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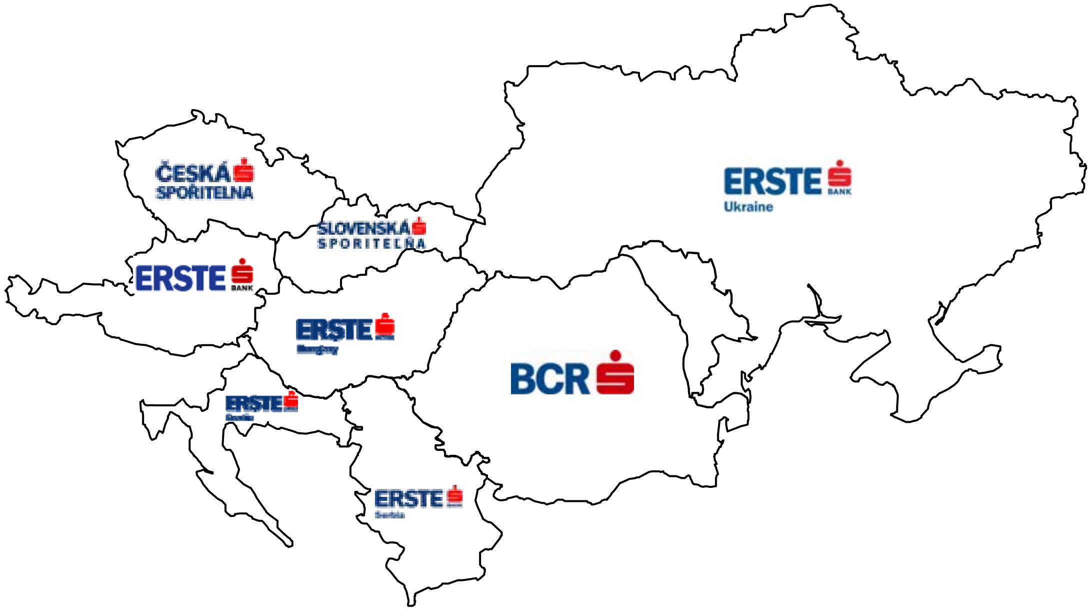


Challenge ICAAP

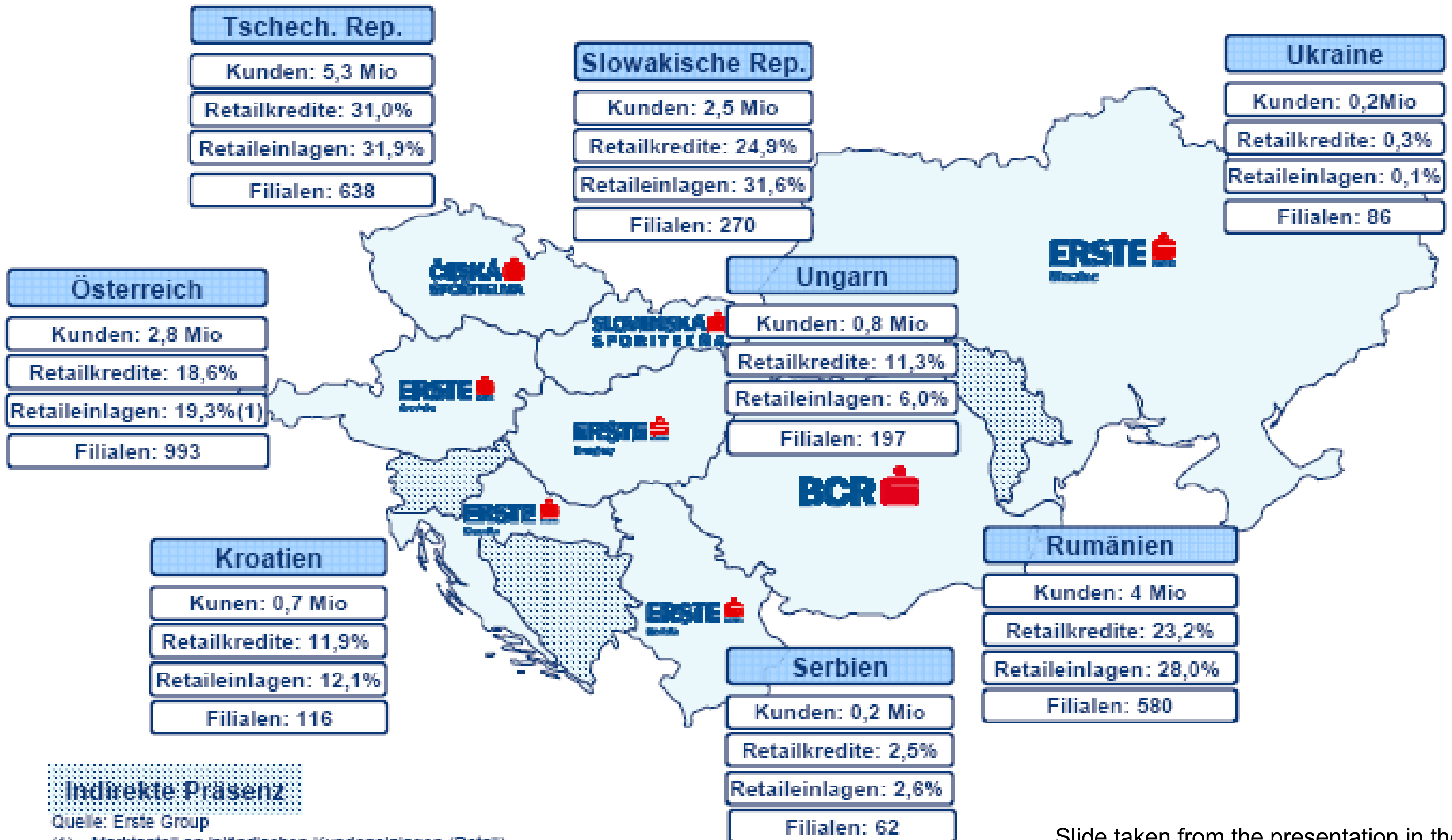
Andreas Weingessel

Agenda

ERSTE GROUP

- Introduction
- Basel II – From Pillar 1 to Pillar 2
- Basel II – Pillar 2
- Risks to be considered
- Challenges in modeling these risks
- Enterprise-wide Risk Management

