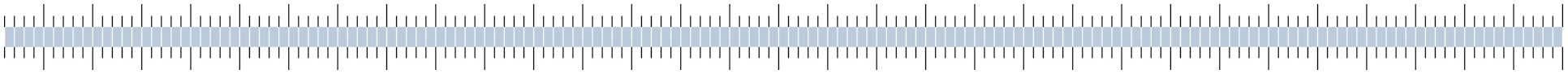
DEUTSCHE BUNDESBANK
EUROSYSTEM

Features of IRB Approaches to Credit Risk

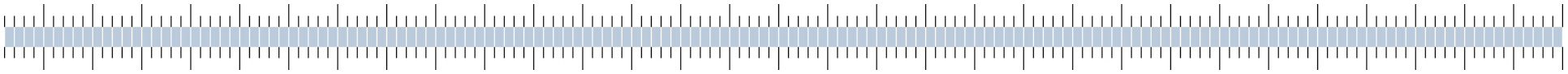
Detailed Features

Dr. Jens Bruderhausen



DEUTSCHE BUNDESBANK
EUROSYSTEM

RATING SYSTEMS



Overview
– Basic Idea Basel II –

DEUTSCHE BUNDESBANK
EUROSYSTEM

- **Strengthening the soundness and stability of the (international) banking system**
  - Risk based capital regulation
    Capital requirements subject to risk appetite of a bank (portfolio)
    - Different approaches for measuring (credit) risk shall (inter alia) reflect the different level of risk management in a bank.

      - Adoption of stronger risk management practices accompanied by reduction of capital requirements (incentive)
      - Increasing quality requirements of risk measurement and risk management involved, shall pave the way for approval internal credit risk models for supervisory purposes.

    - Need for accurate risk quantification (sophisticated approaches)

      Inaccurate calculation of capital/risk can lead to adverse incentives (e.g. increase default risk), and distortion of relative prices and cause inefficiencies.
  - General requirement for banks to hold total capital equivalent to at least 8% of their risk-weighted assets (Basel I-Level)
- **Maintain sufficient consistency that capital adequacy regulation will not be a significant source of competitive inequality among internationally active banks**

Capital requirements and parameters
– Fundamentals (I) –

DEUTSCHE BUNDESBANK
EUROSYSTEM

- Capital requirements for credit risk base on risk weighted exposure amounts.
- Risk weights are derived from estimates of risk parameters, which serve as inputs to risk weight functions.
- Risk weight functions have been developed for separate asset classes.
- The estimates of risk parameters are determined internally using rating systems.

„The term "rating system" comprises all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates."

BCBS (2006): International Convergence of Capital Measurement and Capital Standards, June

- Rating systems are defined by their scope of application
  - assets, which can be assigned to a rating system: IRB-portfolio.
  - assets, which cannot be assigned to a rating system: Portfolio in (temporary or permanent) partial use (CRSA).

Capital requirements and parameters
– Fundamentals (II) –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Probability of Default (PD)

One-year (forecast) Probability of Default associated with the internal obligor's grade to which that exposure is assigned; average percentage of obligors that default in this rating grade in the course of one year.
The PD of obligors assigned to a default grade, consistent with the reference definition of default, is 100%.

Capital requirements and parameters – Fundamentals (III)

indications, e.g. value adjustment resulting from a significant perceived decline in credit quality, bankruptcy

Default

A default shall be considered to have occurred with regard to a particular obligor when either or both of the following events has taken place:

- The institution has material reason to consider that the obligor is **unlikely to pay** its credit obligations in full to the institution / any group enterprise belonging to the group to which the institution belongs without recourse by the institution to actions such as realising security (if held).
- The obligor is **past due more than 90 successive calendar days** on any ***material part*** of its overall credit obligation to the institution / to a group enterprise belonging to the group to which the institution belongs.

In some other EU-Member states: 180 calendar days.

2,5% of current overall obligation of that obligor (≥ 100€)

Fundamentals - PD

- Forecast Probability of Default…
- … is to be estimated
  1. for the rating system grade to which the obligor of the IRBA exposure has been assigned, or
  2. for the rating system risk pool to which the IRBA exposure in the IRBA exposure class Retail claims has been assigned.

Rating grade:
at least 7 for non-defaulted obligors
+ 1 for defaulted obligors

Corporates / Institutions / Retail	0,03 % ...	... 100 %
Central governments	0 %	
Equity claims	0,09 % (further differentiations…)	

Rating grade $=_{\text{Definition}}$ **Assignment of an obligor's risk, based on several different rating criteria the estimated PD can be derived from.**

Fundamentals
– PD, example: Assignment to rating grades –

DEUTSCHE BUNDESBANK
EUROSYSTEM

rating grade	rating class	min PD	mid PD
…	…	…	…
5	1(A+)	0.044721	0.050000
6	1 (A)	0.059161	0.070000
7	1 (A-)	0.079373	0.090000
8	2	0.102004	0.115610
9	3	0.141593	0.173415
10	4	0.212389	0.260123
…	…	…	…
21	15	17.320508	20.000000
22	16	default	100.000000
23	17	default	100.000000
24	18	default	100.000000

Capital requirements and parameters
– Fundamentals (II) –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Probability of Default (PD)

One-year (forecast) Probability of Default associated with the internal obligor's grade to which that exposure is assigned; average percentage of obligors that default in this rating grade in the course of one year
The PD of obligors assigned to a default grade, consistent with the reference definition of default, is 100%.

Exposure at Default (EAD)

Amount outstanding in case the obligor defaults (drawn amount plus likely future drawdowns of yet undrawn lines)
Assessment basis: on-balance sheet exposure (loans, bonds, …)
off-balance sheet exposure x Credit Conversion Factor (CCF)
derivative exposure

Loss Given Default (LGD)

Percentage of exposure the bank might lose in case the obligor defaults
⇐ losses depend, amongst others, on the type and amount of collateral as well as the type of obligor and the expected proceeds from the work-out of the assets

Capital requirements and parameters – Fundamentals (III)

indications, e.g. value adjustment resulting from a significant perceived decline in credit quality, bankruptcy

- **Default**

  A default shall be considered to have occurred with regard to a particular obligor when either or both of the following events has taken place:

  - The institution has material reason to consider that the obligor is **unlikely to pay** its credit obligations in full to the institution / any group enterprise belonging to the group to which the institution belongs without recourse by the institution to actions such as realising security (if held).
  - The obligor is **past due more than 90 successive calendar days** on any ***material part*** of its overall credit obligation to the institution / to a group enterprise belonging to the group to which the institution belongs.

In some other EU-Member states: 180 calendar days.

2,5% of current overall obligation of that obligor (≥ 100€)

- **Loss**

  Loss means economic loss, including material discount effects, and material direct and indirect costs associated with collecting on the instrument.

Fundamentals
– LGD / CCF, example –

DEUTSCHE BUNDESBANK
EUROSYSTEM

There are the following LGD-models based on…

Return out of securities	Contribution by obligor
Real estate	Real estate
Movables	Corporates
Claims	Banks
Financial securities	Leasing companies
Guarantees	Insurance companies
Container (shipping)	Leveraged Finance
Ships	
Aircrafts	
Pre-delivery payments	
Covered bonds	

CCF-models often face problems with lack of data

=> Therefore usually expert-based models

Product	CCF
Project-linked guarantees	19 %
Credit facilities (not immediately cancellable)	61 %
Credit facilities for real estate	5 %
Forward loans	5 %
Credit facilities (immediately cancellable)	5 %
Credit substitutions (guarantees)	100 %
Letters of credit (short-term or securitised by financial collateral)	20 %
Letters of Credit (others)	50 %
NIFs and RUFs	75 %

Capital requirements and parameters
– Fundamentals (II) –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Probability of Default (PD)

One-year (forecast) Probability of Default associated with the internal obligor's grade to which that exposure is assigned; average percentage of obligors that default in this rating grade in the course of one year
The PD of obligors assigned to a default grade, consistent with the reference definition of default, is 100%.

Exposure at Default (EAD)

Amount outstanding in case the obligor defaults (drawn amount plus likely future drawdowns of yet undrawn lines)
Assessment basis: on-balance sheet exposure (loans, bonds, …)
off-balance sheet exposure x Credit Conversion Factor (CCF)
derivative exposure

Loss Given Default (LGD)

Percentage of exposure the bank might lose in case the obligor defaults
⇐ losses depend, amongst others, on the type and amount of collateral as well as the type of obligor and the expected proceeds from the work-out of the assets

Residual Maturity (M)

Relevant Residual Maturity; reference maturity: 2.5 years

Fundamentals
– Adoption of rating / rating systems –

- Development of rating systems or generating ratings is done by third parties
- Adoption of
  - either foundations (i.e. data and/or methods)
  - or results (i.e. risk parameters for risk quantification, ratings for borrowers)

Adoption of …	Requirements on
rating results	plausibility, completeness
methodology	understanding
risk parameter (PD, LGD, CCF)	comparability in terms of risk
aggregated data	
sample(s)	representativity (at least structural)
raw data	

- Reasons for adopting rating systems
  - creating synergies and avoiding double-work
  - group wide uniform measurement of credit risk
  - lack of data and/or resources of developing rating systems
- Principles for adopting rating systems
  - adoption of ratings must not corrupt a bank‘s internal measurement and management of credit risk
  - all relevant internal data must be integrated into the rating

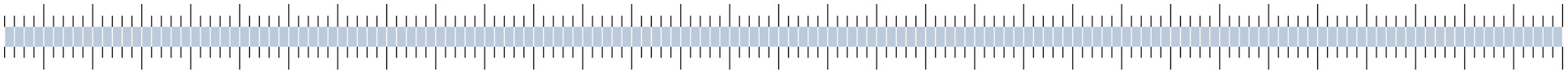
“Regulators require capital for almost all the same reasons that other uninsured creditors of banks ‘require’ capital

–

to protect themselves against the costs of financial distress, agency problems, and the reduction in market discipline caused by the safety net.”

Berger / Herring / Szegö (1995): The role of capital in financial institutions, Journal of Banking & Finance, Vol. 19

IRBA – WRAP-UP

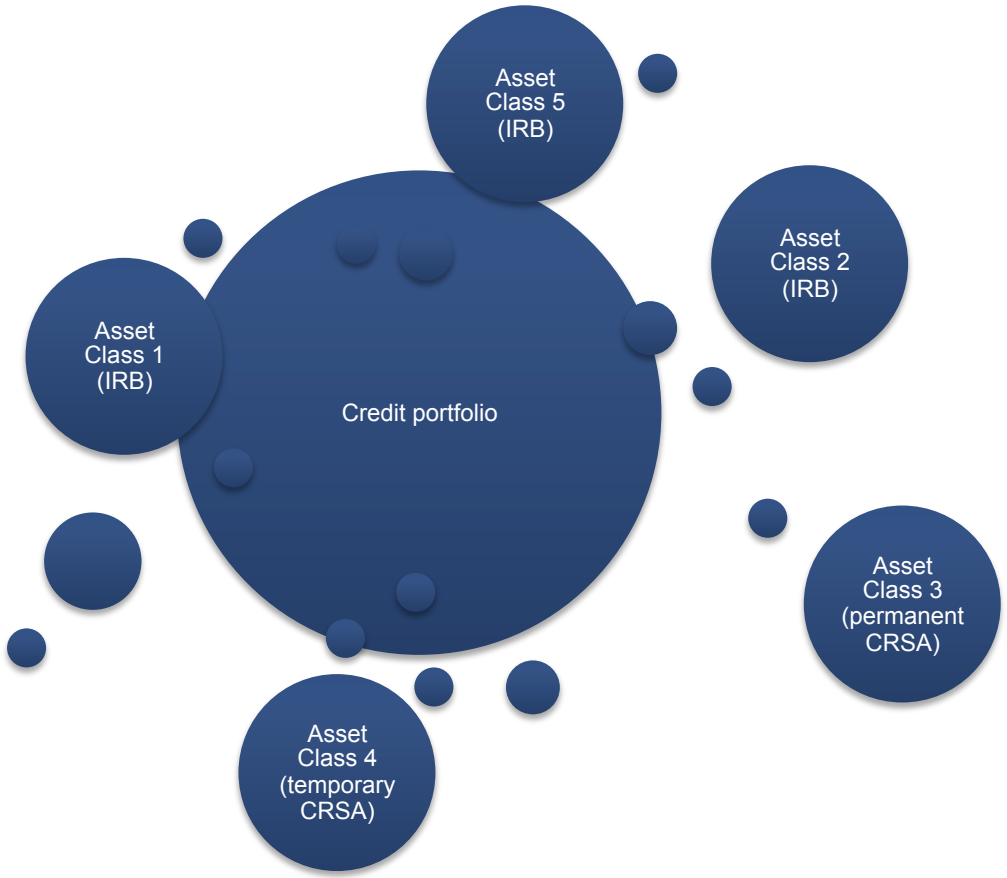


Rating systems

- **The term ‚rating system' comprises all of the**
  - methods,
  - processes,
  - controls, and
  - data collection and IT systems
- **that support the**
  - assessment of credit risk, the
  - assignment of internal risk ratings, and the
  - quantification of default and
  - loss estimates.

