



PÉNZÜGYI SZERVEZETEK  
ÁLLAMI FELÜGYELETE  
HUNGARIAN FINANCIAL  
SUPERVISORY AUTHORITY

## **VALIDATION GUIDELINES**

**ON THE IMPLEMENTATION, ASSESSMENT AND APPROVAL OF INTERNAL  
RATINGS BASED (IRB) APPROACHES AND ADVANCED MEASUREMENT  
APPROACHES (AMA)**

### **PART I INTERNAL RATINGS BASED APPROACH**

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## ABBREVIATIONS

AIG	Accord Implementation Group	Working group of BCBS for Basel II implementation
AIRB	Advanced Internal Rating Based Approach	
AMA	Advanced Measurement Approach	
ASA	Alternative Standardised Approach	
BCBS	Basel Committee of Banking Supervision	
BIA	Basic Indicator Approach	
BIS	Bank for International Settlements	
CEBS	Committee of European Banking Supervisors	
CF, CCF	(Credit) Conversion Factor	
CRD	Capital Requirement Directives	Directives 2006/48/EC (amended 2000/12) and 2006/49/EC (amended 93/6)
EAD	Exposure At Default	
ECB	European Central Bank	
EL	Expected Loss	
GL 9	Guideline 9	CEBS guidelines on the international cooperation of supervisory authorities
GL 10	Guideline 10	CEBS guidelines on the validation of IRB and AMA approaches
IFRS	International Financial Reporting Standards	
IMM	Internal Model Method	
IRB	Internal Rating Based Approach	
IT	Information Technology	
LGD	Loss Given Default	
MDB	Multilateral Development Bank	
PD	Probability of Default	
QRRE	Qualifying Revolving Retail Exposures	
TSA	The Standardised Approach	
ACI [Hpt.]	Act CXII of 1996	on Credit Institutions and Financial Enterprises
DCRR [Hkr.]	Government decree 196/2007	on the Management and Capital Requirement of Credit Risk
DOPR [Mkr.]	Government decree 200/2007	on the Management and Capital Requirement of Operational Risk
DTBR [Kkr.]	Government decree 244/2000	on the rules of calculating the capital requirement of positions, assumed risks, foreign exchange risk and large exposures registered in the trading book and on the detailed rules of keeping the trading book
DCPR [Pkk.]	Government decree 381/2007	on the Management of Counterparty Credit Risk



The fiducial  
Enforcement Act Act LIII of 1994  
The Civil Code Act IV of 1959  
The Bankruptcy  
Act Act XLIX of 1991

on fiducial Enforcement  
on the Civil Code of the Republic of Hungary  
on Bankruptcy Proceedings, Liquidation  
Proceedings



## 1 INTRODUCTION

### 1.1 *Purpose of the Guidelines*

1. At the end of 2005, in conjunction with the tasks related to the approval of advanced approaches that can be used under the new capital requirement rules (CRD), the management of the HFSA decided to develop guidelines explaining the steps of the validation process, giving guidance on the interpretation of the provisions of the Directive, explaining the position of the HFSA and its expectations regarding validation. As the CRD was not yet adapted into Hungarian legislation upon the release of the first version of the Validation Guidelines, the first version could only be based on the CRD and the related international materials as interpreted by the HFSA.
2. Since then, significant progress has been made both in the regulatory environment and in experiences gained. In early 2008, all laws that were directly related to the CRD were adapted into Hungarian legislation. Besides the release of statutory provisions, efforts in European Union committees, cooperation with home supervisors, pre-validation and validation projects, cooperation with institutions and questions posed by the institutions have all generated experiences at the HFSA which both called for and enabled the updating of the Validation Guidelines.
3. The CRD and the Hungarian laws that serve its local implementation make the use of advanced approaches (IRB, AMA) for capital requirement calculations subject to the approval of the supervisory authority. The issuance of such approval, however, embodies a significant departure from the former “Basel I” approach. This freedom of choice of institutions also means that the approval process and the subsequent permanent reviews must take into consideration all non-standard solutions as well while measuring institutions against a standardised set of criteria. **Therefore, under the “Basel II” approach, institutions are required to evidence their compliance with capital requirements to the Supervisory authority.**
4. When applying the Directive, one of the major challenges for supervisors is to decide when and on what basis to accept appropriateness, in other words, to identify the aforementioned standardised set of criteria. Furthermore, the expectations of supervisors should be harmonised across the EU and, as much as possible, should guarantee a level playing field for institutions applying AMA or IRB methodologies. The standardised interpretation of requirements for individual international banking groups is ensured by supervisory colleges set up for the consolidated supervision of such specific banking groups while harmonised interpretation across Member States is ensured by efforts in CEBS working committees. Based on experiences gained throughout Europe, an EU-level amendment to the CRD is under preparation. Besides the necessary technical modifications, the amendment will primarily address regulations on cooperation between supervisors, solvency capital and large risk exposures. At the same time, the HFSA also uses the experiences of domestic implementation, validation and pre-validation efforts to fine-tune the interpretation of applicable laws and, wherever necessary, to initiate amendments to those statutory provisions.

### 1.2 *Documents used*

5. The Guidelines are based on the consolidated English text of Directives 2006/48/EC and 2006/49/EC (Capital Requirement Directives), which contains the amendments adopted by the European Parliament on 28 September 2005. In the framework of the



co-decision procedure, this text was approved by the ECOFIN Council on 11 October 2005, then, following legal-linguistic review, the consolidated text was re-approved on 7 June 2006. The final text of the Directive was issued in the Official Journal (OJ) of the EU on 30 June 2006. After the directives were adapted into Hungarian legislation, legal references were extended to include references to domestic laws and government decrees.

6. Both the overall structure and the individual sections of the Guidelines follow that of the CEBS' GL 10 document. The CEBS paper on validation summarises the consensus reached by European supervisors and gives guidance, mainly to supervisors, on the examination, assessment and approval of the implementation of advanced approaches. In addition to heavily relying on the contents of GL 10, the Guidelines are not a Hungarian version of the invoked sections of the GL 10; instead, they contain the detailed interpretation of the subjects discussed therein as applicable to Hungarian circumstances. Interpretation was assisted by other consultation papers of the CEBS and BIS (Basel Committee on Banking Supervision) on this subject.
7. The sources of the Guidelines include the papers published on similar subjects on websites of other supervisory authorities, primarily of Member States, the consultation paper of the HFSA on the domestic adaptation of the new regulation, the paper written on the areas to be examined in the course of the approval of advanced approaches, as well as the HFSA's responses and position statements in respect of previous questions of banks. While processing that information, the HFSA did keep in mind that all documents and positions issued earlier reflected the conditions known and the knowledge available at the time.

### **1.3 *What is covered and what is not***

8. The purpose of these Guidelines is to explain, in the field of credit risk, the entire validation procedure for the IRB Approach, as well as the entire validation procedure of the AMA in the field of operational risk, and the criteria of the application of more simple methods (BIA, TSA, ASA), therefore it does not contain issues relating to the standardised approach to credit risks, market risks, or the second and third pillar. We use the term validation in multiple senses herein, referring either to validation to be performed by the institution or, in most cases, validation by the supervisor. Whenever we mean validation by the institution, we indicate it clearly in the text.
9. Operational risk is discussed as an independent part and therefore all related aspects (e.g. roll-out, internal governance, documentation requirements) are detailed in the chapter on operational risk. The resulting material is now a separate part, Volume II of the Guidelines.
10. GL 10 documents do not present credit risk mitigation techniques as the criteria of their eligibility differ from country to country. The HFSA, however, may not dispense with the thorough consideration of this topic. The chapter on the eligibility of collaterals will be published in Volume III of these Guidelines. The requirements on internal governance and purchased receivables will also be discussed in Volume III.
11. Although GL 10 documents address securitisation, these Guidelines do not discuss the subject. The same applies to credit derivatives. These topics are expected to be discussed at a later time.
12. These Guidelines do not set out detailed requirements concerning IT system architectures, contingency plans, data integrity and physical security. The discussion of these



topics is beyond the scope of IRB and AMA capital requirement calculations and relate to overall IT security. These requirements are regulated thoroughly by the ACI.

#### 1.4 *How these Guidelines were prepared*

13. The individual chapters were developed by thematic working groups comprising mathematicians, lawyers, economists and staff members working on supervision, licensing, regulation and methodological issues. Due to the working method and the subject matter concerned, the style of each chapter is slightly different, depending on the styles and wording preferences of the authors.
14. Regarding references to the Directive and applicable Hungarian laws herein, we chose to provide references only and did not usually quote any text.
15. The elaboration of certain chapters in the 2006 version of these Guidelines was assisted by the International Training Centre for Bankers of Budapest as professional advisors who won the assignment at a public procurement tender procedure. For elaborating the chapter on operational risk, the advisor also played the role of project leader. When updating the Guidelines in 2008, the HFSA did not employ the services of the Centre.
16. The CRD applies to credit institutions and investment firms which it collectively refers to as institutions. For the sake of simplicity, following the CRD, this paper uses the collective term “institutions” although Hungarian law does not use the term in this concise sense.
17. The CRD and, accordingly, the related Hungarian laws recognise two levels within capital requirement calculations that use the internal ratings based approach:
  - In addition to a PD based on their own estimates, institutions may use the LGD and CCF values<sup>1</sup> specified in the Directive,
  - if they comply with the criteria<sup>2</sup> set forth for the categories of exposures to corporations, institutions and central governments / central banks, they may use their own estimates to define the LGD and CFF values to be used in the risk weight formulae.
18. The CRD distinguishes the two levels by referring, in the case of (2), to “institutions authorised to use own LGD and CFF estimates”. Thereby the Directive avoids the terms ‘Foundation IRB Approach’ (only PD is based on own estimates) and the ‘Advanced IRB Approach’ (all risk parameters based on own estimates) used in the Revised Framework of Basel. However, as the Basel terminology is widely accepted and in order to simplify references, the Guidelines occasionally use the terms “Foundation” and

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<sup>1</sup> CRD Annex VII, Parts 2-3

<sup>2</sup> CRD Annex VII, Part 4



“Advanced IRB Approach” to distinguish between the two levels within the Internal Ratings Based Approach. Obviously, this differentiation does not apply to retail exposures, as method (1) is not applicable there.

19. The references to CRD articles relate to Directive 2006/48/EC and its Annexes. References to Directive 2006/49/EC are indicated clearly throughout the Guidelines.
20. Neither the CRD, the Hungarian laws that implement it nor the HFSA requires the simultaneous introduction of advanced approaches, i.e., the use of IRB for credit risk and that of AMA for operational risk. Institutions may select the approach to be used themselves and submit an application for approval concerning the implementation of advanced approaches.
21. When assessing the application for approval, all institutions must satisfy the minimum criteria set forth in the CRD and in applicable Hungarian laws, but the HFSA, mostly in respect of qualitative factors (e.g. organisational and governance requirements) does take into account, for the examination of compliance, the complexity of the institution and its business operations (principle of proportionality) along with its size.
22. Institutions may chose from several approaches, which may even be different from the solutions recommended and described in the HFSA Guidelines. If an institution gives an adequate explanation for the departure from the commonly accepted or recommended approach, the HFSA may accept such departure. Naturally, the statutory minimum requirements must be complied with in all cases.

## 1.5 *Contents*

23. The first two chapters of Volume I of the Guidelines examine the cooperation between supervisors from two aspects, from the aspects of the home (parent institution) supervisor and the host supervisor (of subsidiaries of international groups). In both functions, the HFSA is a party to the validation process, but its tasks and the interests it represents are different somewhat in each function. As most institutions supervised by the HFSA operate as part of an international group, it is important to explain the approval process in that context as well. The remaining chapters of the Guidelines provide guidance concerning the minimum requirements for the capital requirement calculation under the Internal Ratings Based Approach for credit risk and the key assessment criteria applied during the supervisory review. Thus Volume I addresses the topics of roll-out, permanent partial use, use test, portfolio segmentation, rules and expectations concerning rating systems and estimates of risk parameters, with special emphasis on the definition of important terms (default, loss). Volume II of the Guidelines describes the supervisory acceptance and approval conditions for the use of the various approaches to operational risk, in particular that of the AMA. Volume III sets out the eligibility criteria of collaterals, presents internal governance requirements and reviews purchased receivables.



## 2 COOPERATION BETWEEN SUPERVISORY AUTHORITIES IN THE COURSE OF VALIDATION

24. Article 129 (2) CRD and Articles 14/A-14/B of the ACI declare that in the course of the validation of advanced approaches (IRB, AMA, IMM), the supervisory authorities participating in the supervision of the group, headed by the home supervisor<sup>3</sup>, must cooperate in the approval process and, within six months of the submission of the application, they must make a joint decision concerning the application.
25. In the case of any advanced approach, the applying group or institution should submit the application to the home supervisor. The six-month assessment period starts on the date of the submission of the complete and full documentation. Following receipt of the complete package of documentation, the home supervisor must forward without delay a copy of the application and of the relevant documents to the host supervisors<sup>4</sup>.
26. Supervisory authorities in charge must do everything within their power to reach a joint position on the application. If the supervisors are unable to reach a consensus during the six-month period, the home supervisor must make the final decision; however, in this case it must take into consideration, to the utmost extent possible, the position of the host supervisors.
27. The permission is issued by the home supervisor. The document contains the detailed justification of the decision, including the considerations of the host supervisors and, in the absence of a consensus, the justification of the decision of the home supervisor as well. The approval is sent by the home supervisor to the applicant and to the supervisory authorities in charge. The decision set forth in the document shall be binding on the supervisors of the Member States concerned. In Hungary, the decision enters into effect directly thus the local Supervisor does not issue a resolution on approval on its own. In the case of groups and institutions for which the HFSA is the EU-level supervisor, the HFSA issues the approval resolution as home supervisor (for details please refer to section 3.2.3., Decision and approval.)
28. A Points 2.1 and 2.2 of the GL 10 on the validation of the IRB Approach and AMA contain detailed guidance on the cooperation of supervisory authorities in the validation process. To satisfy the requirements of the Directive, the competent supervisory authorities as well as the supervisors and the institution concerned need to cooperate.

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<sup>3</sup> Supervisor of the parent institution at EU level, also used as consolidating supervisor.

<sup>4</sup> Authority that supervises subsidiary institutions



29. Cooperation may be split into three stages:

- Pre-approval stage - preparation of supervisors and institutions, establishing contacts, preliminary review of the systems proposed to be implemented by the institutions, clarification of interpretation issues.
- Approval stage - submission of the complete application with the required content, supervisory review, decision-making.
- Post approval phase – continuous monitoring of the implementation and application of the approved systems.

Consultation and cooperation steps required in the various stages are set out in Annex I and II to GL 10.

## ***2.1 In the role of home supervisor***

30. As home supervisor, the HFSA is responsible for the international coordination and implementation of the approval process.

### **2.1.1 Principles**

31. When conducting the supervisory approval of the internal model based calculation of the IRB, AMA and IMM in the role of the home supervisor, the HFSA enforces and acts on the basis of the following principles:

- The HFSA coordinates the supervisory cooperation through the application of internal models in line with international recommendations and guidelines, in particular the Guidelines for Co-operation between Consolidating Supervisors and Host Supervisors (GL 09) and the Validation Guideline (GL 10), and it strives for effective cooperation.
- The HFSA decides on the form of cooperation in a differentiated manner for each institution, based on a case-by-case assessment.
- For determining the significance of the institution, the HFSA shall rely on the criteria set out in Section 30 of GL 09 on the role of the subsidiary within the group. The subsidiary is to be considered significant by the home supervisor if any of the following conditions apply:
  - The subsidiary's contribution to the group's<sup>5</sup>

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<sup>5</sup> Consideration concerning the bases of projection to be used for determining ratios: The calculation should be based on consolidated figures on the group level and on balance sheet and income statement data after the elimination of consolidated items on the individual (subsidiary) level. This approach is correct both mathematically and economically, as the individual balance sheets add up to the consolidated balance sheet, and their content, following consolidation, shows the real contribution of the various firms to the consolidated results. The disadvantage of the approach is that the consolidated balance sheet is included in the flash re-



- Total assets > 3%, or
  - Profits > 10%
  - The risk of its activities is deemed material for the group.
  - The internal governance and risk management structure of the group is de-centralised and top management is unable to control in full the risks of individual units.
  - The various units have strong autonomy.
  - A correlation of risks exists among individual units.
32. In the course of preliminary discussions, the HFSA discusses issues of significance with host supervisors, and arrives at a joint position; in the course of this process, it must take into account the considerations of host supervisors. If, based on paragraph 30 of the GL 09, the institution is to be considered significant on the local market by the host supervisor, it is to be treated as significant in the future from that point on.
33. Considerations for determining the form of cooperation:
- the significance of the institution, as agreed by the competent supervisors in the pre-approval period;
  - the approach intended to be implemented in the country concerned;
  - the EU membership of the country concerned;
  - in the case of non-EU countries, the HFSA's assessment of the supervisory authority concerned;
  - as well as any other specific relevant information.
34. Accordingly, in order to determine the depth and form of cooperation, the HFSA classifies institutions into the following categories:

<b>Classification</b>	<b>Strategy</b>
1. Significant subsidiaries or branch offices that use internal models (IRB, IMM or AMA) for measuring credit risk, market risk or operational risk and elaborate local models <sup>6</sup> for certain asset groups / risks.	High-level involvement of the host supervisor is required. During the approval process, the host supervisor is responsible for controlling the local implementation of centrally developed models <sup>7</sup> and for the validation of local models. The HFSA may conclude a special

ports to the stock exchange, but the figures for the various subsidiaries (after consolidation) are not, therefore they must be obtained separately from the parent institution.

<sup>6</sup> In the case of credit risk, local model development means the development of parameter estimation models and rating models by the subsidiary.

<sup>7</sup> A centrally developed model refers to a parameter estimation model developed by the parent institution or sister institution and introduced/implemented at the subsidiary.



Classification	Strategy
	agreement with the host supervisor on participation in on-site audits. Continuous exchange of information and regular contacts with the host supervisor are necessary.
2. Significant subsidiaries or branch offices that use a standardised approach to measure credit risk or operational risk and a simple method to measure market risk, but their parent bank uses an advanced approach (IRB, IMM or AMA). Roll-out to advanced approaches is expected at a later point of time.	The host supervisor participates in the approval process. Commenting on the roll-out plan and participation in the establishment of criteria for future conversion are especially important responsibilities. In the event of a subsequent conversion, the monitoring of roll-out plan implementation is principally the task of the host supervisor, but the HFSA also monitors the process and collects progress information on an ongoing basis through the parent institution (see the chapter on roll-out herein). Continuous exchange of information and regular contacts with the host supervisor are necessary.
3. Significant subsidiaries or branch offices that are expected to use a standardised approach permanently to measure credit risk or operational risk but their parent bank uses an advanced approach (IRB, IMM or AMA).	If the subsidiary uses a standardised approach permanently, the HFSA will negotiate with the supervisor concerned about permanent use. Basically, the relationship is limited to the fair provision of information on the part of the HFSA, but other arrangements may also be devised by way of harmonisation between peer supervisors.
4. Non-significant subsidiaries or branch offices that apply an advanced approach to measure credit risk or operational risk. Development of local models is limited or non-existent, management and risk management is very centralised.	Central models are developed due to the high degree of centralisation. Basically, tasks relating to local application are performed by host supervisors. When necessary, the HFSA participates in this effort to the necessary extent. The low level of significance does not call for the full involvement of the host supervisor in actual cooperation, yet it should be involved in the information flow as necessary, it should be kept duly informed and should have the opportunity to provide comments where justified.
5. Non-significant subsidiaries or branch offices that are expected to use a standardised approach permanently to measure credit risk or operational risk.	Due to the approach selected and the low level of significance, involvement of the host supervisor is justified only to a limited extent, but it should be kept duly informed.

35. The framework, specific content and form of cooperation relating to approval must be defined in written agreements. If (at least three of) the relevant authorities agree, the HFSA does not exclude the possibility of concluding multilateral Memorandum of Understanding. If the supervisory authorities of more than one country are affected in connection with an institution, the HFSA organises so-called single-pole cooperation. The objective is to ensure that all information flow among the relevant supervisors is through the HFSA so that the loss of information is avoided.



36. During both the approval process and ongoing post-approval supervision, the HFSA places special emphasis on reaching a consensus with host supervisory authorities. Unilateral decision making in the absence of a consensus should be an exception.
37. The cover letter and the group-level documents to be submitted should be in Hungarian and in English, documents of foreign subsidiaries (subsidiary groups) should be in English, documents of Hungarian subsidiaries should be in Hungarian (the cover letter should be a printed copy whereas the application package should be on an electronic medium). In exceptional cases, on the reasonable demand of institution's or the host supervisor, the language of the documentation to be forwarded abroad may be other than English. Yet these arrangements should be agreed by all involved parties in advance. The HFSA shall do its best to reach a consensus with the other parties also on the issue of language.
38. In the context of organising international cooperation, the HFSA will strive to avoid the duplication of tasks for institutions and to reduce the workload on the sector as much as possible.

## 2.1.2 Tasks

### Pre-application stage

39. The HFSA expects institutions intending to apply internal ratings based approaches to inform it on these intentions in due time and prior to the legal approval process. Information is especially important in instances when the involvement of host supervisors is necessary due to foreign subsidiaries. In the pre-approval phase, the HFSA should strive for developing good cooperation with the institution concerned and, as applicable laws allow, it should provide all reasonably expectable assistance to the preparation of the institution. The purpose of cooperation in the pre-approval stage is primarily to discuss issues of interpretation, to ensure the settlement of any outstanding issues or disputes as soon as possible, and to fix any application that the HFSA considers incorrect.
40. In the pre-application phase, the HFSA performs the following tasks regarding the institution that submitted the request for approval:
  - Seeks information on an ongoing basis concerning the approaches and models to be implemented by the institution.
  - Based on the cooperation with the institution and the approach to be applied, the supervisor determines the way and means of monitoring the institution's preparation. The primary forms of monitoring will include the assessment of summaries and other documentation submitted in writing, the conducting of consultation sessions and interviews, assessment of replies to questionnaires and on-site collection of information.
  - The HFSA introduces the approval process to the applicant along with the requirements that the applicant should comply with.
  - It strives for settling, as soon as possible, any disagreements or differences in interpretation and to achieve a consensus. In the course of the settlement of interpretation issues or disputes, the starting point should be the principle of a level playing field, and the HFSA should rely strongly on international experiences. To that end, it contacts major foreign supervisory authorities, or the relevant international organisations or committees, and informs the institution without delay about the supervisor's position developed in view of the responses received.



- It may conduct a pre-validation procedure to familiarise itself with the process implemented by the supervised institution.
  - In the course of consultations with the applicant, the HFSA provides information on the proposed schedule of the assessment, in particular on the timing of tasks for the institution (e.g. the time of the on-site audit of the rating systems by the HFSA) and on the delivery of (interim) (pre-) validation results.
41. In the pre-application phase, the HFSA should strive for assuring the following criteria in its cooperation with the host supervisors concerned. In particular, the HFSA shall
- create the framework for bilateral cooperation; in the absence of a general bilateral Memorandum of Understanding between the HFSA and the relevant host supervisors, the HFSA encourages the conclusion of such MoU.
  - specify the role of the relevant supervisors based on the assessment of the subsidiaries' significance and reach an agreement with these supervisors on the issue of significance and on the level of cooperation.
  - contact host supervisors in order to familiarise itself with the model(s) proposed by the institution.
  - establish the framework of cooperation regarding the institution concerned. In line with the aforementioned principles, the HFSA defines the framework, content and form of cooperation with host supervisors and checks it with the relevant authorities. When determining the framework of cooperation, it is essential to specify what the HFSA expects from the foreign supervisor in respect of its role and tasks in the cooperation. If the host supervisor participates in the approval process, both the tasks relating to approval and the subsequent, mostly general responsibilities (essentially monitoring tasks) should be identified during the of establishment of the framework of cooperation. The specific scope of cooperation must be set out in writing.
  - elaborate the supervisory action plan that sets out the steps to be made by the HFSA, the main issues, actions and schedule concerning cooperation between the institution concerned and the host supervisors concerned.
  - elaborate the strategy for communication in order to ensure the necessary exchange of information among supervisors and harmonises this strategy with the host supervisors. Besides serving the approval process, this step also fosters the continuous cooperation among supervisors in the post-approval phase. The information strategy must encompass the written exchange of information and the elaboration of the system of cooperation which should take place in the form of consultations on expert and management levels.
  - evaluate host supervisors in the case of non-EU countries. This evaluation takes place through bilateral, expert level meetings where the HFSA learns about the supervisory and audit methods of the host supervisors, the supervisory tool sets they apply, their CRD capabilities, etc.
  - identify and communicate any issues, problems and material issues to be taken into consideration in the approval process either the group or on the local level.
  - identify any areas where disagreements may arise between the institution and any supervisory authority. The HFSA should appropriately communicate and settle any disagreements as soon as possible.
  - negotiate an agreement on the monitoring of implementation, with special attention to the fact that the home supervisor is responsible for setting up the



schedule of discussions between the host supervisors and that the host supervisors are responsible for complying with that schedule.

### **Approval**

42. During the approval process, the HFSA should act in accordance with its internal procedures and, when foreign subsidiaries are involved, with the cooperation agreement signed with the host supervisors, as set out in the “Approval process” section herein.

### **Post-approval phase**

43. As part of its responsibilities as home supervisor, the HFSA should make efforts to maintain the effective cooperation of host supervisors also after the approval. The specific tasks for the post-approval stage are set out in the applicable agreements with the relevant supervisors. Basically, the related tasks are as follows. The HFSA shall:

- coordinate the monitoring of implementation and organise international cooperation with the competent supervisory authorities.
- coordinate and execute the exchange of information between supervisors in line with the communication strategy.
- participate in on-site audits abroad and coordinate the results of such audits based on the cooperation agreements on validation tasks.
- monitor the operation of the approved system on an ongoing basis.

## ***2.2 In the role of host supervisor***

### **2.2.1 Principles**

44. As most players on the Hungarian financial market are subsidiaries of large international financial groups, the HFSA supervises them in a host role. In the host supervisor’s role, the HFSA acts along the following principles:

- Pursuant to international recommendations and guidelines, in particular the GL 09 and the GL 10, the HFSA participates in the approval procedure, striving for effective cooperation throughout the entire process.
- The HFSA shall make efforts to document the cooperation in writing.
- During the harmonisation steps, the HFSA should make it a point to have the home supervisor submit all approval documentation in English.
- The HFSA shall assess each proposal submitted by home supervisors on the form of cooperation individually and in a differentiated manner.