Stärke des Franchise-Netzwerkes der Erste Bank-Gruppe

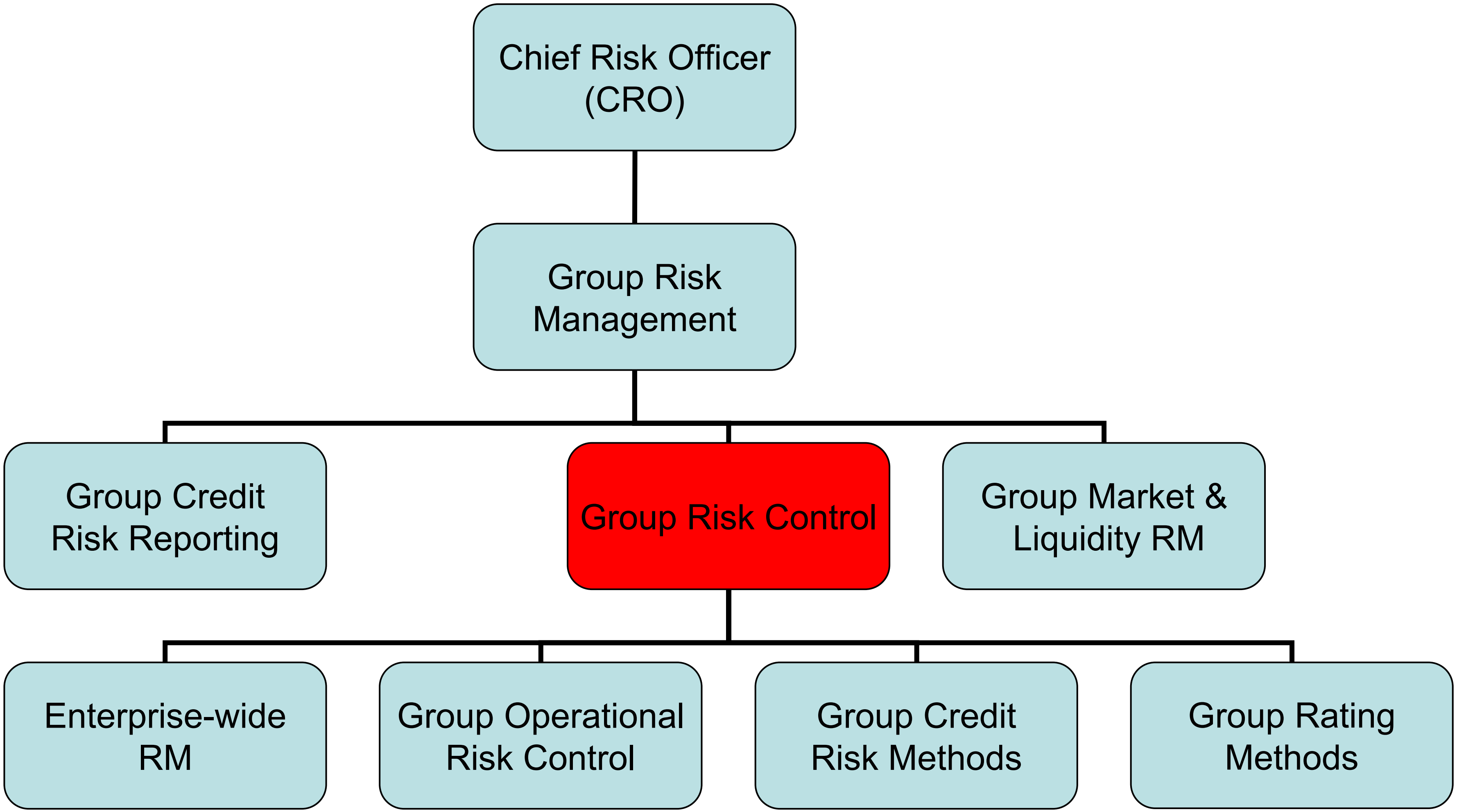


Quelle: Erste Group

(1) Marktanteil an inländischen Kundeneinlagen (Retail)

Slide taken from the presentation in the AGM

Org Chart of Group Risk Management



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Basel II - Overview

Basel II

Pillar 1
Minimum Capital Requirements

- Risk adequate capital
- All specific bank risks and other risks capital
- Market risk in the trading book
- Credit risk
- Operational risk

Pillar 2
Supervisory Review Process

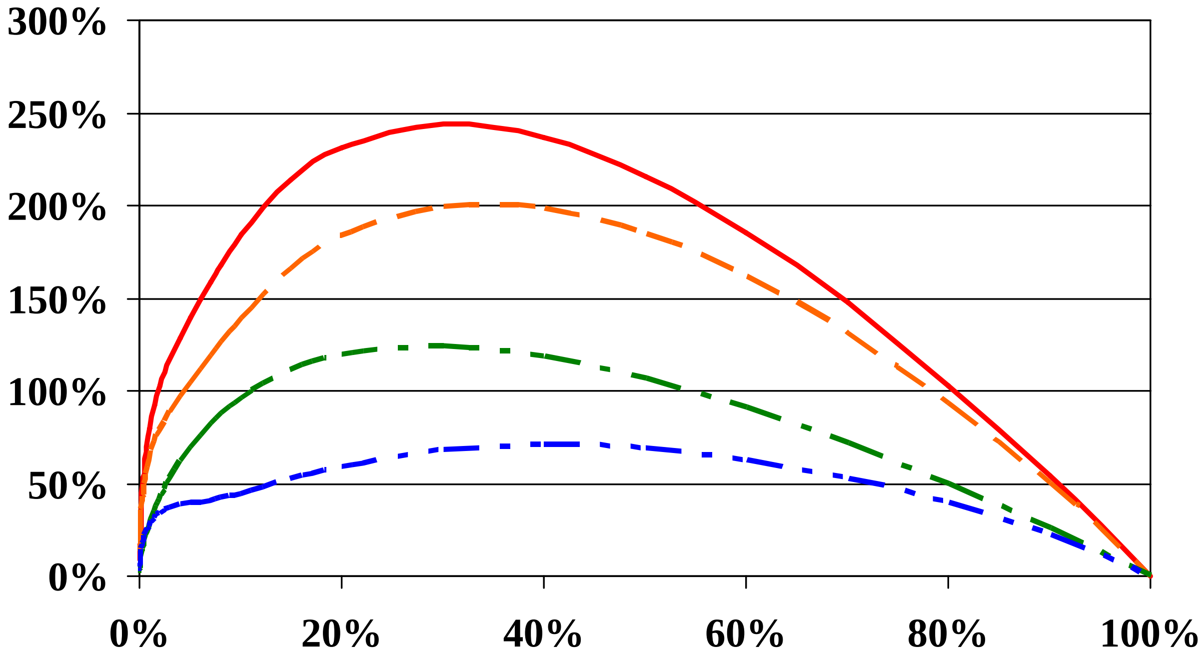
- Continuous risk management process
- Evaluation of bank's internal capital adequacy assessment process (ICAAP)
- Definition of bank's individual solvability-coefficients

Pillar 3
Market Discipline

- Enhanced disclosure
- Better assessment for market participants of capital adequacy of banks
- Increase of market discipline

Pillar 1
Capital Requirements – Credit Risk

- Capital = Exposure x RWA x 8%
- RWA: Risk Weighted Assets
- Basel I
  - RWA depend on type of client (0%, 20%, 50%, 100%)
- Basel II
  - f (Internal Rating)



Pillar 1
Capital Requirements – Market Risk

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- No substantial change from previous regulation
- Internal Model
  - 99% VaR per 10 days x Factor
  - Factor is ≥ 3.
  - Higher Factor
    - Qualitative deficiencies
    - Too many outliers in Backtesting

Pillar 1
Capital Requirements – Operational Risk

- Basic Indicator Approach
  - Gross Income x 15% (α-Factor)
- The Standardized Approach
  - Mapping of Gross Income to standardized Business Lines
  - Per Business Line:
    Indicator (Gross Income) x β-Factor (12%-18%)
- Advanced Measurement Approaches (AMA)
  - Internal Risk Models (99.9% VaR/1y) for capital calculation