BSBS (June 2006): International Convergence of Capital Measurement and Capital Standards

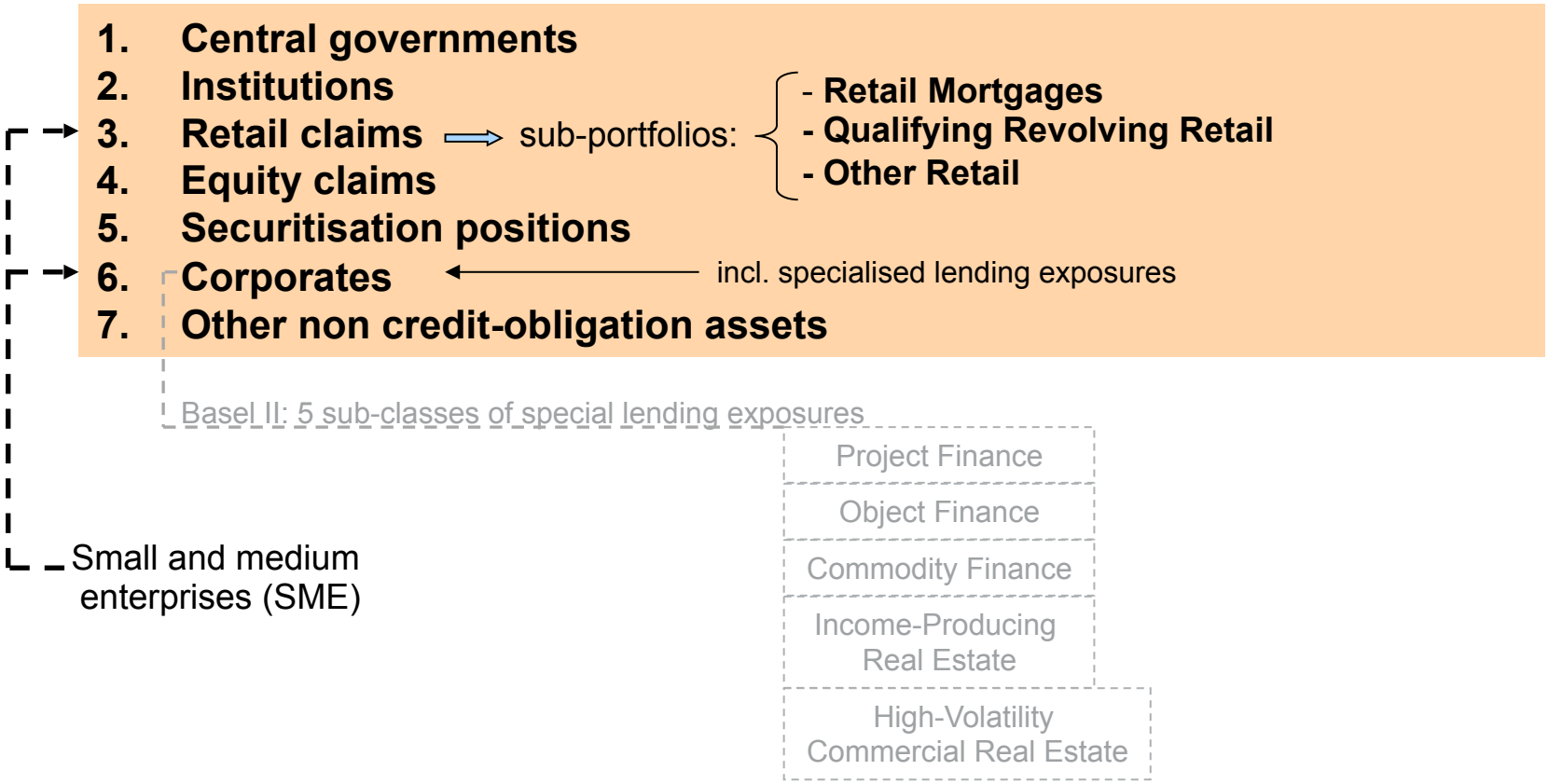
Scope of application of rating systems



Parameters

- **Probability of Default (PD)**
  - One-year forcast associated with the internal obligor‘ grade to which that exposure is assigned.
  - F-IRBA and A-IRBA
- **Exposure at Default (EAD)**
  - Amount outstanding in case the obligor defaults
  - On-balance sheet exposure; off-balance sheet exposure x CCF
  - F-IRBA: model provided; A-IRBA: internal model
- **Loss given Default (LGD)**
  - Estimate of loss in case of default
  - F-IRBA: embedded in K-formula; A-IRBA: model estimate
- **Residual Maturity (M)**
  - Reference value: 2.5 years

Asseignment to IRBA exposure classes



Estimates of risk parameters

	Foundation IRBA	Advanced IRBA
Central government, Institutions	PD	PD, LGD, EAD, M
Corporates		
Special Lending	SL which are not allowed to be assessed by an internal rating system*: simple RW (Slotting Criteria, determined by supervisor)	
Retail	PD, LGD, EAD	
Equity	⇨ position belong to an IRBA equity portfolio subject to the PD/LGD approach, RW_{max} = 1250% ⇨ position belong to an IRBA equity portfolio subject to the Internal Models Approach: RW = 100% ⇨ otherwise: simple approach (RW determined by supervisor)	
Securitisation	⇨ Rating Based Method ⇨ Supervisory Formula Method ⇨ Internal Assessment Approach	
Other non credit-obligation assets	100%	

EU/Germany: 190% up to 370%
Basel: 300% up to 400%

* Because the institution does not meet the requirements for own estimates of PD.

K-FORMULA (GORDY MODEL)

Calculation of Risk Weighted Assets (RWA)
– Risk Weight Function –

Minimum Capital Requirement ≥ (**CC** $_{\textbf{Credit Risk}}$ + CC $_{\text{OpRisk}}$ + CC $_{\text{Market Risk}}$)

8% • RWA $_{\textbf{Credit Risk}}$

RWA $_{\textbf{Credit Risk}}$ **= EAD •** RW(PD, LGD, M)

IRBA risk weight subject to the PD/LGD approach:

$$RW(PD, LGD, M) = 12.5 \cdot SF \cdot LGD \cdot \underbrace{\left(N\left(\frac{N^{-1}(PD) + \sqrt{R} \cdot N^{-1}(0.999)}{\sqrt{(1-R)}} \right) - PD \right)}_{\text{conditional Probability of Default}} \cdot \underbrace{\frac{1 + (M - 2.5) \cdot b(PD)}{1 - 1.5 \cdot b(PD)}}_{\text{Residual Maturity Adjustment (MA)}}$$

SF … Supervisory scaling factor, current calibration: 1.06
N … Standard normal distribution
N^{-1} … Inverse of the standard normal distribution
R … Asset correlation (determined according to asset class)
M … Residual maturity, F-IRBA 2.5 years (in principle)
b … Maturity factor
CC … Capital charge

if the IRBA exposure has not been assigned to the IRBA exposure class Retail claims

Calculation of Risk Weighted Assets (RWA)
– Expected Loss vs. Unexpected Loss (I) –

$$RW(PD, LGD, M) = 12.5 \cdot SF \cdot \left(LGD \cdot N\left(\frac{N^{-1}(PD) + \sqrt{R} \cdot N^{-1}(0.999)}{\sqrt{(1-R)}} \right) - PD \cdot LGD \right) \cdot MA$$

Step I:

$$PD_{0.999} = N\left(\frac{N^{-1}(PD) + \sqrt{R} \cdot N^{-1}(0.999)}{\sqrt{(1-R)}} \right)$$

➔ **conditional PD derived from forecast average PD**
➔ "condition": confidence level of 99.9% of the systematic (economic) factor

Whole term corresponds to the (conditional) loss and therefore Value at Risk (VaR) for a 99.9% confidence level

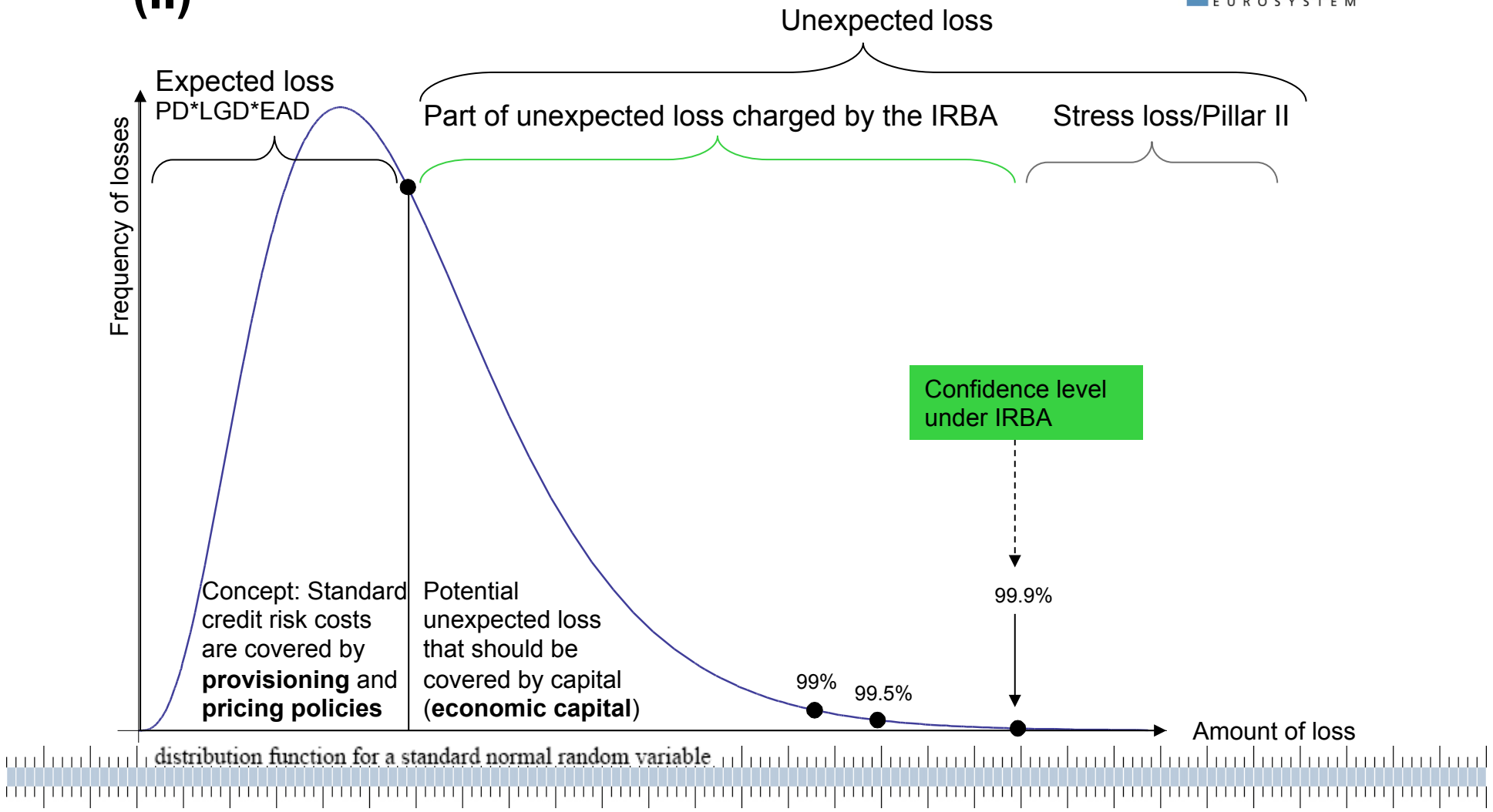
Step II:
Expected Loss (EL), based on

- **Forecast average PD**
  (time horizon: 1 year, non conditional)
- **Forecast/supervisory downturn LGD**

Step III: Interpretation

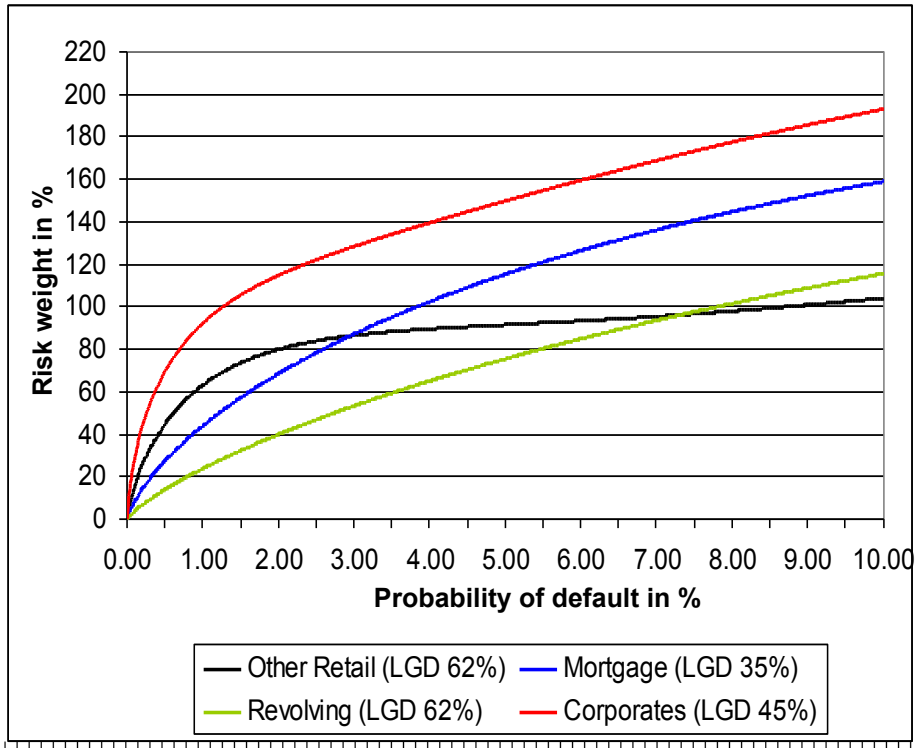
Calculating the difference between the conditional EL/VaR and the forecast EL leads to the **capital requirements** due to the Basel II Framework:
➔ UL-calibration
➔ **UL in this system means „UL above forecast average EL" !**

Calculation of Risk Weighted Assets (RWA) – Expected Loss vs. Unexpected Loss (II) –



Calculation of Risk Weighted Assets (RWA)
– Risk Weight Curves –

$$RW(PD, LGD, M) = 12{,}5 \cdot SF \cdot \left(LGD \cdot N\left(\frac{N^{-1}(PD) + \sqrt{R} \cdot N^{-1}(0{,}999)}{\sqrt{(1-R)}} \right) - PD \cdot LGD \right) \cdot M$$



Different **shapes of risk weight curves** due to

- **residual maturity (M)**
- **maturity factor (b(PD))** and
- **asset correlation R**
  (correlation with the economic factor)

Calculation of Risk Weighted Assets (RWA)
– Risk Weight Function, model (I) –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Explanatory Note, BCBS, July 2005:
http://www.bis.org/bcbs/irbriskweight.pdf?noframes=1

➔ **Why is the asset correlation R determining the shape of the risk weight function?**

➔ **How is R defined?**

✓ **ASRF-model: Asymptotic Single Risk Factor Model (chosen by the BCBS)**

- ✓ **Law of big numbers - supposition: In a portfolio that consists of a large number of relatively small exposures the idiosyncratic (individual) risks tend to cancel out one-another**
- ✓ **Therefore the remaining risk is the systematic (economical) risk that has material influence on the portfolio loss**
- ➔ **so-called 1-factor model (a.k.a Gordy model)**