- To determine the significance of an institution, the HFSA shall apply the criteria on the subsidiary's role on the domestic market as set out in Section 30 of the GL 9. Thus a subsidiary should be considered significant if any of the following criteria apply:
- The subsidiary's contribution to the domestic market's<sup>8</sup>
  - total assets > 3%
  - credit portfolio >3%
  - mortgage loan portfolio >2%
  - deposit portfolio > 3%
  - profits > 5%
- Based on its activities, the subsidiary is a market leader in a certain segment or in a special type of operations (e.g. futures market, government securities market, custody, etc.)
- It plays an integral role in the financial system (value of payments, stock exchange, clearing house)
- It contributes significantly to the liquidity of the market (either for the entire market or for a specific segment)
- When determining the specific form of cooperation, at least the following criteria should be taken into consideration:
  - the significance of the institution (as per section 30 of the GL 9), as agreed by the competent supervisors in the pre-approval period
  - the approach that the institution intends to apply both at group and at local level (the HFSA must also participate in approval if a standard method is proposed for the local level but advanced methods are implemented at group level)
  - whether a method will be developed locally
  - the EU membership of the country concerned
  - in the case of non-EU countries, the HFSA's assessment of the home supervisor concerned
  - as well as any other relevant information.
- Under any form of cooperation, local management expected to be fully familiar with the risk profile of the subsidiary/branch office concerned and to ensure for capital adequacy accordingly. It also means that local management must have good understanding of the operation of the underlying systems, fully possess all information relating to the implementation of the new capital calculation systems and must be able to demonstrate all this to the HFSA if so requested.<sup>9</sup>

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<sup>8</sup> The calculation is based on data received in mandatory reports to the Supervisor.

<sup>9</sup> CRD Annex VII, Part 4, Articles 124-127; DCRR Article 93.



- When central models are applied at a non-significant institution or a non-significant branch office, the HFSA will not insist on gaining an in-depth knowledge of the models. Nevertheless, the HFSA will make it a point to understand the key characteristics and assumptions of those models. See also the “Approval process” section herein.

45. The planned levels of cooperation and the strategies assigned to the specific levels:

<b>Classification</b>	<b>Strategy</b>
1. Significant institutions that use centrally developed internal models (IRB, IMM or AMA) for measuring credit risk, market risk or operational risk and elaborate local models for certain asset groups / risks.	The objective is to gain an in-depth knowledge of the centrally developed models. During the approval process, the task is to review the implementation of central models and to validate the local ones. Active participation in the process is necessary, along with regular contact keeping with the institution and the home supervisor both in the pre-validation and validation phase.
2. Significant subsidiaries or branch offices that use a standardised approach to measure credit risk or operational risk or a simple method to measure market risk, but their parent bank uses an advanced approach (IRB, IMM or AMA). Roll-out to advanced approaches is expected at a later point of time.	The HFSA needs to participate in the approval process, in particular in the assessment of the roll-out plan and in the setting of terms and conditions for future roll-out. The objective is to gain an in-depth knowledge of the centrally developed models. During the approval process, the task is to review the implementation of central models and to validate the local ones. Active participation in the process is necessary, along with regular contact keeping with the institution and the home supervisor in the pre-validation phase.
3. Significant subsidiaries or branch offices that are expected to use a standardised approach permanently to measure credit risk or operational risk but their parent bank uses an advanced approach (IRB, IMM or AMA).	If the subsidiary uses a standardised approach permanently, the HFSA will negotiate with the home supervisor about permanent partial use. (As advanced approaches expect a higher degree of risk awareness, significant institutions and their parent companies should be encouraged to avoid using this option.)
4. Non-significant subsidiaries or branch offices that apply an advanced approach to measure credit risk, market risk or operational risk (IRB, IMM or AMA). Development of local models is limited or non-existent, management and risk management are heavily centralised.	Central models are developed due to the high degree of centralisation. The HFSA's tasks relate to local application. Active participation is needed in the information flow during the approval process but the in-depth knowledge of the central model is not required. Regular contact keeping is required in the pre-application phase.
5. Non-significant subsidiaries or branch offices that are expected to use a standardised approach permanently to measure credit risk or operational risk.	Due to the approach selected and the low level of significance involved, only due information is needed from the home supervisor.



## 2.2.2 Tasks

### Pre-application process

46. The HFSA assesses tasks and obtains detailed information on the models to be implemented.
47. Forming of relations with the home supervisor
  - Initiation of the revision of Memoranda of Understanding
  - Laying down the forms of regular exchange of information at expert level
  - Setting of the host strategy based on significance

### Approval

48. In the course of the approval process, the HFSA proceeds in accordance with its internal procedures and the cooperation agreement concluded with the home supervisor(s).

### Post-approval phase

49. The HFSA's responsibilities are as follows:
  - Monitoring of implementation, in particular the roll-out plan and the fulfilment of conditions set out in the approval.
  - If any problems are encountered during implementation, the HFSA will inform the home supervisor. In the case of severe deficiencies, it may initiate the amendment of the roll-out plan or the revocation of the permission.
  - In line with the communication strategy, the HFSA participates in the exchange of information. It informs the supervisors involved about the risk structure of the institution and requests information on the parent institution's risk structure. The supervisors may also keep each other informed on the findings of on-site audits.
  - In accordance with the Memorandum of Understanding, the HFSA participates in on-site audits abroad and in audits performed by the home supervisor at the Hungarian subsidiary.



### 3 APPROVAL PROCESS

50. The HFSA's permission is required for the application of
- a) Internal Ratings Based Approaches (Foundation IRB and Advanced IRB)<sup>10</sup> in respect of the capital requirement of credit risk;
  - b) the Standardised Approach (in order to verify the fulfilment of application criteria), the Alternative Standardised Approach<sup>11</sup>, the Advanced Measurement Approach<sup>12</sup> or a capital requirement calculation based on the combination of different approaches<sup>13</sup> to determine the capital requirement for operational risk;
  - c) the Internal Model-based Approach<sup>14</sup> for calculating the capital requirement for position risk, commodity risk and foreign exchange risk
  - d) own haircut in the case of a comprehensive approach to credit risk and for the use of an internal model<sup>15</sup> in the case of netting.
51. In the case of the approaches that require an HFSA approval, the institutions (!) need to provide sufficient explanation on their choice of approach in their application and in the attached documentation, prove the appropriateness of those approaches and demonstrate to the HFSA that their systems comply with the criteria set out in the Directive concerning the use of the approaches concerned.
52. The applicant shall submit the application to the home supervisor (see Chapter "Cooperation between supervisory authorities"). The supervisory review is based on the assessment of the documents submitted (with additional supplementary submissions if required) and on the findings of the on-site audit(s).
53. In the context of the approval process, the terms approval/opinion mean the following:

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<sup>10</sup> CRD Article 84; ACI Article 76/B (1)-(5), (14)

<sup>11</sup> CRD Article 104; ACI Article 76/J (3); DOPR Article 4 (5)

<sup>12</sup> CRD Article 105; ACI Article 76/J (4), (8)

<sup>13</sup> CRD Article 102 (4); ACI Article 76/J (5)

<sup>14</sup> Annex V to 2006/49/EC; DTBR Chapter IX

<sup>15</sup> CRD, Annex VIII, Part 3; DCRR Articles 3, 127-155



Home	Host
<p>Approval:</p> <p>As home supervisor, the approval of group-level applications that are within the scope of the HFSA's decision-making competence; assessment of the suitability of models, group-level governance and risk management functions.</p>	<p>Opinion:</p> <p>Section (39) of the GL 10 declares that in the case of locally developed models, the host supervisor should “lead” the assessment of the locally developed models and the local implementation of centrally developed models. As the permission, however, is issued by the home supervisor who also has the decisive vote in the case disagreements, in practice the HFSA can only express its opinion.</p> <p>Depending on the subsidiary's significance<sup>16</sup> in Hungary and the areas to be assessed (model, implementation, roll-out, permanent partial use), the HFSA may wish to exercise a “strong” or “weak” right of providing an opinion.</p>

54. “Strong” or “weak” opinion indicates the extent to which the HFSA, in the course of cooperation with the home supervisors, wishes to enforce its position. In case of a “weak” opinion, the HFSA does not closely monitor the extent to which its opinion is taken into account in the group-level decision. In the case of a “strong” opinion, however, the HFSA intends to employ all the means available under the cooperation framework to assure that its opinion is taken into account when issuing the approval or determining its conditions.

### 3.1 *Pre-approval phase*

55. Considering that the six-month period available for decision-making is relatively short, the so-called pre-application period is crucial. It should be used for gaining an understanding of the systems to be approved and for developing the framework for the joint efforts. In the case of institutions that are significant on the Hungarian market, the HFSA makes it a point to review the proposed solutions at an on-site pre-validation exercise before the application is submitted. The pre-validation exercise also provides an opportunity for consultations prior to implementation.

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<sup>16</sup> The principles for determining the level of significance are set out in chapter “Cooperation between supervisory authorities”



## 3.2 Approval phase

56. The approval process is illustrated in the schematic chart presented in the Annex hereto and consists of three main stages: submission of the application, supervisory assessment, decision-making and approval.

### 3.2.1 Submission of the application

57. The application and the documentation package which the HFSA received either from the applying group leader institution (home role) or from the home supervisor (host role) is then assigned to a so-called sponsor. The sponsor manages and coordinates the efforts of the various expert areas of the HFSA throughout the approval process. The sponsor's role is fulfilled by the senior supervisor in charge with the institution or group concerned.

58. The application and documentation package:

Home	Host
<p>As home supervisor, the HFSA sets forth the following expectations:</p> <p>The cover letter is the actual official application for permission. It has to include a statement that the contents of the attached documents are true and fair and that they include, despite their summary form, all information that is considered material for the assessment of the application.</p> <p>As to the language of the documentation to be submitted, see section 37.</p> <p>The application has to be signed by the top executive of the institution (chairman or chairman-CEO) and the internal board member in charge with risk management. The cover letter must name the contact person designated by the group of institutions.</p> <p>The minimum contents of the documentation package to be submitted is set out in the Annex hereto (List of Documents). The documentation should take a top to bottom approach, i.e. it should progress from a general view to addressing particular details.</p>	<p>In the host supervisor's role, the HFSA accepts the documentation forwarded by the home supervisor as application documentation (in this case, it is the home supervisor's responsibility to check the submission for compliance with the requirements on format and contents). At the same time, the HFSA may request the institution that belongs to its supervision to submit supplementary documentation if it is needed for developing an opinion on specific areas.</p> <p>In the course of cooperation, it should be a general goal to ensure that all documents submitted to the HFSA should be in English.</p>

59. As the first step in the process, the Licensing Department assesses the formal completeness of the submitted documentation and the sponsor assesses its contents regarding basic compliance. If the HFSA detects any deficiency, it sends a request to the applicant institution for submitting the missing documents or calls the attention of the home supervisor to the missing documents, requesting their submission.

60. The six-month period available for the assessment of a group-level application starts when the application package is received in full.



### 3.2.2 Supervisory assessment

61. If the application complies with the requirements in terms of format and basic contents, the sponsor submits a proposal to the Working Committee, a body consisting of the representatives of HFSA areas in charge with assessing the application, outlining the depth of the supervisor's assessment and the schedule of on-site and off-site examinations. The proposal of the sponsor depends on the home or host supervisor role fulfilled in respect of the institution concerned and on the institution's significance as determined in the pre-application period.
62. When elaborating the proposal, the sponsor develops an overall understanding of the systems outlined in the application by reviewing the following:
  - Suitability of the organizational structure, distribution of responsibilities and functions, management, measurement and controlling of risks;
  - Sufficiency of available material and human resources, feasibility of the implementation plan and the roll-out<sup>17</sup> plan;
  - The structure of the group, data of the individual entities within the group, chosen methods, controls, and the level of capital adequacy.
63. Based on the supervisory assessment procedure approved by the Working Committee, the sponsor forwards in electronic form the documentation package or the relevant parts thereof to the areas in charge (also to host supervisors when acting as home supervisor), complete with schedules and deadlines.
64. During the supervisory assessment, it should be verified that the system developed at the institution complies with the requirements of the CRD. The considerations of assessment are set out in the relevant chapters of this Validation Guidelines. As a basic principle for the assessment of the application (and of the documents to be submitted), it is the applicant (!) who needs to demonstrate to the HFSA that the systems applied are suitable for their intended purpose and fulfil the minimum application requirements set out in the CRD, i.e. validation is primarily the task of the institutions. The HFSA evaluates this demonstration by the applicant and may override the result of the independent review.
65. Assessment actually means the comprehensive examination of the rating systems and operational risk measurement systems so that the HFSA can state whether
  - the systems comply with the requirements on use tests and experience tests,

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<sup>17</sup> Roll-out period: the aggregate time of individual periods marked by deadlines after the initial approval has been granted.

Implementation period: the stages including the pre-approval period and the roll-out period combined.



- the outputs are suitable for the declared purpose, including the calculation of the regulatory capital,
  - the institution applies suitable systems and controls with a view to the actual circumstances (country, size, complexity, etc.),
  - they comply with all other minimum requirements.
66. If any additional information is needed during the assessment, the sponsor should inform the applicant when acting as home supervisor, or to the home supervisor when acting as host supervisor. If the HFSA as home supervisor is in charge with issuing the permission and detects a substantial deficiency that may jeopardise approval, the six-month time limit for the approval process may be suspended.
67. In order to improve efficiency, the HFSA may rely on the resources of the institutions (internal audit, internal organisational unit responsible for model validation, users of the models) or on external resources (e.g. external auditors).
68. If a cross-border merger or acquisition takes place during the planning or implementation stage of the supervisor's assessment and, as a result, a new home supervisor replaces the original one, the provisions of Section (92) of GL 10 should be applied.

### 3.2.3 Decision, permission<sup>18</sup>

69. Having collected the opinions of specialist areas and host supervisors as home supervisor and having collected the opinions of specialist areas as host supervisor, the sponsor compiles a report with the main findings. When preparing the report, the sponsor assesses the documentation, the results of on-site and off-site examinations and other available information, e.g. information received from the home supervisor, the group leader institution, etc. If the assessment can be closed, the Licensing Department prepares the supervisory resolution (addressed to the applicant) or the positive or negative opinion (for the home supervisor). The permission or opinion must also include the applicable terms and conditions, if any. Attempts should be made to reach an agreement concerning conditions during the six-month consultation period with home or host supervisors, and the conditions must already be known by the applicant. The setting of terms and conditions without prior consultation should be avoided.
70. The group-level decision is embodied in a single document, prepared and sent to the applicant by the home supervisor. The reasoning behind the decision must be explained in detail. This explanation should include the terms and conditions of the permission (on the group or national level), if any, as well as recommendations for addressing any minor deficiencies identified during the assessment or for the improvement of the sys-

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<sup>18</sup> Decision: the final act in the approval process, the result of the consultation between the competent authorities. Permission: the manifestation of the decision in legal form.



tem. The reasoning behind the decision must clearly set out references to relevant laws and to the application documents. The permission must contain at least the following:

- opinion on the application (detailing whether the application and the models provide appropriate coverage),
- assessment findings, covering compliance with the CRD's requirements
- requirements and recommendations concerning the remedies of deficiencies along with the related deadlines.

71. The document should include the agreement of supervisors on the timing of supervisory actions, the approved roll-out schedule and the requirements concerning the use test.
72. The home supervisor should go out of its way to ensure that the decision is transposed in each host country in line with applicable national regulations as soon as possible.
73. The document representing a group-level decision must be transposed in a fully binding manner through national permissions. The permission enters into force simultaneously in all affected (home and all host) countries (this is one of the things supervisors must agree on), and this common effective date must be included in the permission.
74. When the HFSA is in the host supervisor's role, the resolution of a member state home supervisory authority can be directly applied and implemented in Hungary. The HFSA will disclosure on its home page in Hungarian and in English that a member state authority has released a resolution. Concerning institutions that belong to the HFSA's authority, the execution of the resolution of another member state's supervisor authority, the supervision of fulfilment, measures that can be taken based on such supervision should all be governed by Hungarian laws that apply to HFSA resolutions.<sup>19</sup>

### ***3.3 Post-approval process***

75. During and after the roll-out period, the HFSA will monitor on an ongoing basis (both on-site and off-site) whether the institution's operation complies with CRD rules and local regulations. The HFSA should also monitor the fulfilment of terms and conditions set out in the approval and in the approved roll-out plan. The person with primary responsibility for this is the supervisor of the institution. If a new decision is required due to the amendment of the roll-out plan, the competent authorities, too, must proceed in accordance with Article 129 of the CRD. After the end of the roll-out period, the fulfilment of the terms and conditions set out in the permission are reviewed by the home and host supervisors in a consultation process.

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<sup>19</sup> ACI Article 14/B (6)



## 4 ROLL-OUT AND PERMANENT PARTIAL USE

### 4.1 *Roll-out and permanent partial use*

#### 4.1.1 Principles

76. In relation to roll-out and permanent partial use, the HFSA wishes to enforce the following common principles:

- One important benefit of the application of advanced capital calculation approaches is the strengthening of the institution's risk awareness and the further improvement of their risk management systems. Therefore, the HFSA expects institutions, within the limits of financial reasonability, to develop their systems and internal operations in a way that enables the fastest possible fulfilment of IRB application requirements.
- In order to maintain the competitiveness of the Hungarian financial sector, the HFSA assigns key importance to
  - applying an approach that ensures a level playing field which at the same time excludes cherry-picking, including the unjustified temporary or permanent exemption of exposures from the application of the internal ratings based approach, resulting in a lower capital requirement (Article 85, 2),
  - the application of solutions and interpretations that are in line with international best practices,
  - the establishment of a sufficiently flexible system.
- In order to duly take into account institution-specific circumstances, the HFSA as home supervisor decides upon the approval of the roll-out and permanent partial use in respect of foreign subsidiaries based on a case-by-case assessment. The decision will be made with a view to the institution's significance and with the involvement of competent foreign supervisory authorities.

#### 4.1.2 Roll-out

77. The directive and the Hungarian laws and regulations require that if an IRB approach is used, it must be extended to all exposures of the group except for exposure classes / exposures / business units subject to permanent partial use (or other temporary exemption, see e.g. grandfathering of equity participations). At the same time, the Directive and paragraph (8) of Article 76/B of the ACI allows institutions intending to apply the



IRB approach to implement it gradually in a manner allowed by the HFSA and in compliance with the requirements set out in paragraphs (9)-(10) of Article 76/B in the ACI. This way, institutions do not need to fulfil all minimum criteria associated with the approach all at once and for all exposures already upon the start. The purpose of this option is to make the implementation of the IRB approach easier and more flexible for institutions who can thus schedule their preparation and optimise the utilisation of their resources for preparation accordingly. Roll-out, however, must not be applied for the unjustified reduction of the capital requirement (cherry picking).

78. Roll-out may be applied in the following scenarios<sup>20</sup>:

- In the case of transition from the standardised approach to the fundamental IRB approach:
  - for specific exposure classes or, in the case of the retail exposure class, for sub-classes
  - for specific business units.
- In the case of transition from the fundamental to an advanced IRB approach:
  - for exposures to corporations, credit institutions, investment enterprises and the central government / central bank (in this case, the migration should take place simultaneously for the estimation of both risk parameters (LGD and CCF)).

79. According to Section III/A 20 in Annex 2 to the ACI, a business unit is defined as a group of homogeneous exposures that is clearly identifiable based on criteria defined by a subsidiary or a credit institution and is treated differently from other exposures. A clearly identifiable other unit may refer to a unit that can be segregated based on legal, organisational or geographical criteria or to any other clearly specifiable group of homogeneous exposures (e.g. loans provided by the institution to its employees). A group of exposures is to be considered homogeneous if the institution treats the exposures within the group identically, but differently from other exposures. The bank must clearly define the business units used and justify the separate treatment. In the course of assessing the application, the HFSA pays special attention to the definition of business units applied by the bank and to the justification of the definition (separate treatment).

80. Only entire exposure classes or business units may be subjected to roll-out. In the retail class, roll-out is also allowed for three sub-classes: qualified revolving exposures, exposures secured by real estate collateral and other retail exposures.

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<sup>20</sup> CRD Article 85 (1); ACI 76/B. (7)-(8)



81. The IRB approach should be used for equity stakes<sup>21</sup> wherever the institution used this method to calculate the capital requirement of any other exposure class. There are two exceptions to this rule:
- equity participations exempted under permanent partial use in accordance with the chapter on permanent partial of these Validation Guidelines;
  - in respect of certain equity exposures, temporary exemption (grandfathering) granted on the basis of the transitional provisions of Article 75 in Act LI of 2007, up to 31 December 2017.
82. In addition to the above exemptions, domestic regulations provide yet another favourable facility for calculating the capital requirement for equity stakes held in companies providing ancillary services. According to Article 32 (2)<sup>22</sup> of the DCRR, the capital requirement of these equity stakes can be calculated with the approach applied for exposures that represent a non-credit obligation.
83. For the roll-out, institutions must elaborate a roll-out plan in accordance with Article 76/B (8) of the ACI. The roll-out plan is a mandatory element of the documentation to be submitted for the HFSA approval of the IRB approach. Its purpose is to present the implementation plans relating to the introduction and scheduling of the Foundation or Advanced IRB Approach to be used by the institution along with information relating to the current preparedness of the institution. The roll-out plan must cover all business units and exposure classes that the IRB approach does not cover at the time of introduction but for which the institution wishes to apply an IRB approach later, with the exception of the items subject to permanent partial use.
84. The HFSA's approval of the use of the IRB approach can only be issued if it is clearly transparent and identifiable for the HFSA (a third party) which approach and when exactly the institution intends to apply and for which sub-portfolio. Therefore, it is advised to handle the roll-out plan as a part of a comprehensive implementation plan which presents in a transparent and clear manner the portfolios for which the institution applies an IRB or the standardised approach, the ones intended for permanent partial use along with the scheduled launch time of the IRB approach in the case of roll-out portfolios. It is advised to provide an explanation in the implementation plan concerning the institution's choice of approaches applied or to be applied and to prove compliance with the applicable conditions. It is important that the aggregate value of portfolios under IRB approach, the standardised approach and those benefiting from permanent partial use should equal the grand total of the institution's on and off-balance sheet exposures and that it is supported with figures. The choice of approach, the calculations and the explanation should be presented for institutions subject to con-

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<sup>21</sup> CRD Article 85 (3); ACI Article 76/B (11)

<sup>22</sup> CRD, Annex VI, Part I, Article 18



solidated supervision (i.e. requirements also have to be fulfilled at the consolidated level, not only on a stand alone [solo] basis).

85. The roll-out section of the implementation plan should include at least the following:
- the principles, theoretical considerations and criteria used by the institution in relation to roll-out;
  - the proposed time schedule for the application of the approach broken down by exposure class and/or business unit subject to the roll-out. The schedule should contain not only the final deadline but also the logical interim steps and their deadlines. The level of detail in the schedule is a decisive element in the evaluation of the roll-out plan.
  - presentation of the level or preparedness, as at the time of the submission of the application, of each exposure class and/or business unit subject to the roll-out. This presentation should describe progress to date in the field concerned, the actions taken and the related results, along with the assessment of these by the institution (self assessment).
  - the reasons of the roll-out for each exposure class and/or business unit subject to roll-out.
  - the definition of the business unit(s) subject to roll-out as well as the explanation of their separate treatment.
86. The HFSA sets out the following requirements concerning the roll-out-related section of the implementation plan. The plan should
- be realistic, i.e. feasible along a reasonable schedule,
  - be based on the best effort of the institution,
  - the sequence of the roll-out should be based on the priority of exposure classes, i.e. the advanced approach should be implemented first at business units that are of key importance for the institution's operation (core operations).
87. With a view to international practices, the HFSA requires the fulfilment of the following three conditions for the implementation of the IRB approach through roll-out:
- at the time of the submission of the application, at least 50% of the risk-weighted on-and off-balance sheet assets should be covered by the internal ratings based approach (entry threshold);
  - the roll-out should ensure that within five years the proposed internal ratings based approach is extended to all on- and off-balance sheet exposures, with the exception of exposures/exposure classes/business units subject to permanent partial use. The five-years should be counted from the date of the supervisory approval concerning the use of the more advanced approach. Upon the submission of the application, the approval date must be calculated on the basis of the maximum time available for the HFSA for approval.
  - Within the five-year roll-out period, it has to be ensured that IRB coverage reaches at least 67% of the basis of reference (risk weighted on- and off-balance sheet assets, with the exception of exposures subject to permanent partial use) within 2.5 years after the start of the roll-out period.
88. The entry threshold for roll-out is applicable both upon transition from the standardised approach to the Foundation IRB Approach and upon transition from the Foundation IRB Approach to the Advanced IRB Approach. The five-year period is available separately for both cases. For the calculation of coverage, specialised lending treated



under the slotting approach is to be regarded as exposure under the proposed IRB approach, whereas participations that can temporarily be kept under the standardised approach due to grandfathering<sup>23</sup> are not and must be considered among the portfolios under standardised approach. In the case of transition from the Foundation IRB Approach to the Advanced IRB Approach, retail exposures are to be regarded as exposures managed under the proposed (in this case, advanced) IRB approach, as there is no difference between the two approaches (Foundation and Advanced) for the retail asset class.

89. As the roll-out plan (IRB List of Documents A6.2.)<sup>24</sup> is part of the application documentation for approval, once approved by the HFSA, its implementation becomes a legal obligation. It is the task and responsibility of the institution to implement or ensure the implementation of the roll-out in accordance with the approval decision and it cannot be delegated to any other entity e.g. a subsidiary. The institution must do its best to ensure that roll-out is executed in line with the conditions laid down in the approval decision. It is of outstanding importance that the implementation plan should be feasible and should specify accurately the scope of approaches chosen by the institution broken down by portfolios.
90. Following the approval of the roll-out plan, no additional application for approval needs to be submitted for IRB introduction under the roll-out, but the HFSA must be informed on the execution of steps outlined in the plan. The HFSA monitors the progress of implementation and requests progress information from the institution as necessary but at least upon the milestone dates. Whenever the more advanced approach is extended to a new exposure class or business unit under the roll-out, the institution must confirm to the HFSA in writing that implementation has taken place in accordance with the approval granted earlier. In each case, the HFSA shall perform a unique evaluation to decide how to verify compliance with the minimum requirements during the roll-out of the IRB Approach.
91. The top management of the institution should monitor the fulfilment of the implementation plan and continuous compliance with requirements. The institution is required to specify the contents and frequency of reports that serve progress tracking and name the organisation in charge with generating the report. Management must monitor plan fulfilment and take corrective actions in case of deviation from the plan. (E.g. for equity participations enjoying exemption under grandfathering until 2017 it should be ensured

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<sup>23</sup> Act LI of 2007, Article 75; CRD Article 154 (3)

<sup>24</sup> Reference to the relevant point of the List of Application Documents (Document List). If a document, method, procedure etc. is mentioned without reference to a section of the Document List, it must still be available in the institution, but does not have to be submitted to the HFSA in the documentation package of the application for approval. Not all sections of the document list are referred to in the Guidelines if their content requires no detailed explanation.



that the quantity and ratio of such equity stakes do not increase otherwise these exposures are subject to IRB treatment.)