Regulatory Capital vs. Economic Capital

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	Risk	Basel I	Basel II	Best Practice	Erste Bank AG
Creditrisk	Counterparty Risk	Yes, but not risk sensitive	significant improvements	Internal model (VaR)	Portfoliomodel based on Credit-Value-at-Risk (CreditManager)
	Concentration Risk	Yes, but not risk sensitive	significant improvements		
	Transfer Risk	No	No		
	Settlement Risk	Yes, but not risk sensitive	significant improvements		
Market-risk	Trading book	Internal model (VaR)	Internal model (VaR)	Internal model (VaR)	Internal model (VaR)
	Interest risk in the Banking book	No	Monitoring (Pillar II)		
	Equity risk	Yes, but not risk sensitive	significant improvements	Internal model (VaR)	No
	Real estate risk	No	No	Internal model (VaR)	No
	Operational Risk	No	yes, different approaches	Internal model (VaR)	Internal model (VaR)
	Business Risk	No	No	Internal model (VaR)	Internal model (VaR)
	Liquidity Risk	No	Monitoring (Pillar II)	Internal monitoring	Internal monitoring
	Riskaggregation	Total Risk = MR+CR	Total Risk = MR+CR+OR	Correlations / Copulas	Correlations / Copulas

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Basel II –
Supervisory Review Process (Pillar 2)

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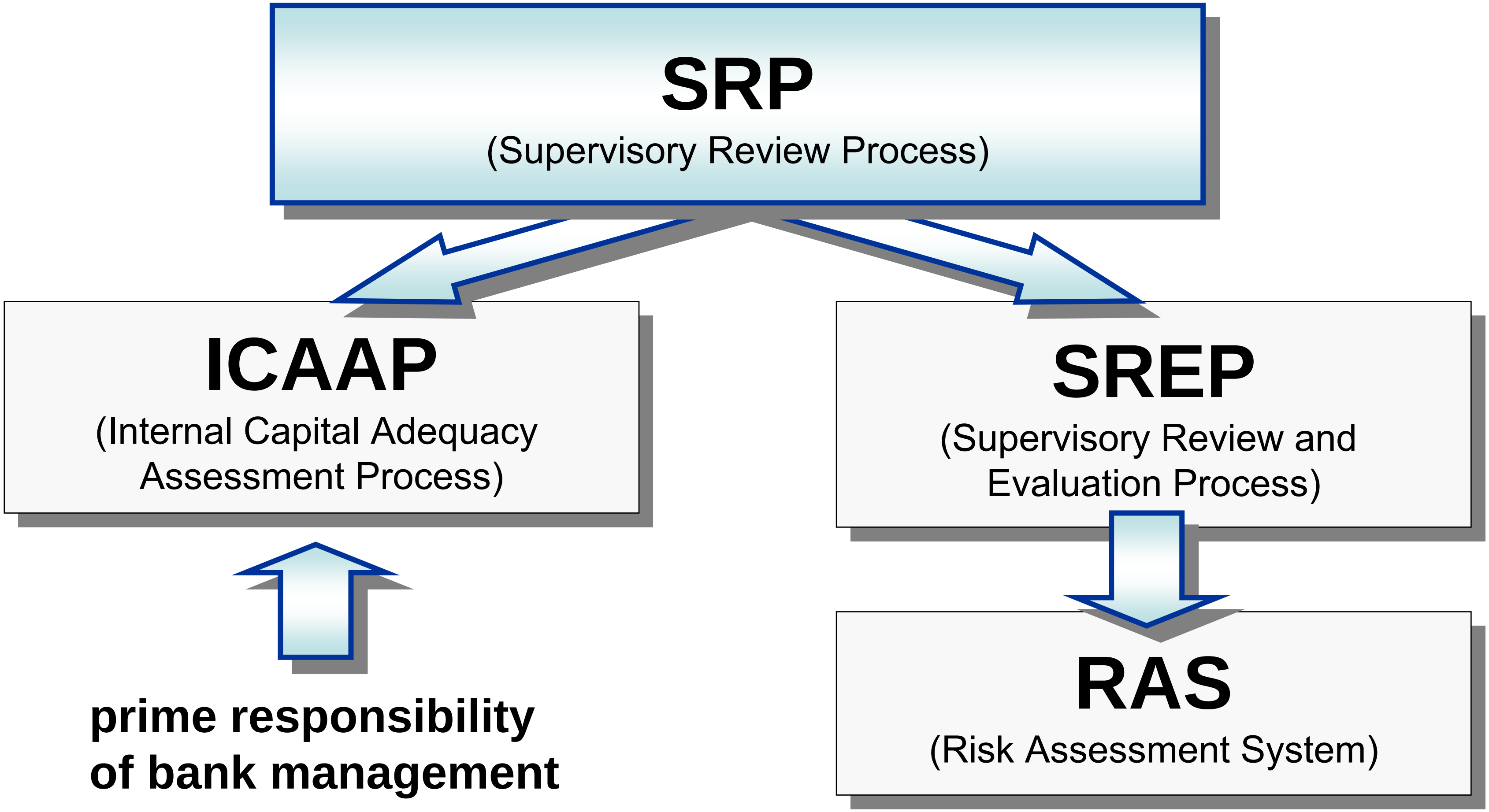

Definition of Economic Capital

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Economic Capital is ...

an adapted Value-at-Risk, calculated

- with horizon 1 year
- at a confidence level that reflects the default probability of Erste Banks aspired rating

→ **99,95% confidence level**

Economic Capital is the minimum capital necessary to cover unexpected losses

Targeted Rating and Economic Capital

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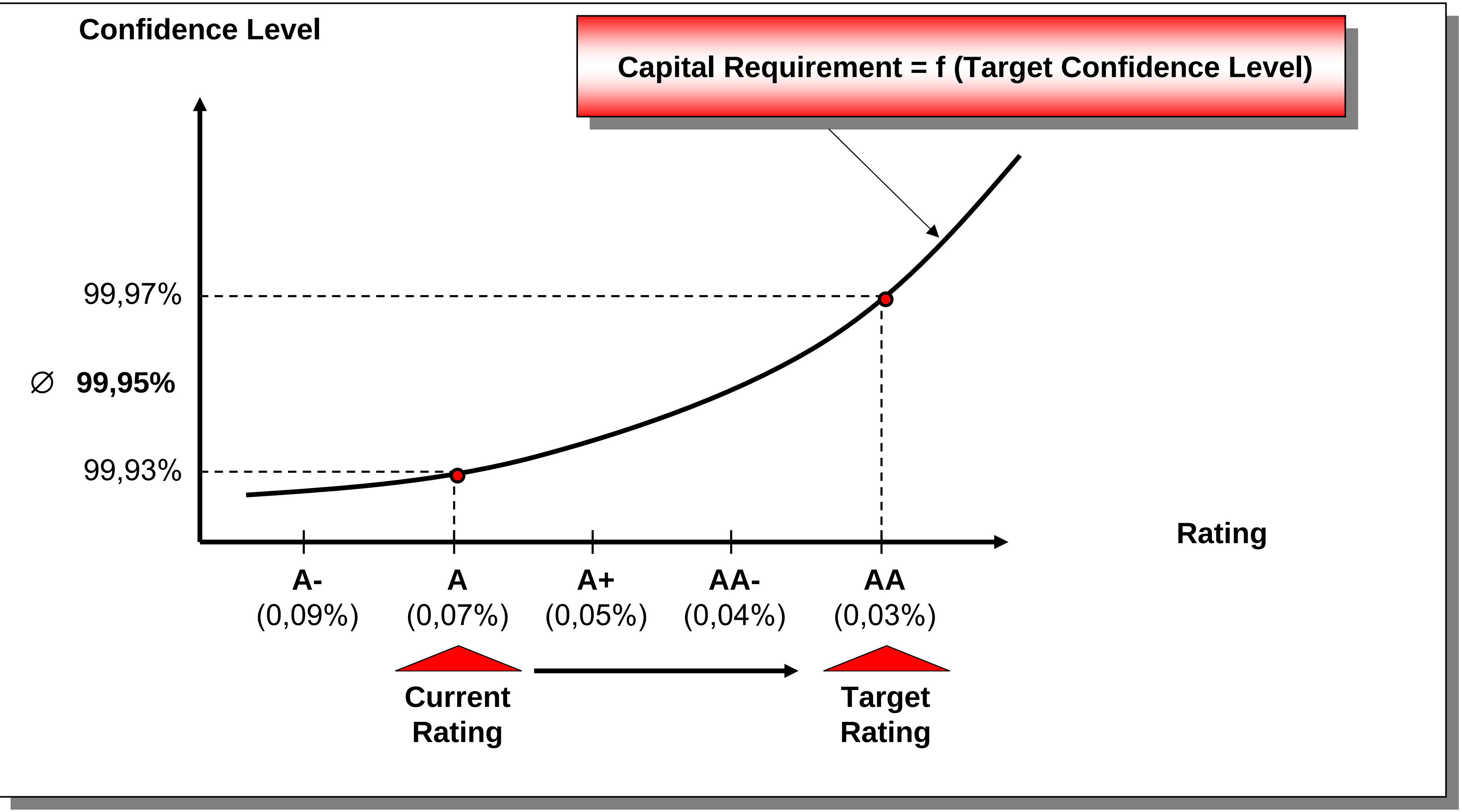