Calculation of Risk Weighted Assets (RWA)
– Risk Weight Function, model (II) –

DEUTSCHE BUNDESBANK EUROSYSTEM

- ✓ The systematic factor is interpreted as reflecting the state of the global economy
- ✓ The different economic sectors obviously are more or less dependent on the state of global economy:
  - ✓ R describes the degree of dependence of one asset value (exposure) to the general state of economy (systematic factor)
  - ✓ This dependence is determined per IRBA-exposure class
  - ✓ Calculation of R according to formula 2 in annex 2 of SolvV:

$$R = R_{min} * (1 - e^{(-K*PD)}) / (1 - e^{-K}) + R_{max} * [\, 1 - (1 - e^{(-K*PD)}) / (1 - e^{-K}) \,]$$

- min- and max-values of R per exposure class determined by supervisory authorities
- E^x = exponential function
- K = coefficient
- PD = probability of default

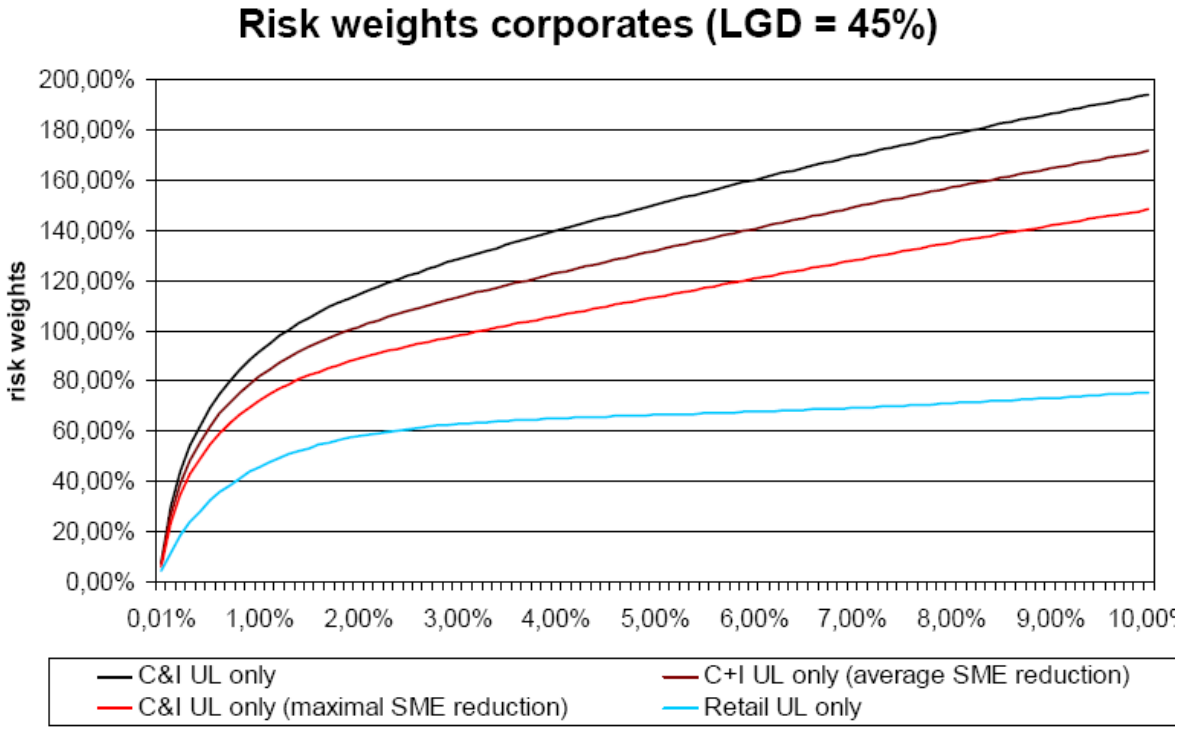
Calculation of Risk Weighted Assets (RWA) – Risk Weight Function, model (III) –

R asset correlation for

- **Central governments, institutions and corporates** with following parameters:
  R_{min} = 0.12, R_{max}= 0.24, Coefficient K = 50

  => R-adjustment for small and medium sized enterprises (SME): 0,04*(1-((max(S;5)-5)/45))
  => SME: All firms with turnovers < 50 mio €
  => Floor by a turnover of 5 mio €

Calculation of Risk Weighted Assets (RWA) – Risk Weight Function, R-adjustment for SME –



Calculation of Risk Weighted Assets (RWA) – Risk Weight Function, model (III) –

R asset correlation for

- **Central governments, institutions and corporates** with following parameters:
  R_{min} = 0.12, R_{max}= 0.24, Coefficient K = 50

  => R-adjustment for small and medium sized enterprises (SME): 0,04*(1-((max(S;5)-5)/45))
  => SME: All firms with turnovers < 50 mio €
  => Floor by a turnover of 5 mio €

- **"Other retail"**-exposures with following parameters:
  R_{min} = 0.03, R_{max}= 0.16, Coefficient K = 35

- **Retail mortgages**: 0.15 (constant)

- **Qualifying revolving exposures**: 0.04 (constant)

Relatively low asset correlations !

as from 2013

BUT:

As a consequence of financial crisis there will bei an increase of R with big „financials" by multiplier 1.25 !

Risk coverage – asset correlation for „Financials“:
- Changes as from 2013 -

- **IRB-approaches for credit risk:**
- **Inter-dependence of big financials obviously isn‘t included in a sufficient way within the current Basel II framework**
- **Increase of asset correlation „R“ by 25 %**
  - R_{min}= 15 % (instead of 12 %) and R_{max}= 30 % (instead of 24 %)
- **Applicable to:**
  - **Regulated financial institutions, insurance companies, broker/dealer, thrifts and futures commission merchants** whose **total assets are ≥ US $100 billion on consolidated basis**
  - **Unregulated financials institutions, regardless of size:**
    Legal entities whose main business includes e.g. management of financial assets, lending, factoring, leasing, securitisation, investments, financial custody or central counterparty services, incl. hedge funds

⇒ **no adequate adjustments for big financials‘ risk weights in the CRSA**

Calculation of Risk Weighted Assets (RWA) – Expected Loss vs. Unexpected Loss (III) –

- Regulatory capital requirements refer to **unexpected loss**, i.e. the risk of higher credit risk costs due to increased number of defaults in one year than forecasted by PD-estimate.
- Concept: **amount of expected loss = provisions**

Deviations to provisions can be due to

- **Differences in calculation methodology** (e.g. regulatory method is based on a one-year time horizon, while external accounting standards usually count the entire time to maturity of the exposure)
- Non-stable **portfolio composition**
- Progressive risk-estimation by institutions in order to enhance **competitive abilities**

Consequences:

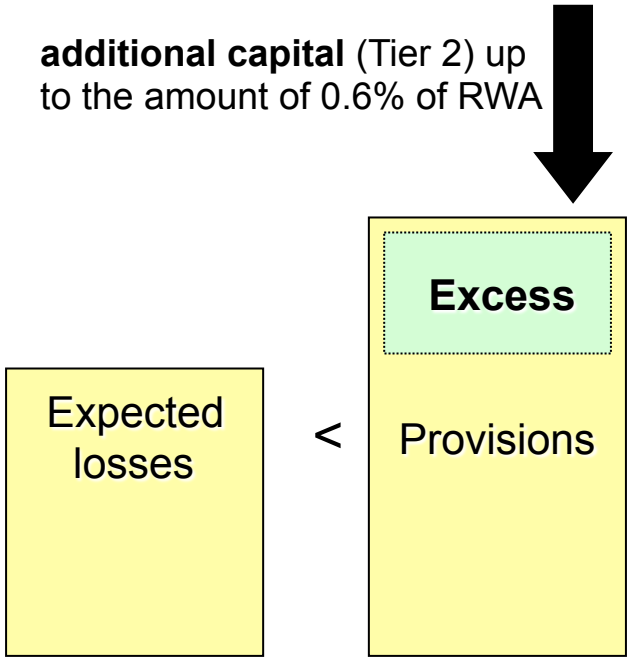
1. **Introduction of a value adjustment offset** for all exposures of the IRBA-exposure classes sovereign, institutions, corporates und retail
2. Due to UL-calibration the **calculation of the IRBA assessment basis** differs from the CRSA-method. Whereas in the CRSA the assessment basis is defined as book value (that means adjusted by loss provisions) the IRBA assessment basis is defined as **„drawn amount“**, which means no deduction of loss provisioning is allowed
3. No unexpected loss with **defaulted exposures** (usually)

Value adjustment offset

∑ Expected loss amount – provisions*

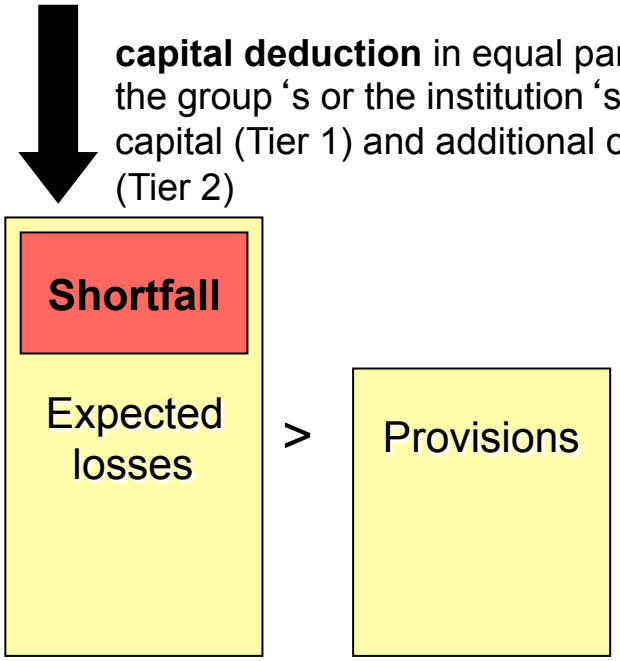
Provision excess
(expected loss amount < provisions)

additional capital (Tier 2) up to the amount of 0.6% of RWA



Provision shortfall
(expected loss amount > provisions)

capital deduction in equal parts from the group ‘s or the institution ‘s core capital (Tier 1) and additional capital (Tier 2)



* Provisions for actual or potential value impairments due to credit-related loss risk set up and recognised in the annual or interim financial statements

Own estimates of forecast-LGD with defaulted obligors – Retail exposures and A-IRBA-exposures

DEUTSCHE BUNDESBANK EUROSYSTEM

Calculation of forecast-LGD for <u>non-defaulted</u> obligors (LGD_D):

- Average values for periods of an **economic downturn**
- Forecasts must be **conservative**

Forecast-LGD for <u>defaulted</u> obligors or exposures (LGD_{best}):

- „For LGDs with defaulted IRBA-exposures the institution shall use the **sum** of its **best estimate EL given current economic circumstances** and its **estimate of the potential rise in EL** owing to additional unexpected losses during the recovery period.“

=> LGD_{best} **covers <u>current expected loss</u> according to an institution‘s risk management** (use for calculation of the expected loss)

=> **Problem:** The **LGD_{best} might be lower** than the **LGD_D** for non-defaulted exposures in an economic downturn

Structure of capital charging under the IRBA

DEUTSCHE BUNDESBANK
EUROSYSTEM

Loss amount of exposures

Expected loss
PD*LGD*EAD

Unexpected loss

Coverage by provisioning
(corrective: **value adjust-ment offset**)

F-IRBA:
Use of supervisory LGD

A-IRBA/Retail:
Use of LGD_D for non-defaulted and LGD_{best} for defaulted exposures

default

„RW(PD, LGD)“

1. **If no own estimate of LGD** (F-IRBA): **0%** => no UL (PD = 1; supervisory LGD as riskless constant)

2. **Own estimate of LGD** (Retail, A-IRBA):
   max { 0 ; 12.5 x (LGD_D-LGD_{best}) } !

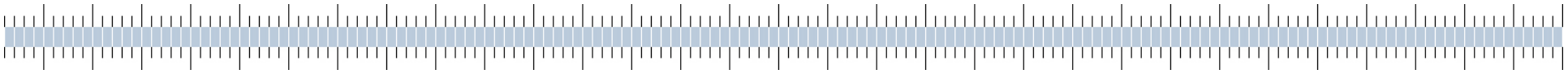
UL-capital charge, if $LGD_{best} < LGD_D$

No default

Calculation of RWA

Charging 8%

EXPOSURE CLASSES



Categorisation of exposures

- **Corporate**
  - 5 subclasses of specialised lending
  - Possible distinct treatment for purchased receivables
- **Sovereign**
- **Bank**
- **Retail**
  - 3 subclasses
  - Possible distinct treatment for purchased receivables
- **Equity**

- **Bank may use different definitions in their internal risk management and measurement systems**

Corporate exposures

- In general, a **corporate exposure** is defined as a debt obligation of a corporation, partnership, or proprietorship.
- Banks are permitted to distinguish separately exposures to small- and medium-sized entities (SME)
- Within the corporate asset class, five sub-classes of **specialised lending** (SL) are identified. Such lending possesses all the following characteristics, either in **legal form** or **economic substance**.
- The five sub-classes of **specialised lending** are
  - project finance,
  - object finance,
  - commodities finance,
  - income-producing real estate, and
  - high-volatility commercial real estate

Specialised lending (corporate exposure)

- The **exposure** is typically to an entity which was created specifically to finance and/ or operate physical assets;
- The borrowing entity has **little or no other material assets or activities**, and therefore little or no independent capacity to repay the obligation, apart from the income that it receives from the asset(s) being financed;
- The terms of the obligation give the lender a **substantial degree of control** over the asset(s) and the income that it generates; and
- As a result of the preceding factors, **the primary source of repayment** of the obligation is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.

Project finance

- Project finance (PF) is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure.
- The lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant.
- The borrower is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation.
- Repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the exposure depends primarily on a well established, diversified, credit-worthy, contractually obligated end user for repayment, it is considered a secured exposure to that end-user.