92. According to paragraph (7) in Article 76/A of the ACI, when calculating the consolidated capital requirement, exposures among group member institutions can only be made exempt from the application of the IRB and be weighted with a 0% risk weight under the standardised approach if the principles of risk management are the same at group level. Therefore, in order to be eligible to use the 0% risk weighting risk management must be harmonised before submitting an application for the use of the IRB approach even if this approach will only be launched at a later time concerning the exposures of subsidiaries (i.e. the subsidiary is under gradual roll-out).
93. Departure from the approved implementation plan is possible only with the HFSA's approval, based on a case-by-case assessment. Changes in the roll-out plan are only allowed when a significant new circumstance emerges, such as a change in strategy (including the launch of a new product), or a merger/acquisition. In other instances, departure from the plan may be allowed only in exceptionally justified cases. In the aforesaid scenarios, the roll-out plan may need to be modified or supplemented. When acting as home supervisor, the HFSA may choose to involve other competent authorities in the approval of the amendment.
94. When the roll-out plan is modified due to a change in strategy, efforts should be made to meet the final deadline in the originally approved plan. In this case, the changes may affect primarily the roll-out sequence of portfolios and the schedule, and they may result in the amendment of the approved implementation deadline only in justified cases.
95. In the event of acquisitions, Article 76/B (14)-(15) of the ACI shall apply as follows:
  - If an IRB institution acquires a non-IRB institution, or an Advanced IRB institution acquires a Foundation IRB institution, the acquiring institution must submit, within 180 days of the date of the acquisition of control, a roll-out plan concerning the acquired unit. The contents of the roll-out plan submitted upon acquisition must comply with the general criteria on roll-out plans presented above. If the launch of a more advanced approach is not planned at the acquired institution, compliance with the criteria for permanent partial use as set out in the permanent partial use chapter of the Guidelines must be demonstrated to the HFSA.
  - If a non-IRB institution acquires an IRB institution or a Foundation IRB institution acquires an Advanced IRB institution, the acquiring institution must inform the HFSA in writing, within 180 days of the acquisition, on its plans concerning the rating and risk management systems and proposed capital calculation method of the institution emerging from the deal. Even though the decision on the approach to be used is the responsibility of the new institution, the HFSA expects the use of the more advanced approach in these cases as well. If a decision is made to introduce the more advanced approach, the application will be regarded as a new application, thus its contents must comply with the provisions of the chapter on approval and permission in these Guidelines.
  - If the plans of the institution resulting from the acquisition concerning the launch of the advanced approach do not affect the original schedule of the acquired institution that is still in the roll-out phase, there is no need to submit the schedule; again; this fact, however, must be indicated in the application for approval.
  - If the plans of the institution resulting from the acquisition concerning the launch of the advanced approach call for an amendment to the implementation schedule



of the acquired institution that is still in the roll-out phase, the amended schedule must be submitted to the HFSA as part of the approval package.

96. In the event of a merger, the emerging new institution should inform the HFSA on its plans concerning the rating and risk management system and the capital calculation method to be applied. This information should be submitted along the same deadlines as specified above for acquisitions.
97. Reversion from the Foundation IRB approach to the Standardised Approach or from the Advanced IRB Approach to the Foundation Approach is possible exclusively in justified cases, only with the approval of the HFSA and in accordance with paragraph (12) of Article 76/B of the ACI. In the case of reversion from the Advanced IRB Approach to the Foundation IRB Approach, the provisions of the chapter on permanent partial use in the Validation Guidelines should be observed on a continuous basis. By default, the HFSA does not support reversion from a more advanced approach, but in justified cases, based on individual assessment it may approve such a move. The reversion may not be aimed at the intentional reduction of the minimum capital requirement by applying a capital calculation approach more favourable for the institution (cherry picking). The institution must adequately justify the reversion in its application and present all the circumstances that prove that the intention of the institution is not the reduction of the capital requirement.

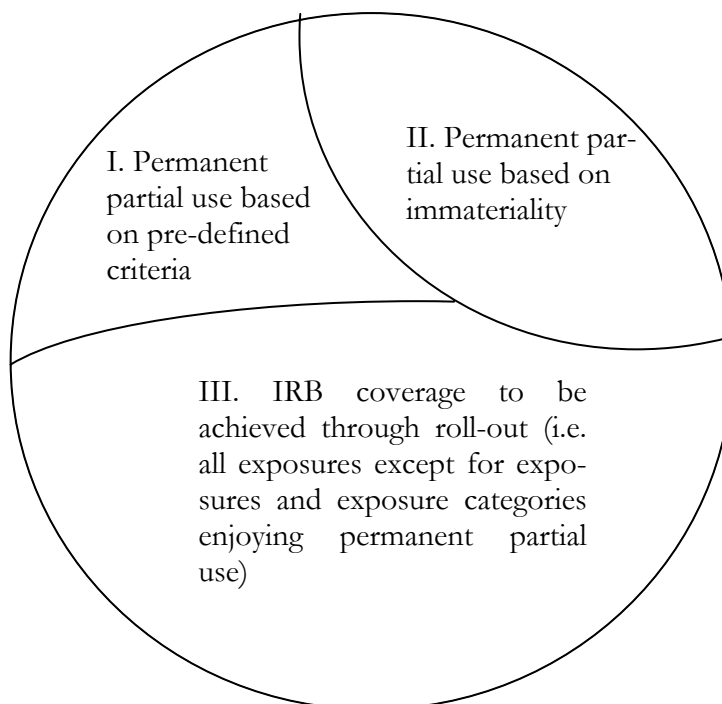
### **4.1.3 Permanent partial use**

98. The Directive and the Hungarian laws and regulations also allow institutions implementing the IRB approach to exempt certain exposure classes/exposures/business units from the application of the IRB in specific cases and on a permanent basis. This exemption is subject to the approval of the supervisory authority. The purpose of permanent partial use is to allow the permanent use of the less risk-sensitive but significantly simpler standardised approach in exposure classes/exposures/business units where the development of the rating system is unduly burdensome due to reasons specified in Article 76/D of the ACI. Permanent exemption may be granted both from the Foundation IRB Approach and from the Advanced IRB Approach. It is the institution's responsibility to present the valid reasons of permanent partial use concerning the proposed exposures/exposure classes/business units.
99. An exposure class/exposure/business unit may be under permanent partial for two main reasons:



- in the case of exposure classes/exposures/business units expressly specified by applicable statutory provisions and exposure classes/exposures/business units<sup>25</sup> that comply with applicable conditions (“specified exemption”),
- on grounds of immateriality, for exposure classes which qualify as insignificant due to the volume and risk profile of exposures involved and for exposures existing at insignificant business units<sup>26</sup>

With a view to the above, the relation of roll-out and permanent partial use to total assets (on- and off-balance-sheet) as at the end of the roll-out period can be charted out as follows:



100. In the submission for approval of the use of the Internal Ratings Based Approach, institutions must demonstrate that the proposed capital requirement calculation approaches cover their entire portfolio and that all exemption criteria are complied with in respect of exposures / exposure classes and business units subject to permanent partial use (IRB Document list A 6)

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<sup>25</sup> CRD Article 89, paragraphs 1. a), b), d), e), f), g); ACI Article 76/D, paragraphs (1) a), b), d), e), f), g), h)

<sup>26</sup> CRD Article 89 1 c); ACI Article 76/D, (1) c)



101. In the case of acquisitions or mergers, the conditions on roll-out are applicable as appropriate with the proviso that in addition to the implementation schedule, institutions must demonstrate again that
- the capital requirement calculation approaches cover the entire new portfolio,
  - the conditions of approved permanent partial use continue to exist and that
  - exemption criteria are fulfilled for all additional exposures / exposure classes / business units to be subjected to permanent partial use.
102. If the criteria for permanent partial use are no longer fulfilled (regardless of whether it was provided based on a specified exemption criterion or based on immateriality) the IRB approach shall be extended to include the exposure classes/exposures/business units previously exempted in the manner agreed with the HFSA. As it is the responsibility of the parent institution to monitor compliance with these criteria, it must possess all the necessary systems and procedures to fulfil this role.
- If the institution perceives any material change concerning compliance with the criteria of permanent partial use, it must notify the HFSA without delay. In this case, the procedures in place must describe how the institution can re-establish compliance with the criteria within the shortest possible timeframe after a threshold has been exceeded. In view of the circumstances, the HFSA assesses on a case-by-case basis whether the measures initiated/taken by the institution are sufficient for compliance with the regulatory and supervisory requirements.
  - If the compliance with the conditions of permanent partial use ceases due to a strategic/business policy decision of the institution (e.g. expansion of the formerly immaterial portfolio to increase market share), or due to some other cause which is expected to lead to non-compliance with the criteria, the institution must submit to the HFSA, for approval, the method and schedule of transition to the IRB Approach in the framework of a roll-out plan for the given portfolio(s).

#### **4.1.4 Permanent partial use based on specified exemption criteria**

Under permanent partial use, the Directive and the Hungarian laws and regulations allow for exemption from the use of the IRB approach in the following specific cases:

103. **Exposures to the central government and the central bank**, if the credit institution is able to demonstrate that that the number of material counterparties belonging to this exposure class is limited and that the development of a rating system is unduly



burdensome. Based on this condition, however, permanent partial use can only be approved for an entire exposure class, not for a part of it<sup>27</sup>.

104. **Exposures to credit institutions and investment firms (together referred to as institutions)**, if the credit institution demonstrates that the number of material counterparties in this exposure class is limited and that the development of a rating system is unduly burdensome. Besides institutions, this category also includes local governments, public sector entities (PSE's), financial enterprises and multilateral development banks which are treated under the same methodology as institutions in the standardised approach. For the "exposure to institutions" class, permanent partial use can be approved also per sub-category.
105. There are two eligibility criteria for the exemptions specified in the two sections above: the limited number of clients and the disproportionate nature of the effort which the elaboration of the associated rating system would require. When assessing compliance with these criteria, the HFSA will give equal weight to the following considerations:
- The market share of the institution in the market segment concerned. When examining this factor, the HFSA looks at the relationship of the institution's exposure to clients in the segment concerned (e.g. central government) and the exposure of the entire banking system to the same segment. If reasonable (in the case of a finite number of potential counterparties, e.g. exposures to local governments) market concentration measured on the basis of client numbers is also examined.
  - Quantity of default data. The low number or lack of data on defaults on its own cannot be considered the fulfilment of this condition, but it will be taken into consideration when assessing the unduly burdensome nature of the effort concerning the development of the rating system.
106. In the standardised approach, in the case of exposures to the central government, local governments and PSE's of countries of domicile with a 0% risk weight.
107. Exposures to the central government, local governments and PSE's of countries of domicile can also be exempted permanently from the application of the IRB if
- the conditions set out in paragraph 103 (CRD Article 89, point 1. a) are not fulfilled and/or
  - if the institution applies an IRB approach to exposures to other central governments, local governments and PSE's.

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<sup>27</sup> CRD Article 89 1 a); ACI Article 76/D (1) a)



108. Permanent partial use can be granted without compliance with any additional criteria in the case of exposures to the central government of the country of domicile. In contrast, permanent partial use can only be granted to regional governments, local authorities and PSE's pursuant to this section if both of the following conditions are fulfilled simultaneously:
- By way of a guarantee or counter guarantee the central government warrants for the payment obligations of the local government and the PSE, and
  - the risk weight of exposures to the central government concerned is 0% under the Standardised Approach.
109. As the regulations do not distinguish between exposures in the domestic currency and foreign currencies, in theory the following exposures can be granted permanent partial use and be assigned a 0% risk weight:
- HUF-denominated exposures to the Hungarian state because exposures to the central government of the country of domicile denominated and funded in the domestic currency can be exempted<sup>28</sup> without any further conditions.
  - exposures to the Hungarian state denominated and funded in euro or in the currency of another EU Member State up to 31 December 2012, pursuant to the exemption provided among the transitional provisions.<sup>29</sup>
  - exposures to PSE's which are to be treated the same way as exposures to the central government and have been given a 0% weight (such as the Hungarian Privatization Agency (ÁPV ZRt.), State Debt Management Agency (ÁKK), Hungarian Treasury (MAK), etc.)
110. Exposures to Hungarian local governments cannot be granted exemption from the application of the IRB method because due to their risk characteristics, they are to be treated in the same manner / way as exposures to institutions instead of exposures to the central government.
111. **Exposures of a credit institution to its parent, subsidiary or subsidiary of the parent**, if the client is a credit institution, investment enterprise, financial institution (including financial holdings), asset management company or ancillary services company, plus exposures among institutions that are members to the same institution protection scheme<sup>30</sup>.
112. Equity stakes held in entities that are financed by the central government or local governments and which qualify for a 0% risk weight.
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<sup>28</sup> CRD Annex VI, Part 1, paragraph 4; DCRR Article 4 (3)

<sup>29</sup> CRD Article 153; DCRR Article 163 (1), (3)

<sup>30</sup> CRD Article 80 paragraph 7. a); ACI Article 76/A (8); CRD Article 89, paragraph 1. e); ACI Article 76/D (1) f)



113. **Equity exposures incurred under legislated programmes** launched to promote specified sectors of the economy, where the capital investments of the credit institution are supplemented by significant subsidies and therefore the projects involve government oversight and restrictions on the use of the subsidy<sup>31</sup>.
114. Equity stakes meeting these conditions can be granted an exemption up to 10% of the aggregate value of original and additional own funds. The fulfilment of this condition should be examined at the application levels stipulated in the regulation (at individual, consolidated and, occasionally, sub-consolidated level).
115. For equity stakes which are eligible for the application of the standardised approach based on the laws of another Member State, domestic credit institutions can also apply the standardised approach (mutual recognition).
116. Mandatory reserves placed at a correspondence bank can also be made exempt of the application of the IRB subject to the conditions laid down in relevant regulations..
117. Exposures guaranteed or counter guaranteed by the state which fulfil the requirements concerning guarantees and counter guarantees may also be given exemption from the application of the IRB.

#### 4.1.5 Permanent partial use based on immateriality

118. In addition to exposure classes eligible for permanent partial use based on specified exemption criteria, exemption from the application of the IRB approach may also be granted in cases when the exposure is not material as per the definitions in paragraph (1) c) in Article 76/D of the ACI. Exposures exempted based on immateriality can be of two kinds:
  - Exposures in non-significant business units (including equity stakes) and
  - Exposures which belong to an immaterial exposure class based on their size and risk profile.
119. The aggregate value of these two types of exposures must not exceed either 10% of total exposures (on- and off-balance sheet assets, as indicator of size), and 10% of risk-weighted exposures (as indicator of the risk profile). Apart from that, no additional requirements are imposed by exposure class. For the calculation of the 10% limit, the following must be taken into consideration:
  - For the calculation of both total exposures and risk weighted exposures, the exposures and exposure classes which may be exempted permanently from the use

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<sup>31</sup> This exemption criterion is supposed to have been added to the CRD under German influence, as institutions in Germany are also allowed to finance SME through equity stakes.



of the IRB based on a specified exemption shall not be considered. Accordingly, using the symbols of the chart in paragraph 99, the limit is specified with the following formula both for exposures and for risk-weighted exposures:

$$\frac{II}{II + III} \leq 10\%$$

- When calculating the IRB coverage ratio, specialised lending exposures treated under the slotting approach are to be regarded as exposures treated according to the proposed IRB approach. Equity exposures treated under the standardised approach under a ‘grandfathering’ arrangement, however, must be treated as exposures under the Standardised Approach. This latter type of equity stakes cannot be considered as specified exemptions, i.e. these exposures can only be granted exemption within the framework of immateriality limits. Upon transition from the Foundation IRB Approach to the Advanced IRB Approach, exposures classified in the retail class can be regarded as exposures treated according to the proposed (in this case, advanced) IRB Approach.
  - Off-balance sheet items are to be calculated taking into consideration the credit conversion factor.
  - For the calculation of risk-weighted exposure amounts, the value of exposures already covered by the IRB approach must be calculated with the IRB approach, the value of exposures covered by the standardised approach should be calculated with the standardised approach, and then the two values must be added up in the denominator. For an institution in the roll-out stage, it means that the risk-weighted amount of exposure classes/business units for which the roll-out plan allows the use of the Standardised Approach must also be calculated with the Standardised Approach.
  - Institutions must comply with the aforementioned 10% limit for immateriality on an ongoing basis – upon the launch of the IRB approach and during and after the roll-out period.
120. The monitoring of the 10% threshold is the responsibility of the parent institution, which must possess the necessary systems and procedures for this role. In this context, the expectations discussed earlier regarding non-compliance with the conditions of permanent partial use are applicable.
121. Business unit means an entity as defined in the chapter on roll-out. A business unit can be granted permanent partial use if it does not qualify as significant. The key criteria for the assessment of a business unit’s significance are its role within the group and that on the relevant market (or in a relevant segment).
122. Concerning permanent partial use, the equity exposure class can be considered immaterial if the value of exposures in this class does not exceed, on the average of the preceding 12 months, 10% of the institution’s solvency capital. If the equity exposure class consists of less than 10 individual equity stakes, the threshold shall be 5% of the average solvency capital of the preceding 12 months. Equity participations as per point (1) g) and h) of Article 76/D of the ACI do not have to be taken into consideration for the calculation of this exposure class.
123. With a view to the requirement set out in GL 10 declaring that the restrictions for the equity exposure class are to be calculated on the same level as the application of the capital requirement, the thresholds must be complied with on the individual, sub-consolidated and consolidated levels as well. If the institution enjoys exemption from



the obligation to comply with the requirements of specific application levels, it is not required to meet the limits outlined above either. Equity stakes other than those specified in point (1) g) and h) of Article 76/D of the ACI (e.g. companies providing ancillary services, etc.) must not be exempted from the limitations.

#### **4.1.6 Roll-out and permanent partial use from the host supervisor's view**

124. In case of institutions where the HFSA has a host supervisory role, the application of requirements concerning roll-out and permanent partial use depends on whether the consolidated supervision of the parent institution concerned is performed by the supervisory authority of a Member State (or of a third country recognised as equivalent) or of a (non-equivalent) third country.

##### **If the home supervisor is:**

- the supervisory authority of a Member State (or third country recognised as equivalent): the requirements imposed by the home supervisor are recognised, with the proviso that bilateral consultation and case-by-case assessment is necessary in issues affecting the institution/group in Hungary. In this case as well, the implementation plan must cover the full range of institutions subject to consolidated supervision as per the ACI, regardless of whether they qualify as a material or immaterial subsidiary from the parent institution's aspect. The proposed approach has to be specified and presented for each portfolio also for subsidiaries. In case of groups established in another Member State and having a subsidiary in Hungary, the HFSA, similarly to the considerations described for home supervisors, does not require compliance with the requirements on roll-out at the individual and sub-group level set out in this chapter of the Validation Guidelines.
- the supervisor of a non-equivalent third country: the requirements set as home supervisory authority are applicable to the institution in Hungary on the individual and/or sub-group level.

Recognised supervision means a supervisory authority of a country with a legal system equivalent to that of the European Union, in accordance with the provisions of Directive 2002/87/EC (ACI Article 96/P).

125. The start date of the period available for roll-out at the Hungarian institution is the date of approval of the application for permission submitted by the parent institution. The date for the implementation of IRB coverage of the Hungarian institution is set on that basis, based on case-by-case assessment. In the course of consultations with the home supervisor, the HFSA tries to enforce its decision on the acceptability of the



roll-out plan which it made in view of the significance<sup>32</sup> of the institution concerned, while striving for a consensus.

126. The HFSA monitors the implementation of the roll-out plan and the fulfilment of conditions on permanent partial use on an ongoing basis; in that context, it may conduct on-site or off-site examinations. If it encounters circumstances (e.g. conditions, deadlines) during implementation which a deviation from the permission, it contacts the home supervisor.
127. Agreement with the home supervisor is necessary concerning the definition of immateriality at the level of an EU-level parent company. This agreement should cover the common understanding of conditions that serve as a basis of exemption, the criteria for evaluating their fulfilment and the methods of monitoring.

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<sup>32</sup> See the section on cooperation between home and host supervisors herein.



## 5 INTEGRATION OF RATING AND RISK CALCULATION RESULTS INTO BANK PROCESSES (USE TEST, EXPERIENCE TEST)

128. In the course of permitting the use of advanced approaches, the HFSA must ascertain that the presented rating systems, processes and the default and loss estimates are generated by the institution not only for the calculation of capital requirements, but they also play an essential role, i.e. are integrated into the institution's risk management, credit rating, credit approval, internal capital allocation and corporate governance functions<sup>33</sup>.
129. The use test examines the way the outcomes of debtor rating and of PD, LGD, CCF calculations are integrated into the internal regulations effective at the time of the submission of the application and in the practices of the institution. The HFSA reviews how the results of rating mechanisms are integrated into e.g. the end-to-end lending process (preparation, submission, monitoring, work-out), decision making, management information system and governance processes of the institution. The underlying principle is that if the institution itself does not trust these rating mechanisms so as to rely on them in its internal processes, the ratings should not be used for calculating the capital requirement either.
130. The HFSA also checks practices in force before the submission of the application for compliance (experience test) to verify the viability of the system and that the institution not only established the required rating mechanisms but also uses and develops them.<sup>34</sup>

### 5.1 *Use test*

131. For the assessment of the applicability of the IRB approach, the integration of the results of the rating into processes, i.e. the assessment of the use test is a key factor. When assessing the reliability of the use of the IRB approach, the HFSA looks at the depth of integration into institutional processes, that is, if on the whole the IRB approach is not adequately integrated into processes, this may make the permission of the use of the IRB approach questionable on its own.

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<sup>33</sup> CRD Article 84 (2) b); ACI Article 76/B (2) b), e); DCRR Article 91 (1), (2), Article 93 (4)

<sup>34</sup> CRD Article 84 (3); ACI Article 76/B (4); CRD Article 154 (2); Act LI of 2007, Article 75 (1); CRD Article 84 (4); ACI Article 76/B (5); CRD Article 154 (3); Act LI of 2007, Article 75 (2)



132. While it is fair to say that it is impossible to define simple criteria for adequacy, the structure and composition of the rating systems used for the calculation of capital requirements on the one hand and in internal bank processes on the other hand should not be significantly different. Any deviation must be documented and justified by the institution.
133. When examining the use test, the HFSA considers the criteria listed below. Nevertheless, other considerations may also be observed in the processes and decision-making mechanisms and the significance of criteria may change from process to process. The HFSA examines at the areas of application by exposure classes.

The rating results may affect the following considerations:

- In the corporate lending process (proposal, risk management, credit decision, monitoring):
  - setting of a client limit
  - limitation of product eligibility
  - facility grading
  - use of collaterals, level of coverage
  - pricing
  - approval level
  - monitoring (frequency, depth and consequences of data report requests, analyses and account monitoring)
  - setting up impairment loss
  - work-out activities
  - impact of a default event on the lending process and on work-out activities
  - rules of override/override for all elements
  
- In the retail lending process (proposal, risk management, credit decision, monitoring):
  - conditions based on client/transaction rating
  - product development process
  - pricing
  - use of collaterals, level of coverage
  - monitoring (frequency, depth, consequences of monitoring)
  - setting up impairment loss
  - work-out activities



- impact of a default event on the lending process and on work-out activities
- acceptance / rejection ratio
- use of overrule / override rules

In respect of the corporate and retail lending process, assessment of the use test is based on the examination<sup>35</sup> of the relevant risk management procedures (IRB List of Documents C 1) (e.g.: risk taking, debtor rating, lending, monitoring etc..) and the verification of harmony between regulations and practical application relying on interviews, process monitoring and selected documents.

- For the other exposure classes (e.g. central government, institutions, local governments), use test should be interpreted in line with the specific characteristics of the category concerned.
- At the level of strategic processes and governance:
  - development of a strategy and risk profile, establishment of a risk control mechanism
  - establishment of an acquisition strategy
  - allocation of decision-making competences within the bank/banking group
  - analyses, reports prepared for internal use, reporting
  - risk management at portfolio level (e.g. setting of portfolio/product limits)
  - internal capital adequacy assessment process (ICAAP)
  - internal capital allocation decisions (definition of the capital requirements of segments with different risk ratings)

Again, the basis of the assessment is the examination of the internal regulations for the various elements and of other documents (e.g., content and form of regular reports, effective strategy, minutes of board meetings, etc.) (IRB List of Documents C1; B 1- B 3; A 4; C3), plus the assessment of actual processes and practices applied at the institution.

For the use test, the institution shall also demonstrate its internal capital adequacy assessment model. If it is materially different from the models used for the calculation of capital requirements, the difference must be presented and explained (IRB List of Documents C 5). Naturally, before the issue of the permission by the supervisor, the supervisory assessment is extended also to the operation of these mechanisms.

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<sup>35</sup> ACI Article 13/C (3) a), b); DCRR Article 64 (1), 93 (1); Government decree 250/2000, Annex 7/chapter III.



134. The self-assessment of compliance with the requirements of the use test forms part of the application for permission; in the self assessment, institutions explain in writing where and how the rating systems and estimated parameters used in the IRB approach are incorporated into their processes and decision making, and explain any differences (IRB List of Documents C 2). Nevertheless, with a view to the diversity of eligible models and that of process engineering at institutions, the regulators do not expect exclusivity. I.e. other factors may also be taken into account in the risk management process and other internal processes and there may also be differences in the parameters used (e.g. due to maturities different from the requirements of the regulator). If the variables used during decision making at the institution are different from the variables generated by the rating system, the differences must be documented and their acceptability must be demonstrated convincingly to the HFSA.
135. In addition to the survey at start-up, the institution shall regularly review what activities are the internal ratings and the underlying risk parameters, systems and procedures used for<sup>36</sup>. This must also be reviewed by the internal audit<sup>37</sup> based on a procedure specifically geared towards compliance with the requirements of the use test (IRB List of Documents C 4). The internal audit report must be submitted to the HFSA as well. This document must discuss all material differences, specifying in particular whether the applied procedure is more conservative or less conservative from a capital calculation standpoint than the regulatory calculation. The related internal procure must be part of the documentation of the rating system.
136. To support the validity of the use test, the aforementioned rules and documents must be submitted in an attachment. To some extent and depending on the supervisor's opinion, the roll-out may be acceptable in the case of use test, but it must also be demonstrated in the presentation of the use test. It has to be underlined that the roll-out of the use test must not question compliance with the requirement on the integration of rating system results upon the submission of the application. E.g. if an institution uses rating results exclusively for setting client limits at the time of submitting the application and intends to roll-out application to the remaining areas gradually, the institution is unlikely to fulfil requirements regarding the use test and, apart from extraordinary cases, will probably not receive the IRB approval. The examination of the use test partly relies on the evaluation of the submitted documents, i.e. on reviewing how the estimates of the advanced approach are enforced in risk taking rules, areas where differences exist and whether these differences are justified; This review is then supple-

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<sup>36</sup> ACI Article 76/B (2) e)

<sup>37</sup> CRD Annex VII, Part 4, paragraph 131; DCRR Article 95



mented by an on-site examination that is intended to verify the practical implementation of integration.