Capital (99,95%)

Definition:

Available bank capital to cover losses.

Components (exemplary):

- **Equity**
  - Shareholder capital
  - Reserves
  - Funds for general bankrisk
- **Hidden Reserves**
- **Overendowment in provisions, general bad debt charge, ...**
- **Item to be deducted**

  Devaluation of fixed assets (i.e. securities)

ICAAP (Internal Capital Adequacy Assessment Process) – **High Level Principles**

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The ICAAP should be proportionate to the nature, size, risk profile and complexity of the institution.

(1) *Every institution must have a process for assessing its capital adequacy in relation to its risk profile (an ICAAP).*

(2) *The ICAAP is the responsibility of the institution.*

(3) *The ICAAP should be formal, the capital policy fully documented and the management body's responsibility.*

(4) *The ICAAP should form an integral part of the management process and decision-making culture of the institution.*

(5) *The ICAAP should be reviewed regularly.*

(6) *The ICAAP should be risk-based.*

(7) *The ICAAP should be comprehensive.*

(8) *The ICAAP should be forward-looking.*

(9) *The ICAAP should be based on adequate measurement and assessment processes.*

(10) *The ICAAP should produce a reasonable outcome.*

Capital – Economic Capital

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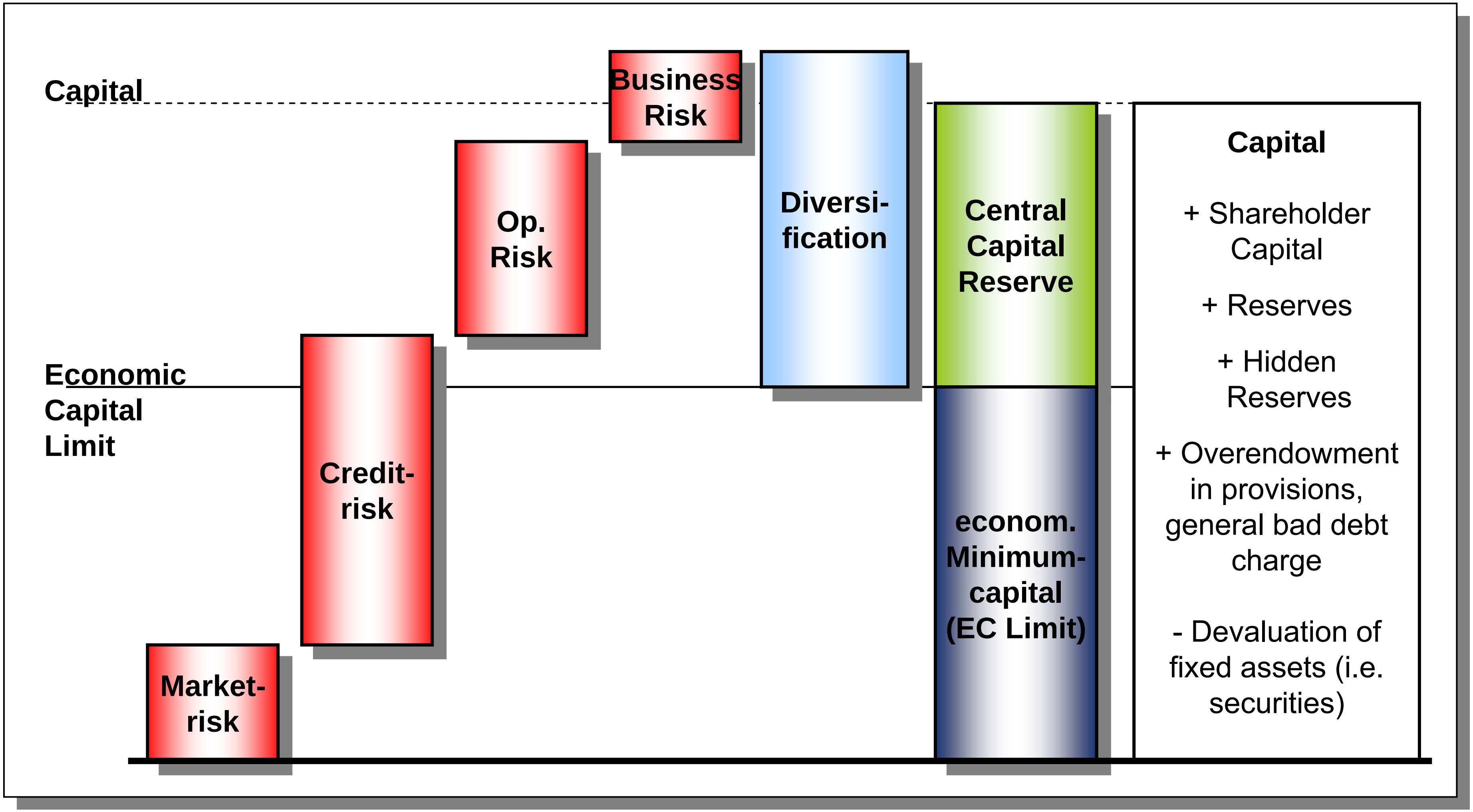

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Classification of Banking Risks