Object finance

- Object finance (OF) refers to a method of funding the acquisition of physical assets
- where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lender.
- If the exposure is to a borrower whose financial condition and debt-servicing capacity enables it to repay the debt without undue reliance on the specifically pledged assets, the exposure should be treated as a collateralised corporate exposure.

Commodities finance

- Commodities finance (CF) refers to structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay the exposure. This is the case when the borrower has no other activities and no other material assets on its balance sheet. The structured nature of the financing is designed to compensate for the weak credit quality of the borrower. The exposure's rating reflects its self-liquidating nature and the lender's skill in structuring the transaction rather than the credit quality of the borrower.
- The Committee believes that such lending can be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate borrowers. Banks are able to rate the credit quality of the latter type of borrowers based on their broader ongoing operations. In such cases, the value of the commodity serves as a risk mitigant rather than as the primary source of repayment.

Income-producing real estate

- Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The borrower may be, but is not required to be, an SPE, an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralised by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

High-volatility commercial real estate

- High-volatility commercial real estate (HVCRE) lending is the financing of commercial real estate that exhibits higher loss rate volatility (i.e. higher asset correlation) compared to other types of SL. HVCRE includes:
- Where supervisors categorise certain types of commercial real estate exposures as HVCRE in their jurisdictions, they are required to make public such determinations. Other supervisors need to ensure that such treatment is then applied equally to banks under their supervision when making such HVCRE loans in that jurisdiction.

High-volatility commercial real estate

- Commercial real estate exposures secured by properties of types that are categorised by the national supervisor as sharing higher volatilities in portfolio default rates;
- Loans financing any of the land acquisition, development and construction (ADC) phases for properties of those types in such jurisdictions; and
- Loans financing ADC of any other properties where the source of repayment at origination of the exposure is either the future uncertain sale of the property or cash flows whose source of repayment is substantially uncertain (e.g. the property has not yet been leased to the occupancy rate prevailing in that geographic market for that type of commercial real estate), unless the borrower has substantial equity at risk. Commercial ADC loans exempted from treatment as HVCRE loans on the basis of certainty of repayment of borrower equity are, however, ineligible for the additional reductions for SL exposures described in paragraph 277.

Sovereign exposure

- This asset class covers all exposures to counterparties treated as sovereigns under the standardised approach. This includes sovereigns (and their central banks), certain PSEs identified as sovereigns in the standardised approach, MDBs that meet the criteria for a 0% risk weight under the standardised approach, and the entities referred to in paragraph 56.

Bank exposures

- This asset class covers exposures to banks and those securities firms outlined in paragraph 65. Bank exposures also include claims on domestic PSEs that are treated like claims on banks under the standardised approach, and MDBs that do not meet the criteria for a 0% risk weight under the standardised approach.

Retail exposures

- **An exposure is categorised as a retail exposure if it meets all of the following criteria:**
  - Exposures to individuals
  - Residential mortage loans
  - Loans extended to small businesses (< 1 million EUR) and managed as retail exposures
  - Large number of exposures
- **Sub-classes**
  - Exposures secured ny residential properties
  - Qualifying revolving retail exposures
  - All other retail exposures

Qualifying revolving retail exposures

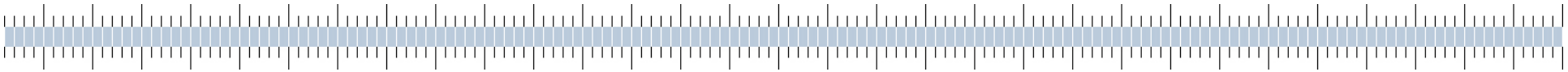
- All of the following criteria must be satisfied for a sub-portfolio to be treated as a qualifying revolving retail exposure (QRRE). These criteria must be applied at a sub-portfolio level consistent with the bank's segmentation of its retail activities generally. Segmentation at the national or country level (or below) should be the general rule.
  - The exposures are revolving, unsecured, and uncommitted (both contractually and in practice). In this context, revolving exposures are defined as those where customers' outstanding balances are permitted to fluctuate based on their decisions to borrow and repay, up to a limit established by the bank.
  - The exposures are to individuals.
  - The maximum exposure to a single individual in the sub-portfolio is €100,000 or less.
  - (...)

Qualifying revolving retail exposures

- Because the asset correlation assumptions for the QRRE risk-weight function are markedly below those for the other retail risk-weight function at low PD values, banks must demonstrate that the use of the QRRE risk-weight function is constrained to portfolios that have exhibited low volatility of loss rates, relative to their average level of loss rates, especially within the low PD bands. Supervisors will review the relative volatility of loss rates across the QRRE subportfolios, as well as the aggregate QRRE portfolio, and intend to share information on the typical characteristics of QRRE loss rates across jurisdictions.
- Data on loss rates for the sub-portfolio must be retained in order to allow analysis of the volatility of loss rates.
- The supervisor must concur that treatment as a qualifying revolving retail exposure is consistent with the underlying risk characteristics of the sub-portfolio.

Equity exposures

- An instrument is considered to be an equity exposure if it meets all of the following requirements:
  - It is irredeemable in the sense that the return of invested funds can be achieved only by the sale of the investment or sale of the rights to the investment or by the liquidation of the issuer;
  - It does not embody an obligation on the part of the issuer; and
  - It conveys a residual claim on the assets or income of the issuer.
- Debt obligations and other securities, partnerships, derivatives or other vehicles structured with the intent of conveying the economic substance of equity ownership are considered an equity holding. This includes liabilities from which the return is linked to that of equities.
- The national supervisor has the discretion to re-characterise debt holdings as equities for regulatory purposes and to otherwise ensure the proper treatment of holdings under Pillar 2.

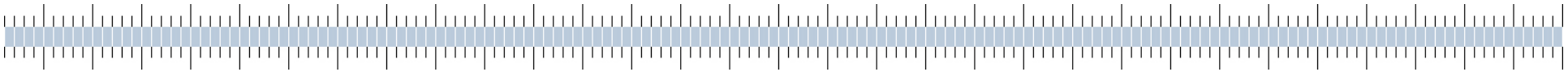


Equity exposures

- An instrument with the same structure as those permitted as Tier 1 capital for banking organisations.
- An instrument that embodies an obligation on the part of the issuer and meets any of the following conditions:
  - The issuer may defer indefinitely the settlement of the obligation;
  - The obligation requires (or permits at the issuer's discretion) settlement by issuance of a fixed number of the issuer's equity shares;
  - The obligation requires (or permits at the issuer's discretion) settlement by issuance of a variable number of the issuer's equity shares and (ceteris paribus) any change in the value of the obligation is attributable to, comparable to, and in the same direction as, the change in the value of a fixed number of the issuer's equity shares;
  - (...)

Equity exposures

- (...)
- The holder has the option to require that the obligation be settled in equity shares, unless either (i)
  - (i) in the case of a traded instrument, the supervisor is content that the bank has demonstrated that the instrument trades more like the debt of the issuer than like its equity, or
  - (ii) in the case of non- traded instruments, the supervisor is content that the bank has demonstrated that the instrument should be treated as a debt position. In cases (i) and (ii), the bank may decompose the risks for regulatory purposes, with the consent of the supervisor.



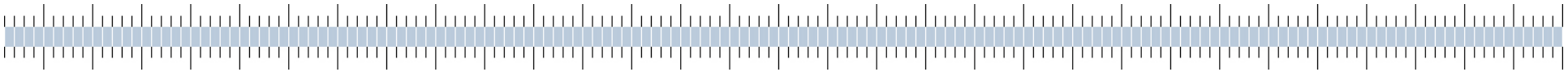
Retail receivables

- Purchased retail receivables, provided the purchasing bank complies with the IRB rules for retail exposures, are eligible for the top-down approach as permitted within the existing standards for retail exposures.

Corporate receivables

- In general, for purchased corporate receivables, banks are expected to assess the default risk of individual obligors consistent with the treatment of other corporate exposures.
- Supervisors may deny the use of the top-down approach for purchased corporate receivables depending on the bank's compliance with minimum requirements. In particular, to be eligible for the proposed 'top-down' treatment, purchased corporate receivables must satisfy the following conditions:
  - The receivables are purchased from unrelated, third party sellers, and as such the bank has not originated the receivables either directly or indirectly.
  - The receivables must be generated on an arm's-length basis between the seller and the obligor.
  - The purchasing bank has a claim on all proceeds from the pool of receivables or a pro-rata interest in the proceeds.

APPROVAL



Approval of IRBA
– Overview – Use of IRBA

- **IRBA in Germany is available for all banks**
- **65 banks applied for approval**
- **54 banks already got approval**
  - 28 A-IRBA and Retail
  - 26 F-IRBA
- **422 rating systems approved**
- **IRBA-banks represent 62% of total assets of the German banking system**

Praxisbeispiele Ratingsysteme: Landesbanken (Folie 1)

- **DSGV-Standard-Rating:**
  - Geschäftskunden
  - Gewerbekunden
  - Firmenkunden ab 2,5 -20 Mio Umsatz
  - Firmenkunden ab 20 Mio Umsatz
  - Mittelgroße Kapitalgesellschaften
  - Freie Berufe
  - Existenzgründer
- **DSGV-Immobiliengeschäftsrating**
  - Bauträger
  - Investor
  - Betreiberimmobilie (Sonderform des Investors)

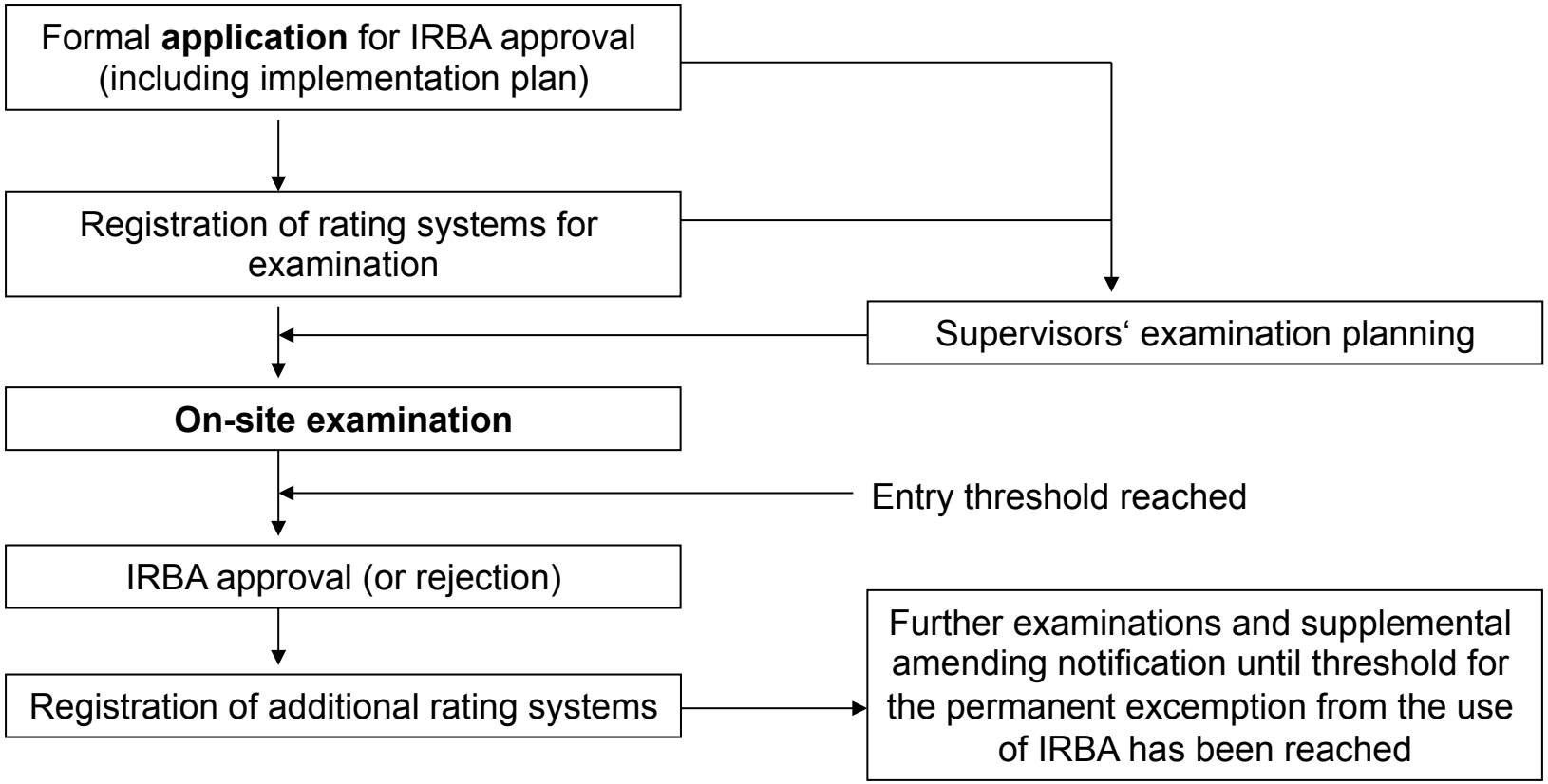
Praxisbeispiele Ratingsysteme: Landesbanken (Folie 2)

- **DSGV-Scoring-Verfahren:**
  - Baufi-Antragsscoring
  - Baufi-Bestandsscoring
  - Antragsscoring für Konsumentenkredite
  - Antragsscoring Girokredite
  - Giro-Verhaltesscoring
  - Kleinkundenrating für gewerbliche Kunden
  - Existenzgründer
- **Spezialfinanzierungen**
  - Projekte
  - Flugzeuge
  - Schiffe
  - Internationale Immobilien

Praxisbeispiele Ratingsysteme: Landesbanken (Folie 3)

- Corporates
- Banken
- Versicherungen
- Leasinggeschäfte
- Länder- und Transferrisiko
- Internationale Gebietskörperschaften

Approval of IRBA
– Approval process –



BaFin/Deutsche Bundesbank (2007): Guidelines for applications to use the IRBA for calculating minimum capital requirements

Approval of IRBA
– Prerequisites for using the IRBA –

- **Approval** by BaFin
- Complete **coverage** of new business exposures and recognisable existing business
- Compliance with the **minimum requirements** for using IRBA
- Meet the **disclosure** requirements (pillar 3)
- Comply with the **implementation plan** authorised with IRBA approval