137. Experience shows that each institution has a different structure for its risk management systems: at some institutions, no coverage expectation and limit is set for the specific rating categories, but the credit decision is based on the expected return on the transaction, calculated on the capital at risk (pricing), while in other cases the coverage ratio and limit structure are assigned to debtor rating categories, while pricing is not based exclusively on risk rating.
138. Examples of non-compliance with use test requirements:
- Harmonisation based on independent risk management cannot be enforced if (override/overrule) rights independent of risk management exist at any decision-making level in respect of rating categories and conditions (except pricing).
  - The rating systems for the calculation of capital requirements and those for internal debtor rating are based on completely different indicators.

## 5.2 *Experience test*

139. An institution applies for the use the IRB Approach must demonstrate that it has been using rating systems<sup>38</sup> that are broadly in line with the minimum requirements for the IRB approach for at least three years prior to the submission of the application (IRB List of Documents C 6). For institutions which use the Foundation IRB, the HFSA includes in this scope the use of retail LGD and CF estimates as well. For institutions that implement the IRB approach before 2010, the three-year mandatory application period can be reduced to not less than one year if they submit the application for the use of the IRB approach before 31 December 2009<sup>39</sup>.
140. The HFSA examines when the effective risk management and credit decision processes and rules were introduced and how long they have been in use (IRB document list C1), to what extent the formerly used rules and their practical application were different. Again, the examination consists of two parts: the comparison of internal rules, verification of the time of their introduction, supplemented by the on-site examination of the applied practices and processes. The goal is to verify the reliable operation of applied models and procedures, thus minor modifications are acceptable during this period.
141. Similarly, institutions using own estimates of LGDs and conversion factors (Advanced IRB – non-retail portfolios) must demonstrate that they have been using esti-

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<sup>38</sup> CRD Article 84 (3); ACI Article 76/B (4)

<sup>39</sup> CRD Article 154 (2); Act LI of 2007, Article 75 (1)



mates of LGDs and conversion factors<sup>40</sup> that are broadly in line with the minimum requirements for the IRB approach for at least three years before the submission of the application. For institutions that implement the IRB approach in 2009, the three-year mandatory application period can be reduced to not less than two years if they submit the application for permission by 31 December 2008<sup>41</sup>.

142. Further harmonisation is required at home-host meetings on what is allowed by the supervisor of the parent/subsidiary and whether they would accept favourable terms for the subsidiary if the competent supervisor is not planning on granting the exemptions allowed by the CRD.
143. It is important to point out that although the text of the applicable laws only set a requirement on the time period for the experience test, the HFSA advises that the results of the first review of the applied rating systems (validation by the institution, i.e. backtesting of the models) should be available upon the submission of the application for permission. The point of the experience test is to collect and use experiences regarding the systems in order to further improve the rating mechanisms. This way, the results of the review provide a good indication to both the institution and the HFSA on the actual performance and thus the suitability of the systems.
144. Another important thing to note is that minor, corrective amendments executed as a result of the experience test and the review will not constitute the breaching of the “broadly in line”<sup>42</sup> requirement set out in the applicable law, i.e. do not trigger a restart of the experience test period. If it turns out during the experience test, however, that the established systems and mechanisms are not suitable for capturing the risk profile of the institution’s portfolio and therefore a significant reshaping or perhaps a concept change is needed, it also triggers the restart of the required experience test period and the postponing of the submission of the application. (At the same time, please note that according to CEBS recommendations, once an institution received approval for using the IRB method and then modified its rating systems, even substantially and changing the concept, the institution does not need to request an approval again. Still, all obligations concerning documentation must be complied with in full. Albeit no approval is needed for it, in case the new model does not meet the minimum criteria in the HFSA’s opinion, the HFSA may issue a resolution forbidding its further application for calculating the regulatory capital.)
145. Both the CRD and relevant Hungarian laws set out requirements for the minimum length of the experience test and for that of data series to be used for model development. In order to standardise the interpretation of these requirements, however, it

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<sup>40</sup> CRD Article 84 (4); ACI Article 76/B (5)

<sup>41</sup> CRD Article 154 (3); Act LI of 2007, Article 75 (2)

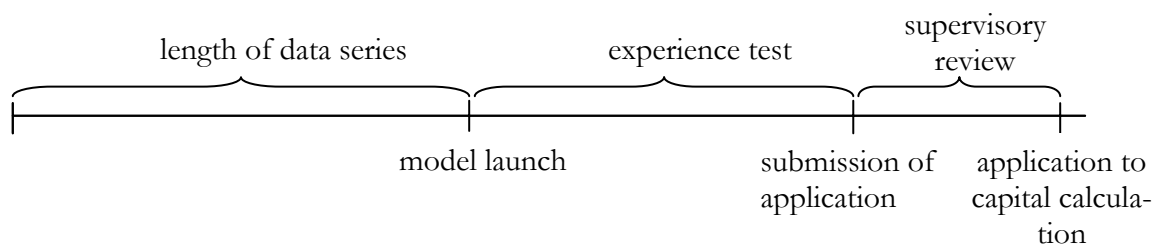
<sup>42</sup> ACI Article 76/B, paragraph 4



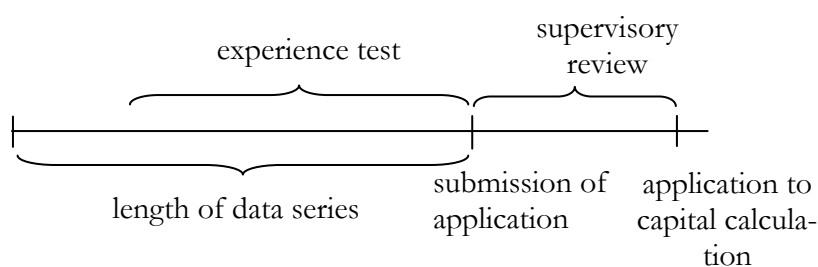
is probably useful to clarify the requirements on time periods. As a general expectation, (also) the requirement on the experience test must be fulfilled upon the submission of the application for permission concerning the use of the IRB approach. If this requirement is not met, the HFSA is not in a position to examine the fulfilment of the related minimum requirements (as there is no fulfilment) which leads to the rejection of the application by default. The table below sets forth the requirements concerning the length of data series used for the estimates and for the duration of the experience test:

	Non-retail				Retail	
	Foundation IRB	Reference	Advanced IRB	Reference	IRB	Reference
<b>Experience test</b>	3 years (min. 1 year if application is submitted before 31. 12. 2009)	ACI 76/B (4) (Act LI of 2007, 75 (1))	3 years (min. 2 years if application is submitted before 31. 12. 2008)	ACI 76/B (5) (Act LI of 2007 75 (2))	3 years (min. 1 year if application is submitted before 31. 12. 2009)	ACI 76/B (5) Act LI of 2007 75 (1)
<b>Data series PD</b>	5 years (min. 2 years if application is submitted before 31.12. 2012, grows with one per year until 5 years are reached)	DCRR 72 (9), 167	5 years	DCRR 72 (8)	5 years (min. 2 years if application is submitted before 31.12. 2012, grows with one per year until 5 years are reached)	DCRR 73 (6), 167
<b>Data series LGD/CF</b>	-	-	5 years (grows with one per year until 7 years are reached)	DCRR 75 (1), 78. (1)	5 years (min. 2 years if application is submitted before 31.12. 2012, grows with one per year until 5 years are reached)	DCRR 76 (5), 79 (3), 167

146. The HFSA expects the institution to comply with the requirement on the length of data series used for the estimates by the completion of model development. The period of the experience test starts after that. By the time of the submission of the application, the requirement on the experience test's duration must also be fulfilled. The requirements are shown in the following diagram:



147. In especially justified cases and provided all other approval requirements are fulfilled, the HFSA may consider accepting the parallel fulfilment of the requirements on the length of data series and that of the experience test but fully overlapping periods are not allowed. In this case however, the deadline is still the date when the application is submitted. This scenario is charted out below:





## 6 EXPOSURE CLASSES (PORTFOLIO SEGMENTATION)

148. Instead of the standardised approach, the institution may also choose<sup>43</sup> the Internal Ratings Based Approach for the calculation of the capital requirements for credit risk. The IRB approach may be used for all the exposures of the institution, except the cases of combined use with the standardised approach in accordance the chapter “Roll-out and permanent partial use” herein
149. This chapter addresses exclusively the assignment of exposures to the exposure classes specified in the Article 76/C of the ACI the significance of assignment and the contents of the various categories, including segmentation relating to corporate and retail classes, whereas it does not discuss the requirements relating to the estimation of risk parameters or the calculation of risk weighted exposures.
150. Institutions using (or intending to use) the IRB Approach must assign every exposure into one of the exposure classes listed below<sup>44</sup>. The IRB exposure classes reflect the rationale of the IRB Approach, therefore the exposures must be assigned using the classification principles of IRB classes in respect of portfolios where the institution intends to use an IRB Approach. In these cases the use of standardised exposure classes is not allowed. Assignments must be reviewed regularly, at least once a year (IRB List of Documents D1). The frequency of the review and the person responsible for it must be specified in a procedure. Each exposure has to be assigned to one of the following exposure classes:
- exposures to central governments or central banks<sup>45</sup>
  - exposures to credit institutions and investment firms (hereinafter “institutions”)<sup>46</sup>
  - exposures to corporates – derived partly on the “residual principle”<sup>47</sup>
  - retail exposures, including exposures to eligible small and medium enterprises and purchased retail receivables<sup>48</sup>
  - equity exposures<sup>49</sup>
  - securitisation positions<sup>50</sup>
  - other exposures non credit-obligation assets<sup>51</sup>.

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<sup>43</sup> ACI Article 76/B (1)

<sup>44</sup> CRD Article 86 (1); ACI Article 76/C (1)

<sup>45</sup> CRD Article 86 (1) a), (2); DCRR Article 24

<sup>46</sup> CRD Article 86 (1) b), (3); DCRR Article 25

<sup>47</sup> CRD Article 86 (1) c), (7); DCRR Article 26

<sup>48</sup> CRD Article 86 (1) d), (4); DCRR Article 27

<sup>49</sup> CRD Article 86 (1) e), (5); DCRR Article 28

<sup>50</sup> CRD Article 86 (1) f);

<sup>51</sup> CRD Article 86 (1) g), (8); DCRR Article 29



151. For the practical implementation of the IRB approach, it is important to clarify the relations between exposure classes, rating systems and risk weight formulae.
152. Institutions use at least one rating system for each exposure class. With a view to the requirements set forth on rating systems and the heterogeneity of exposure classes, for certain exposure classes (e.g. institutions or corporate exposures) it may not be sufficient to use a single rating system per exposure class to provide robust estimates for risk parameters of the risk weight formulae.
153. In order to calculate the risk-weighted exposure amounts, the regulations assign risk weight formulae to the various exposure classes, depending on the risk profile of the exposure class concerned.
154. In terms of risk, the exposures to the central government, central bank, local governments or PSE's which the Standardised Approach assigns to separate exposure classes all behave similarly to exposures to institutions or corporates. If the PD of a central government is 0.5%, then, applying the same logic, the capital to be allocated to that exposure is similar to the capital required for an exposure to a corporation or institution with a 0.5% PD. Accordingly, the CRD requires the use of the same risk weight formulae for exposures in the central government, institutions and corporate exposure classes. In each of these categories, however, different risk parameters must be inserted into the formulae. The parameters are derived from various rating systems depending on the mechanisms used by the entity concerned, e.g. local government, leasing company, SME, etc.
155. Applicable laws also set forth special requirements for the estimation of risk parameters (please refer to the chapter on Risk parameter estimation herein for details). These requirements are also assigned to exposure classes in line with the aforementioned principle of "at least one rating system per exposure class".
156. In summary, based on the paragraphs above and other parts of the regulations, the assignment to exposure classes has the following functions:
  - it determines the risk formula to be used with the specific exposure classes (corporate, retail, etc.) which does not mean, however, that each exposure class has a unique risk formula;
  - it sets a minimum requirement concerning the number of rating systems to be used by the institution (at least one rating system per exposure class)
  - it serves as the basis for the exposure class-specific requirements on the estimation of risk parameters;
  - it partly determines the range of exposures that can be kept under the standardised method either temporarily or permanently in the framework of roll-out or permanent partial use (please refer to the chapter "Roll-out and permanent partial use" herein for details).
157. Assignment into exposure classes, however, does not determine definitively either the number or the structure of rating systems to be applied. With a view to applicable minimum requirements, rating systems must be aligned to the risk profile and risk management principles of the institution.
158. Purchased receivables are governed by special rules, yet they do not constitute a separate exposure class and thus have to be assigned to one of the above categories (retail/corporate).
159. Past due exposures must be assigned to the exposure class which they would belong to upon contract signing (e.g. past due retail receivables should go to the retail



class, receivables from an SME to the retail class while past due receivables from a local government should be assigned to the institutions exposure class).

160. To assign exposures to exposure classes, credit institutions and investment firms must employ appropriate methods that are also consistent over time (IRB List of Documents D 1.1) (ACI Article 76/C (3) and CRD Article 86 (9)).

- The method of assignment must ensure that each exposure is assigned in accordance with legal regulations.
- If a type of exposure is assigned to a certain exposure class, it must be ensured that exposures of the same type are always assigned to the same class subsequently.
- In case of clients assigned to the corporate exposure class it is advised to make sure that the client has only one single debtor rating and that this rating is used by every member of the banking group.
- The principles of assignment can be modified only in particularly justified cases, e.g. upon regulatory changes, major change in business policy, e.g. different treatment of private banking clients. These changes must be documented in writing along with their valid explanation.
- The principles of assignment into classes must also be identical within the group. Considering, however, that the specifics of the local market must also be observed upon the calculation of capital requirements, the aforesaid requirement may be put into practice in a way that the system of classification used at the foreign subsidiaries can be clearly mapped into the system used by the parent institution by moving the exposure groups but without moving individual exposures.

161. The scope and contents of exposure classes in the IRB approach can be summarised as follows:



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
(a) Exposures to central governments and central banks	<ul style="list-style-type: none"><li>• exposures to central governments</li><li>• exposures to central banks</li><li>• exposures to the European Central bank</li><li>• exposures to local governments which represent the same level of risk as the central government</li><li>• within the class of exposures to PSE's, exposures which qualify for the same treatment as the central government based on DCRR Article 6 (3) (CRD Annex VI, Part 1, point 15).</li></ul>	A local government in Hungary cannot be assigned to this exposure class <sup>52</sup> and neither can exposures to a company owned by the state, a local government or a church.	Any exposure to the state, e.g. government securities, debts taken over by the central budget (e.g. loans to Hungarian State Railways [MÁV], etc.). Exposures to the Hungarian National Bank, the European Central Bank or the central bank of a Member State. Exposures to the International Monetary Fund (IMF), the World Bank, the Bank of International Settlements (BIS). PSE's which belong here: Hungarian Privatiza-

<sup>52</sup> If a third country allows the same risk treatment for a certain country's local and regional governments as for its central government, Hungarian institutions are also allowed to apply the same treatment.

<sup>53</sup> According to Article 74/G (1) of the Act 4 of 1959 (the Civil Code) a public benefit foundation is a foundation established by the Parliament, the central government, the representatives of a local government or of a minority government for the permanent fulfilment of a public duty. The establishment of a public benefit foundation may be made mandatory by law.

A public benefit foundation is a special type of foundations. While it is also a foundation itself, its purpose, the range of eligible founders and the authorities it is entitled to are substantially different from that of a "regular" foundation, thus the applicable legislation is different as well. According to paragraph (1), the permanent purpose of public benefit for a public benefit foundation can only be the fulfilment a duty that belongs to the central government or a specified local government or minority government by law. Private entities and businesses are not eligible for establishing a public benefit foundation.



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
	<ul style="list-style-type: none"><li>exposures to MDB's listed in DCRR Article 7 (4)-(5) (CRD Annex VI, Part 1, point 20) and to international organizations specified in Article 8.</li></ul>		tion Agency (ÁPV ZRt.), State Debt Management Agency (ÁKK), Hungarian Treasury (MÁK), social security funds and their institutions, Student Loan Centre, public benefit foundations <sup>53</sup> founded by the state, non-profit organisations and public benefit companies financed/directed by the central government and assigned to it under the standardised statistical numbering scheme.
(b) Exposures to credit institutions and investment firms	<ul style="list-style-type: none"><li>exposures to credit institutions and investment enterprises</li><li>exposures to local governments except for exposures<sup>54</sup> reassigned to the central</li></ul>		Exposures to any Hungarian local government (also minority government) and to PSE's owned and directed by them, e.g. their executive organisations, schools, universities, fire

<sup>54</sup> Act LXV of 1990, Article 88

(1) A local government

*a)* may set up a public benefit foundation and enter into commitments for public benefit ...

*b)* may take out a loan and issue bonds; the core assets of the local government, regular contributions from the central government, subsidies, personal income tax and revenues received from the central budget for operational purposes (except liquid loans) cannot not be used as collaterals for such loans and bonds;

*c)* decides on depositing its liabilities not assigned to a particular purpose (except contributions from the central government);

*d)* decides on using other banking services.



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
	<p>government and relating to local governments specified in a list issued by the supervisory authority.</p> <ul style="list-style-type: none"><li>• Exposures to PSE's that are to be treated identically to credit institutions and other investment enterprises as per CRD Annex VI, Part 1, point 14<sup>55</sup></li><li>• Exposures to MDB's not assigned to the class of exposures to the central government.</li><li>• Exposures to financial enterprises specified in ACI Article 87/A [CRD Annex VI, Part 1, point 24, definition of financial enterprise: CRD Article 4 (5)]</li></ul>		<p>brigades, social institutions, public benefit foundations founded by the local government, development councils supported by the local government etc. Water utility associations established with local government participation for developing the communal water and sewage network also belong here but they should not be mixed up with water management associations specified in the act on water management which must be assigned to corporate exposures.</p>

(2) The upper limit of the year-through debt-generating commitments (borrowings and charges, issue of bonds, guarantees and avals provided, leases taken out) of a local government shall be its adjusted own revenues.

(3) The upper limit of the year-through debt-generating commitments (borrowings and charges, issue of bonds, guarantees and avals provided, leases taken out) of a local government shall be its adjusted own revenues.

(4) The consequences of deficits generated are chargeable to the local government. The central budget is not liable for these obligations.

<sup>54</sup> Not to be mixed up with water management associations which belong to the corporate category

<sup>55</sup> DCRR Article 6 (2)



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
(c) Corporate exposures	<ul style="list-style-type: none"><li>• Exposures to corporations</li><li>• Purchased receivables which cannot be treated as retail exposures based on DCRR</li></ul>		Exposures to churches registered in Hungary and to enterprises owned by them. Exposures to companies owned by the state or the local government, e.g. exposures to the

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<sup>56</sup> DCRR Article 27 (3)



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
	<p data-bbox="562 268 1137 336">Article 26 (2) (CRD Annex VII, Part 1, point 14<sup>56</sup>)</p> <ul data-bbox="528 344 1137 568" style="list-style-type: none"><li data-bbox="528 344 1137 416">• Special lending exposures to be shown separately within the corporate exposure class</li><li data-bbox="528 424 1137 496">• Exposures deriving from leases assigned to the corporate exposures class</li><li data-bbox="528 504 1137 568">• Any other exposure which cannot be assigned to the other exposure classes in this table<sup>57</sup></li></ul>		<p data-bbox="1507 268 2101 336">property management firms of local governments.</p> <p data-bbox="1507 344 2101 587">Exposures to PSE's not assigned to category a) or b), e.g. exposures to Duna Televízió Rt., Hungarian State Radio (Magyar Rádió Rt.), Hungarian State Television (Magyar Televízió Rt.), State Motorway Management Company (Nemzeti Autópálya Rt.), exposures to chambers and public bodies.</p> <p data-bbox="1507 595 2101 663">Exposures to social organisations, foundations, unions, political parties, etc.</p> <p data-bbox="1507 671 2101 842">Exposures to financial enterprises and financial holdings which do not operate under equivalent regulation as credit institutions and investment firms, e.g. financial enterprises registered in Hungary.</p> <p data-bbox="1507 850 2101 916">Exposures to insurers, re-insurers, and export credit guarantee institutions, pension funds,</p>

<sup>57</sup> DCRR Article 26 (1)



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
(d) Retail exposures	<ul style="list-style-type: none"><li>• Exposures to individual persons</li><li>• Exposures below EUR 1 million at client group level, exposures to SME's except those covered with a residential real estate property</li><li>• Any retail or SME exposure covered with a residential real property regardless of the magnitude of the exposure.</li><li>• Purchased receivables treated as retail</li></ul>	Conditions specified for retail exposures [CRD Article 86 (4)] <sup>58</sup> must be complied with.	healthcare funds and self-support funds.

<sup>58</sup> DCRR Article 27



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
(e) Equity exposures	exposures <ul style="list-style-type: none"><li>• Non-debt exposures conveying a subordinated claim on the assets or income of the [CRD Article 86 (5) a)]<sup>59</sup> issuer entity</li><li>• Debt exposures with a similar economic scope as in the previous point, representing a credit obligation [CRD Article 86 (5) b)]</li><li>• This way, all equity stakes held in any company and not deducted from the solvency capital while meeting the above criteria should be assigned here</li></ul>	Ancillary enterprises are to be assigned here. On approval from the HFSA, a risk weight applicable to other non credit-obligation assets may be used with these exposures [CRD Annex VII, Part 1, point] <sup>60</sup>	
(f) Securitisation positions	<ul style="list-style-type: none"><li>• Securitisation positions meeting the conditions set out in the STA approach</li></ul>		
(g) Other assets not representing credit obligations	<ul style="list-style-type: none"><li>• Other items not representing credit obligations</li><li>• Any non rated exposure (e.g. tangible assets),</li></ul>		

<sup>59</sup> DCRR Article 28

<sup>60</sup> DCRR Article 32 (2)



Exposure class per IRB	Exposures belonging to class	Remark	Examples of exposures to be assigned to exposure class concerned
	excluding exposures exempted from the application of the IRB.		



162. Point III/A 14. of Annex 2 to the ACI defines public sector entities as follows:  
“A public benefit company or non-profit company in the majority ownership of the central government or a budgetary institution as per the Act on Public Finances whose debts are warranted for or guaranteed by the central government either by law or on a contractual basis, and any organisation recognised as a public sector entity by the jurisdiction of any EU Member State.
163. Under specific conditions, the risk assessment of exposures to PSE’s can be identical to that of exposures to the central government or to institutions<sup>61</sup>. As the breakdown of PSE’s per risk level would require substantial resources while offering only limited benefits, it is advised to assess all exposures to PSE’s in a single rating system and then use the resulting risk parameters in the risk formulae to calculate the capital requirement of these exposures.
164. Within corporate exposures, special lending exposures (structured loans to finance projects, assets, commodities or commercial real estate property purchases) must be presented separately. From a risk perspective, the primary consideration for the classification of these exposures is the fact that their repayment depends on the incomes generated by the asset. Therefore, it is not acceptable on the part of institutions to assign these exposures to retail exposures, even if their value is below the limit qualifying for the corporate exposure class (e.g. projects set up for the construction of small apartment houses).
165. In the day-to-day operation of institutions, assignment of exposures to exposure classes is typically the responsibility of relationship managers. The correctness of this segmentation should always be verified by the risk management function and make corrections as necessary. If a correction is needed, the relationship manager in charge should be informed on the correction and on the underlying reason in order to avoid subsequent erroneous segmentations. In case of repeated erroneous segmentation and borderline cases, proper segmentation should be regulated in internal guidelines. If the lending process is supported by multiple information systems, special attention should be paid to ensure consistency of segmentation. The classification of a specific exposure may also be influenced by automated data cleaning thus the parameters for cleaning should be set with utmost care.
166. Institutions should make it a point to apply the same classification for business purposes and for capital adequacy calculations. In case identical classification is not possible, differences should be identified and documented accurately.
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<sup>61</sup> CRD Annex VI, Part 1, paragraph 15; DCRR Article 6



167. Below we discuss requirements concerning exposure classes and sub-portfolios where assignment to exposure class is based on special requirements and where segmentation is not obvious. The related classes are as follows:

- retail exposures
- special lending exposures
- equity exposures

## 6.1 *Retail exposures*

168. Exposures classified as retail exposures must comply with the conditions detailed below.<sup>62</sup>

### 6.1.1 Segmentation of individuals and small and medium sized enterprises

169. The criteria for assignment in the retail exposure class in the Internal Ratings Based Approach are set out in Article 27 of the DCCR (Article 86 (4) of the CRD). The guiding principle for distinguishing between retail and corporate exposure classes is that the retail class should include exposures which are homogeneous based on certain criteria set by the institution, they are managed in a standardised manner, they are sufficiently small in volume compared to the entire portfolio and are sufficiently numerous. This way, the addition of another exposure to the portfolio (or reversely, the moving of any exposure classified here into another portfolio) has no substantive effect on the risk characteristics of the exposure class or sub-class. This approach, on the one hand, recognises the risk-mitigating effect of a diversified portfolio while allowing the distinction between retail and corporate exposures to be aligned to the characteristics of the institution concerned. This approach also means that all applicable criteria concerning assignment into the retail class must be met simultaneously. In its own, neither the 1 million EUR limit nor the mass product type treatment (standardised treatment) can be considered a decisive factor.

#### **Definition of borrower**

170. The retail exposure class includes exposures to individual persons<sup>63</sup> (regardless of the volume of the exposure) and exposures to SME's not exceeding EUR 1 million.