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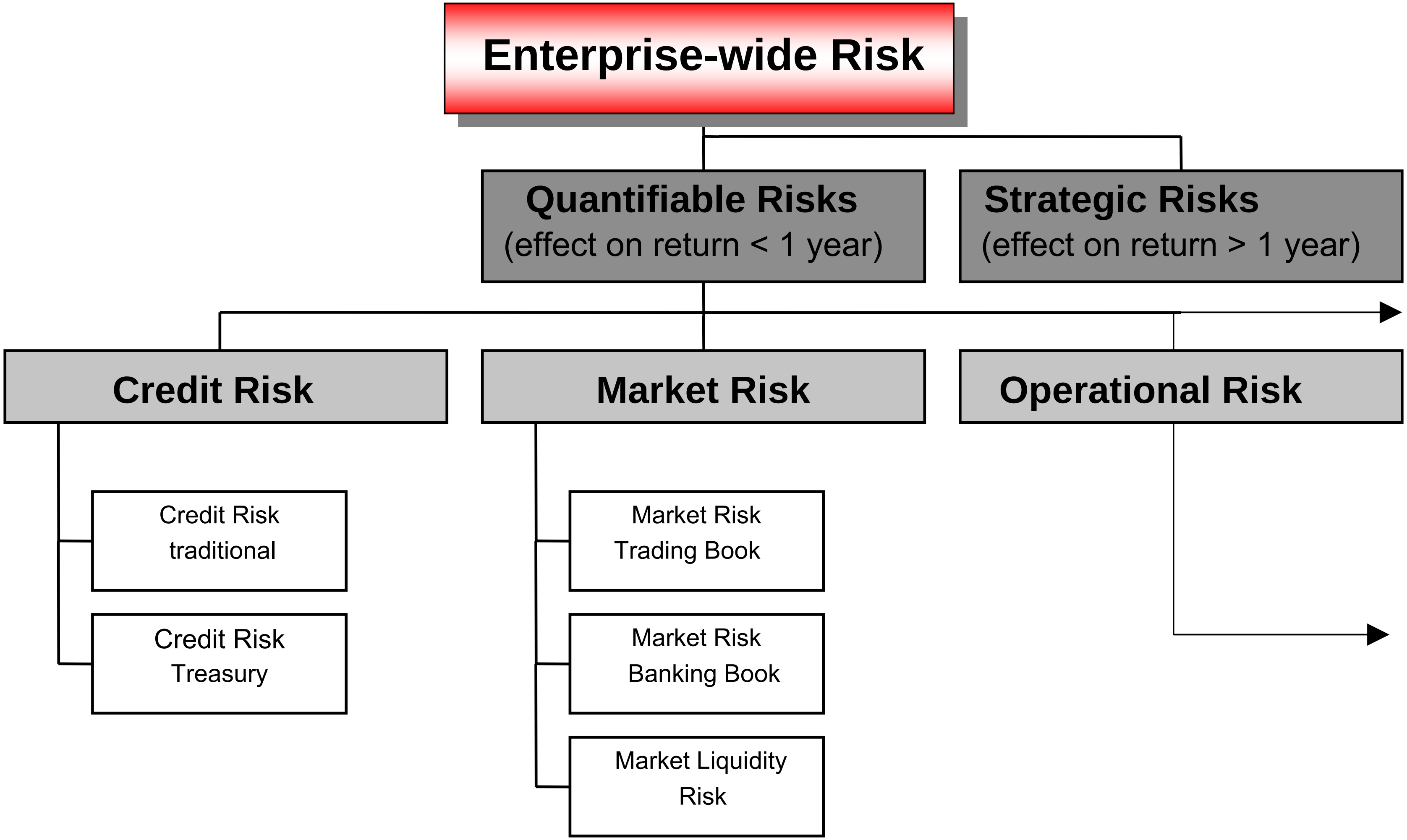

Classification of Banking Risks

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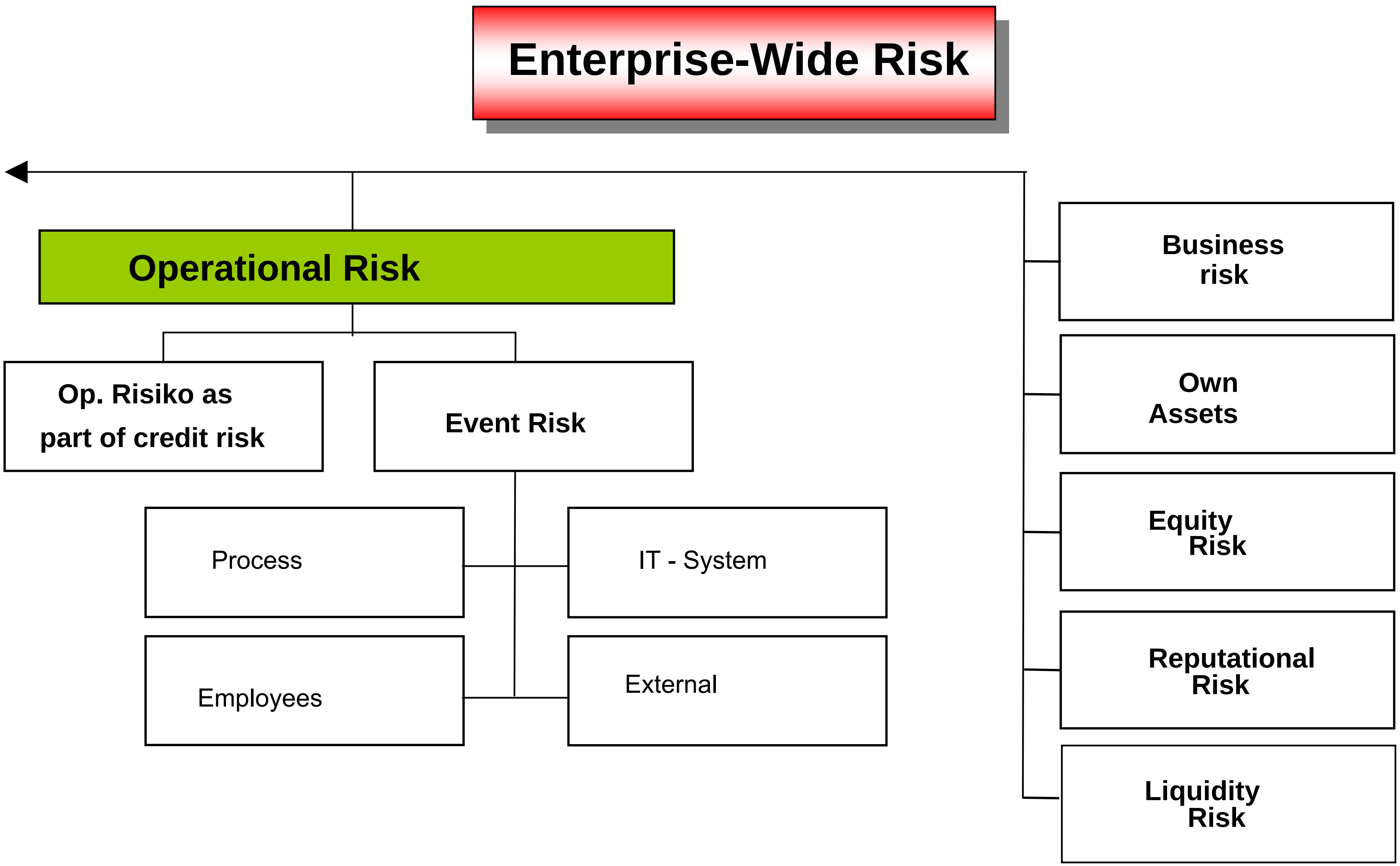

General Due Diligence Obligations Article 39 BWG (Federal Banking Act)

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Article 39 (2)

Credit institutions must have in place administrative, accounting and control mechanisms for the capture, assessment, management and monitoring of risks arising from banking transactions and banking operations. These mechanisms must be appropriate to the type, scope and complexity of the banking transactions conducted. Wherever possible, the administrative, accounting and control procedures must also capture risks arising from banking transactions and banking operations which might possibly arise. …

Article 39 (2b)

In particular, the procedures pursuant to para. 2 must include the following:

