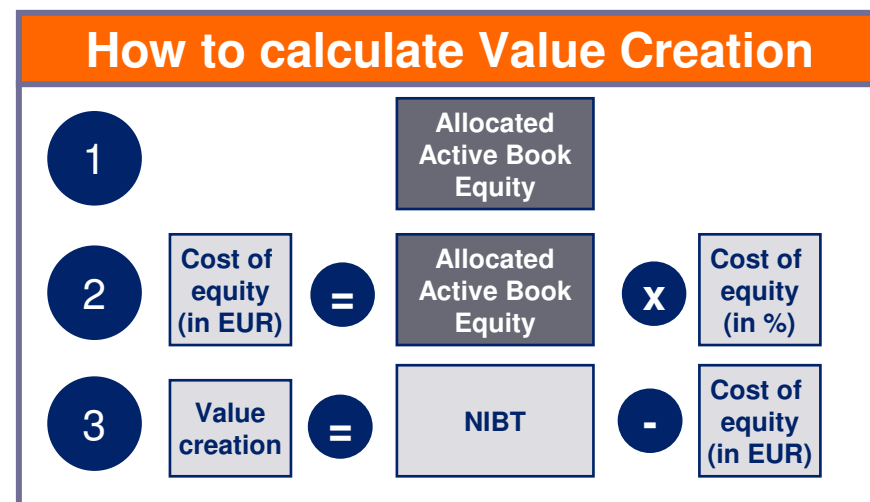
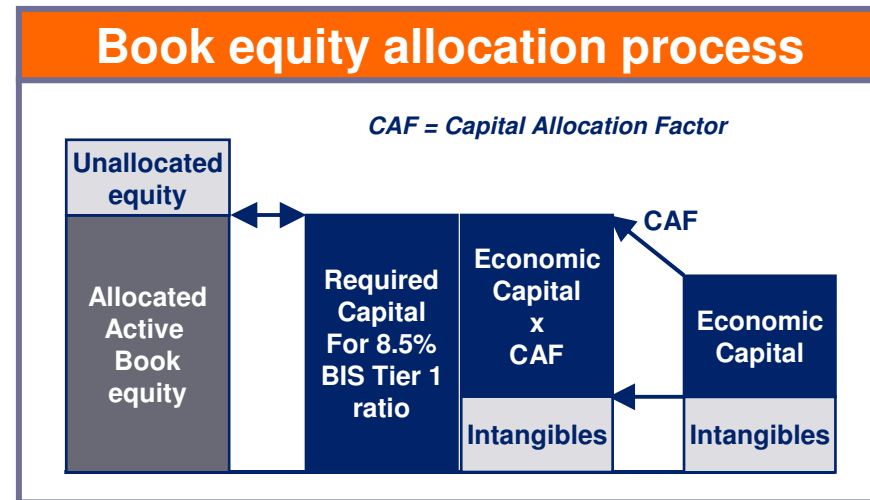
Methodology concept:

RAROC post calculation needs all input information on customer level

- Available data source feed for EL and EC for Credit Risk
- Time horizon is the past twelve months from the calculation date
- Breakdown to lowest aggregation level, e.g. to business areas
- Global ratios are taken to estimate all quantities which are not yet available on customer level, e.g. Costs, EL and EC for Operational Risk, and EC for Market Risk
- Time averages over all quantities are to be taken

Capital Allocation is a pre-requisite to measure value creation

- Book equity allocation to businesses is driven by economic capital and goodwill
- Goodwill/intangibles attract capital proportional to business volume
- Allocation of Economic Capital is adjusted for regulatory needs by a Capital Allocation Factor (CAF)
- CAF ensures that book equity allocated to businesses is in compliance with the targeted capital adequacy (BIS tier 1 ratio of 8.5%)
- Allocation of capital joins economic and regulatory perspective
- And is a key input to measure value creation



Your contact at d-fine

Dr Christian Oehler

Manager

+49 (0) 69 9073 7304

christian.oehler@d-fine.de

Dr Georg Stapper

Director

+44 (0) 1622 6300 04

georg.stapper@d-fine.co.uk

Dr Bernd Appasamy

Managing Director

+49 (0) 69 9073 7306

bernd.appasamy@d-fine.de



d-fine GmbH

Opernplatz 2

60313 Frankfurt

Germany

Tel +49 (0) 69 9073 70

www.d-fine.de

d-fine Ltd

28 King St

London

EC2V 8EH

Tel +44 (0) 20 7776 1000

www.d-fine.co.uk

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