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<sup>62</sup> If these conditions are fulfilled, the risk weighted exposure formula specified in Annex VII part 1 Section 9 is to be applied for the calculation of credit risk capital requirement. If the exposure can also be assigned to one of the sub-categories of the retail class, the risk weighted exposure formula relating to the sub-category concerned is to be applied (CRD Annex VII, part 1, 10-11).



171. From a prudential standpoint, the ACI provides a similar definition of micro, small and medium enterprises as Recommendation no. 2003/361/EC of the Commission. With a view to the regulations in the ACI, institutions must have internal procedures (IRB List of Documents D 1.2) for the definition of small and medium enterprises. Institutions are allowed to set a lower size limit than that specified in the regulation. Exposures to SMES must be assigned to the retail class if they meet the applicable requirements. If not, they should be assigned to the corporate exposure class.
172. Furthermore, institutions should have internal procedures to differentiate between individual persons and small and medium enterprises (IRB List of Documents D 1.2). The significance of this segmentation lies in the fact that the 1 million EUR limit can only be applied to exposures to SME's (and only exposures to natural persons can be assigned to the revolving sub-class; see later). Private entrepreneurs and private banking clients can be assigned to the retail exposure class and can be considered natural persons provided the conditions of classification in to the retail class, in particular the requirement on risk management and granularity are fulfilled. In the case of SME's, annual revenue cannot be the sole decisive factor for classification into the retail exposure class, a volume limit on the exposure is also needed in each case. At the same time, it is advised to apply a revenue limit in order to prevent even the temporary assignment of large corporate clients with a low exposure to the retail exposure class. (Typically, standardised treatment is not implemented for these corporations.)

#### **Definition of total exposure to a single client**

173. In the case of SME's, the value of all outstanding exposures<sup>64</sup> must be aggregated when determining the value of the exposure to the client/client group. The amount of past due exposures should be included in the aggregate value of exposures, whereas exposures secured by residential – and only residential – real estate should not be included in the calculation of the exposure limit. Institutions are allowed not to include the exposures secured by residential real estate in the aggregate exposure of an SME; If the institution decides, however, to stay away from monitoring this and to consider the 1 million EUR limit as an absolute one, it is entitled<sup>65</sup> to do so regardless of whether the aggregate exposure is secured by residential real estate or not.
174. For the examination of the 1 million EUR limit, the institution must take into account the value of the exposure to the client group (group of connected clients) (see ACI Annex 2, III/20). In case of individual persons, pursuant to the aforesaid section of the ACI, persons living in the same household should be considered as a client group; this has no relevance here, however, because the 1 million EUR limit is not relevant to individuals in the Internal Ratings Based Approach.

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<sup>64</sup> CRD Annex VII, Part 3 (definition of EAD)

<sup>65</sup> CRD Article 86 (4) a); DCRR Article 27



175. The 1 million EUR limit must be examined on a stand-alone (solo) level by the institution and, on a consolidated level, by the parent institution. The regulations require that institutions must take reasonable steps<sup>66</sup> to establish whether their aggregate exposure to a client/client group exceeds the 1 million EUR limit. The steps to be taken to establish the aggregate exposure must be described in the internal regulations of institutions (IRB List of Documents D 1.4). In order to determine the aggregate exposure, institutions must strive to maintain a group-level integrated client registration system which ensures that the same client is assigned the same identifier by the parent and its subsidiaries, and if any client within the group engages in a bank transaction at any unit of the group, the related clients are automatically displayed, along with the nature of the relationship and the volume of exposures (if this is allowed by data protection rules). This way, a specific client/client group should be assigned to the same exposure class throughout the group.
176. Where an integrated system is not implemented, as an alternative solution, the members of the banking group should check the 1 million EUR limit in instances where a volume of exposure specified by the institution is exceeded (e.g. if a new transaction exceeds EUR 100,000, it triggers the examination of the aggregate exposure to the client group as well). If, assuming the same limit, the new exposure remains below EUR 100,000, however, the exposures are not aggregated for each transaction. Still, these exposures must also be checked on the client group level at least once per year.
177. If a client group includes at least one corporate client, the group must not be assigned to the retail exposure class upon the calculation of the capital requirement.

#### **Treatment of the 1 million EUR limit**

178. As explained earlier in this chapter, the 1 million EUR limit is not the only and absolute factor for deciding on the assignment of SME's to the retail exposure class. Based on the composition of their SME portfolio, risk profile and risk management principles, institutions must specify SME classification criteria (IRB List of Documents D 1.2.). In this context, it is allowed, what is more, desirable, to define a limit below EUR 1 million if it is justified by the risk profile of the exposures (e.g. clientele, average volume of exposures, etc.)<sup>67</sup>.

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<sup>66</sup> According to the wording of domestic regulations, the credit institution must take reasonable steps.

<sup>67</sup> Example: Bank ABC's SME portfolio typically consists of exposures in the HUF 150-250 million range, BANK XYZ's portfolio contains mostly exposures in the HUF 50-75 million range. It is expected for Bank ABC to apply the 1 million EUR limit, while Bank XYZ should set lower, e.g., EUR 300 thousand limit, because a new exposure of EUR 1 million would have a material effect of Bank XZY's SME portfolio, while such an exposure is also likely to be transferred to individual (corporate) treatment, which in itself would preclude retail treatment.



179. Institutions are required to monitor compliance with the 1 million EUR limit (or that of a lower limit set by the institution). Institutions must have documented internal procedures (IRB List of Documents D1.2) on the treatment of exposures which exceed these limits either temporarily or permanently. These procedures should take into consideration the following:
180. Temporary violation: Temporary violation of the 1 million EUR limit refers to situations where the threshold is exceeded for a short period of time and the violation is immaterial in terms frequency and size. The HFSA considers a violation temporary if it does not exceed 10% and lasts no longer than 90 calendar days. In this case, for risk management purposes, the exposure may be kept in the rating system for retail exposures. The related capital requirement can be calculated either with the risk weight formula for retail exposures or with that for corporations, as decided by the credit institution, provided consistency is ensured.
181. Permanent violation: If the threshold is exceeded by more than 10%, or for more than 90 calendar days, the exposure must be moved to the corporate exposure class and the corporate risk weight formula must be applied to calculate the related capital requirement. Basically, this reassignment may follow two scenarios:
- The exposure was originally assigned to the retail SME class by the institution, then the institution's exposure to the client concerned subsequently increases above the EUR 1 million threshold (while no other member of the banking group has exposure to the client). In this case, the exposure may remain in the retail rating system provided that the rating system applied to the SME class fulfils the requirements for rating systems in the corporate exposure class (in this case, the exposure may also keep its original PD), but the corporate risk weight formula must be applied. If the rating system applied to the retail exposure class does not fulfil the requirements for ratings systems in the corporate exposure class, the exposure must be moved to the corporate rating system.
  - A member of the banking group (e.g. the parent) already has SME exposure assigned to the retail class to a member of the client group, and now a new exposure emerges at another member of the banking group to any member of the client group. As a result, the exposure aggregated on the level of the banking group (but not at the individual institutions) exceeds EUR 1 million. In this case, as the statutory requirements must be fulfilled on the consolidated level, each member of the banking group must move the exposure to the corporate rating system. (or rather, the exposure can only remain in the retail SME rating system if this system fulfils the requirements set for corporate rating systems.) In this scenario, the



corporate risk weight formula must be applied and the PD generated by the corporate rating system must be used.

### **Risk management requirements (IRB List of Documents D 1.2)**

182. According to DCRR Article 27 (1) b), institutions must process risk management systems which treat in a similar manner all retail class exposures that have a similar risk profile. The risk management system must be consistent over time<sup>68</sup>, changing, if at all, only when professionally justified and in a documented manner. Consistency over time means that the credit institution treats exposures with similar risk profiles in a similar manner at any point in time.
183. The criterion as per DCRR Article 27 (1) d) requires that credit institutions should treat exposures in the retail class in a less customised manner<sup>69</sup> than exposures in the corporate exposure class. Breaking down the lending process to basic elements may help judgement on this matter.
184. If any element of the lending process that is material concerning risk management (e.g. rating system, rating process, credit approval, consideration of credit risk mitigation, monitoring, work-out) is different for the two exposure classes, the condition is complied with. In other words, if the only difference is e.g. in marketing activities, it does not constitute fulfilment of the condition i.e. different treatment is not implemented.
185. Thus an exposure to an SME is eligible for assignment to the retail class if it can be evidenced that client and risk management for this SME exposure is at least as standardised as in the case of retail loans. From the aspect of risk management requirements, “uniqueness” revealed during risk management is a key consideration upon segmentation and assignment to the corporate exposures class (the product is not standardised, decision making is not automatic, high percentage of override, non-homogeneous clientele – a simple arithmetic test can be set up for this).

### **Interpretation of granularity**

186. Applicable regulations require that the exposure must be part of a pool of a significant number of similarly managed exposures<sup>70</sup>. The HFSA would consider it inappropriate to set a minimum number of items; instead, it recommends that the granularity of the portfolio should enable the approximate satisfaction of the equation  $EL = \text{realised losses}$  and thereby the use of the related PD and LGD estimation methods. Various tests of concentration (Lorenz curve, HH Index) should be used to demonstrate granularity. (IRB List of Documents D 1.2.)

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<sup>68</sup> CRD Article 86 (4) b)

<sup>69</sup> CRD Article 86 (4) c)

<sup>70</sup> CRD Article 86 (4) d); DCRR Article 27 b)



## 6.1.2 Sub-classes of the retail exposure class

187. An exposure is eligible for classification into a retail sub-class if it already fulfilled the eligibility criteria of the retail exposure class in the first step.

### 6.1.2.1 Retail exposures secured by real estate collateral

188. If an exposure assigned to the retail class is secured by real estate collateral, it must be classified into this sub-class<sup>71</sup>. This sub-class may include both exposures to individual persons and exposures to SME's eligible for classification to the retail class, provided the exposures are secured by residential or commercial real estate. (In this respect, the Directive which serves as a basis for domestic regulations departs from the Basel recommendation as the latter only classifies exposures secured with residential real estate property into this sub-class.)

189. An exposure is qualified as covered with residential real estate if it is secured with an eligible real property as per point “(4) a” in Article 147 of judicial execution. Commercial property means any property not qualifying as residential (e.g., industrial building, warehouse, arable land, etc.).

190. Exposures secured by residential real estate collateral are exempted from the EUR 1 million threshold applicable to exposures to SME's. Accordingly, institutions do not need to apply any maximum limit to exposures to SME's assigned to this sub-class and secured by residential real estate. There is no threshold for exposures to individual persons secured by commercial real estate collateral either. A limit should be applied, however, to exposures to SME's secured by commercial real estate. If the value of such exposure exceeds EUR 1 million, it must be assigned to the corporate exposure class.

### 6.1.2.2 Qualified revolving retail exposures<sup>72</sup>

191. Pursuant to point (6) in Article 31 of the DCRR (CRD Annex VII, Part 1, point 13), exposures that fulfil the following criteria are eligible for assignment to the sub-class of qualified revolving retail exposures:

#### **The exposure is to an individual person and is qualified as revolving**

192. The revolving sub-class must not contain reassigned corporate exposures. It is a qualified revolving loan product which can be considered unsecured and unconditionally and immediately cancellable by the institution.

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<sup>71</sup> CRD Annex VII, Part 1, paragraph 12; DCRR Article 31 (4)

<sup>72</sup> The capital requirement for revolving exposures is set out in paragraph 13 of Part 1 in Annex VII to the CRD which has to be calculated in accordance with DCRR Article 31 (5) in domestic practice.



193. A loan is considered revolving if client exposure can fluctuate freely within specified limits during the term of the loan as a result of withdrawals and repayments within the limit (e.g. overdraft facility, credit card limit, debit card limit).

#### **Possibility of immediate cancelling**

194. Unused credit facility may be considered immediately cancellable even if consumer protection rules or related provisions call for a minimum notice period. Compliance with consumer protection rules makes the exposure eligible for classification into the revolving retail exposure class provided the exposure also fulfils all other applicable conditions.

Example: The bank may withdraw a debit card at any time, without explanation, by sending a written notice to the main cardholder. The bank is entitled to terminate the agreement with immediate effect if a breach of contract occurs, whereas in other cases the agreement may be terminated with a 15-day notice period, accompanied by the simultaneous cancellation of the card. The bank is not required to provide reasons for ordinary termination. The termination results in the closure of the account linked to the card and the termination of all related services.

195. On the product level (credit cards, overdraft facilities and similar products) immediate cancellability can be evidenced by presenting the text of the bank's contract templates.
196. Pursuant to Article 31 (9) of the DCCR, a loan should also be considered unsecured if the setting up of the credit limit is subject to the remittance of a regular monthly income. Furthermore, a loan may also be regarded as unsecured if there is other collateral to secure the credit line, but the exposure is treated as unsecured for capital calculation purposes, i.e. recoveries from the collateral were NOT taken into account in the LGD estimate for the product.

Example: The awarded overdraft facility can be used by the account owner without any separate credit approval, either with his bank card or by remittance from the account. The overdraft facility is automatically repaid from the transfers credited on the account, the credit line is revolving i.e. the repaid amount can be re-used again.

The overdraft facility may be:

- based on the private banking contract with the client up to HUF 500,000,
  - an amount equal to the regular monthly income credited to the account
  - 90% of the amount of the client's fixed deposits at any time
  - In addition to salary transfers credited to the account, up to 50% of other regularly credited amounts may also be taken into consideration.
197. The overdraft facility in the previous example should be considered unsecured even if a certain amount of deposit is required (e.g. deposits not tied up as collateral) or regular salary remittance. In this case, however, the collateral must not be taken into account as an LGD-reducing factor. If, on the other hand, the collateral was taken into account in the LGD calculation, the product cannot be regarded as unsecured (the exposure cannot be regarded as eligible for assignment to this sub-class).

#### **Maximum exposure to a single debtor is EUR 100,000**

198. The EUR 100,000 limit can be applied at sub-portfolio level provided the bank sets up separate sub-portfolios within the revolving retail exposure portfolio, as it is allowed to create sub-portfolios based on loss characteristics (e.g. credit cards, overdraft credit, etc.). In this case the QRRE portfolio must be segmented by LGD.



199. The HFSA examines if the institution has performed segmentation within the QREE portfolio and whether it is able to segment the products on an LGD basis (IRB List of Documents D1.2.) If yes, which the HFSA accepts, the bank may also apply the limit separately for each product.
200. The volatility of the portfolio's loss rates is low (IRB List of Documents D1.2)
201. The institution must be able to evidence that the loss rates of the portfolio assigned to the revolving retail exposure class are low compared to average loss rates and, in particular, compared to categories with low loss and PD ratings.
202. In this case, the institution must also supply data on the loss rates of various sub-portfolios (credit card, overdraft facility and/or other) in addition to the aggregate data of revolving retail exposures.
203. Volatility may be measured, for instance, by relative standard deviation (standard deviation expressed as a percentage of the mean). A sufficient number of data is required to calculate deviation, whereas the minimum allowed PD, LGD time horizon is 2 years; Therefore, to avoid contradictions, the credit institution is also allowed to calculate loss rates for smaller units of the available 2-year period (for quarters or, for larger portfolios with thousands of items, for months). The loss rate should be defined as the realised loss within a fixed period of time, measured as a percentage of the total value of the exposures in the exposure class. Realised losses include write-offs, value adjustments and accrued interest.
204. It is unacceptable if the credit institution has a significant "other retail" portfolio and still fails to perform comparisons against the loss rate volatilities of the whole or part of that portfolio.

**The treatment of qualifying revolving retail exposures is consistent with the underlying risk characteristics of the sub-class (IRB List of Documents D 1. 2)**

205. The HFSA examines compliance with this condition and will only permit assignment to the revolving class if it finds the practice of the institution appropriate. The institution must demonstrate risk management procedures (e.g. rating and/or decision and/or monitoring etc.) which relate specifically to this sub-portfolio. For the absence of such elements would indicate that the risk of the sub-portfolio is similar to that of exposures in other retail sub-classes and thus compliance with this condition cannot be ascertained, therefore the use of a separate risk weight formula cannot be allowed.
206. The definition in Article 51 (12) of the DCRR (CRD Annex VII, Part 3, point 9) (retail, immediately cancellable, with reference to consumer protection) is also in line with QRRE criteria, therefore CF=0%.



### 6.1.2.3 Other retail exposures<sup>73</sup>

207. Exposures that cannot be assigned to either of the above categories, 1) retail exposures secured by real estate collateral and 2) revolving retail exposures, but fulfil the conditions of assignment into the retail exposure class should be assigned to “other” retail exposures.<sup>74</sup>

## 6.2 Specialised lending (SL) exposures

208. Pursuant to CRD Article 86 (6)<sup>75</sup> institutions are required to separate specialised lending exposures within corporate exposures. Specialised lending exposures have the following characteristics:

- the exposure is to an enterprise established for the financing and/or operation of physical assets,
- the contractual arrangements give the lender a substantial degree of control over the assets and the income that they generate and
- the primary source of repayment concerning the contractual obligation is the income generated by the financed asset.

209. Based on these requirements, specialised lending should include in particular project finance loans, income-producing real estate (IPRE), object finance and commodities finance loans.

- Project finance is generally a financing arrangement for large, complex and expensive assets, where the lender expects repayment primarily from the income generated from the financed project, and where the project also constitutes the collateral. Project finance loans may be granted to new projects or to refinance existing projects.
- Asset finance serves to finance specifically physical assets (e.g. ships, aircraft, railway engines or fleets), the primary source of repayment being the revenue from the rental of the asset (rent or leasing fee).
- Commodities finance is structured short-term lending to finance reserves, inventories or commodities traded on the exchange. In this case, the borrower

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<sup>73</sup> The capital requirement of revolving exposures must be calculated in accordance with CRD Annex VII, Part 1, paragraph 13 (DCRR Article 31 (5)-(6))

<sup>74</sup> The capital requirement of other retail exposures must be calculated in accordance with CRD Annex VII, Part 1, paragraph 10 (DCRR Article 31 (1)-(2))

<sup>75</sup> DCRR Article 26 (2)



generally has no income apart from the sale of the commodity, nor any assets, and does not perform activities other than selling.

- In the financing of income-producing real estate, the primary source of repayment is the income from the rent-out, lease-out or sale of the real estate (e.g. an office building, land, industrial property, warehouse, apartment house, residential park, etc.) i.e. the income generated with the real estate. The main difference between loans financing income-generating real estate and other corporate loans secured by real estate collateral is that in the case of an IPRE, there is a strong positive correlation between the probability of repayment or, in case of a default, between the probability of recovery and the income-producing capacity of the real estate. With other corporate exposures secured by a real estate property, the real estate is only accepted as collateral if the repayment of the facility does not depend materially on the income generated by the property concerned. (Under national discretion, however, this condition may be disregarded in countries with developed real estate markets.) Furthermore, it is also required that the value of the property should not depend materially on the creditworthiness of the borrower.

210. The main criterion for identifying special lending exposures is the correlation of repayment with the cash flow of the asset. The institution must pay special attention to the separation of SL and corporate exposures and to the separation of SL and securitisation positions and to draw a clear borderline between these categories. Exposures must be treated consistently in the sense outlined at the beginning of the chapter. The fact that correlation between repayment and the cash flow of the financed project is a primary consideration for assignment to the SL segment means that all transactions that fulfil this condition must be assigned to this class regardless of the fact that the borrower may be other than a stand-alone project company. Non-SL transactions of clients with special loans are not to be assigned to the SL sub-segment.

211. Institutions using an IRB Approach must make it a point to have own PD estimates of the specialised lending portfolio which complies with the conditions set out in Chapter XIII of the DCRR (CRD Annex VII, Part 4). If the requirement of PD estimates cannot be met, the institution should allocate the specialised loans into five slotting classes or, if the conditions of permanent partial use are fulfilled, it may request the approval of the supervisor for the treatment of specialised lending permanently under the Standardised Approach and apply the risk weights specified in the regulations.<sup>76</sup> The use of the slotting approach is restricted exclusively to institutions that apply the Internal Ratings Based Approach to calculate the capital requirement for their credit risk. (I.e. institutions using the Standardised Approach are required to use risk weights that correspond to the exposure classes of the Standardised Approach.

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<sup>76</sup> CRD Annex VII, Part 1 (5); DCRR Article 30 (5) and 39 (3)



212. The first four categories in the regulation<sup>77</sup> (see below) are fully in line with the slotting categories defined in Annex 4 to the recommendation of the Basel Committee.<sup>78</sup> Accordingly, specialised lending exposures must be assigned to one of the 4 slotting (SL rating) categories with due consideration of the criteria set out in the Basel recommendation. Annex I.2 is the transposition of qualification criteria for special lending exposures set forth in the Basel recommendation. The categories can be mapped as follows:
- Category 1: equivalent to the “strong” rating in the Basel recommendation
  - Category 2: equivalent to the “good” rating in the Basel recommendation
  - Category 3: equivalent to the “satisfactory” rating in the Basel recommendation
  - Category 4: equivalent to the “weak” rating in the Basel recommendation.
213. If the institution finds that the categorisation criteria set out in Annex I.2 should be refined further, it may do so but the application of amended classification criteria is subject to the HFSA’s approval (IRB List of Documents D1.2). In order to obtain approval, the institution must provide a detailed and valid explanation for the amendments and demonstrate their expected effect.
214. On the institution’s request and based on a case-by-case decision, the HFSA may permit the institution to use favourable risk weights for category 1 and 2 special lending exposures with a high rating assessment. To obtain this permission, the institution must be able to supply evidence (IRB List of Documents D1.2) that the underwriting characteristics are substantially strong for the relevant categories.<sup>79</sup>

### 6.3 *Equity exposures*<sup>80</sup>

215. Pursuant to DCRR Article 28 (CRD Article 86 (5)), exposures belonging to this category include

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<sup>77</sup> CRD Annex VII, Part 1, paragraph 6; DCRR Article 30 (5) and 39 (3)

<sup>78</sup> International Convergence of Capital Measurement and Capital Standards (“Revised Framework”)

<sup>79</sup> CRD Annex VII, Part 1, paragraph 6; DCRR Article 30 (5)-(8)

<sup>80</sup> The capital requirements for the equity exposure class must be calculated in accordance with CRD Annex VII, Part 1, (17)-(27). The institution may use different calculation methods for different equity sub-portfolios, but in this case it must demonstrate to the HFSA the rationale of the selection of the approach, its consistency, it must also demonstrate that it did not choose the various methods to reduce the capital requirements (cherry picking) (Annex VII, Part 1, paragraph 17). The selected approach must reflect the size and complexity of the portfolio. Furthermore, the regulators may allow the institutions to assign holdings in firms performing ancillary services to the institutions to non-credit obligations for purposes of capital calculations, with a risk weight of 100% (Annex VIII, Part 1, paragraph 16). Such auxiliary services may include real estate utilisation or data processing, etc. provided the company concerned performs such services for the group (outsourced activities). It shall be examined to what extent the firm performs commercial activities outside the group.



- non-debt exposures conveying a subordinated, residual claim on the assets or income of the issuer (participations),
- or debt exposures with a similar economic substance to that of exposures described in point a) above.

216. Thus exposures are assigned to the equity exposures class based on their economic substance: both directly and indirectly owned equity stakes belong here regardless of whether they entail any voting rights or not and whether they are held in a company providing financial services or in any other business entity. Accordingly, exposures assigned to this class

- are irredeemable in the sense that the invested funds can only be recovered through the sale of the equity stake to a third party or from the subordinated residual assets upon the liquidation of the issuer;
- do not represent an obligation on the part of the issuer;
- convey a subordinated claim on the income and assets of the issuer;
- includes any instrument accepted as original own funds for the calculation of the institutions' own funds.
- includes instruments that embody an obligation on the part of the issuer but meet the following criteria:
  - the issuer may defer the settlement of the obligation for an uncertain length of time
  - the issuer may also settle the obligation by issuing a fixed number of shares
  - the issuer may also settle the obligation by issuing a variable number of shares and (all other things equal) any change in the value of the obligation also changes the value of the shares to be issued
  - the holder of the instrument has an option to convert his claim into shares.<sup>81</sup>

217. The HFSA will rely on the above considerations and on the examination of the economic substance of the instrument to decide whether to accept the assignment of a particular asset into the equity exposure class (IRB List of Documents D 1.2) or reject it if, based on the above criteria, it is a debt-type instrument which belongs to another exposure class.

218. Accordingly, the equity stakes of the credit institution as well as shares, participations in undertakings acquired to mitigate losses (under debt/equity swaps) or remaining in the possession of the credit institution (non-marketable, not traded on the ex-

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<sup>81</sup> Provided the conditions in section 214 are fulfilled.



change or OTC market), whether acquired for permanent holding or for trading, must be assigned to the equity exposure class.

219. Ordinary shares, preferred shares (dividends, liquidation shares, voting shares, pre-emption shares) as well as interest bearing shares, equity stakes in limited liability companies and capital deposits in limited partnerships should be assigned to this class.
220. Investments subject to consolidation and investments deductible from the solvency capital as per the ACI do not need to be assigned to the equity exposures class, i.e. they do not have to be taken into consideration when calculating the value of risk-weighted exposures.

#### **Treatment of certain key equity stakes**

221. With the so-called hybrid securities, the nature of the equity participation must be examined, i.e. whether the instrument has the characteristics of equity participation (no maturity, embodies a subordinated residual claim, non-redeemable, etc.) or if it rather has debt-type characteristics.
222. Redeemable shares are defined in Act CXLV of 1997 on corporations (types: equity embedded with a call option, put option or both options together). Due to redeemability, it does not fulfil the applicable conditions: albeit it has no maturity, a redeemable bond represents an obligation when the put or call option is exercised, therefore it must be treated as other securities (i.e. it should be classified in the exposure class corresponding to the issuer).
223. The holder of convertible bonds with subscription privilege issued by public companies remains a creditor of the company throughout the term of the bond, but he is also entitled to require the conversion of the bonds into equity shares, or subscribe new shares upon public offerings. Pursuant to Government Decree 244/2000, convertible securities must be treated as shares in the trading book provided
  - the time remaining until the first conversion opportunity is less than three months or the time until the next conversion is less than one year and
  - the price of the convertible security exceeds the market price of the underlying share with less than 10 per cent of the latter price.
224. In all other cases, the institution must treat the securities convertible to shares as bonds. This interpretation is applicable to convertible bonds in the banking book and the trading book alike.
225. Subordinated debt as defined in point 10 of Annex 5 to the ACI can only be assigned to the equity exposures class if it can be taken into account as additional own



funds for the calculation of the institution's own funds. Subordinated debt not fulfilling these conditions must not be classified in the equity exposure class.

