BASEL II
Regulatory impact on treasury instruments
ECB MMCG, Meeting on 04.12.2007

Michael Schneider – Global Head of Liquidity & Collateral Management
## Introduction – Regulatory structure

<table>
<thead>
<tr>
<th>Solvency regulations</th>
<th>Large exposure regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International framework</strong></td>
<td><strong>None</strong></td>
</tr>
<tr>
<td>BASEL II</td>
<td></td>
</tr>
<tr>
<td>International convergence of the capital evaluation and equity requirements of the Basel Committee on Banking Supervision (26.06.2004)</td>
<td></td>
</tr>
<tr>
<td><strong>EU Capital Requirement Directive (CRD)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>EU law</strong></td>
<td></td>
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<tr>
<td>German Banking Act (KWG; 17.11.2006)</td>
<td></td>
</tr>
<tr>
<td>According to a letter from BaFin dated 28.05.2007, the application of SolvV and the approval of the risk valuation procedure means that from 2007 onwards the BIZ report will no longer need to be prepared.</td>
<td></td>
</tr>
<tr>
<td><strong>National law</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large Exposure and Million Loans Regulation (GroMiKV; 14.12.2006)</td>
</tr>
</tbody>
</table>
Introduction – Depiction of quota/credit amount 1/2

1.) Equity requirements for default risks and operational risks

\[
\text{Credit amount for default risks} + \text{Credit amount for operational risks} \leq \text{Available modified equity}
\]

2.) Equity requirements for market risks

\[
\text{Credit amount for market risk positions} + \text{Credit amount for option price risks} \leq \left( \text{Available modified equity} - \sum \text{Credit amounts for default risks and operational risks} \right) + \text{Available tier 3 funds}
\]

3.) Overall ratio

\[
\text{Eligible own funds} = \frac{12.5 \times \left( \sum \text{Credit amounts for default risks and operational risks} + \sum \text{Credit amounts for market risk positions and option risks} \right)}{\text{Overall ratio}}
\]

The **eligible own funds** are defined as:

\[
\text{Available modified equity} + \text{For securing the credit amounts for market risk positions and option transactions, utilised tier 3 funds}
\]
Introduction – Depiction of quota/credit amount 2/2

4.) Core capital ratio

The core capital ratio is not used to assess the adequacy of an institution’s own funds (§ 2 SolvV). It is, however, required as a further quantitative indicator within the framework of disclosure (§ 325 SolvV).

\[
12.5 \times \left( \sum \text{Credit amounts for default risks and operational risks} + \sum \text{Credit amounts for market risk positions and option risks} \right) = \text{Core capital ratio}
\]
Introduction – Principles and time schedule

SolvV remains true to the basic rule: equity ratio $\geq 8\%$

\[
\frac{\text{equity}}{\text{risk-weighted position value}} \geq 8\%
\]

SolvV is concerned mainly with ascertaining the risk-weighted position value. In addition to the overall credit amount for default risks, this value also encompasses the credit amounts for market risks and the operational risk.

The report in accordance with SolvV must be submitted by the AG and the group on each reporting cut-off date in each Bundesbank calendar quarter. The submission deadline for the AG is the 15th business day in the subsequent month, for the group the last business day of the subsequent month.
Solvency regulations – Three-pillar model

**Pillar 1**
Minimum capital requirements

**Default risk positions**
1) Balance-sheet default risk positions
2) Derivative default risk positions
3) Off-balance-sheet default risk positions
4) Advance payment risk positions
5) Handling risk positions

**Pillar 2**
Supervisory review process

**Market risk positions**
- Counterparty credit risks such as default risks in banking book
- Consideration of investment interests in trading book
- Other internal model

**Pillar 3**
Wider disclosure

**Default regulations**
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD
- CRD

**Market risk positions**
- SolvV
- SolvV
- SolvV
- SolvV
- SolvV
- SolvV
- SolvV
- MaRisk
- MaRisk
- MaRisk
- SolvV
- SolvV
- SolvV

**Special regulations**
1) Securitisations
2) Shareholdings
3) Hedging techniques (CRM)
Different approaches under SolvV – Credit risk

**Standard credit approach (SA)**
- Extension of Principle I old
- Derivation of risk weighting from client’s external ratings
- Consideration of warranties and financial collateral possible
- No supervisory approval procedure necessary

**IRB foundation approach**
- Risk weighting calculated on basis of bank’s internal ratings
- Loss ratios prescribed by supervisory authority (except for retail)
- Extended catalogue of loan collateral
- High demands on the quality of the data warehouse
- Supervisory approval procedure