1. credit risk (Article 2 no. 57),
2. concentration risk (Article 2 no. 57b),
3. risk types in the trading book (Article 22o para. 2),
4. commodities risk and foreign exchange risk, including the risk arising from gold positions, where these are not covered by no. 3,
5. operational risk (Article 2 no. 57d),
6. securitization risk (Article 2 no. 57c),
7. liquidity risk (Article 25),
8. interest rate risk arising from any transactions not already covered by no. 3,
9. the residual risk from credit risk mitigation techniques (Article 2 no. 57a) and
10. risks arising from the macroeconomic environment

Grey Areas between the Risk Types

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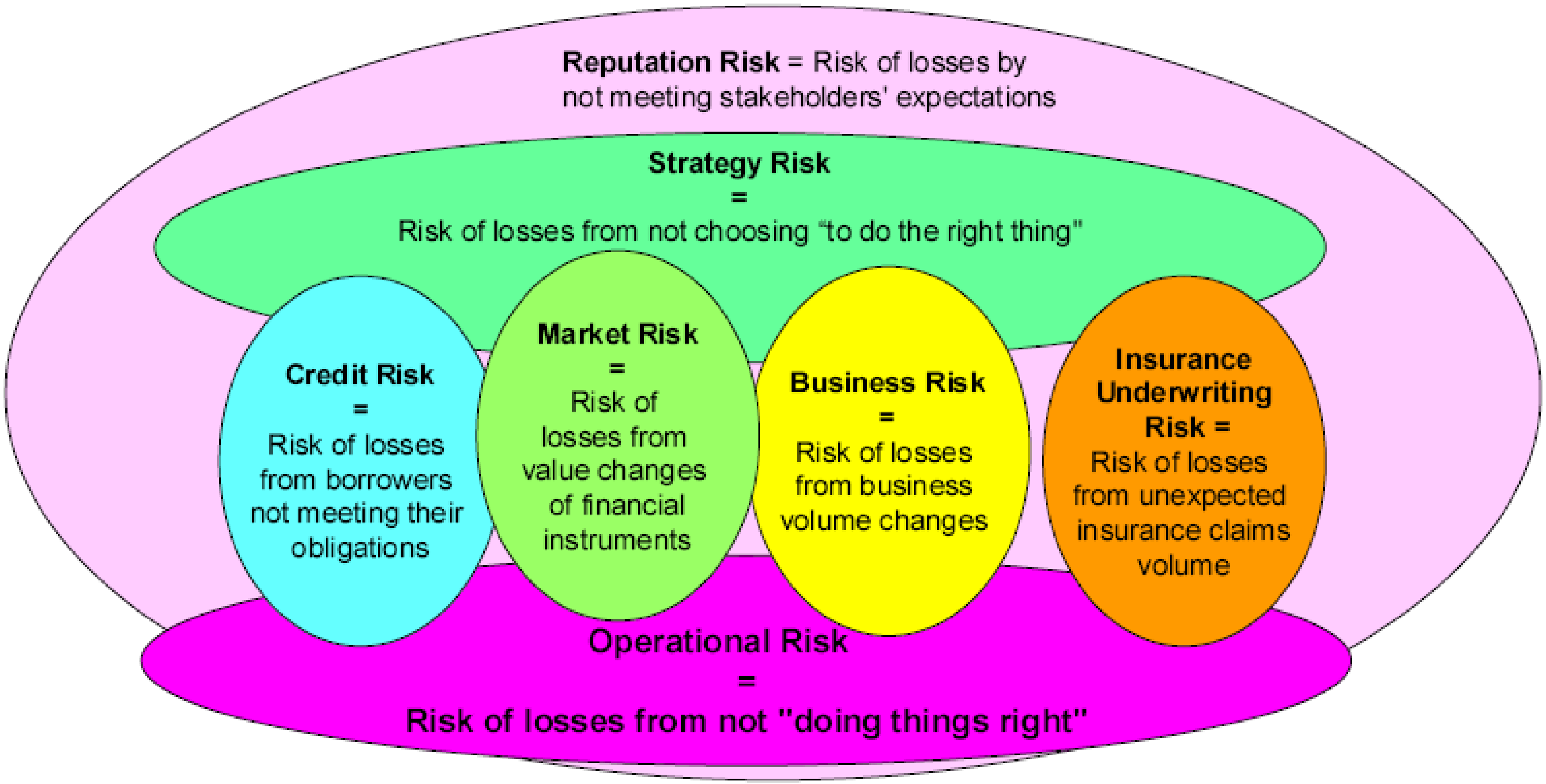

Source: Credit Suisse Group / GRM, 2000.

What Risk is

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- Subprime Crisis?
- Société Générale?
- Northern Rock?
- and the known cases from Austria?

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Which Risks to Model?

- Not covered by Pillar I
  - Banking Book (Interest Rate Risk)
  - Dependency and Concentration Risk in Credit Risk
- To be covered by capital?
  - (Funding) Liquidity Risk
  - Business Risk
  - Strategic Risk
  - Reputational Risk

Challenges in Modeling Credit Risk

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- Quality of Time Series
  - Consistent definition and use of default events…
  - Structural Changes
- Understanding of the Operative Credit and Workout Process
  - Treatment of open lines
  - “Revival” of defaulted clients
- Correlation between clients
- Incomplete information (monthly/yearly re-rating)

Challenges in Modeling Operational Risk

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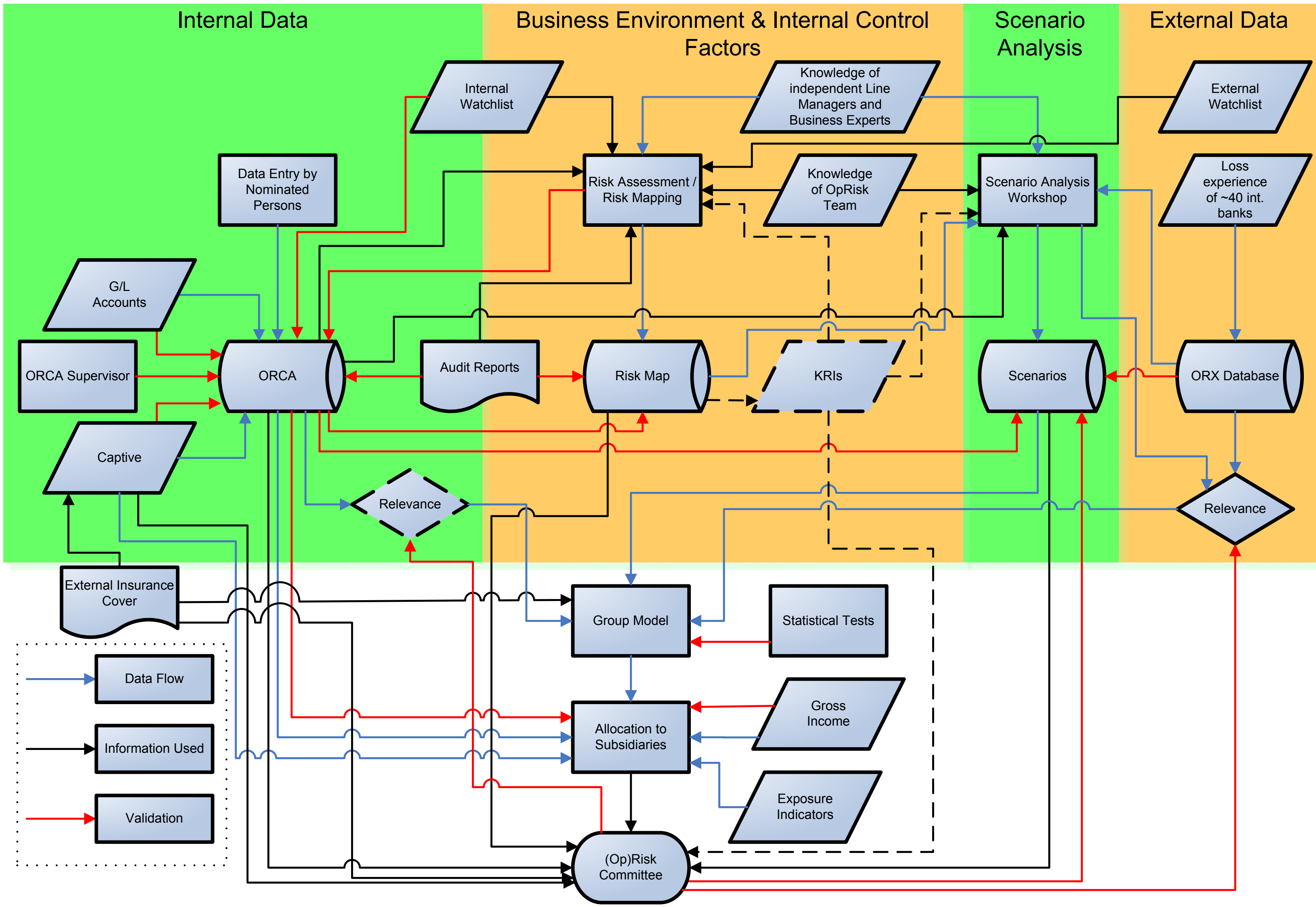