226. Participations acquired by the institution under debt/equity swaps must be classified in the equity exposure class.

## 7 DEFINITION OF DEFAULT

227. Pursuant to applicable laws,<sup>82</sup> default by a client should be considered committed if either or both of the following events has taken place:

- The institution is of the opinion that the client is unlikely to fulfil its debt repayment obligation or a part thereof to the institution, its parent undertaking or any of its subsidiaries, unless the institution seeks recourse in order to realise the collateral (if any).
- The client has been in default on material loan obligation to the institution, its parent undertaking or any of its subsidiaries for more than 90 days or three months continuously.

228. The concept of default in the CRD is to be interpreted from the aspect of capital requirements, and it is therefore different from the accounting and legal concept of default. The concept of impairment used in international accounting is not completely identical to the concept of default.

### 7.1 *90 days past due*

#### 7.1.1 Definition of obligor

229. The CRD defines default on the level of the obligor but based on the default of facilities. Nevertheless, default of a facility may have different consequences on the obligor in the case of retail and non-retail exposures. In the case of retail exposures, the institution may apply the definition both at facility and obligor level.<sup>83</sup> E.g. if a retail client has defaulted on his credit card, he does not have to be regarded as defaulting also on his mortgage loan agreement. In the case of central governments and central banks, institutions and corporations, if any of the facilities of the obligor is in default, the obligor can only be reassigned to the default class.<sup>84</sup> For a specific client type (retail), default on one facility does not mean that another facility of the same client has also defaulted.<sup>85</sup> This way, according to the CRD and the DCRR, in the case of corporate cli-

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<sup>82</sup> CRD Annex VII, Part 4, paragraph 44; DCRR Article 68 (1)

<sup>83</sup> DCRR Article 68 (4)

<sup>84</sup> CRD Article 86 (1) a)-c); ACI Article 76/C (1) a)-c)

<sup>85</sup> CRD Article 86 (1) d); ACI Article 76/C (1) d)



ents, it is the client that is in default regardless of the facility type, defaults of retail clients are not “contagious”. Nevertheless, the stricter, debtor-level definition may naturally be applied to retail clients as well.

### 7.1.2 Group-group member

230. According to applicable laws<sup>86</sup>, rating must be defined in respect of the “legal entity”. If rating is assigned to the entire group as an entity to which the individual borrower belongs (e.g. if it is based on the consolidated balance sheet and the rated entity is a member of the group), the default is automatically extended to group members, unless there is clear bankruptcy remoteness in the applicable legislation. If exposures are rated on a stand-alone basis, it is not necessary to consider the entire group a single borrower. If one group member is moved to default status, the other group members may not necessarily be considered as defaulting, except if the agreement concerned clearly reveals the liability of the group members.
231. Regardless of the form of rating, the bankruptcy of a parent undertaking has consequences for the subsidiary, while the consequences of the bankruptcy of a subsidiary is subject to case-by-case examination.<sup>87</sup> In summary, if a member of a group is moved to default status, it does not automatically impact the group (there is no automatic cross-default), but the relationship must be investigated thoroughly at connected enterprises.
232. The HFSA expects consistency regarding the definition and treatment of defaults within banking groups, both in terms of regulations and practices. Any differences in the definition and treatment of default between group members should be presented and explained to the HFSA.

### 7.1.3 Materiality

233. The concept of “materiality” had to be introduced to enable the elimination of technical default and to avoid the need to declare default in the case of insignificant amounts. Events of default for technical, i.e. administrative reasons (systems, administrative errors, mistakes etc.) are not to be regarded as general default and therefore they must be taken out of the definition. It is definitely necessary to distinguish delays of a technical nature from credit-related default, because the former represent a type of operational risk. For the interpretation of the concept, it should be noted that it does not refer to the total credit amount but to the exposure part that is past due.

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<sup>86</sup> CRD Annex VII, Part 4, paragraph 22

<sup>87</sup> According to Article 4 (2) of the Bankruptcy Act, the assets of a subsidiary are qualified as the assets of the parent undertaking and therefore the bankruptcy and liquidation proceedings are extended to it.



The threshold for transferring 90 days past due items to default has been determined in the applicable government decree (DCRR). In the case of deviation from the threshold, a valid explanation and analysis are required.<sup>88</sup>

234. Materiality thresholds are as follows:

- For the retail segment:
  - Absolute threshold: the lowest monthly minimum wage effective at the time of the default
  - Relative threshold: 2% of the total obligations of the client or the monthly repayment instalment
- For the non-retail segment:
  - Absolute threshold: HUF 250,000 forint (EUR 1,000).
  - Relative threshold: the ratio of the total past due debt of the client exceeds 2% of the total exposure to the client (i.e. the contractual amount). For determining the contractual amount, the value of off-balance sheet items adjusted with the credit conversion factor must be taken into consideration.

235. There is a requirement which is closely related to the previous point and should be handled together with it: If the characteristics of the product justify a different treatment, it is the responsibility of the institution to set reliable thresholds relevant for those characteristics and reflecting the unique features. When determining materiality, the institution must take into account the characteristics of its own business lines and facility classes, i.e. materiality must be tailored to the institution concerned. Materiality should be interpreted by business line and product class: separate criteria should be specified for revolving and non-revolving credits. Should the institution wish to apply a lower threshold, it has to be demonstrated to the HFSZ that this move facilitates a more accurate PD estimation.

236. Both absolute and relative threshold calculation may be chosen and the HFSZ also accepts the combined application of the two thresholds (IRB List of Documents D 2). In case the institution chooses to define default as the exceeding of both thresholds, it must demonstrate to the HFSZ the potential impact on default data if the reaching of the lower threshold on its own could trigger the default (IRB List of Documents D 2)

237. In order to set the materiality thresholds, institutions must perform an analysis to determine what should be considered as a technical default. Institutions must review their materiality thresholds to keep the average portfolio of past due obligors classified as immaterial at an appropriate level. The HFSZ must assess the entire process (thresh-

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<sup>88</sup> DCRR Article 68 (5), (6), (7)



old, stability, averages, procedures, etc.). The setting of materiality thresholds must not lead to arbitrage (IRB List of Documents D 2).

238. In justified cases, the HFSA accepts the use of thresholds which is different from Hungarian regulations. [E.g. In case of an international banking group, a uniform materiality threshold on the group level is acceptable; it should be examined, however, whether the threshold is disproportionately high in the Hungarian market (e.g. the materiality threshold above one thousand euros for retail exposures)] The impact of deviation from national regulations on the actual portfolio is subject to analysis and should be accompanied by ongoing default detection. The results of the analysis must be presented to the HFSA. If they indicate a disproportionately high deviation, the HFSA may require the application of a threshold that is compliant with national regulations.

#### **7.1.4 Definition of the 90 days past due status**

239. A client or transaction can be moved to default status if a debt qualified as material has been past due continuously for more than 90 calendar days or through 3 months. When presenting the definition of default, the institution must also demonstrate the method it employs to measure past due status along with the related internal rules (IRB List of Documents D 2). Basically, the HFSA evaluates the definition and the default measurement method based on their economic scope instead of formal criteria. Thus the term default is used in instances where it may cause significant potential credit losses, or where the institution is able to demonstrate that no material credit loss will be incurred on exposures defined as non-defaulting. If the institution sets a threshold lower than the 90-day or three months limit, it has to present to the HFSA the characteristics of the product/business line which justify this shorter period and it has to be able to demonstrate that the purpose of the lower thresholds is to increase the accuracy of the PD estimate and not only to reduce the capital requirement.

#### **7.1.5 Start date of days past due and its relation to limits**

240. Days past due measurement starts on the day when the client fails to fulfil a contractual obligation. For overdrafts days past due commence once the client breaches an advised limit. Due to technical reasons, the institution's account keeping system may not allow the customer to exceed his credit line. In this case, default can also be linked to the termination of the current account contract (see the chapter "Indications of unlikelihood to pay"). Thus days past due must be calculated from the start date of past due status, however, default occurs only if the client is 90 days or 3 months past due in respect of a credit obligation that is considered material.



241. For credit cards, the start date of days past due measurement shall be the due date of minimum repayment<sup>89</sup> in case the minimum amount is not paid.
242. Advised (committed) limit refers to the contracted credit facility, while unadvised limit is the limit set for the client and approved with certain conditions (term, collateral, etc.) but not communicated to the client. As long as the client has no contractual relationship with the bank, all limits are uncommitted, while after the conclusion of the contract, the amount advised to the client and included in the contract becomes the advised/committed limit. In certain cases the bank may conclude a contract with a client for an amount below the (unadvised) limit linked to the client's risk level. The amount between the two limits may serve as coverage for technical overdrafts (e.g. conversion, default interest, charges for other banking services, etc.). The breaching of the committed limit, up to the level of the unadvised limit, is not considered a default as long as it serves to cover technical overdrafts.

### 7.1.6 Past due limit

243. Albeit the definition of default in the CRD sets forth a 90-day past due limit, the Directive allows<sup>90</sup> competent authorities to accept past due limits above 90 days but not higher than 180 days in the case of retail exposures and exposures to PSE's, for the purpose of defining default. Until the end of 2011, regulations may also allow a longer period of past due days in respect of corporate exposures for the purpose of calculating default<sup>91</sup>. Hungarian regulations and the HFSA do not support the acceptance of past due periods longer than 90 days in either case.<sup>92</sup>

## 7.2 *Indications of unlikeliness to pay*

244. According to applicable laws,<sup>93</sup> a default also occurs if the institution considers it unlikely that the obligor would fulfil its credit obligation<sup>94</sup>. Therefore, in addition to the definition based on the number of days past due, the institution must also give a definition based on the indicators of the unlikeliness to pay of the obligor. The institution may complete the criteria stipulated in the regulations with its own considerations that relate to a specific debtor, transaction or market (e.g. withdrawal of the supervisory license of a credit institution, extraordinary termination of the contract in certain cases,

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<sup>89</sup> For instance, a credit card payment is debited on 19 September while the due date of payment is 15 October. If the card holder does not pay the bank at least the minimum amount by the due date, he is moved into past due status. In case of default, the commencement of days past due will be 15 October.

<sup>90</sup> CRD Annex VII, Part 4, paragraph 48

<sup>91</sup> CRD Article 154 (7)

<sup>92</sup> DCRR Article 68 (1) b)

<sup>93</sup> CRD Annex VII, Part 4, paragraph 44; DCRR Article 68 (1) a)

<sup>94</sup> CRD Annex VII, Part 4, paragraph 45 and DCRR Article 69 (1) list factors which signal this for the institution.



e.g. if the debtor has lost his creditworthiness, but the background of the termination itself is also a cause of the default, payment moratorium in a certain country, default in the case of projects, etc.). (IRB List of Documents D 2)

### 7.2.1 Accrued interests

245. According to Hungarian regulations<sup>95</sup>, interest must be put into accrued status after 30 days past due. In the HFSA's opinion, although the accrued status of an interest obligation is a warning sign, it does not automatically trigger a default event. Therefore, the HFSA accepts if a 30-day delay in interest payment does not trigger a default in itself, only interest receivables beyond 90 days past due (and items in accrued status for at least 60 days) which exceed the objective threshold.

### 7.2.2 Impairment or provision setting due to significant perceived deterioration in credit quality

246. Hungarian regulations require institutions to specify the procedures they intend to follow in their internal regulations on value adjustment for impairment loss and provisioning<sup>96</sup>. When developing these regulations, expected recovery should be the primary consideration.<sup>97</sup> Similarly to the previous point, the booking of impairment loss and provisions is the result of the rating procedure rather than an indicator; therefore it cannot be used as an indicator on its own. The institution may determine, however, what it considers a "significant decline in credit quality". This definition may consist of a definition or a non-exhaustive list.

247. The deterioration of credit quality includes all events and conditions which have an adverse impact on the circumstances of the repayment and are likely to deteriorate the timely and complete fulfilment of the obligor's commitments. Items belonging here include e.g.

- the decline in the solvency and payment willingness of the debtor (guarantor, aval, etc.)
- breaching of other contractual obligation of the debtor or obligor (financial and legal covenants)

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<sup>95</sup> Government decree 250/2000 on the special elements of the bookkeeping obligations of institutions and financial enterprises, Article 17

<sup>96</sup> Decree No. 14/2001 (III.9.) of the Minister of Finance on the classification and evaluation criteria for outstanding receivables, investments, off-balance sheet items and collaterals. New no.: Government Decree 250/2000, Article 3 (3), (6), only applicable to financial statements on the business year 2008 and beyond

<sup>97</sup> The setting of a material threshold (paragraph (4) b in Article 14 of the Accounting Act) for the charging of impairment loss and the setting up of provisions continues to be a requirement. Similarly, institutions are also required to lay down the attributes of the significant deterioration of credit quality.



- any other event which results in or increases the probability of the deterioration of credit quality (adverse change of ownership, devaluation of collateral, events in the market or environment which endanger the continuation of the core activity, negative market news about the debtor, etc.)

### **7.2.3 The institution has sold its claim with a material loss**

248. Material loss is to be defined in relative terms, as a percentage of the claim sold. The institution must demonstrate the business considerations of selling a non-defaulted claim and must justify the discount value applied (e.g. exiting a market, sale of a sub-portfolio which has diminished to a negligible size, etc.).

### **7.2.4 Distressed restructuring of a credit obligation**

249. It is important to note that default is applicable to the distressed restructuring of principal and interest which results in a certain degree of debt forgiveness (that of principal, interests or fees, deferred payments) while restructuring or re-aging for business considerations (e.g., the adjustment of the repayment schedule to the cash-flow of the client) does not constitute a default signal.

250. The institution should have a procedure in place to differentiate the two types of restructuring, regulating the instances where so-called business re-structuring is allowed (e.g. specifying the personnel authorised to approve restructuring along with eligible clients and potential terms). Distressed restructuring requires a different treatment and approval (e.g. more frequent monitoring, write-off, work-out treatment, higher-level approval). Re-structuring not entailing debt forgiveness can be accepted as business restructuring only on certain conditions: the payment deadline may not be extended significantly compared to the original term and the credit obligation may only be restructured once. In exceptional cases, depending on the product (e.g. with project loans), deviation from this rule may be accepted if such deviation follows the applicable internal rules. The procedures to follow upon business restructuring should take into account the characteristics of the product concerned and should be laid down in the institution's internal regulations.

### **7.2.5 Bankruptcy and liquidation proceedings**

251. According to applicable laws,<sup>98</sup> the initiation of bankruptcy proceedings or similar procedures by the institution against the debtor should be considered an indication of

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<sup>98</sup> CRD Annex VII, Part 4, paragraph 45 e)



default<sup>99</sup>. [According to Hungarian regulations<sup>100</sup>, it is sufficient in these cases if the liquidation proceedings have been initiated (credit institutions are not in a position to initiate bankruptcy proceedings, only a debtor can initiate it against itself)]

252. If the institution files a request for liquidation to the Court, default can be established on the date of the stamp indicating receipt of the request by the Court. The Court issues an order of liquidation of the debtor if it establishes the debtor's insolvency. The Court establishes the debtor's insolvency if it has failed to perform its non-disputed or recognised debt within 60 days of its due date. In our opinion, even though the Bankruptcy Act mentions a 60-day and not 90-day past due debt, the initiation by the institution of liquidation against the debtor should certainly be considered a default. Although the DCCR<sup>101</sup> does not stipulate regulations on it, with a view to the fact that creditors of local governments are also entitled to initiate debt settlement proceedings<sup>102</sup>, the initiation of such proceedings against the obligor local government should also be regarded as default.

253. According to applicable laws<sup>103</sup>, it should be considered an early sign of default if bankruptcy proceedings are underway against the debtor or if he has been granted similar protection provided such protection means that the debtor cannot fulfil his payment obligation, or at least not in a timely manner, to the credit institution, its parent undertaking or to any other subsidiary. The DCCR<sup>104</sup> applies more general wording and declares that ongoing bankruptcy, liquidation or debt settlement proceedings against the debtor should be considered a sign predicting default.

254. Based on the above, the following events constitute indications of the likelihood of non-payment,

- if the credit institution has filed a request for liquidation proceedings (or debt settlement proceedings in the case of local governments) at the court;
- if bankruptcy or liquidation / debt settlement proceedings have been initiated against the debtor, not by the institution but by the debtor or a third party respectively. The institution may learn about the filing for or commencement<sup>105</sup> of bankruptcy proceedings from national daily papers that publish the announcement of the negotiations required for a payment moratorium. In the case of liquidation and debt settlement proceedings, the institution may learn about the event from

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<sup>99</sup> “The credit institution has filed for the obligor’s bankruptcy or a similar order in respect of an obligor’s credit obligation to the credit institution, the parent undertaking or any of its subsidiary.”

<sup>100</sup> DCCR Article 69 (1) f)

<sup>101</sup> DCCR Article 69 (1) f)

<sup>102</sup> As per Article 4 (2) of Act XXV of 1996 on the procedure of settling the debts of local governments

<sup>103</sup> CRD Annex VII, Part 4, paragraph 45 f)

<sup>104</sup> DCCR Article 69 (1) e)

<sup>105</sup> Bankruptcy act, Article 9 (1)



the Cégközlöny (Company Gazette) which publishes the final and enforceable court ruling on such proceedings. As these announcements may be published months after the filing of the requests, it is advised to stipulate the debtor's notification obligation in the loan contract. An additional requirement set by the CRD here is that [the aforementioned proceedings] should hinder the debtor in fulfilling his payment obligations or in fulfilling them in a timely manner while the DCRR does not stipulate any further conditions. We are of the opinion that in case bankruptcy, liquidation or debt settlement proceedings are underway, non-payment or late payment should be assumed as the satisfaction of obligations from the debtor's assets would follow a set sequence, so that creditors have to file their claims in advance, and the debtor may be granted a payment moratorium in a bankruptcy procedure, plus the claims of creditors may be forgiven under a bankruptcy agreement. This way, the prerequisites of default are fulfilled in each scenario outlined above, even if the client pays the institution promptly upon the start of bankruptcy or liquidation proceedings.

### **7.3 *Return to performing status***

255. The default status may be terminated if the client recovers (e.g. it has no more material obligations that have been overdue for 90 days or for three months continuously, provided the institution is of the opinion that there are no indications of probable non-payment) i.e. if the client is moved from defaulting to performing status. The procedures for this status change must be laid down in the institution's regulations. If the "recovered" client defaults again, it should be considered a second default event<sup>106</sup>.

### **7.4 *Use of external data of loss***

256. When external loss data are used, two types of controls may be applied<sup>107</sup>:

- result-based method: instances of default/non-default in the own portfolio would be in the default/non-default categories in the external data base without any "significant difference" (or vice versa). This can be analysed on a representative sample of adequate size;
- condition-based method: no significant difference between the individual criteria (which must be analysed one by one – e.g. no significant difference in the number of days, etc.).

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<sup>106</sup> CRD Annex VII, Part 4, paragraph 47; DCRR Article 69 (3)

<sup>107</sup> CRD Annex VII, Part 4, paragraph 46; DCRR Article 69 (4)



## 7.5 *Examination of the fulfilment of requirements*

257. The definition of default must be adequately formalised and documented. When defining default, the institution must also demonstrate the indicators of the unlikelihood to pay:

- Is the definition of default clearly laid down in the internal regulations of the institution? Is it suitable for both the HFSÁ and internal audit to check how many default events have been identified by the institution and for which client/contract? Is the definition of default set for each business line and product type?
- How the materiality threshold has been identified, is it in line with the characteristics of the business line concerned?
- Does the institution have procedures in place outlining how and on what conditions can a defaulting client be returned to the non-default (performing) category?
- Whether default is applied at debtor level, but it can also be applied at transaction/facility level in the case of retail transaction.
- How are data on defaults collected? Are all data specified in the regulations collected by the institution?<sup>108</sup>
- How are data on defaults collected at group level (group level cross default)?
- Whether default occurs after 90 days or 3 months; how are days past due counted for specific products?
- Does the institution disregard technical default, are there references to this in the internal rules? Are the instances to be considered technical default are listed (e.g.: limit violation due to exchange rate difference (multi-currency clause), repayment in progress, excess fees for non-credit-related institutional service, etc.)?
- It has to be verified that the institution has specified the indications of the unlikelihood to pay in its internal rules, furthermore, whether it has defined any additional indicators for the same purpose;
- It has to be examined how the institution perceives and learns about factors indicating the unlikelihood to pay and how the related information is examined (e.g. methods to monitor bankruptcy and liquidation proceedings) and whether procedures are in place for this purpose;
- Are there appropriate procedures in place to distinguish distressed and business restructuring (if not all instances of restructuring are considered as default)
- if external data of economic loss are used, the adequacy of the external databases is to be justified and examined (mapping).

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<sup>108</sup> DCRR Article 65, 66



## 8 DEFINITION OF LOSS<sup>109</sup>

258. As the term “loss” arises elsewhere as well and as the Directive does not provide any other definition of it, it is expedient to interpret loss in accordance with the definition set out in the CRD.<sup>110</sup>

### 8.1 *Definition of economic loss*

259. The concept of economic loss is not the same as loss in an accounting context – it refers to a broader category. The definition of the concept is important because subsequently it will serve as a basis for the calculation of LGD. In case of a credit exposure, economic loss can be determined as the outstanding amount of the exposure at the time of default as a percentage of the recoverable amounts adjusted with the discount effect. The resulting amount must be amended with e.g. the costs of collection which also have to be discounted. The result is the economic loss. In Hungary, the lowest possible LGD is 0% (negative LGD is not possible due to prudential reasons, even if the collectible amount exceeds claims and costs, i.e. if the institution achieves positive recovery.)

260. To determine the amount of economic loss, at least the following factors must be taken into consideration:

- Total receivables from the customer as at the time of default (definition of principles which can be used to calculate the amount of receivables, i.e. if various commissions, default interests are to be included in the calculation etc.);
- Amount recovered by collection (recovery);
- Costs of collection;
- Time requirement of collection and the discount rate applied.

All these considerations may vary depending on the type of the loan, the client and on other factors.

### 8.2 *Definition of materiality*

261. Pursuant to the Directive, materiality refers to the size of the exposure, the time factor and the magnitude of cost elements. In our view, if more than a year elapses between the date of default and collection, the discount effect should be considered material. Naturally, under certain circumstances a period below one year may also be regarded as material. The amount of “material” costs can be determined objectively by

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<sup>109</sup> Article 4 paragraph 26 of the CRD defines loss as follows: “loss”, for the purposes of Title V. Chapter 2, Section 3 (determining minimum capital requirements for credit risk), means economic loss, including material discount effects, and material direct and indirect costs associated with collecting on the instrument”

<sup>110</sup> CRD Article 4, paragraph 26



specifying a sum, or based on subjective criteria, taking into account all the circumstances of the specific case. Based on the established validation principles, the HFSA considers it more appropriate to leave the definition of the “materiality” threshold to the institutions, with the proviso that where justified, the HFSA may overrule the methods and amounts used for defining materiality (IRB List of Documents D2).

### **8.3 *Devaluation over time***

262. The term “discount effect” in the Directive is interpreted as “devaluation over time”<sup>111</sup>. Its magnitude depends on the time horizon (span of time for which the cash flow of recoveries and costs is examined, i.e. the length of work-out time considered) and the applied discount rates. Upon discounting, all changes have to be taken into consideration which were relevant for collection and occurred between the time of non-payment and collection (e.g. changes in real estate prices and foreign exchange rates).

263. While the selected discount rate has a significant effect on the calculated LGD, there is no established and widely accepted practice for setting the proper discount rate. Basically, institutions can apply one of the following two methods:

- historical discount rate method
- current discount rate method

264. The historical discount rate method means that for each claim in the risk database which is in default status, a rate or yield curve specified at a certain point of the transaction’s lifecycle is selected for discounting. This can be the interest rate of disbursement, or the risk-free yield curve defined at the time of default + interest margin, or a yield curve (interest rate) typical of an instrument with similar risk characteristics, or the refinancing interest rate of the exposure. The use of the current discount rate method means that the yield curve adjusted for the current risk premium is allocated to each LGD estimation period.

265. The institution must have adequate procedures in place for setting the discount rate (IRB List of Documents D 2). In case the institution specifies in advance the selected method, either one of them will be acceptable.

### **8.4 *Definition of direct and indirect costs***

266. To measure losses, all the (material) costs incurred in the course of recovery must be taken into account, including the indirect costs incurred as a secondary cost in the course of recovery. Direct and indirect costs include, for instance, the cost of work-out, recovery, sale of the real estate, enforcement of other collateral or guarantee, additional

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<sup>111</sup> E.g. HUF 100 collected 10 years from now is not worth more than HUF 60 today



legal or other expert work, as well as the costs of any extra work within the organisation. Furthermore, any (material) costs associated with recovery in the specific case must also be taken into account. The more sophisticated the recovery system of the institution, the more it is aware of the direct costs of work-out for each client and of the costs of the specific measures taken. After deducting from the total loss the work-out costs that can be directly allocated, we receive the remaining general overheads, which must somehow be allocated to the defaulted transactions. Direct cost allocation results in a more accurate LGD than the use of an allocation algorithm, because the cost allocated to a certain client in this case will accurately reflect the institution's efforts on that client (as opposed to an average amount) but there are certain practical obstacles to this approach.

267. The institution is required to present the procedure of allocating indirect costs<sup>112</sup> (IRB List of Documents D 2).

### **8.5 Requirements imposed by the HFSA**

268. In the validation procedure (IRB List of Documents D 2), institutions applying for own estimation of LGD and conversion factors (including retail LGD and CF estimates for institutions using the Foundation IRB) are required to:

- demonstrate that it has interpreted the concept of loss appropriately and collected sufficient data both for the calculation of estimated and realised LGD and for the assessment of costs;
- monitor on an ongoing basis if available data are sufficient for the measurement of LGD;
- observe the requirement of conservatism during estimations and calculations;
- present the procedure that it used for determining the materiality. The institution should review the threshold on an ongoing basis to make sure that it is still suitable for the purpose with a view to economic changes that have occurred in the meantime;
- present the discount rate method applied and the scope of the work-out period considered;
- demonstrate that it has taken into account all material expenses and collection-related costs along with the allocation method applied.

269. It is unacceptable if the losses and therefore the LGD are calculated exclusively on the basis of exposure minus collateral value; therefore the time requirement of re-

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<sup>112</sup> In the current practice of institutions in Hungary, incurred costs are usually not allocated to specific exposures. Instead, costs are charged to the entire collection process. Therefore, the establishment of a transparent allocation procedure is an important issue.



covery, i.e. the time value of money, is not taken into consideration for the calculation of the loss, or if the costs of recovery are not taken into account.