**Advanced IRB approach**
- Risk weighting calculated on basis of bank’s internal ratings
- Consideration of internal estimates of the loss ratios (incl. collateral) and amount at risk of default
- Consideration of further parameters (e.g. important times to maturity)
- Very high demands on the quality of the data warehouse
- Detailed approval procedure

Advantages:
- Likely to be lower capital charge
- Commercial momentum through use of advanced risk valuation procedures

Advantages:
- Simpler implementation
- Lower demands on the processes

**Capital charge**
- High
- Low

**Implementation expense**
- Low
- High

**Advantages:**
- Likely to be lower capital charge
- Commercial momentum through use of advanced risk valuation procedures

**Advantages:**
- Simpler implementation
- Lower demands on the processes
**Treasury trading instruments: New vs. old solvency regulatory impacts**

**Assumption: IRB Bank**

### Open-market operations

### Unsec. assets (depot)

### Sec. assets (liqui-reserve)
- Governments
- Banks, corporates
- Securitisation position (ABS)

### Repo/Sec. lending
- Bilateral repos
- Tri-party repos

### Central counterparty

### Liquidity provider
- Credit facilities
- Facilities as securitisation position

<table>
<thead>
<tr>
<th></th>
<th>banking book</th>
<th>trading book</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>GSI old</strong></td>
<td><strong>SolvV</strong></td>
</tr>
<tr>
<td>0% RW</td>
<td>Depends on the customer group (0%, 20%, 50%, 100%)</td>
<td>Depends on the internal rating (PD, LGD, M)</td>
</tr>
<tr>
<td>0% RW</td>
<td>Depends on the customer group (0%, 20%, 50%, 100%)</td>
<td>Depends on the external issue rating</td>
</tr>
<tr>
<td>0% RW</td>
<td>Backing the repo object or the counterparty credit risk</td>
<td>Included using CRM techniques (incl. haircuts)</td>
</tr>
<tr>
<td>Orig. time to mat.</td>
<td>&lt;1y. → 0% CCF</td>
<td>75% CCF</td>
</tr>
</tbody>
</table>
Treasury trading instruments: New vs. old solvency regulatory impacts

**Assumption: IRB-Bank**

**Open-market operations**

**Unsec. assets (depot)**

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<th>banking book</th>
<th>trading book</th>
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<tbody>
<tr>
<td>Complexity</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Cost of equity</td>
<td>+/-</td>
<td>-/+</td>
</tr>
</tbody>
</table>

| Component | changed | Complexity | ++ |
| Component | changed | Complexity | +++ |
| Component | changed | Complexity | ++ |
| Cost of equity | +   | +          |

| Component | unchanged | Complexity | ++ |
| Component | changed | Complexity | (+++) |
| Component | changed | Complexity | ++ |
| Cost of equity | 0.00 € | ++ |

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05.12.2007
Calculation of the RWA under SA and IRBA for banking book transactions

Calculation of the risk-weighted assets (RWA):

**SA:** \[ RWA = \text{position value} \times \text{RW} \]

**IRBA:** \[ RWA = \text{position value} \times \text{RW} \]

* Overall: Depends on borrower and its external rating
* Individual: Depends on a diversity of variables within a risk weighting function

\[ 12.5 \times 1.06 \times (\text{conditional PD}^{**} - \text{forecast PD}) \times \text{LGD} \times \text{“residual term correction factor”} \]

* Position value = calculation basis x conversion factor
** incl. the economic correlation and incl. the correlation deduction for SMEs

Is influenced by the “decisive residual term”:  
5 y. with shareholdings  
0.5 y. with repo/loan  
1 y. with verifier risk  
2.5 y. with other
NEW: Change in the treatment of lending commitments

Under **SA**, open commitments must be taken into account with the following conversion factors:
- immediately callable credit lines 0%
- not immediately callable credit lines with an original term to maturity of no more than 1 year 20%
- not immediately callable credit lines with an original term to maturity of more than 1 year 50%

After calculation with the relevant conversion factor, the credit-related risk weighting is carried out.

Under **FIRB**, open commitments must be taken into account with the following conversion factors:
- 0% if the institution has granted the credit line as non-binding or if the institution has an unconditional right of cancellation without notice or
  - a deterioration in the debtor’s creditworthiness leads directly to the cancellation of the credit line that was granted, and if the institution actively monitors the debtor’s financial situation and the internal control and monitoring systems make it possible for the institution to recognise a deterioration in the debtor’s creditworthiness situation immediately,
- otherwise 75%

After calculation with the relevant conversion factor, the credit-related RWA calculation is carried out; the self-assessed probability of default (PD) must be taken into account.
Overview: Percentage capital relief for each hedging instrument

The following table represents, in simplified form, the percentage capital relief of the various hedging instruments under IRBA.