Challenges in Aggregation

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- Different Time Horizons
  - From 99%/1d to 99.9x%/1y
  - Scaling up
    - square root of time
    - modeling of stop loss
    - holding strategy
- Validation / Backtesting

Challenges in Aggregation

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- Diversification
  - Correlation vs. Copula
  - Estimation of the Dependency
  - Dependency in the Extreme
  - Inter-risk vs. intra-risk diversification
  - Diversification between BLs, Legal Entities, Countries

Challenges in the Interpretation

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- Risk Measure to Use
  - Pitfalls of the VaR
  - Desirable Characteristics*
    - Intuitive
    - Stable
    - Easy to Compute
    - Easy to Understand
    - Coherent
    - Simple and meaningful risk decomposition

*Cited from: Basel Committee: Range of practices and issues in economic capital modelling. Forthcoming

Challenges in the Interpretation

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- Limits and Measures
- Stress Tests
- Absolute vs. Relative Correctness
- Robustness and Stability of Results

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Regulatory capital vs. Economic Capital

Regulatory Capital allocation

pro:

- simply and easily reproducible (transparency)
- similar to external ROE

cons:

- no risk differentiation
  ➔ danger of wrong management actions
- only Market-, Credit-, and Op-risk
- Unacceptable for Investors, Analysts und Rating agency

Economic Capital allocation

pro:

- risk differentiation and risk-adjusted pricing possible
- all risk types included
- Capital allocation over all business lines (e.g. Asset Mgt.)

cons:

- Regulatory capital will not be managed

Capital allocation process - an Overview

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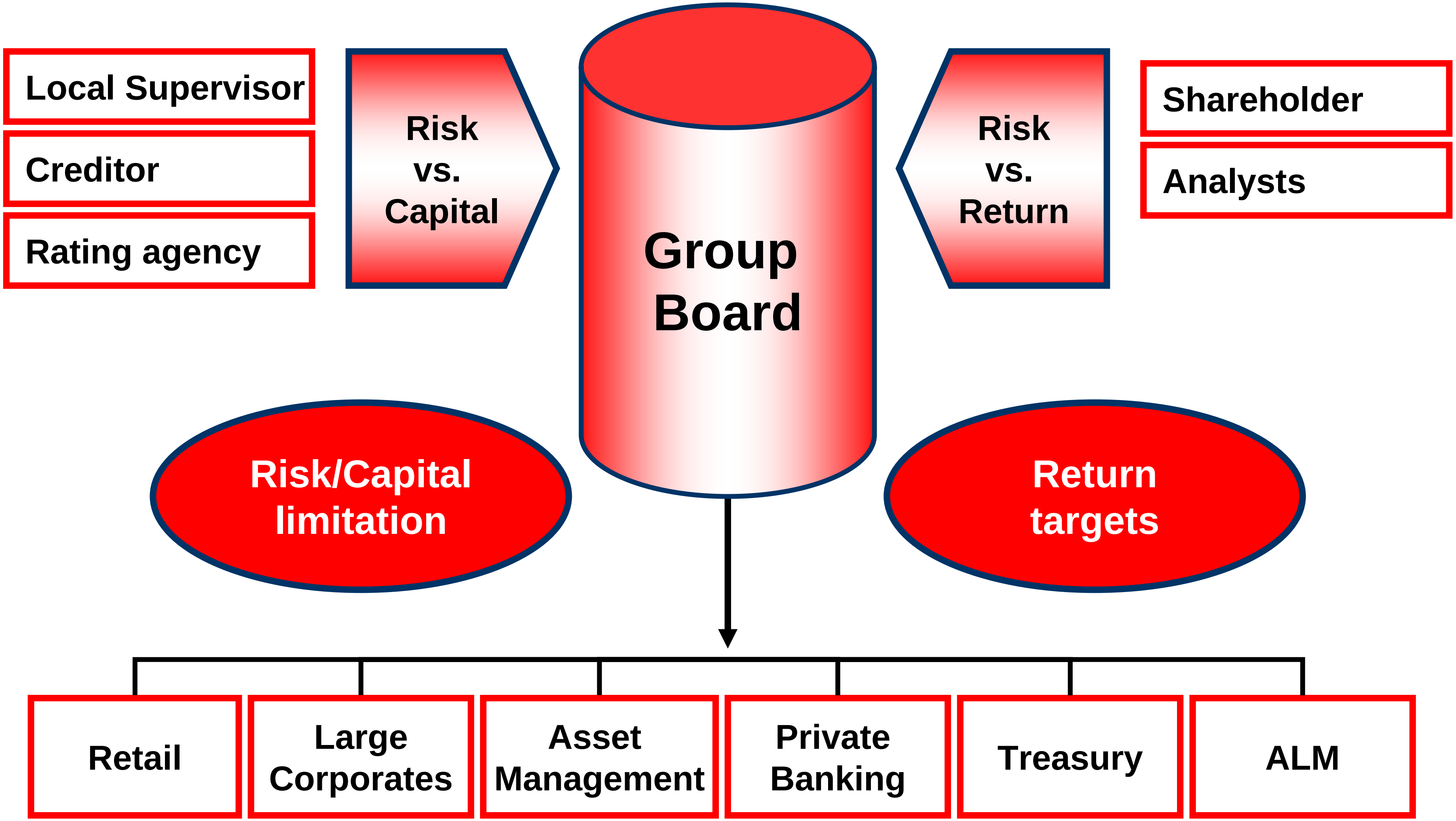