## 9 RATING SYSTEMS<sup>113</sup>

270. The rating system shall comprise all of the methods, processes, controls, data collection and IT systems that support, for each type of exposure, the assessment of credit risk, the assignment of exposures to grades or pools (rating) and the quantification of risk parameters<sup>114</sup> (1)<sup>115</sup>.
271. Within a portfolio class, different rating systems may be used for different sub-portfolios. In this case, however, the rationale for assigning an obligor or a transaction to a rating system must be justified<sup>116</sup> (2)<sup>117</sup>.
272. Assignment criteria and processes must be periodically (at least yearly) reviewed to determine whether they remain appropriate for the current conditions (3)<sup>118</sup>. The institution must prepare a review policy (IRB List of Documents D 8), determining the assignment criteria for each rating system as well as the
- frequency
  - depth of the review of processes and
  - the situations requiring extraordinary review.

### 9.1 *Structure of rating systems*

273. Ultimately, rating systems serve to determine the risk parameters of the elements of a portfolio. They typically attain that goal in two steps: first, they classify exposures into rating classes or pools<sup>119</sup> (this is called assignment) then risk parameters are assigned to these classes (pools) (this process is called calibration). There are some (typically statistical) methods that estimate risk parameters (mostly PD) in one step, directly from the characteristics of the exposure (these are called direct approaches).

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<sup>113</sup> The figures in parentheses indicate the numbering of the paragraphs of Part 4 of Annex VII to the CRD.

<sup>114</sup> This can be interpreted as a broader definition of rating systems. When the Directive imposes a requirement on rating systems (e.g. documentation), it must be extended to all the elements listed here. What it also means is that the requirements on use test and experience test are applicable to all elements.

<sup>115</sup> CRD Annex VII, Part 4, paragraph 1; DCRR Article 54 (1)

<sup>116</sup> This is particularly important if the borderlines between the portfolios associated with specific rating systems are not perfectly clear.

<sup>117</sup> CRD Annex VII, Part 4, paragraph 2; DCRR Article 54 (2)

<sup>118</sup> CRD Annex VII, Part 4, paragraph 3; DCRR Article 54 (3)

<sup>119</sup> Pools can be used only in case of retail portfolios. Therefore the Directive uses the expression “class or pool” exclusively for retail portfolios, while the Guidelines also use it when talking about any portfolio. This terminology is logically correct.



274. Direct estimates can be viewed as the outputs of grades on a continuous rating scale (4)<sup>120</sup>. Rating scales must be designed in case of direct parameter estimates as well (e.g. bankruptcy distance models, logistical regression reflecting PD), as according to the regulation, risk parameters may be estimated exclusively on a group basis, therefore rating classes must be determined in this case as well (determined by the outer limits of risk parameters), where all the clients in a category are assigned identical PDs. This is the only way to assure the back-testing of the system, i.e. that the estimates are comparable with realized figures. No actual PD exists for individual exposures – it can only be established per category that a certain number of transactions have run into default.
275. Assignment into grades or pools must be performed based on rating criteria (7, 10)<sup>121</sup>. The regulations include only very general requirements concerning the criteria (5, 17)<sup>122</sup> (obligor and transaction risk characteristics, and, for retail portfolios, past due status) which therefore need to be specified by the institution based on the characteristic features of its activities.
276. Only characteristics that are known about the rated entities should be used as rating criteria, i.e. features that can be identified based on available data<sup>123</sup>. Rating grades or pools are to be treated differently for non-retail and retail portfolios.

### 9.1.1 Exposures to corporations, institutions, central governments and central banks

277. These rating systems must have an obligor rating scale, containing a minimum of 7 grades for non-defaulted obligors and one for defaulted<sup>124</sup> obligors (6)<sup>125</sup>. For the own estimates of LGD or CF, a distinct facility rating scale for LGD and CCF must also be incorporated (9, 10).<sup>126</sup> Each scale must reflect exclusively the risks to be expressed by it (6, 9, 10)<sup>127</sup>.

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<sup>120</sup> CRD Annex VII, Part 4, paragraph 4; DCRR Article 55

<sup>121</sup> CRD Annex VII, Part 4, paragraphs 7 and 10; DCRR Article 56 (1)

<sup>122</sup> CRD Annex VII, Part 4, paragraphs 5 and 17; DCRR Article 56 (1) and DCRR Article 58 (1)-(4)

<sup>123</sup> There are typical data usually collected for each portfolio type (one such compilation is found in the documents published by the Austrian FMA, for instance), but any such list should be considered as for information only. It is common to talk about application or behavioural criteria (or rating systems). The former tend to rely on the data available when assessing a credit application, while the latter also take into account the conduct of the borrower during repayment (e.g., whether payments are regular).

<sup>124</sup> The Directive sets forth specific requirements here.

<sup>125</sup> CRD Annex VII, Part 4, paragraph 6; DCRR Article 56 (1)

<sup>126</sup> CRD Annex VII, Part 4, paragraphs 9 and 10; DCRR Article 56 (1)

<sup>127</sup> CRD Annex VII, Part 4, paragraphs 6, 9, 10; DCRR Article 56 (1)



278. The definition of obligor grades and the related risk parameters must be documented<sup>128</sup> (7)<sup>129</sup> (IRB List of Documents D 6). This documentation requirement must be extended to facility rating. The definition of rating grades and classes must be supported by a valid explanation. Undue concentration of obligors or of facilities into certain rating grades must be avoided, and such concentrations are acceptable only if the rated obligors/exposures cover a narrow PD (LGD, CCF) band and can be demonstrated to fall into that band (8, 11)<sup>130</sup>, that is, if the nature of the portfolio is such that it is homogenous enough (or consists of a few homogenous groups). This requirement should be met at rating system level.
279. A maximum of one third of clients in the entire portfolio can be assigned to any particular grade or pool (without justification). The breakdown of the portfolio by rating grades must be documented and justified, especially for concentrations exceeding the above level (IRB List of Documents D 6). This should be met at portfolio level.

### 9.1.2 Retail exposures

280. Retail rating systems need not apply separate scales for client and transaction rating. Institutions are allowed to use scales that reflect both of these together or to create relatively homogenous pools in terms of risk parameters.
281. For the purposes of assignment into grades or pools, two conflicting requirements must be met: on the one hand, the requirement that the rating grades should be narrow enough to enable the adequately meaningful differentiation of risk (15)<sup>131</sup>, and on the other hand, the number of exposures should be sufficiently large to enable the meaningful estimation of parameters<sup>132</sup> (14)<sup>133</sup>.
282. International experiences show that the sufficient number of exposures for meaningful estimation in each pool is in the range of a few hundred.

## 9.2 *Assignment to rating grades and pools*

283. Regarding ratings, the regulations set forth important qualitative criteria promoting consistent application<sup>134</sup>:

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<sup>128</sup> This requirement should be extended to retail systems as well.

<sup>129</sup> CRD Annex VII, Part 4, paragraph 7; DCRR Article 56 (1)

<sup>130</sup> CRD Annex VII, Part 4, paragraphs 8, 11; DCRR Article 56 (1)

<sup>131</sup> CRD Annex VII, Part 4, paragraph 15; DCRR Article 57 (1)

<sup>132</sup> These two contradictory requirements should be extended to non-retail portfolios as well.

<sup>133</sup> CRD Annex VII, Part 4, paragraph 14; DCRR Article 57 (1)

<sup>134</sup> It is important to note that this is irrespective of the applied method. That is, these criteria are also applicable to approaches relying completely on expert judgement (we dare say that they are even more important in that case than with the use of models).



- Detailed definitions and processes must be defined for assigning exposures to grades or pools (IRB List of Documents D 8) and they must be documented so as to assure the consistent assignment across business lines, departments and geographic locations; furthermore, third parties (the HFSA's specialist associate) should be able to understand and replicate the assignment (17).<sup>135</sup>
- Assignment procedures must be consistent with internal lending standards and policies for handling problem obligors and facilities<sup>136</sup> (17).
- All relevant information must be taken into account in rating, that is, even if sufficient volume and quality of internal data is available, relevant external information should not be disregarded (18).<sup>137</sup>
- The requirement of the use of external data is explicit in cases where the bank uses an external rating as a primary factor determining an internal rating assignment (18). In other words, an internal rating system must not consist of simply the automatic takeover of external ratings (as with the standardised approach): any external ratings used as input must be evaluated and considered in conjunction with other data, information and specialist assessments.
- The less information is available, the more conservative the estimate must be (18). In this context this means that if little information is available, the exposures must be assigned to less favourable rating grades than they would be assigned to based on the information at hand (e.g., in case of LGD estimates, generally supported by less information).

### 9.2.1 Assignment of exposures

284. Over and above the aforementioned qualitative requirements:

- as part of the credit approval process, each obligor or exposure must be assigned: to an obligor grade in case of non-retail obligors, to LGD or CF facility grades in case of AIRB, and to grades or pools in case of retail exposures (19, 20, 24)<sup>138</sup>,
- in case of non-retail portfolios, exposures to the same obligor must be assigned to the same obligor grade (with some special exceptions) (23)<sup>139</sup>. One such exception is the case where the guarantee can be treated by an adjustment to the rating.<sup>140</sup>

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<sup>135</sup> CRD Annex VII, Part 4, paragraph 17; DCRR Article 58 (3)

<sup>136</sup> Again, the underlying intention is to ensure that rating should be incorporated into the day-to-day operations of the bank.

<sup>137</sup> CRD Annex VII, Part 4, paragraph 18; DCRR Article 58 (5)-(6)

<sup>138</sup> CRD Annex VII, Part 4, paragraphs 19, 20, 24; DCRR Article 59 (1) and DCRR Article 60

<sup>139</sup> CRD Annex VII, Part 4, paragraph 23; DCRR Article 59 (2)-(3)

<sup>140</sup> There are several possibilities to take guarantees into account, one being where the effect of the guarantee is reflected in the assignment into a different grade (using the PD of the guarantor, resulting in a transfer to a



- each legal entity must be separately rated. The institution must demonstrate that it has acceptable policies regarding the treatment of individual obligor clients and groups of connected clients (22<sup>141</sup>) (IRB List of Documents D 8). Group rating is not obligatory (or prohibited, for that matter), and if it is applied, it is not obligatory (or prohibited) to maintain any sort of relationship between solo and group rating (e.g., that they should be identical). Such questions should be addressed in the policy for the treatment of group of connected clients (D8).
285. The regulations do not provide specific guidance on the method of assignment, either prohibiting or recommending any technique. It is possible for human judgement to override the inputs or outputs of the assignment process, but situations where this is possible as well as the overrides themselves must be documented and analysed (25<sup>142</sup>). Institutions must have separate procedures for overrides (IRB List of Documents D 8) and they have to separate rating and other overrides.<sup>143</sup>
286. In practice (essentially depending on the quantity of available data), a wide range of combined subjective and objective elements is used during rating. On the one hand, there are models (automated procedures) that rely on a wealth of data (typically for retail portfolios), and on the other hand there are procedures that are forced to be based on few data only, relying almost entirely on informal expert assessment (country rating is a typical example). The stages in between are characterised by varying degrees of standardisation of the subjective elements (information, procedures). The so-called hybrid systems (combining subjective and objective procedures) are frequently used, with different methods of combination. Models (mechanical procedures) also come in a number of versions. Statistical and in particular diverse regression models are used the most frequently, but a number of other techniques may also be encountered.
287. Although the regulations do not provide any guidance whatsoever on the applicable methods<sup>144</sup>, experience shows that the more mass products (the more numerous, more simple, more homogenous etc.) are involved in the exposures, the greater the role of models (mechanical procedures). And the other way around: the more unique the product (low number of complicated, highly differentiated exposures), the less the institution should rely merely on mechanical procedures (models) and the bigger the role that should be left for human judgement. Therefore a country rating system based on a

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different PD class). Thus different exposures to the same obligor may be placed in different grades. Under another approach, the guarantees may be considered in the LGD.

<sup>141</sup> CRD Annex VII, Part 4, paragraph 22; DCRR Article 59 (1)

<sup>142</sup> CRD Annex VII, Part 4, paragraph 25; DCRR Article 61 (1)

<sup>143</sup> An override does not always mean the override of the rating (and this that of the PD), but the override of consequences deriving from the rating (e.g. rejection, limit). These are called other overrides.

<sup>144</sup> What is more, even international working groups dealing with validation issues follow the principle of “not suggesting any method”.



statistical model is generally not acceptable, nor is the rating of a large retail portfolio exclusively by subjective method.<sup>145</sup>

## 9.2.2 Updating of ratings

288. Ratings must be updated at least annually (27)<sup>146</sup>. This requirement (i.e. that ratings should reflect the risk level of exposures on an ongoing basis) can only be fulfilled if the information used for rating is updated at least annually (like e.g. financial statements used for corporate ratings), or other data that reflect the payment behaviour of the debtor are permanently available. With retail systems, data obtained upon credit application usually cannot be updated (clients are normally not asked to report their actual income etc. regularly) thus the use of behaviour data is the only viable approach.
289. In case of non-retail portfolios, problem obligors and exposures must be subjected to more frequent review and, if material new information becomes available, a new assignment must be undertaken (27). To that end, information that may lead to the change of ratings must be collected (28)<sup>147</sup>. The institution may decide which obligors and transactions to regard as being of high risk. This, as well as the frequency of the review of such clients and transactions must be defined in internal regulations (e.g. monitoring and/or rating procedure). (IRB List of Documents D 8)
290. Ratings and periodic reviews of ratings must be completed or approved by an independent party that does not directly benefit from decisions to extend the credit (26)<sup>148</sup>.
291. For retail portfolios, in addition to the updating of rating assignments, the loss characteristics and delinquency status of each pool must be reviewed at least annually. Also, in a representative sample the status of individual exposures within each pool must be reviewed at least annually as a means of ensuring that exposures continue to be assigned to the correct pool (29)<sup>149</sup>. Institutions must have appropriate policies and procedures for the assignment of the various exposures to the appropriate pools (the monitoring of the assignment criteria of the various exposures should be part of this). The appropriate frequency and scope of review are determined by the characteristics of the pool. Review based on annual representative samples is considered as a minimum requirement.

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<sup>145</sup> The advantages and disadvantages of the various methods and their applicability to different portfolios are discussed in detail in the validation paper published by the National Bank of Austria.

<sup>146</sup> CRD Annex VII, Part 4, paragraph 27; DCRR Article 62 (1)

<sup>147</sup> CRD Annex VII, Part 4, paragraph 28; DCRR Article 62 (2)

<sup>148</sup> CRD Annex VII, Part 4, paragraph 26; DCRR Article 62 (1)

<sup>149</sup> CRD Annex VII, Part 4, paragraph 29; DCRR Article 62 (3)



292. These reviews and their frequencies must be specified in internal rules, as well as the timing and nature of any subsequent measures to be taken as a result of the reviews.

### 9.2.3 Use of models

293. The use of models is one possible method of rating. Mechanical methods (which can be automated and are typically but not necessarily statistical methods) can be used essentially with homogeneous client or standardised product groups<sup>150</sup> that involve a large number of elements. Due to the opportunity enabled by the large sample, these methods can be handled well with statistical methods (models).

294. To use these tools, additional requirements must be fulfilled. The fundamental requirement concerning models is to have good predictive capabilities (30a)<sup>151</sup>. While there are indirect (quantitative) methods to judge this, in most cases no sufficient data is available for their adequately strict application.

295. As the correctness of models usually cannot be ascertained reliably with direct, quantitative methods, its implementation, environment and use should be reviewed. The regulations explicitly mention some reviews of this sort<sup>152</sup>:

- a process must be in place (IRB List of Documents D 7) for vetting data inputs into the model assessing the accuracy, completeness and appropriateness of the data (30b)<sup>153</sup>; see also Paragraph 375 of the Guidelines.
- it must be demonstrated that the data<sup>154</sup> used to build the model is representative of the actual portfolio (30c)<sup>155</sup>. This is one of the most difficult and predictably highly controversial tasks. What must be proved is that within the data used to build the models, the assignment into rating grades depends on the rating criteria in the same (or at least similar) way as in the actual portfolio<sup>156</sup>. In most cases there is insufficient data for the correct statistical analysis of this; therefore we must settle for more simple methods (e.g. examination of the similar distribution of the two data sets by key parameters).

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<sup>150</sup> E.g. retail consumption loans.

<sup>151</sup> CRD Annex VII, Part 4, paragraph 30a; DCRR Article 63 (2)

<sup>152</sup> The section discussing validation principles describes additional tools that do not (directly) follow from the Directive.

<sup>153</sup> CRD Annex VII, Part 4, paragraph 30b; DCRR Article 63 (3)

<sup>154</sup> Two sets of data should be mentioned in connection with models, which may overlap or may be different. One set is used for estimating the parameters of the models (these describe how the assignment into a rating grade depends on the selected criteria), the other for estimating risk parameters (PD, LGD, CCF).

<sup>155</sup> CRD Annex VII, Part 4, paragraph 30c; DCRR Article 63 (4)

<sup>156</sup> It is frequently believed that this may only be a problem when external data is used. In reality, even when own data is used, major changes may occur in the portfolio, credit policy of the bank or simply in the external environment.



- the credit institution must have a regular (validation) cycle<sup>157</sup> (30d)<sup>158</sup> and policy (IRB List of Documents D 16), which includes
  - monitoring the performance and stability<sup>159</sup> of the model, including the comparison of the model and the actual outcomes,
  - review of the model specification.

296. As no model (mechanical procedure) is perfect, the models must not be used mechanically. They must be supplemented by human judgement relying on material information not considered by the model (the method of this must be documented to avoid arbitrariness (IRB List of Documents D 8)) and by the review of these overrides with a view to identifying and addressing the weaknesses of the model (30e)<sup>160,161</sup>.

#### 9.2.4 Stress tests used in the assessment of capital adequacy

297. In the second pillar, stress tests must be performed to supplement the internal capital calculation. The regulations require a stress test specifically for credit risk. This test is to be chosen by the institution, but is subject to supervisory review. The test (IRB List of Documents D 20) must cover the overwhelming majority of exposures and it must be reasonably conservative, considering at least the effect of mild recession scenarios<sup>162</sup> (40, 41)<sup>163</sup>. Credit institutions using the treatment set out in Annex VII, Part 1, paragraph 4 must consider as part of their stress testing framework the impact of deterioration in the credit quality of protection providers (42)<sup>164</sup>.

298. The institution must devise stress scenarios which determine the exposure (risk) of its portfolio in a recessionary business environment. Based on the stress scenarios, the institution must examine the effects of the scenarios on its portfolio at least once a year.

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<sup>157</sup> Obviously these tests must also be performed in the course of the first validation in the period of approval, where the (probably rather short) history of the model can be taken into account for the functions described in the first point.

<sup>158</sup> CRD Annex VII, Part 4, paragraph 30d; DCRR Article 63 (5)

<sup>159</sup> The institution must measure the predictive and discriminative power (default/non-default) and stability of the model with appropriate methods: using out-of-sample and out-of time tests. During development, the out-of sample test is acceptable for short time series, but subsequently both tests must be applied.

<sup>160</sup> CRD Annex VII, Part 4, paragraph 30e; DCRR Article 63 (6)

<sup>161</sup> This is the repetition of the general override requirements (25) as applicable to models

<sup>162</sup> International experts also consider it acceptable if capital calculations are performed with a certain worsening of risk parameters and/or ratings.

<sup>163</sup> CRD Annex VII, Part 4, paragraphs 40 and 41; DCRR Article 67 (1)-(4)

<sup>164</sup> CRD Annex VII, Part 4, paragraph 42; DCRR Article 67 (5)



### **Additional requirements regarding the rating systems**

299. The rating system must be accurate, must have adequate discriminative power and must be stable, which the institution must be able to demonstrate with appropriate tests.

These may include (inter alia):

- CAP (Cumulative Accuracy Profile) analysis and the AR (Accuracy Ratio) index
- ROC (Receiver Operating Characteristic) analysis and the ROC index, as well as the Pietra Index
- tests of discriminative power
- stability (robustness) tests (out-of-sample, out-of-time)

300. If the institution uses new tests different from international best practices, the entire theoretical foundation must also be documented.

## **10 QUANTIFICATION OF RISK PARAMETERS**

### **10.1 Overall requirements for estimation**

301. The last step in the establishment of rating systems is the determination of risk parameters for each rating grade and pool, or calibration (“quantification” in the terminology of the regulations).

302. Probably the most important requirement concerning the estimation of risk parameters is that they must be forecasts rather than the ex post recording of facts<sup>165</sup>, that is, any average derived from even large and high-quality data series can represent only the starting point and not the estimation itself. Therefore, parameters calculated from historic data are not acceptable without justification<sup>166</sup>. As a minimum, institutions must make some assumptions regarding the expected development of risk drivers, and they must adjust the primary estimates accordingly. In theory, this can be adjustment downwards, but for prudential reasons the HFSA would accept that only based on very sound and convincing reasoning.

303. External, internal and pooled data as well as their combination can be used for estimation.

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<sup>165</sup> While this requirement does make sense, it is not laid down explicitly either in the Directive or in the annexes to it. They are declared in such definite manner in the AIG principles. The key is the interpretation of the term “estimate”.

<sup>166</sup> Ideally, we should also have (for instance econometric) models for the forecasting of the risk parameters themselves. However, in the initial period this would obviously be an unrealistic demand due to the lack of adequate time series, but with the passage of time supervisors may become more demanding regarding the methods of the forecasting of parameters.



304. The regulations define some important general requirements for the estimation of parameters:

- to promote the soundness of estimates, all relevant data, information and methods must be used (49)<sup>167</sup>, obviously within the constraints of reasonable expenditures
- estimates must be derived using both historical experience and empirical evidence, and not based purely on considerations<sup>168</sup> (49)
- estimates must be based on the material drivers of the risk parameters (49)
- institutions must be able to demonstrate that their estimates are representative of long run experience (50)<sup>169</sup> which may mean one of two things: on the one hand, the elimination of fluctuations over time by using averages, and on the other hand, the observation of long term trends and their incorporation in the estimates.
- any changes in the lending practice or work-out process over observation periods referred to in paragraphs 66, 71, 82, 86, 93 and 95 in Part 4 of Annex VII to the CRD must be taken into account(51)<sup>170</sup>.
- estimates must reflect the implications of technical advances and new data and other information as it becomes available. Estimates must be reviewed when new information comes to light but at least on an annual basis (51).
- the population of exposures represented in the data used for estimation, the lending standards used when the data was generated and other relevant characteristics affecting the risk parameters must be comparable with the current ones. The same applies to the economic or market conditions behind the data (52)<sup>171,172</sup>.
- the number of exposures in the sample and the data period used for quantification must be sufficient to provide confidence in the accuracy and robustness of estimates (52). The institution must demonstrate that it has used a sample containing sufficient number of exposures and data series of sufficient length. The institution must prepare internal policies for the range and quality of the minimum acceptable required data and the mode of their utilisation (IRB List of Documents D 10), supported by analyses.

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<sup>167</sup> CRD Annex VII, Part 4, paragraph 49; DCRR Article 70 (1)-(2)

<sup>168</sup> Compliance with this obvious principle may cause (and usually does cause) problems with low-default portfolios.

<sup>169</sup> CRD Annex VII, Part 4, paragraph 50; DCRR Article 70 (3)

<sup>170</sup> CRD Annex VII, Part 4, paragraph 51; DCRR Article 70 (4)

<sup>171</sup> CRD Annex VII, Part 4, paragraph 52; DCRR Article 70 (5)

<sup>172</sup> Please refer to the “Data” section for details



- a margin of conservatism must be added to the estimates in relation to the expected range of estimation errors. The less satisfactory the data and the larger the expected range of errors, the larger the margin should be (49, 54)<sup>173</sup>.
  - if an institution uses different risk parameters (PD, LGD, CF) for the calculation of regulatory capital and for internal purposes, the reason behind it must be demonstrated (55)<sup>174</sup> (IRB List of Documents C 2). This situation may arise because different versions of the various risk parameters are appropriate to use for different purposes (e.g. expected long term PD for the calculation of capital requirements, and maybe short term PD for pricing). The justification must demonstrate that the different values come from a single system and their difference results exclusively from the different intended use.
  - if a credit institution can demonstrate that for previously collected data appropriate adjustments have been made to achieve broad equivalence with the definitions of default and loss as per the regulations, the supervisory authority may allow the institution some flexibility in the application of the required standards of data (56)<sup>175</sup>. In such cases, the adjustments must naturally be documented in detail (IRB List of Documents D 10) and broad equivalence with the Directive must be demonstrated.
  - For the time being, this chapter does not address requirements concerning pools (57, 58)<sup>176</sup>.
305. If the reliability of the methods used or of the data is low for any reason<sup>177</sup>, this must be offset by the use of a margin of conservatism. The institution must prepare an appropriate internal policy (IRB List of Documents D 10) and demonstrate, concerning concrete estimates, that the rate and use of the so-called margin(s) of conservatism offsets the uncertainty arising from the errors<sup>178</sup>. For the sake of clarity and back-testing, it should be made clear what margin is being used in which phases. It is acceptable if the margin is applied only in the final phase, as a lump sum. (Naturally, it must be justified in details why it is applied and at what rate.)
306. The absence of data cannot be substituted for by conservatism.
307. Special attention must be paid to the possibility of a special arbitrage: an institution may sell a poor quality claim just before it would need to be declared defaulting. Thus its estimated PD will be lower than realistic, and the calculated capital require-

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<sup>173</sup> CRD Annex VII, Part 4, paragraph 54; DCRR Article 70 (7)

<sup>174</sup> CRD Annex VII, Part 4, paragraph 55; DCRR Article 70 (8)

<sup>175</sup> CRD Annex VII, Part 4, paragraph 56; DCRR Article 70 (9)

<sup>176</sup> CRD Annex VII, Part 4, 57., paragraph 58; DCRR Article 71 (1)-(2)

<sup>177</sup> E.g. insufficient quantity of data, estimation error, changed circumstances, etc.

<sup>178</sup> More specifically, the important thing from the supervisor's aspect is that it should not result in the under-estimation of the risk parameter i.e. to that of the capital requirement.



ment will also be reduced. It is also not the right solution to rate these claims as defaulting because this would distort the estimated LGD. Therefore institutions are expected to record such claims separately, in a transparent manner, and to use them for estimating the parameters in such a way as to assure that it does not result in the undue reduction of capital requirements. (The institutions must be able to demonstrate this sort of use.) This issue is closely linked with the interpretation of one element of the definition of default (the institution transfers a claim at a significant loss, see 7.2.3.). Institutions must state in their internal rules (IRB List of Documents D 10) how to classify controversial or uncertain cases.