- Financial collateral and guarantees lead to very high regulatory relief.
- Assignments of receivables and charges on property lead to medium regulatory relief.
- Asset collateral lead to low regulatory relief.

<table>
<thead>
<tr>
<th>Supervisory collateral category</th>
<th>Deductions from the value of the collateral and/or the guarantee</th>
<th>CRM technique</th>
<th>Percentage RWA reduction [before] and after consideration of the fluctuation factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guarantees</td>
<td>Adjustment due to term mismatch: 8%</td>
<td>Substitution of the guaranteed part of the receivable with the risk weighting of the guarantor</td>
<td>[0% to 100%] 0% to 100% (Extent of relief effect depends on the PD of the borrower and guarantor)</td>
</tr>
<tr>
<td></td>
<td>Adjustments due to term mismatch, possibly up to 99.98%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial collateral</td>
<td>Adjustment due to value fluctuation: 25% x √2*** = 35.25%***</td>
<td>Reduction in the LGD for the secured part of the receivables from 45% to 0%</td>
<td>[100%] 53.5% to 100% (Extent of relief effect depends on the deduction)</td>
</tr>
<tr>
<td></td>
<td>Adjustment due to currency mismatch: 8% x √2** = 11.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Adjustments due to term mismatch, possibly up to 99.98%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assigned receivables</td>
<td>Adjustment due to overcollateralisation level: 1 – 1/1.25 = 20%</td>
<td>Reduction in the LGD for the secured part of the receivables from 45% to 35%</td>
<td>[22.2%] 17.8%</td>
</tr>
<tr>
<td>Recognised charges on property</td>
<td>Adjustment due to overcollateralisation level: 1 – 1/1.4 = 28.6%</td>
<td>Reduction in the LGD for the secured part of the receivables from 45% to 30%</td>
<td>[33.33] 23.8%</td>
</tr>
<tr>
<td>Asset collateral</td>
<td>Adjustment due to overcollateralisation level: 1 – 1/1.4 = 28.6%</td>
<td>Reduction in the LGD for the secured part of the receivables from 45% to 40%</td>
<td>[11.1%] 7.9%</td>
</tr>
</tbody>
</table>

* maximum with shares
** possibly plus adjustment in the event of non-daily revaluations
*** with a liquidation period of 20 days.
Bilateral repo transaction

- In order to ascertain the equity requirement for repo transactions, detailed information about the underlying factors for determining the relevant regulatory haircut are required.

- If no detailed information about the underlying factors is available, a “worst-case haircut” must be used, which in turn leads to a higher cost of equity (exercise care with basket trades).
Central counterparty (1/2)

- In accordance with § 1 para. 31 KWG, no own funds are to be deposited for SA and IRBA positions vis-à-vis central counterparties that are set up by means of a closed transaction or collateral furnished for the purpose (§ 49 para. 2 no. 7 and § 100 para. 10 SolvV)
- A central counterparty is a company which, in contracts of sale within one or more financial markets, acts as an intermediary between the buyer and the seller to serve as contracting partner for both of them, and whose receivables from counterparty default risks vis-à-vis everyone involved in its systems are sufficiently collateralised on a day-to-day basis.

- At present, the following business partners are approved as central counterparties:
  - EUREX AG (including Eurex GC Pooling)
  - LCH Clearnet
Central counterparty (2/2)

- The following companies have been earmarked for audits in respect of their classification as central counterparties:
  - SIS Swiss Financial Services Group AG (Switzerland),
  - Japan Government Bond Clearing Corporation (Japan),
  - Keler Central Depositary and Clearing House (Hungary),
  - Natural Gas Exchange Inc. (Canada),
  - Tel Aviv Stock Exchange Ltd. (Israel),
  - Canadian Depository for Securities Limited (Canada),
  - Moscow Interbank Currency Exchange (Russia),
  - Bolsa de Mercadorias & Futuros (Brazil),
  - LCH.Clearnet (United Kingdom),
  - Tokyo Financial Exchange Inc. (Japan),
  - Taiwan Stock Exchange Corporation (Taiwan/Republic of China),
  - Mercado a Termino de Rosario S.A. (Argentina),
  - Fixed Income Clearing Corp (USA)

- The audit is carried out in three stages:
  1. Checking the correct name of the company involved,
  2. Audit for criterion 1, i.e. identification of the types of transactions for which the company operates as a central contracting partner,
  3. Audit for criterion 2, i.e. identification of the types of transactions for which the company operates as a central contracting partner and is sufficiently collateralised.