Risk-Adjusted Pricing

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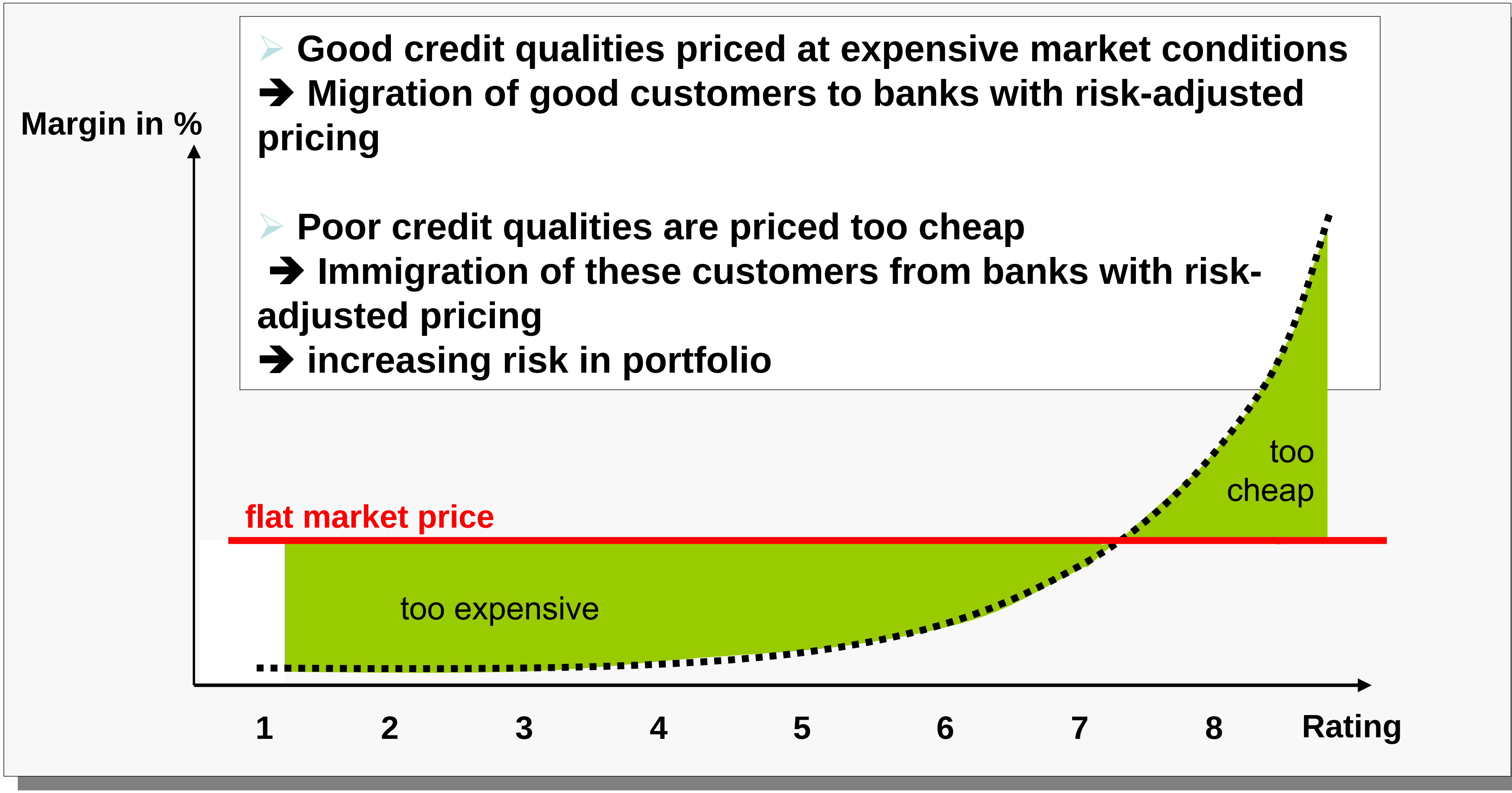
- Good credit qualities priced at expensive market conditions
  ➔ Migration of good customers to banks with risk-adjusted pricing
- Poor credit qualities are priced too cheap
  ➔ Immigration of these customers from banks with risk-adjusted pricing
  ➔ increasing risk in portfolio



Capital Allocation Process

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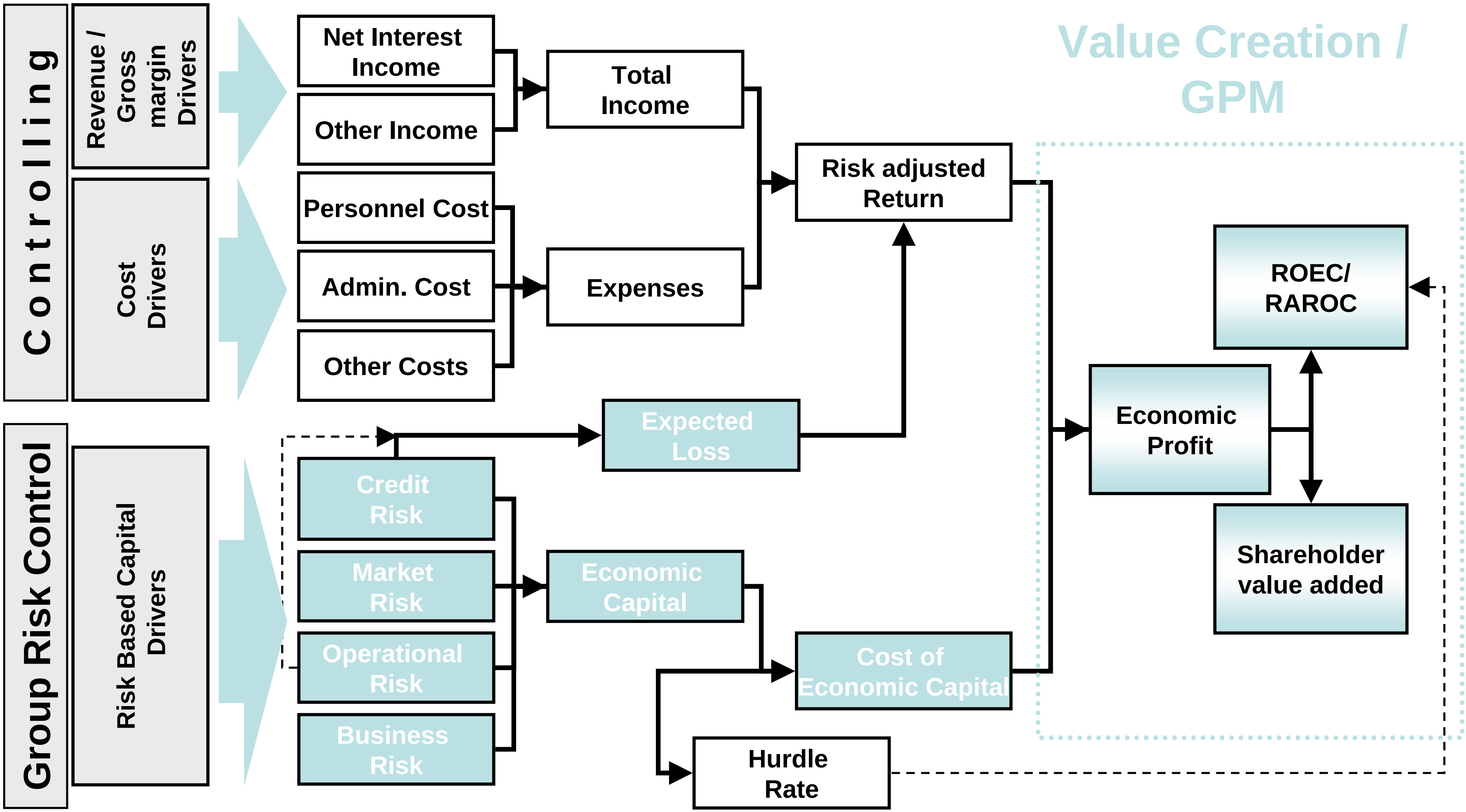

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