Approval of IRBA

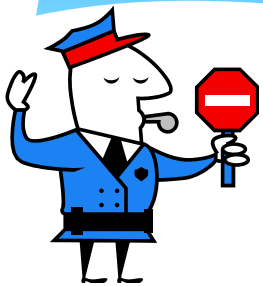
– Non-compliance with the prerequisites for using the IRBA –

DEUTSCHE BUNDESBANK EUROSYSTEM

Submission of a plausible plan showing how to achieve a timely return to compliance, and

or

Proof of immaterial effects of non-compliance



Otherwise: revocation of the IRBA approval

Approval of IRBA
– Application for approval (I) –

Application for IRBA approval (in German language)

Initial IRBA-Approval

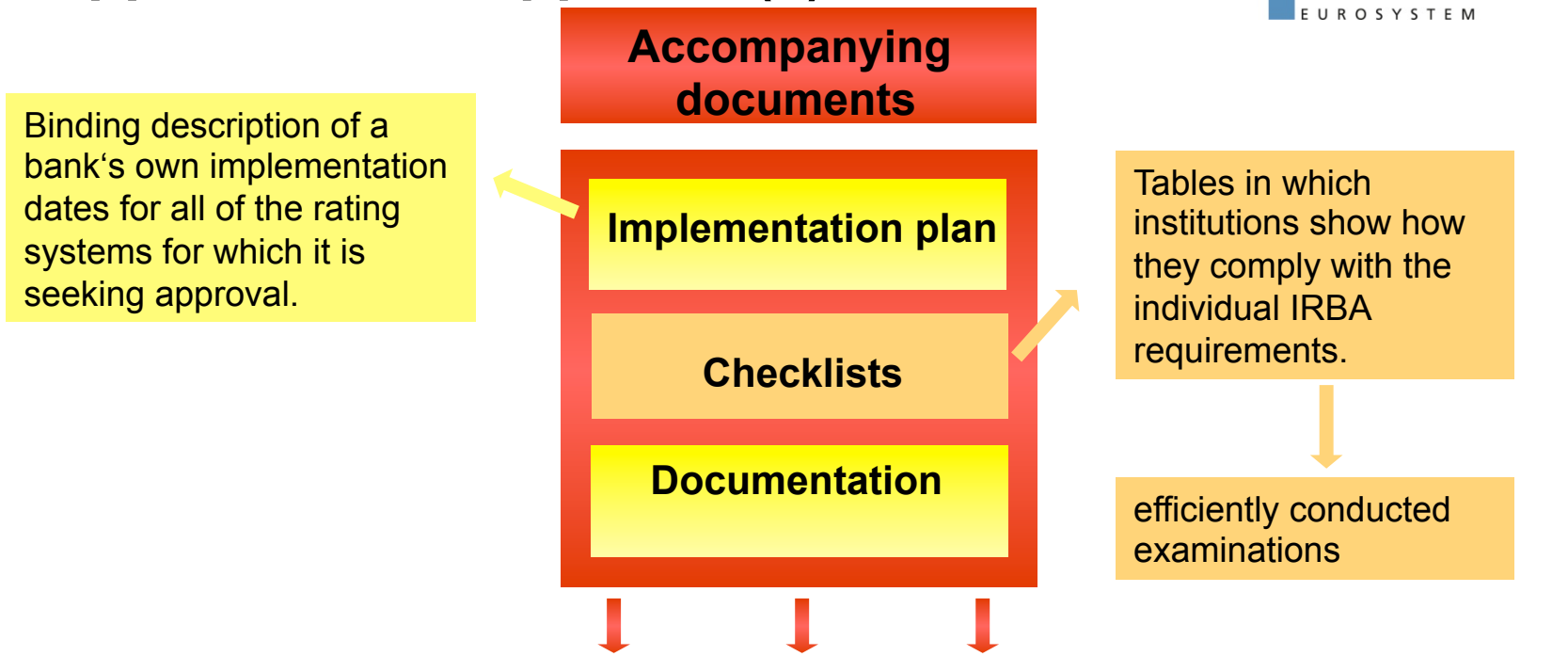
Extension of existing IRBA-approval

Internal estimates of additional risk components (LGD, CCF)

Additional business lines, new products or markets (as far as not covered by an approved rating system)

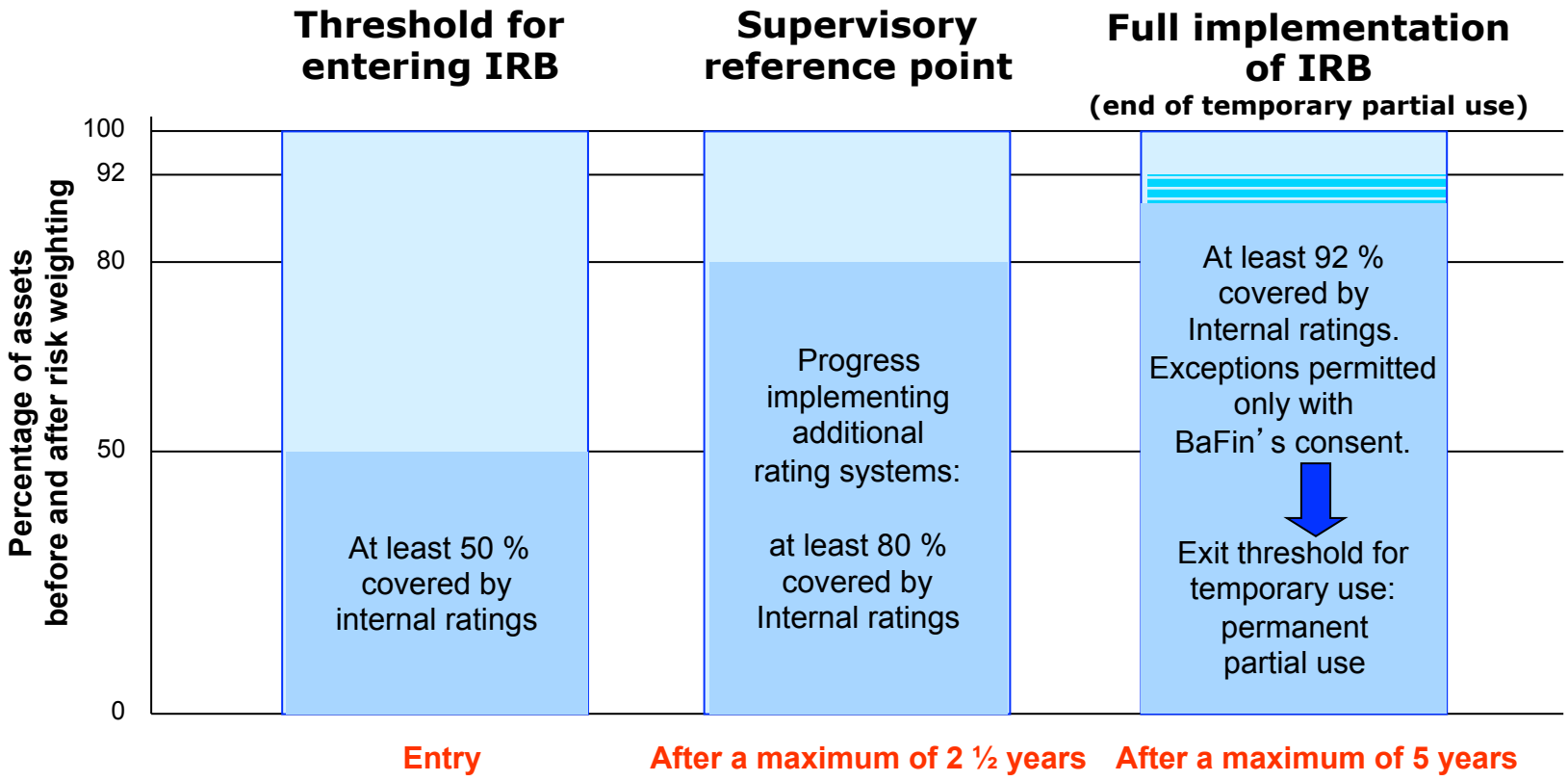
Joint projects: application for IRBA approval by every single institute

Approval of IRBA
– Application for approval (II) –



Application for approval (II)
– Implementation plan / coverage ratio –

Temporary and permanent partial use of the selected IRBA



Deutsche Bundesbank (2005): Monthly Report, June

Application for approval (II)
– Implementation plan / coverage ratio –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Degree of coverage for

- IRBA exposure

$$= \frac{\sum \text{IRBA exposures}}{\sum \text{IRBA exposures and CRSA exposures}}$$

- Risk-weighted IRBA assets (IRBA RWA)

$$= \frac{\sum \text{IRBA RWA}}{\sum \text{IRBA RWA and CRSA RWA}}$$

insofar as they belong to the denominator

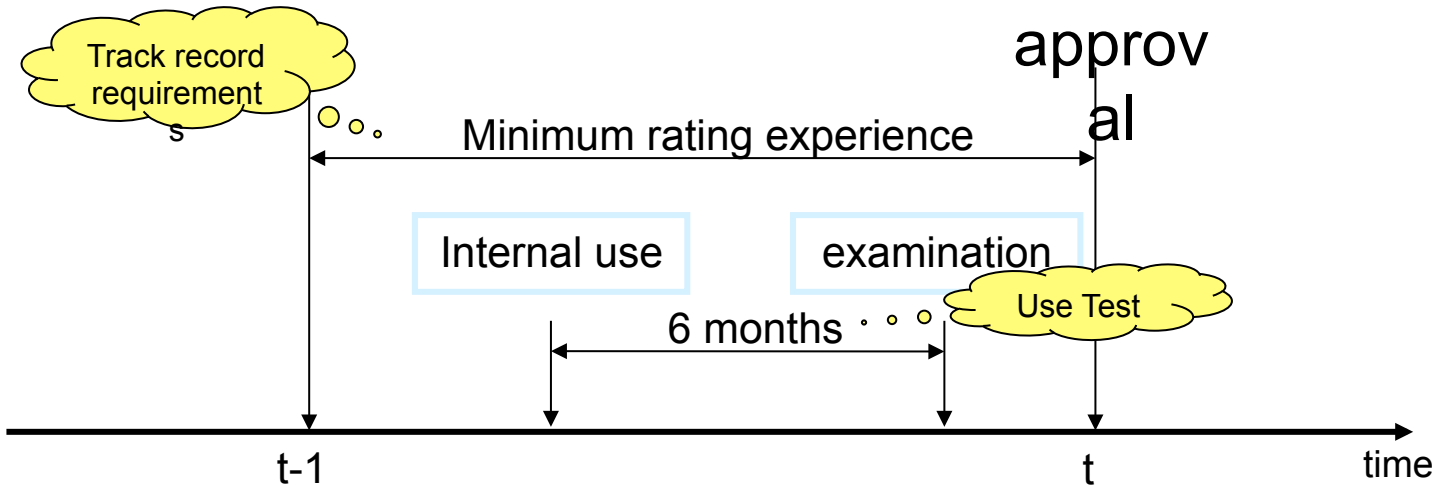
excluding e.g. other non credit obligations, exposures arising from business in investment fund assets, indefinite exemption from using IRBA at the institution's discretion (e.g. exposures belonging to an expiring business unit or to an exemptible existing business of a non-expiring business unit)

Option: additional recognition of certain exposures of the exposure classes securitisation, equity and exposures arising from business in investment fund assets ⇨ no recognition in the numerator

To determine the degree of coverage, the exposure values and the risk-weighted exposure amounts shall be calculated according to the procedure envisaged for each risk exposure at that point in time in the implementation plan or already specified by the IRBA approval.

Approval of IRBA
– On-site examination –
Prerequisites

- **A rating system to be examined must be used prior to examination.**



On-site examination – Prerequisites – Application and track record requirements –

DEUTSCHE BUNDESBANK EUROSYSTEM

Rating systems

Equity risk models

Use Test

Appropriate period of time

use as principal instrument for measuring and managing credit risks

Rating systems

Experience

Minimum period of time: 3 years

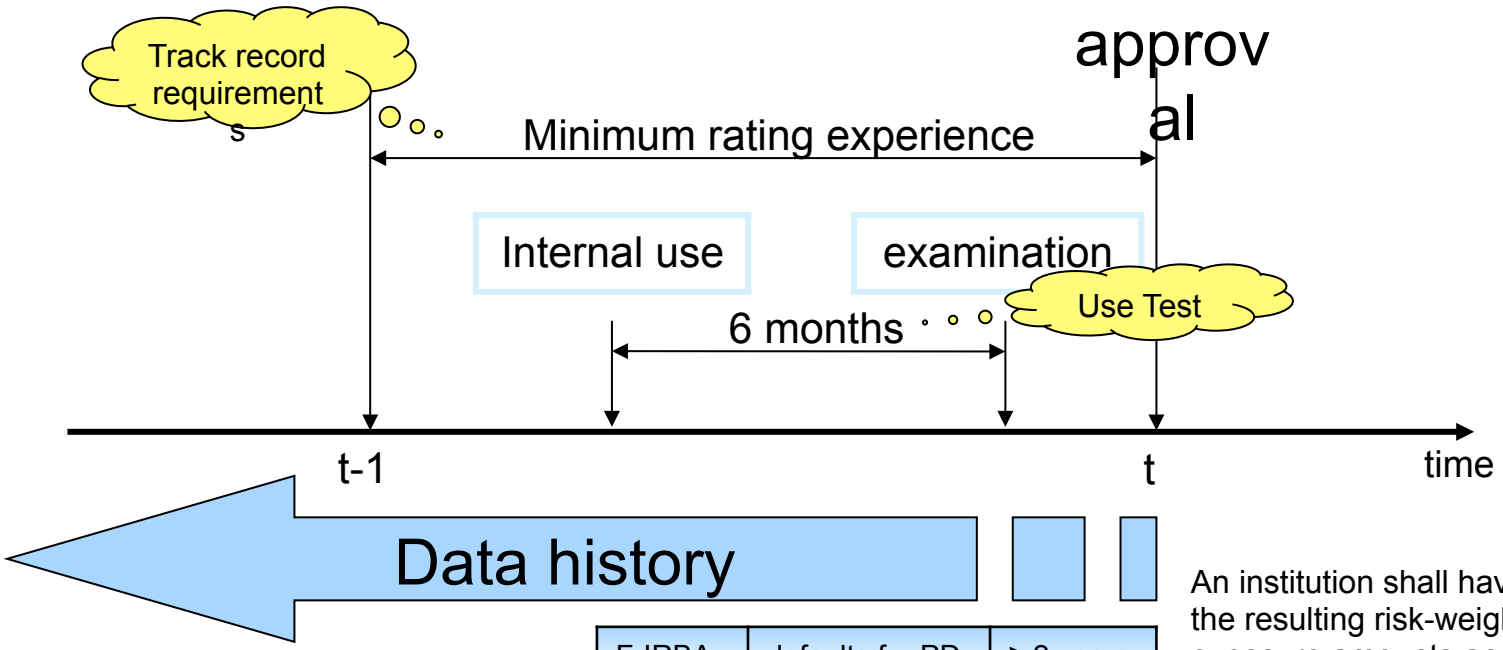
- ***broadly in line*** **with the requirements of the regulation, in particular the minimum requirements for using IRBA**
- **use for the principal risk measurement and management processes (until 2009: 1 year)***

Own estimation/use of LGD, CCF for exposure classes central governments, institutions and corporates was *broadly consistent* with the minimum requirements for using own estimates of these risk parameters. (until 2008: 2 years)*

* Transitional provisions

Approval of IRBA – On-site examination – Prerequisites

- **A rating system to be examined must be used prior to examination.**



F-IRBA	defaults for PD	≥ 2 years
Retail	defaults and losses for PD/ LGD/CCF	≥ 2 years
A-IRBA		≥ 5 years

An institution shall have calculated the resulting risk-weighted IRBA exposure amounts and expected loss amounts for IRBA exposures at least once.

Approval of IRBA – On-site examination – Guidelines / principles

Supervisory preparation

- IRBA suitability examinations are **system audits**, that are geared to risk- and processual procedures within the institution. They are largely conducted on-site at the applicant institution.
- Designed as examinations of the bank ‘s **organisational structure** and as **operational checks** of the bank ‘s procedures
  - Organisational structure: supervisory requirements compared with a bank’s internal regulations (**conceptual design**)
  - Operational checks of procedures: **adequacy of implemented rating systems** and compliance with supervisory requirements
  - ↪ Adequate **examination methods** are interviewing members of staff, observing internal processes, individual audits e.g. sample of credit assessments

- **Preparation tasks:**
  - Preliminary **meeting** (optional)
  - **Evaluation** of the submitted implementation plan and of compliance with use-test and minimum experience requirements
  - Analysis of „accompanying documents“ and information such as checklists
  - ↪ Derivation of **examination focuses**

Approval of IRBA
– On-site examination and review –

DEUTSCHE BUNDESBANK
EUROSYSTEM

Conduction of examination

The examinations cover compliance with the requirements for

- **implementation plan**
- **portfolio analysis and partial use:** complete coverage of new exposures and exposures in stock
- degree to which an institution's business units are covered by **suitable internal rating systems**
- **design of rating systems,** including preparation for **stress tests and validation**
- **integration** of the internal rating system **into the relevant processes and procedures** (e.g. credit assessment process, risk management procedures)
- **calculation of regulatory minimum capital requirements**
- **internal revision**
- **IRBA disclosure**

Why only IRBA- but no CRSA suitability examination ?

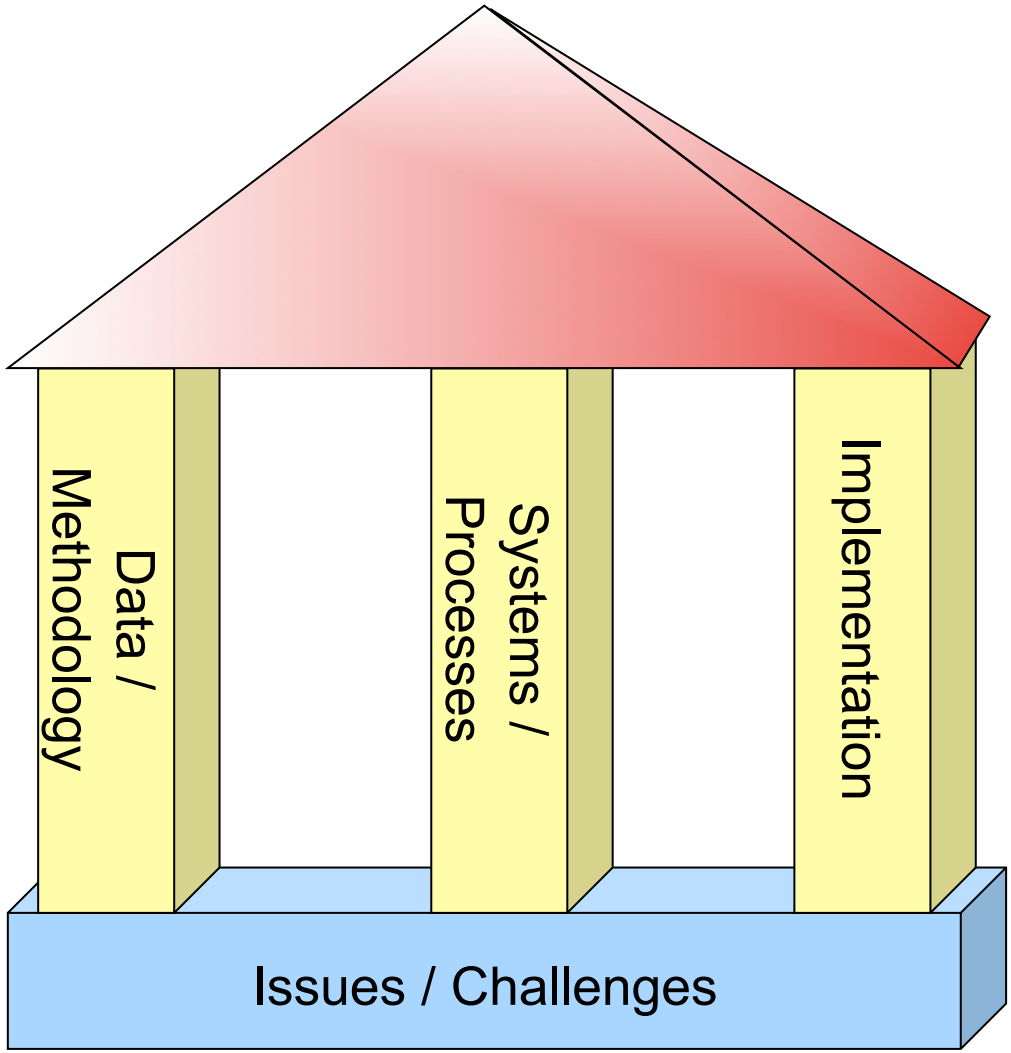
Review

- **Debriefing** with institution (optional)
- Final **supervisory discussion** on evaluating the results and categorisation of gravity (4 categories). This leads to a **report** to the institution and a written **notification** on:

Approval

Approval subject to compliance with conditions imposed in the written notification

Rejection


Data / Methodology
Systems / Processes
Implementation
Issues / Challenges

Approval of IRBA – On-site examination – Issues / Challenges related to …

- **Data / Methodology**
  - Data quality, data history, default data collection
  - Definition of Default (level playing field)
  - Calibration/validation of so-called Low Default Portfolios

    see http://www.bis.org/publ/bcbs_nl6.pdf
- **Systems / Processes**
  - Embedding IRBA not only into risk management ar… in other processes like strategy/planning and reporti…
  - Rating assignment / scope of application, setting up… overrides, credit risk control unit
  - Robust and adequate internal processes for validati… rating systems
- **Implementation**
  - Implementation of IRBA in its final legal shape as a “moving target”
  - Banks’ internal project management
  - Fostering a rating culture within a bank

Shortcomings in data can be mitigated by data pooling, mapping to external data

•Conservative estimates with less data

•Margins of conservatism related to the expected range of estimation errors due to lacks of quality and/or quantity of methods and data

•Appropriate adjustments to data to achieve “broad equivalence” with the definitions of default resp. loss may be allowed.

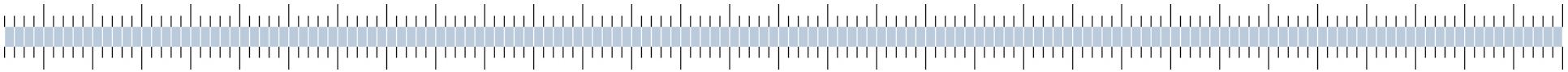
Model Change Policy

- **If a bank changes components of an approved IRBA system or the system itself, it has to fulfill the „Guidelines on changes to IRBA systems and other borrower-related internal risk measurement systems“. The bank has to categorise the change as follows:**

Category of change	Requirements	example
Extension	New recognition by examination before application	Extension to other customer or product groups (scope of application), estimation of additional parameters, […]
Major change	New recognition before application	Fundamental changes in parameter estimation, lending practice, organisational environment, […]
Significant change	Informal agreement with BaFin (Federal Financial Supervisory Authority)	Changes in identifying defaults, recording losses, incorporation of the results into risk management, rules for overrides, […]
Insignificant change	Communication at regular reporting intervals	Change caused by scheduled validation, […]

- **Background:** The approval is only valid for the authorised methods, processes, controls, data collection and IT systems that support the assessment of credit risk, the assignment of IRBA exposures to grades or pools (rating), and the qualification of default and loss estimates for a given type of IRBA exposure (supervisory definition of rating system). It is hereby intended to avoid evasion of the IRBA-regulation.

CRM



Credit Risk Standardised Approach
Credit risk mitigation techniques (CRMT)

- **Applies for both CRSA and IRBA; differs in the scope of application and/or calculation of capital reduction**
- **Reduction of credit risk by charging of**
  - Securities
  - On-balance-sheet and repo-netting
- **Requirements that have to be met**
  - **General minimum requirements** e.g. adequate risk management processes to control risks with CRMT (concentration risk, residual risk …), full credit risk assessment for secured claims, legal effectiveness and enforceability
  - **Specific minimum requirements** to certain CRM instruments, e.g.concentration risk management for unfunded credit protection (guarantees and credit derivatives), list of eligible protection providers (only sovereigns, institutions, corporates with credit quality step assessment 1 and 2)
- **Special treatment real estate in the CRSA:** Separate **exposure class** for the fully and completely secured part of the exposure (virtual exposure splitting). Risk weights of 35% (residential mortgage) and 50% (commercial real estate).

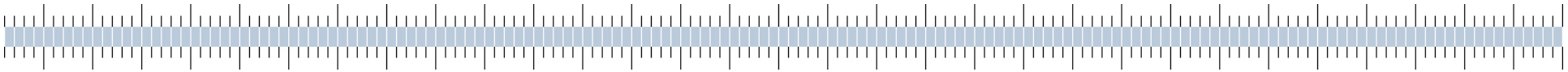
Credit risk mitigation techniques
Eligible protection instruments

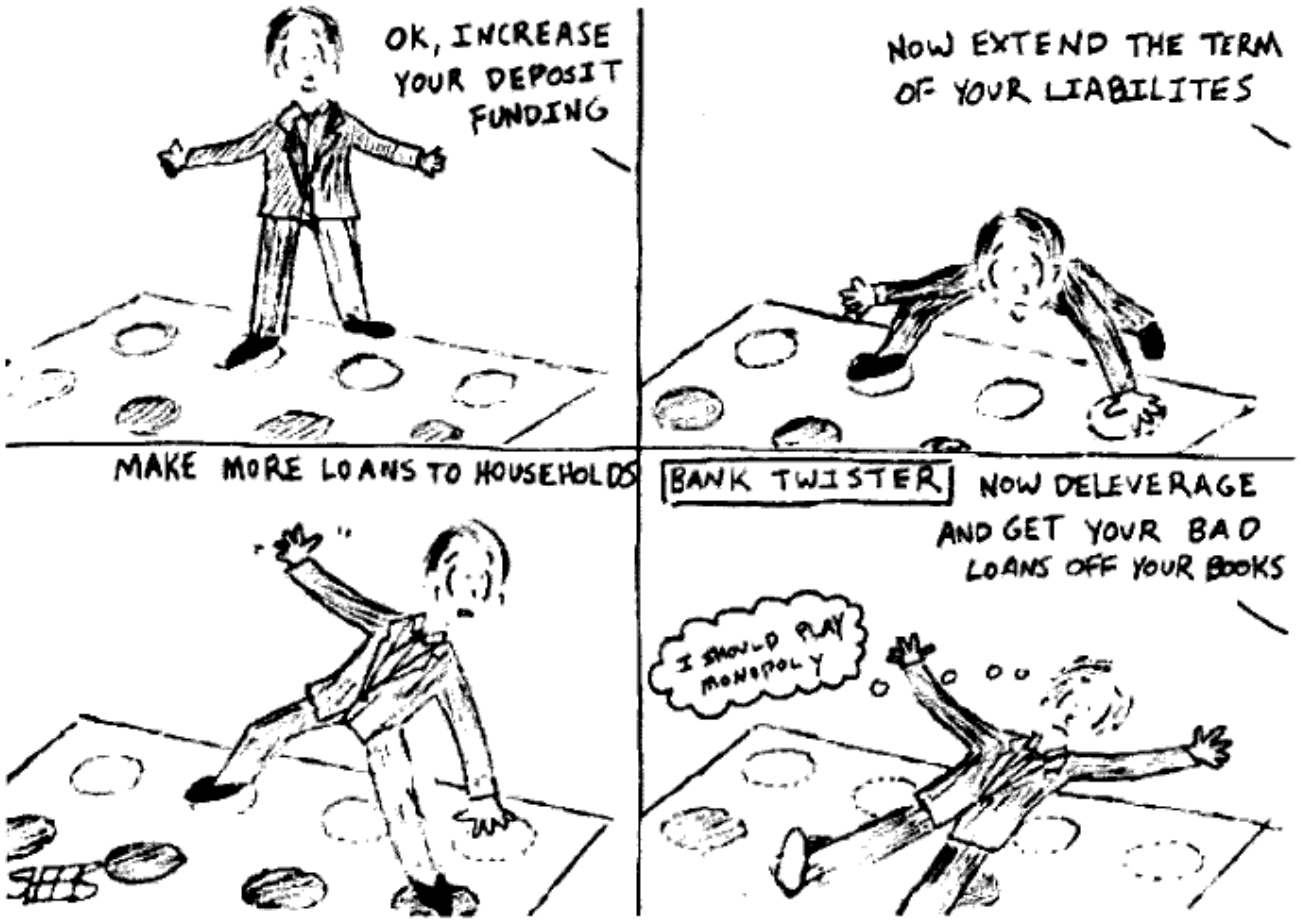
Standardised Approach	**Real estate collateral**	**Assignment of receivables**	**Other physical collateral**
• Financial collateral • Unfunded credit protection (guarantees and credit derivatives) • Netting	•Residential real estate •Commercial real estate	•From commercial transactions •Others ≤ 1 year	•Liquid markets •Available market prices •Realised price doesn ‘t deviate „significantly“

* In the CSRA technically not treated as CRMT

Further collateral in the A-IRBA by estimation of LGD (subject to supervisory approval); the above mentioned minimum requirements have to be met „generally“ !

DISCUSSION

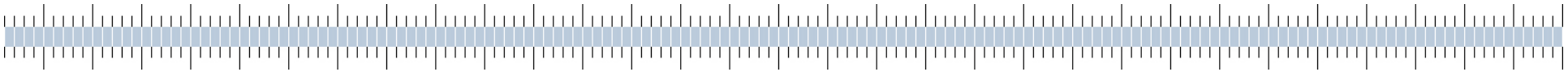



OK, INCREASE YOUR DEPOSIT FUNDING
NOW EXTEND THE TERM OF YOUR LIABILITES
MAKE MORE LOANS TO HOUSEHOLDS
BANK TWISTER
NOW DELEVERAGE AND GET YOUR BAD LOANS OFF YOUR BOOKS
I SHOULD PLAY MONOPOLY

Implementation Challenges

- Collateral data quality, collateral data managemnt etc.
- Above problems in CRM
- Approval process

ANNEX



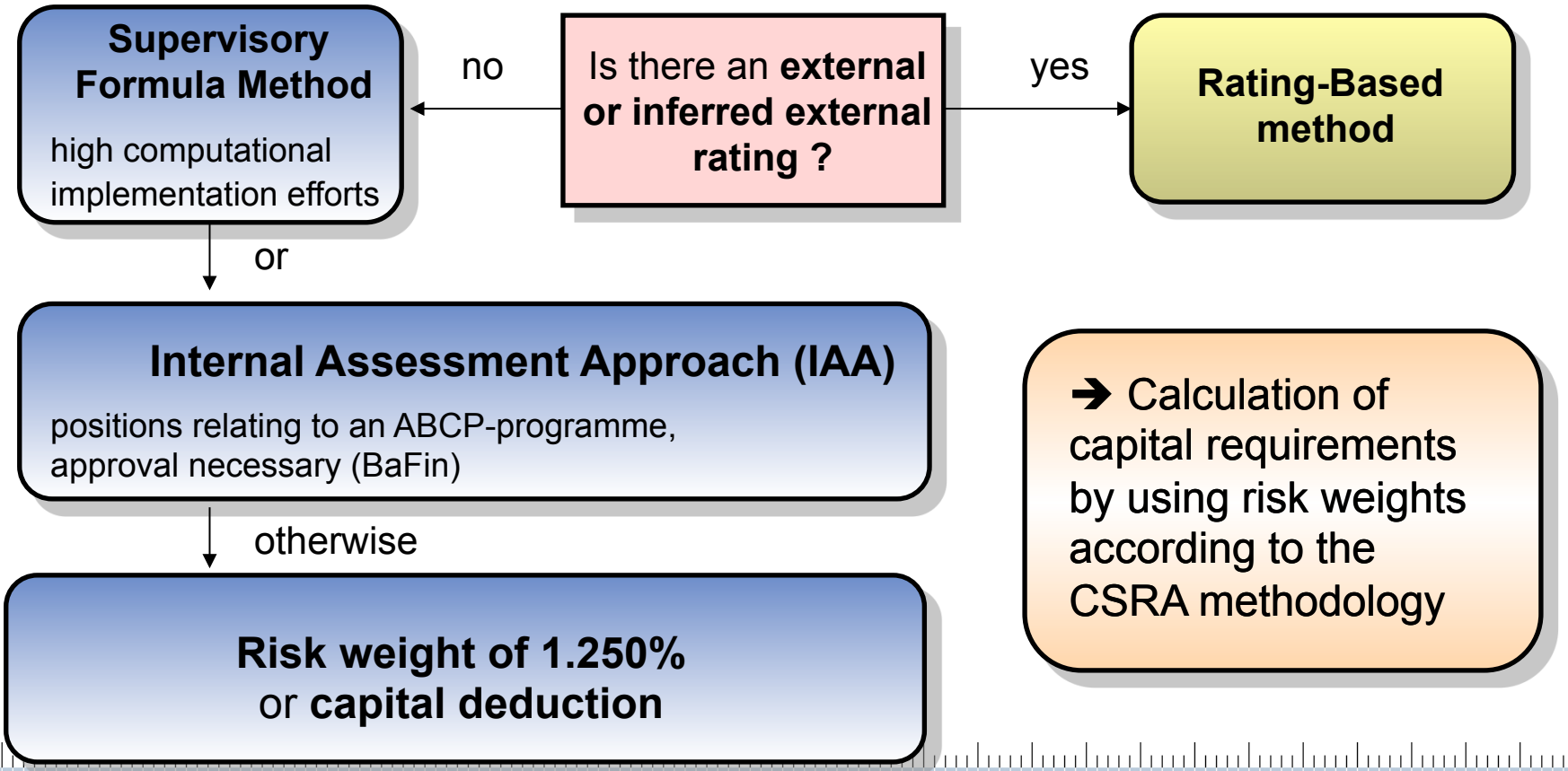
Annex

- **Annex 1: Securitisation**
- **Annex 2: Approval**
- **Annex 3: Example for calculation of capital requirements**
- **Annex 4: QIS 5**
- **Annex 5: Monthly Report June 2005 (excerpt), Deutsche Bundesbank**

Annex 1: Securitisation (I)

DEUTSCHE BUNDESBANK EUROSYSTEM

Ranking of procedures:



Annex 1: Securitisation (II)
Rating-Based Method: Risk weights

Credit quality steps (ex: S&P's ratings)		IRBA-securitisation positions				
Long term	Short term	No resecuritisation			Resecuritisations	
		„granular And super senior"	„granular and not super senior	„non-granular"	„super senior, portfolio doesn't contain further resecuriti-sations"	„non-super senior or portfolio contains further resecuritisations"
1 (AAA)	1	7%	12%	20%	20%	30%
2		8%	15%	25%	25%	40%
3		10%	18%	35%	35%	50%
4	2	12%	20%		40%	65%
5		20%	35%		60%	100%
6		35%	50%		100%	150%
7 (BBB)	3	60%	75%		150%	225%
8		100%			200%	350%
9 (BB+)		250%			300%	500%
10		425%			500%	650%
11		650%			750%	850%
Others (< BB-)		1250%				

as from 2012

➔ **Better external rating** grades until BB+ lead to lower risk weights in the IRBA than in the CRSA , but **external ratings below BB+** lead to lower risk weights in the CRSA (350 % instead of 425% or 650%)

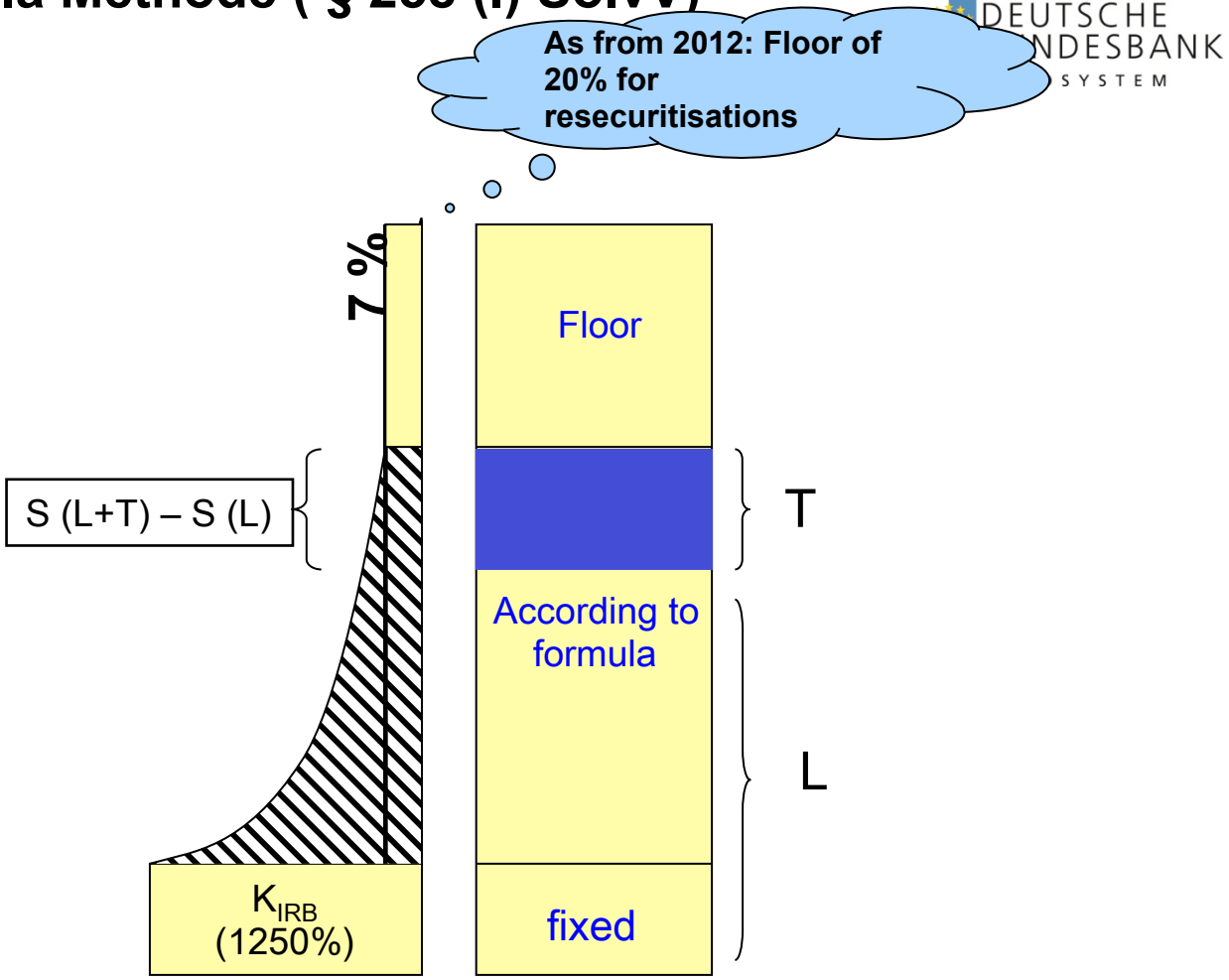
➔ **Risk weights are more diversified** in comparison with the CRSA-external rating steps depending on the granularity of the portfolio

➔ Changes after the financial crisis concerning **resecuritisations** as a third criteria from 2011

„x^{2}" „x^{3}"

Supervisory Formula Methode (§ 258 (I) SolvV)

- **Crucial input parameters:**
  - Credit-Enhancement-Level (Loss buffer L)
  - Thickness of tranche (T)
  - Capital requirement before securitisation (Kirb)
  - Number of effective risk exposures in the securitised portfolio Forderungen (N)
  - Exposure-weighted loss given default (E-LGD) *

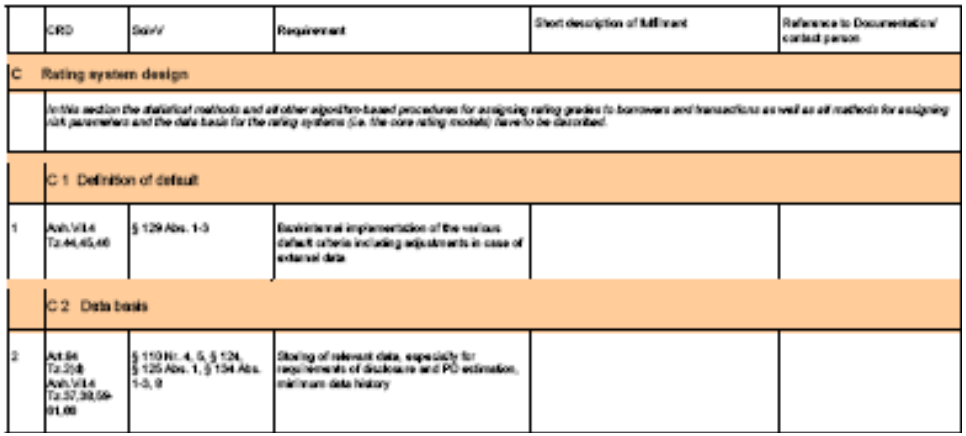


* LGD of 100% for CRSA-positions and securitisation positions in the securitised portfolio

Annex 2: Approval
– Accompanying documents – checklists

- Instrument for meeting two targets:
  banks: check for completeness of the IRB systems
  supervisors: effective preparing of on-site examination
- Different checklists for F-IRB, A-IRB, Retail, Equity, Securitisation
- Content: requirements regarding …

Assigning internal portfolios to supervisory asset classes
Credit process
Rating system design
Credit risk mitigation techniques
Use test
Calculation of regulatory capital
Documentation



	CRD	SolvV	Requirement	Short description of fulfilment	Reference to Documentation/ contact person
C	Rating system design				
	In this section the statistical methods and all other algorithm-based procedures for assigning rating grades to borrowers and transactions as well as all methods for assigning risk parameters and the data basis for the rating systems (i.e. the core rating models) have to be described.				
	C 1 Definition of default				
1	Anh.VII.4 Tz.44,45,46	§ 129 Abs. 1-3	Bankinternal implementation of the various default criteria including adjustments in case of external data		
	C 2 Data basis				
2	Art.84 Tz.2)b Anh.VII.4 Tz.37,39,56-61,66	§ 110 Nr. 4, 5, § 124, § 125 Abs. 1, § 134 Abs. 1-3, 9	Storing of relevant data, especially for requirements of disclosure and PD estimation, minimum data history		

Annex 3: Example for calculation of capital requirements – Comparison of the CRSA and the IRBA (I) –

DEUTSCHE BUNDESBANK EUROSYSTEM

- **Question:** Which approach is advantageous?
- Calculation of capital requirements for the following claim:

obligor	institution
country	Germany
amount	1 mio. €
maturity	2.5 years
external rating	none
collateral	none

- **CRSA-calculation**
  - Risk weight according to option 1 (i.e risk weight is derived from sovereign rating: one credit quality step above sovereign) Germany is in possession of an AAA-rating an therefore matched to credit quality step 1
  - One step above: risk weight of 20%
  - Capital Charge = 1 mio.€ X risk weight X 8% = **16,000 €**

Annex 3: Example for calculation of capital requirements – Comparison of the CRSA and the IRBA (II) –

DEUTSCHE BUNDESBANK EUROSYSTEM

IRBA-calculation

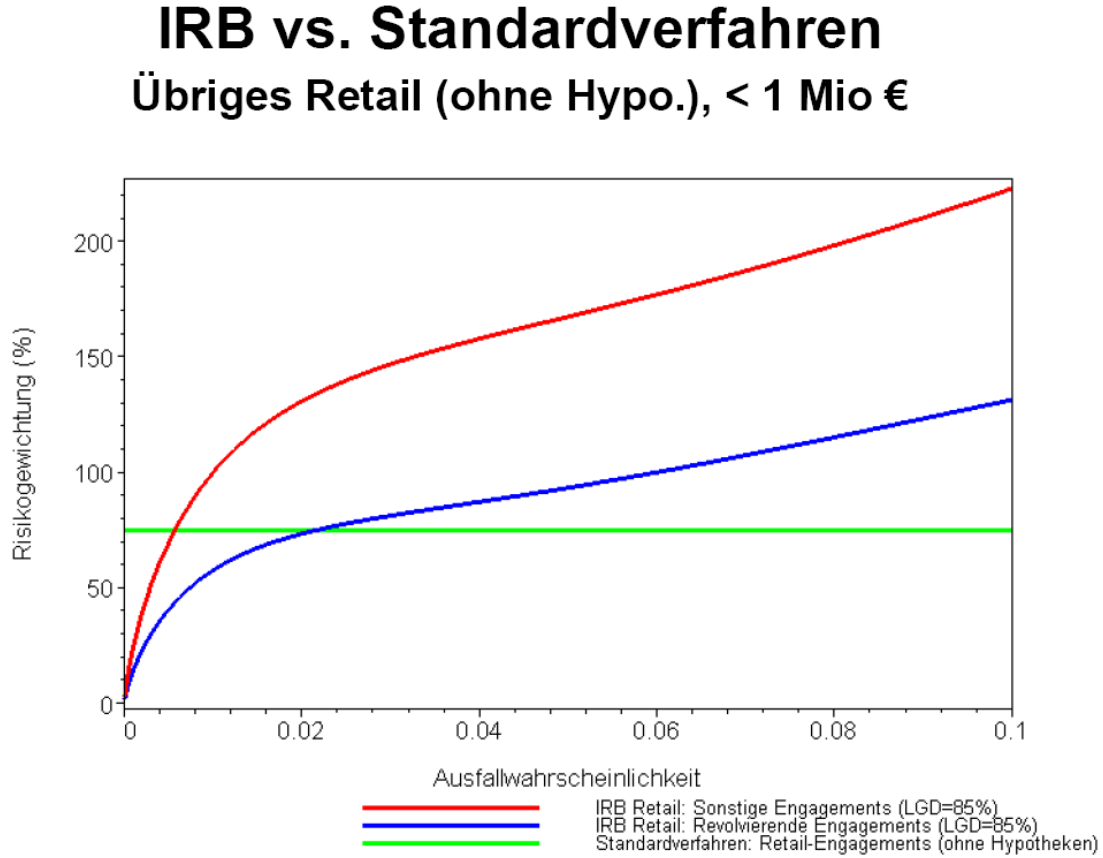
Assumption 1: Internal PD = 0.02% (corresponds approx. Rating AA)

- LGD = 45% (supervisory LGD for unsecured, not subordinated claims)
- RW (PD, LGD) = 11.99%
- Capital Charge = 1 mio.€ X risk weight X 8% = **9,598 €**
- PD-floor with corporates / banks 0.03% => RW= 15.31%! = **12,248 €**

Assumption 2: Internal PD = 0.50% (corresponds approx. Rating BB+)

- LGD= 45%
- RW (PD,LGD) = 73.79%
- Capital Charge = 1 mio.€ X risk weight X 8% = **59,031 €**

Vergleich von Risikogewichtungsfunktionen: Studie der EBK



Annex 3: Example for calculation of capital requirements – Comparison of the CRSA and the IRBA (III) –

DEUTSCHE BUNDESBANK EUROSYSTEM

Variation of assumptions	CRSA-result	IRBA-result
PD = 0.02% ~ AA-Rating RW = 11.99% resp. 15,31%	16,000 €	(9,598 €) 12,248 €
PD = 0.50% ~ BB+-Rating RW = 73.79%	16,000 €	59,031 €

Conclusion: Advantage of capital charge especially depends on the **credit quality** (parameters such as PD and LGD) but also on the risk weight formula per asset class in the IRBA and - therefore - on the **individual portfolio structure**.

Annex 3: Example for calculation of capital requirements – Comparison of the CRSA and the IRBA (IV) –

DEUTSCHE BUNDESBANK EUROSYSTEM

Examples of the CRSA-session (Claim amount: 1000 EUR)	CRSA-result	IRBA-result
AMB Generali AA-Rating ~ PD = 0.02% , LGD 45%, M=2.5 RW_{CRSA} = 20% RW_{IRBA}= 12% (15,3%)	16 €	9.60 € 12.24 €
Telekom BBB+-Rating ~ PD = 0.12% , LGD 45%, M=2.5 RW_{CRSA} = 100% RW_{IRBA}= 34.9%	80 €	27.95 €
Ford B- -Rating ~ PD = 13% , LGD 45%, M=2.5 RW_{CRSA} = 150% RW_{IRBA}= 224.5%	120€	179.60 €

Annex 4: QIS 5
– Quantitative Impact Study by BCBS in 2005 in comparison to Basel I (old framework) –

DEUTSCHE BUNDESBANK EUROSYSTEM

Results of the QIS 5 –
Change in Minimum Required Capital

	Standardised Approach	Foundation IRB Approach	Advanced IRB Approach	„Most Likely" Approach
G10				
Group 1	1.7 %	-1.3 %	-7.1 %	-6.8 %
Group 2	-1.3 %	-12.3 %	-26.7 %	-11.3 %
CEBS				
Group 1	-0.9 %	-3.2 %	-8.3 %	-7.7 %
Group 2	-3.0 %	-16.6 %	-26.6 %	-15.4 %
Germany				
Group 1	8.4 %	-1.0 %	-5.2 %	-4.2 %
Group 2	-5.4 %	-8.3 %	-26.9 %	-6.7 %
Other non-G10				
Group 1	1.8 %	-16.2 %	-29.0 %	-20.7 %
Group 2	38.2 %	11.4 %	-1.0 %	19.5 %

Annotations:
Group 1: Internationally active banks with a core capital of at least 3 bio. €
Group 2: all other banks

Main reasons for divergencies between

Germany and G10/ EU:

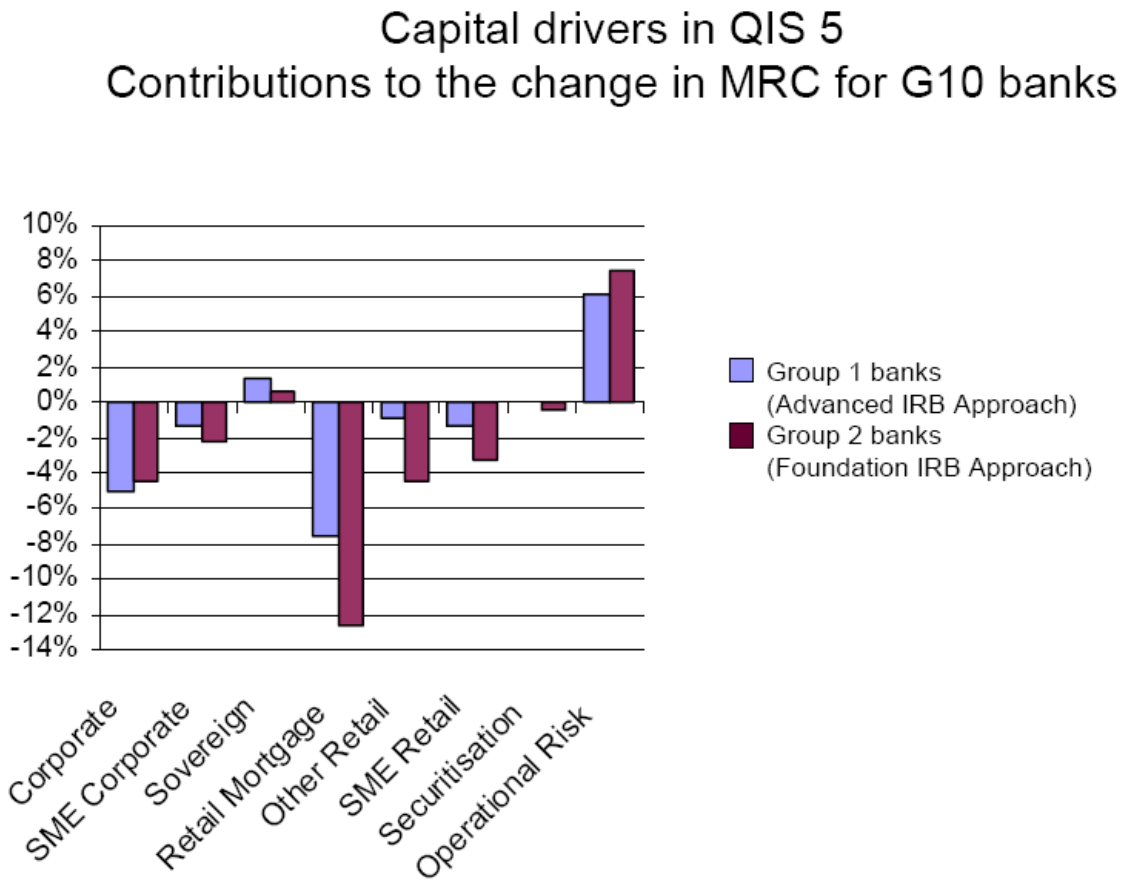
- specific economic environment
- conservative estimates

Group 1 and Group 2 banks:

- volume of retail business

➔ Incentive to adopt sophisticated approaches

Annex 4: QIS 5
– Capital drivers –



Bestimmung des Abdeckungsgrades: Ausnahmen

Wahlrecht: Positionen im sog. „dauerhaften Partial Use“ nach § 70 SolvV wie:

- **Kirchen**
- **Zentralregierungen und Institute, wenn**
  - Anzahl wesentlicher Schuldner gering (< 40)
  - und übermäßige Belastung durch geeignetes Ratingsystem
- **Bund, Länder und Kommunen** sowie ausschließlich von diesen getragene Förderinstitute mit Haftungserklärung (soll auf EWR ausgedehnt werden)
- **Intragruppenforderungen** nach § 10c KWG Abs. 3 KWG
  - Innerhalb einer Institutsgruppe, sofern die Anforderungen nach § 10c Abs. 1 KWG erfüllt sind.
  - Zwischen Mitgliedern desselben institutsbezogenen Sicherungssystems, sofern die Anforderungen des § 10c Abs. 2 KWG erfüllt sind.
- **Bestimmte Beteiligungspositionen**, z.B. KSA Risikogewicht 0, im Rahmen von Wirtschaftsförderung
- **Auslaufende Geschäftsbereiche** des Instituts
- **Übergangsbestimmung („Grandfathering“) für Beteiligungen bis 2017** (Positionen, die vor 2008 eingegangen und seither nicht verändert wurden, § 338 Abs. 4)

„Grundsätzlich“ nicht zu berücksichtigen sind

- **Beteiligungspositionen** und **kreditunabhängige Aktiva** (per Definition IRBA-Positionen)
- **Verbriefungspositionen**
- **Investmentvermögen**

Beispiel: Bestimmung des Abdeckungsgrads (1)

DEUTSCHE BUNDESBANK
EUROSYSTEM

Positionen	Forderungskl.	Ansatz	CCF	RW
900 Kredite à 1,5 (=1.350 €)	Mengengeschäft	IRB	100 %	(z.B.) 32 %
10 Kredite à 40 (=400 €)	Institute	KSA	100 %	(z.B.) 20 %
100 Kreditlinien à 5 (=500 €)	Unternehmen	KSA	50 %	(z.B.) 150 %

$$ADG^{Pos.w.} = \frac{1.350*1}{1.350*1 + 400*1 + 500*0,5} = 67,5\ \%$$

$$ADG^{ris.gew.\ Pos.w.} = \frac{1.350*1*0,32}{1.350*1*0,32 + 400*1*0,2 + 500*0,5*1,5} = 48,7\ \%$$

Beispiel: Bestimmung des Abdeckungsgrads (2)

Option zur Herausnahme von Positionen ggü. Instituten, da Anzahl kleiner als 40.

Positionen	Forderungskl.	Ansatz	CCF	RW
900 Kredite à 1,5 (=1.350 €)	Mengengeschäft	IRB	100 %	(z.B.) 32 %
~~10 Kredite à 40 (=400 €)~~ § 70 SolvV	Institute	KSA	100 %	(z.B.) 20 %
100 Kreditlinien à 5 (=500 €)	Unternehmen	KSA	50 %	(z.B.) 150 %

$$ADG^{Pos.w.} = \frac{1.350*1}{1.350*1 + 400*1 + \sout{500}*0,5} = 84,4\ \%$$

$$ADG^{ris.gew.\ Pos.w.} = \frac{1.350*1*0,32}{1.350*1*0,32 + \sout{400*1*0,2} + 500*0,5*1,5} = 53,5\ \%$$