## 10.2 Requirements specific to PD estimation

308. There are several methods for PD estimation (IRB List of Documents D 12):
- from long run averages of one-year default rates (59, 67)<sup>179</sup>
  - for retail and purchased receivables exposures only, from realised losses and estimates of LGDs (68, 70)<sup>180</sup>.  $PD = EL / LGD$ , i.e. institutions that know loss characteristics<sup>181</sup> may also use this “indirect” method. In the case of indirect methods, the homogeneity of the portfolio becomes important, because without that, the calculations may result in a PD greater than 100%,
  - statistical bankruptcy prediction models (65, 69)<sup>182</sup>,
  - for non-retail exposures exclusively, mapping (to the rating grades used by an external rating agency (64)<sup>183</sup>). In this case, some additional requirements of the directive and domestic regulations must also be fulfilled.
309. Long run averages must mean averages spanning at least one full economic cycle which are therefore independent of cycles. Initially, two-year data series may be used, but later efforts must be made to use parameters calculated from long run averages. In the risk weight formulae (because of their theoretical foundations) long run average PDs must be used, more specifically, ex ante (expected) averages rather than historical averages. The institution must present the method (IRB List of Documents D 12) it intends to use for generating long run PD from annual PDs.
310. For estimation, data series spanning at least five years must be used. Upon launch and in the case of Foundation IRB and a retail portfolio, data series covering at least 2

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<sup>179</sup> CRD Annex VII, Part 4, paragraphs 59, 67; DCRR Article 72 (1) and 73 (1)

<sup>180</sup> CRD Annex VII, Part 4, paragraphs 68, 70; DCRR Article 73 (1) and 73 (4)

<sup>181</sup> E.g. unsecured or hedging transaction with a strong secondary market in case of a small, high-volume portfolio

<sup>182</sup> CRD Annex VII, Part 4, paragraphs 65, 69; DCRR Article 72 (7) and 73 (2)

<sup>183</sup> CRD Annex VII, Part 4, paragraph 64; DCRR Article 72 (6)



years are also allowed, but this minimum period must be increased by one year annually until the five years are reached (66, 71)<sup>184</sup>.

311. In the case of non-retail portfolios, PD estimation techniques may only be used with supporting analysis<sup>185</sup> (IRB List of Documents D 12) and with the appropriate adjustments (62)<sup>186</sup>, mainly to eliminate constraints presented by information and procedures.
312. For retail portfolios, primarily internal data should be used as a basis. If external data or statistical models are used, a strong link must be demonstrated between the internal risk profile and the composition of the external data, and between the internal rating procedure and the rating process used by the external data source (69)<sup>187</sup>.
313. For retail portfolios, the expected changes of risk parameters over the life of credit exposures must be identified and analysed (IRB List of Documents D 12) as well (seasoning effect, 72)<sup>188</sup>.
314. Seasoning effect may cause problems for exposures with longer term, where e.g. the default rate is lower in the first year(s) and increases substantially later, or it increases for a while and then decreases, etc. This pattern can be observed in the case of long-term retail exposures, typically mortgage loans, and particularly upon the issue of bonds<sup>189</sup>. In these cases the age of the exposure is also an important factor in determining the likelihood of the borrower's bankruptcy in the following one-year period.
315. If the seasoning effect is material, it must be measured and managed in some way. For this purpose, data must either be adjusted for age ("unseasoning") or the issue may be managed on the model level.

### ***10.3 Requirements concerning LGD estimation***

#### **10.3.1 Comments relating to sections of the Directive<sup>190</sup>**

316. LGDs must be estimated by facility grade<sup>191</sup> or pool on the basis of average realised LGD (risk weighted average) using all observed defaults within the data sources (73)<sup>192</sup> (IRB List of Documents D 14).

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<sup>184</sup> CRD Annex VII, Part 4, paragraphs 66, 71; DCRR Article 72 (8) and 71 (5)

<sup>185</sup> This is where the way and extent of departure from e.g. historic averages should be discussed, as well as the case described under (63) (not detailed here)

<sup>186</sup> CRD Annex VII, Part 4, paragraph 62; DCRR Article 72 (4)

<sup>187</sup> CRD Annex VII, Part 4, paragraph 69; DCRR Article 73 (2)

<sup>188</sup> CRD Annex VII, Part 4, paragraph 72; DCRR Article 73 (7)

<sup>189</sup> One explanation may be that the issue of bonds generates significant free cash flow for the debtor from which he can easily pay due instalments in the beginning (even if it is a debtor with the worst rating).

<sup>190</sup> All paragraph numbers refer to CRD Annex VII, Part 4.



317. The data set related to the LGD estimate (Reference Data Set, RDS) contains exclusively exposures in default. For these, the own LGD of the exposures can be defined individually. The “risk weighted average” mentioned at the calculation of the “average realised LGD” is the simple (unweighted) arithmetic average of individual LGDs (by exposure)<sup>193</sup>.
318. The term “on the basis of the average realised LGD” in the regulations indicates that the estimate cannot be mechanically identified with actual historical data. The expected direction (and rate) of change of LGD against the expected development of factors affecting LGD must always be examined. The result of those analyses (as a kind of derivation of LGD values from realised values) must be documented (IRB List of Documents D 14).
319. LGDs appropriate for an economic downturn must be applied if these are far more conservative than the long run average (74)<sup>194</sup>.
320. Downturn LGD is intended to take into account a situation where (contrary to the conditions applied for the theoretical description of risk weight formulae) the LGD is not independent of the cycle but (typically) increases with an economic downturn which is reflected in the positive correlation between the PD and the LGD<sup>195</sup>.
321. The GL10 requires the execution of the following steps:
- Identifying appropriate downturn conditions for each exposure class<sup>196</sup> within each jurisdiction<sup>197</sup>,
  - identifying any material (negative) dependencies between economic downturn and LGD<sup>198</sup>,
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<sup>191</sup>Examples of facility grades: senior, junior, secured, unsecured, or coverage bands (e.g. <40%, 40%-60%, 60%-80%, >80%).

<sup>192</sup> CRD Annex VII, Part 4, paragraph 73; DCRR Article 74 (1)

<sup>193</sup>Statistical practitioners would tend to use the weighted average in such a situation, because it is considered more stable. Both estimates are unbiased, and it can be demonstrated that, if certain obvious assumptions are made, the unweighted average has a smaller standard deviation. Incidentally, the difference between the two averages is largest if there is a correlation between the LGD and the size of exposures, which indicates incorrectly formed rating grades/pools. Thus situations where the two averages significantly differ must be avoided (explained).

<sup>194</sup> CRD Annex VII, Part 4, paragraph 74; DCRR Article 74 (2)

<sup>195</sup> As the techniques of LGD estimation are much less elaborated those of PD, the estimation of downturn LGD is a considerable challenge for banks. Surveys also revealed that banks tend to manage the above PD-LGD correlation with other techniques (and typically within Pillar II) rather than using the downturn LGD. At the CRD retained the requirement, however, and the international forums addressing the issue also failed to accept relaxation in practice, despite all difficulties, banks and supervisors must take this seriously.

<sup>196</sup> Examples: decrease of GDP and high unemployment, high default rates, recession in the market of collaterals (e.g. housing properties).

<sup>197</sup> Differentiation by jurisdiction is necessary where this results in significant differences in downturn LGD.



- determining downturn LGD (IRB List of Documents D 14).<sup>199</sup>

322. The institutions must demonstrate in some manner (IRB List of Documents D 14) that the downturn LGD thus determined is not less than the long-run average LGD. When addressing the question of downturn LGD, the following factors must be taken into consideration<sup>200</sup>:

- only effectively material correlations<sup>201</sup> should be taken into account
- reliance must be placed on external data and analyses
- for an introductory period (until sufficient data and international experience is accumulated) the HFSA considers it acceptable that
  - material dependencies are identified based on external data<sup>202</sup> and analyses rather than own data. The main dependencies (e.g. residential mortgage).
  - the values are also determined based on external data/information, in this case not necessarily with classic statistical tools but e.g. by combining aggregate data and reasonable assumptions and considerations (e.g., for the ratio of long-run average and downturn LGDs, the ratios observed by others can be used as long as their applicability, potentially with some adjustments, can be demonstrated).

Institutions must document (IRB List of Documents D 14):

- the justification of the use (disregard) of PD-LGD correlations;
- the method and justification of downturn LGD calculations.

323. there is strong dependency between the risk of the obligor and the risk of the collateral (or collateral provider)<sup>203</sup>, this must be addressed by a sufficient downward adjustment of the LGD (75<sup>204</sup>) (IRB List of Documents D 14).

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<sup>198</sup> Through the examination of correlations between the aforementioned circumstances and the LGD or certain factors of LGD, e.g. value of collateral.

<sup>199</sup> For instance, by analysing downturn LGDs, or forecasting LGD drivers.

<sup>200</sup> The main obstacle to meeting the above requirements is the absence of downturn data, and even the definition of downturn. In this situation, reasonable compromises are needed.

<sup>201</sup> As the issue is rather difficult in the absence of data and experience, the downturn LGD should be defined specifically only where it is expected to be substantially different from the expected long-run average LGD otherwise used. Smaller effects and differences may, or should, be handled through a sufficient margin of conservatism.

<sup>202</sup> External data effectively means data from other countries. Either the Hungarian market economy has not experienced downturns such as, for instance, the real estate markets of some developed countries, or there are no useful data available about historic downturns (e.g. the collapse of former USSR markets).

<sup>203</sup> Like e.g. in the previous point

<sup>204</sup> CRD Annex VII, Part 4, paragraph 75; DCRR Article 74 (3)



324. In case of currency mismatches between the underlying obligation and the collateral, a conservative estimate is required again (IRB List of Documents D 14). (IRB List of Documents D 14). Conservative treatment means assuming adverse exchange rate trends (and appropriate loss calculation) (76)<sup>205</sup>.
325. If LGD estimates take into account the existence of collateral, these estimates may not solely be based on the collateral's estimated market value. Potential inability to gain control of the collateral and liquidate it must also be taken into account (77)<sup>206</sup> (IRB List of Documents D 14)<sup>207</sup>.
326. If LGD estimates take into account the existence of collateral, institutions must establish internal requirements for collateral management, legal certainty and risk management that are generally consistent with those set out in Annex VIII, Part 2 (78)<sup>208</sup>.
327. Uncertainties of enforcing collateral (see previous paragraph) necessitate the (conscious) management of such risks and the establishment of internal (minimum) requirements to keep adverse effects in an acceptable (and calculable) range. It is expedient to set this out in an internal rule<sup>209</sup>. (IRB List of Documents D 14)
328. Where collateral is recognised for determining the EAD, the expected recoveries from collateral must not be taken into account (also) in the LGD estimates (79)<sup>210</sup>
329. For exposures already in default, the best estimate of expected loss for each exposure given current economic circumstances must be used, adding the possibility of additional unexpected losses during the recovery period (80)<sup>211</sup>.
330. If unpaid late fees have been capitalised, they must be added to the exposures and losses (81)<sup>212</sup>

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<sup>205</sup> CRD Annex VII, Part 4, paragraph 76; DCRR Article 74 (4)

<sup>206</sup> CRD Annex VII, Part 4, paragraph 77; DCRR Article 74 (5)

<sup>207</sup> Such uncertainty is, for instance, the price that can be achieved at a distress sale, the aforementioned exchange rates or the uncertainty mentioned in (77) relating to control over the collateral in bankruptcy. As a result, it is not true, for instance, that LGD is approximately identical (apart from costs, time delays etc.) to the  $1-(1/LTV)$  expression if the "value" for the calculation of LTV (loan to value) means market value. It would only be so after an adjustment that approximates the market value to the realisable value.

<sup>208</sup> CRD Annex VII, Part 4, paragraph 78; DCRR Article 74 (6)

<sup>209</sup> It can be another one, e.g. a part of the rules of risk management.

<sup>210</sup> CRD Annex VII, Part 4, paragraph 79; DCRR Article 74 (7)

<sup>211</sup> CRD Annex VII, Part 4, paragraph 80; DCRR Article 74 (8)

<sup>212</sup> CRD Annex VII, Part 4, paragraph 81; DCRR Article 74 (9)



### Exposures to corporations, institutions, central governments and central banks

331. Initially, estimates must be based on data over a minimum of five years for one data source. This increases by one year each year after implementation until a minimum of seven years is reached (82)<sup>213</sup>.

### Retail exposures

332. Notwithstanding paragraph 73 and only in the case of retail exposures and purchased receivable, LGD estimates may be derived from realised losses and estimates of PDs (83)<sup>214</sup>. This is the technique known as implied historical LGD. It is based on the fact that the ratio of expected loss (EL/EAD) is the same as the PD multiplied by LGD, that is, the LGD can be calculated if the loss ratio and the PD are known<sup>215</sup>. The use of this technique is subject to the demonstration of the accuracy of the EL estimate (in addition to the demonstration of the adequate quality of PD estimation) (IRB List of Documents D 14). EL can (generally) be estimated using realised losses. What needs to be examined is the extent of coincidence between realised and expected losses (to what extent the effect of unexpected losses is eliminated). The chances of this are higher where longer time series are used. Therefore, we consider this technique justifiable only in the case of portfolios<sup>216</sup> with a large number of exposures and with longer time series.

333. Notwithstanding paragraph 89, future drawings may be reflected either in the conversion factor or in the LGD estimates (84)<sup>217</sup>.

334. Estimates must be based on data from time series spanning at least five years. At the time of implementation, with permission, this can be reduced to two years, which is to increase by one year in each year until the data cover a period of five years (86)<sup>218</sup>

335. Notwithstanding paragraph 73, historic data pertaining to different points of time do not need to be rendered equal weight if the institution is able to demonstrate to the supervisor that more recent data enable a better estimate (86). The clause “do not need to be rendered equal weight” means if, for instance, the average LGD for several years is calculated, the more recent years may be given greater weight (weighted average).

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<sup>213</sup> CRD Annex VII, Part 4, paragraph 82; DCRR Article 75

<sup>214</sup> CRD Annex VII, Part 4, paragraph 83; DCRR Article 76 (1)

<sup>215</sup> Contrary to the former definition, this method practically renders a weighted average. True, it is only allowed with retail exposures where the weighted and not weighted averages do not differ substantially due to granularity.

<sup>216</sup> The large number of elements in itself reduces relative fluctuations.

<sup>217</sup> CRD Annex VII, Part 4, paragraph 84; DCRR Article 76 (2)

<sup>218</sup> CRD Annex VII, Part 4, paragraph 86; DCRR Article 76 (4)



### 10.3.2 Comments not directly linked to sections of the Directive<sup>219</sup>

336. When evaluating LGD issues, two principles must be taken into consideration:
- the LGD depends to a very large extent on the practices and experience of the institution concerned as well as on its economic and legal environment. Therefore external data and sector-specific estimates must be used with great caution (in proportion to the difference between the circumstances of the data source and those of the data user), and generally only after the data have been adjusted (to reflect differences).
  - the capital requirement is more sensitive to the LGD than to the PD<sup>220</sup>, therefore approximations and simplifications affecting the accuracy of LGD estimates must be handled even more critically.
337. Estimates of risk parameters must be based on the material drivers of the risk (49)<sup>221</sup>. In the case of the LGD, the following types of risk drivers may be used<sup>222</sup>:
- transaction related (facility type, collateral, guarantees, time in default, seasoning, loan-to-value, recovery procedures);
  - borrower-related (borrower size, exposure size, firm-specific capital structure, geographic region, industrial sector, line of business);
  - institution-related (internal organisation, internal governance);
  - external (interest rates, legal environment (length of the recovery process))
  - other

The institution has the right and obligation to establish the risk drivers actually used. The institution must justify and (together with the justification) document its choice (IRB List of Documents D 14).

338. The regulations neither require nor suggest any method for LGD estimation. The choice of method, however, must be justified, including the demonstration (IRB List of Documents D 14) of the fact that the selected method is in line with the characteristics of the institution. Four methods are described in technical literature: Workout, Market, Implied Market and Implied Historical<sup>223</sup>. In work-out methods, losses on non-

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<sup>219</sup> This section is broadly based on GL10 3.3.3.2.

<sup>220</sup> A change in the LGD results in a change of the same rate and direction of the capital requirement. When the PD changes (due to the shape of the risk weight curve), the capital requirement tends to trigger a smaller change.

<sup>221</sup> CRD Annex VII, Part 4, paragraph 49; DCRR Article 70 (2)

<sup>222</sup> This listing and classification is not mandatory in any way, it is intended to provide guidance only.

<sup>223</sup> The latter was discussed in the context of paragraph 82. The two “market” methods estimate LGD based on information arising in the market (price, spread, etc.) We will not discuss them any further herein because



performing exposures found in the database are quantified then the results are used as a basis for calculating the average LGD for the grade/pool concerned in line with paragraph 73.

339. For the estimation of LGD, incomplete workout cases must also be taken into account, unless the institution can demonstrate (IRB List of Documents D 14) that the cases are irrelevant and their exclusion does not lead to underestimation of the capital requirement. In the opinion of the HFSA, only those workouts should be considered which allow the relatively accurate estimation of related future cash flows. In an extreme case, it may mean that incomplete workouts are not taken into account at all for LGD estimation.
340. The future cash flows of incomplete cases can usually be determined with estimates only. Following a conservative approach, these estimates should also take into account the uncertainties of future cash flows and predictions. The HFSA expects institutions to document the methods they use (IRB List of Documents D 14) and demonstrate that the methods yield sound results<sup>224</sup>.

## 10.4 *Requirements specific to own-conversion factor (CF) estimates*

### 10.4.1 Comments relating to specific sections<sup>225</sup> of the Directive

341. Conversion factors by facility grade or pool must be estimated on the basis of the average realised conversion factors using all observed defaults within the data sources (default weighted average) (87)<sup>226</sup>
342. The data set related to the CF estimate (Reference Data Set, RDS) contains exclusively exposures in default. For these, the own CF of the exposures can be defined individually. The “risk weighted average” mentioned at the calculation of the “average realised CF” is the simple (unweighted) arithmetic average of individual CFs (by exposure).
343. The term “on the basis of the average expected CF” in the regulations indicates that the estimate cannot be identified mechanically with actual historical data. Even if

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their application generally requires liquid and deep markets (they are rarely used even in countries with more sophisticated financial systems).

<sup>224</sup> The requirements described in this paragraph are not explicitly stated either in the CRD or in the GL 10, but they are not in conflict with their letter or spirit.

<sup>225</sup> All paragraph numbers refer to paragraphs in CRD Annex VII, Part 4.

<sup>226</sup> CRD Annex VII, Part 4, paragraph 87; DCRR Article 77 (1)



we start directly from those data, the direction (and magnitude) of change of the CF, given the expected development of CF drivers, must be examined. The result of those analyses (as a kind of derivation of CF values from realised values) must be documented (IRB List of Documents D 13).

344. Conversions factors appropriate for an economic downturn must be applied if these are far more conservative than the long term average (88)<sup>227,228</sup>, (IRB List of Documents D13).
345. The estimates must reflect the possibility of additional drawings up to and after the time a default event is triggered (89)<sup>229</sup>. This, on the one hand, repeats the part of the definition of CF, in different words, stating that only the not drawn portion must be taken into account<sup>230</sup>, and, on the other hand, points out that drawings can occur after a default event as well<sup>231</sup>, which must also be taken into account when defining the total exposure.
346. A larger margin of conservatism must be incorporated if a stronger positive correlation can reasonably be expected between the default frequency and the magnitude of the conversion factor (89). This, similarly to LGD, states that if there is close positive correlation between the risk of the obligor (PD) and the risk of the exposure (CF), this must be addressed by a sufficient upward adjustment of the CF (IRB List of Documents D 13).
347. Institutions must consider their specific policies and strategies adopted in respect of account monitoring and payment processing (IRB List of Documents D 13), as well as their ability and willingness to prevent further drawings in circumstances short of payment default (90)<sup>232</sup>.
348. The CF depends to a large extent on the account monitoring and payment processing practices of the institutions as well as the ability and willingness of the institution to prevent further drawings in certain circumstances which do not yet constitute a default. Therefore the related policies, rules and procedures must be documented, together with the way these characteristics (e.g., that drawings after default are not prevented) were taken into consideration for the estimation of CF (IRB List of Documents D 13).

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<sup>227</sup> CRD Annex VII, Part 4, paragraph 88; DCRR Article 77 (2)

<sup>228</sup> This issue is by far not getting as much publicity as downturn LGD, but obviously it has to be handled the same way.

<sup>229</sup> CRD Annex VII, Part 4, paragraph 89; DCRR Article 77 (3)

<sup>230</sup> The drawn portion will be included in capital requirement calculations as a regular balance sheet exposure.

<sup>231</sup> This may sound surprising, but just consider that transfer to default status does not necessarily entail the immediate recognition of this status change or trigger the automatic prevention of any further drawings.

<sup>232</sup> CRD Annex VII, Part 4, paragraph 90; DCRR Article 77 (4)



349. Adequate systems and procedures must be in place to monitor facility amounts, current outstanding amounts against committed lines and changes in outstanding amounts. Credit institutions must be able to monitor outstanding balances on a daily basis (91)<sup>233</sup>.
350. CF estimates can be taken seriously only if the institution can adequately control the aforesaid factors affecting their sizes. This imposes requirements mainly on credit monitoring<sup>234</sup> (IRB List of Documents D 13).
351. Rating systems should be used not only for the calculation of capital requirements but they should be integrated in the day-to-day work of the institutions (use test).<sup>235</sup> An evident way of doing this is to apply the CF used for capital requirement calculations in other areas as well (such as reserving). However, often different “versions” of the same risk parameters are used for different purposes. (E.g. downturn CF for regulatory capital calculation, forward-looking estimate for the next year for reserving). Therefore the use of different CFs cannot be regarded as non-compliance with the use test, but the differences should be justified<sup>236</sup>.
352. Initially, non-retail estimates must be based on data spanning a minimum of five years for one data source. This increases by one year each year after implementation until a minimum of seven years is reached (93)<sup>237</sup>. As the LGD and the CF can be permitted only in conjunction, both conditions must be satisfied for the use of the AIRB approach.
353. For retail exposures (and only for those), future drawings may be reflected also in the LGD estimates, not only in the conversion factors (94)<sup>238, 239</sup>.
354. In the case of retail exposures, estimates must be based on data spanning a minimum of five years. Initially it can be reduced to two years which then increases by one year in each year until the five years are reached (95)<sup>240</sup>.

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<sup>233</sup> CRD Annex VII, Part 4, paragraph 91; DCRR Article 77 (5)

<sup>234</sup> The fulfilment of requirements set out here is mostly taken as natural today (especially for non-retail exposures).

<sup>235</sup> CRD Article 84 2/b

<sup>236</sup> Similarly, it should be justified if the definition (and partly application) of the different values is done in a single integrated system rather than separately.

<sup>237</sup> CRD Annex VII, Part 4, paragraph 93; DCRR Article 78

<sup>238</sup> CRD Annex VII, Part 4, paragraph 94; DCRR Article 79 (1)

<sup>239</sup> The most obvious example is the case of drawings after default (the rule itself also applies to drawings prior to default!). In such cases future drawings may be treated in two ways. Either they are taken into account in the CF estimates (discounting back to the time of the default event), increasing the value of the CF, or in the course of the LGD estimation, as negative recovery (also discounting back to the time of the default event, increasing the LGD).

<sup>240</sup> CRD Annex VII, Part 4, paragraph 95; DCRR Article 79 (2)-(3)



## 10.4.2 Comments not relating directly to sections of the Directive<sup>241</sup>

355. For the evaluation of CF issues, the following principles must be taken into consideration:

- CF, even more than PD and LGD, depends on how the relationship between institution and client evolves in adverse circumstances.
- CF depends to a very large extent on the practices and experience of the institution concerned as well as on its economic and legal environment. Therefore external data and sector-specific estimates must be used with great caution (in proportion to the difference between the circumstances of the data source and those of the data user), and generally only after adjustments to the data (to reflect differences).
- the capital requirement is more sensitive to CF than to PD<sup>242</sup>, therefore approximations and simplifications affecting the accuracy of CF estimates must be handled even more critically<sup>243</sup>.

356. It comes from the definition of CF (Article 4 (28) of the CRD) that CFs

- must be applied to currently outstanding undrawn commitments
- must be expressed as a percentage of undrawn commitments

357. Estimates of risk parameters must be based on the material drivers of the risk (49)<sup>244</sup>. There is even less experience with CF than with LGD and no standardised solutions have evolved as yet. Therefore below we shall mention, strictly as non-binding examples, some areas which play a major role in the evolution of CF:

- account monitoring strategies and policies (90.)<sup>245</sup>
- the ability and willingness of the institution to prevent further drawings in circumstances short of payment default (90)
- factors influencing the borrower's demand for funding
- factors influencing the lender's willingness to supply funding
- the presence of third party alternative financiers on the market
- the nature of the facility and the features built into it (such as covenant protection)

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<sup>241</sup> This section is broadly based on GL 10 3.3.3.2

<sup>242</sup> A change in the CF results in a change of the same magnitude and direction in the capital requirement. When the PD changes (because of the shape of the risk weight formula), the capital requirement tends to generate a smaller change.

<sup>243</sup> In the initial period of "data shortage" there are limitations to accuracy. Errors resulting from acceptable approximations and simplifications may be offset only by greater conservatism.

<sup>244</sup> CRD Annex VII, Part 4, paragraph 49; DCRR Article 70 (2)

<sup>245</sup> CRD Annex VII, Part 4, paragraph 90; DCRR Article 77 (4)



The institution has the right and obligation to establish the risk drivers actually used. The institution must justify and (together with the justification) document its choice.

358. The regulation neither requires nor suggests any method for CF estimation. The choice of method (and underlying assumptions), however, must be justified, including the demonstration of the fact that the selected method is in line with the characteristics of the institution<sup>246</sup> (IRB List of Documents D 13).
359. Contrary to its name, the EAD does not mean the actual exposure at default but a conservative estimate of that exposure. This is most obvious for on-balance-sheet items (e.g., a regular fix-term loan), where the EAD means the (gross) debt at the time of capital calculation and not the (presumably smaller) amount remaining after any additional repayments prior to a default event<sup>247</sup>. The situation appears to be different in case of a classic credit line, because, in addition to the debt outstanding at the time of the capital calculation (and therefore included in the balance sheet) the previous drawings are also taken into account. This applies, however, only to the undrawn part of the credit line, while for the drawn part (as an on-balance-sheet exposure) events between the capital calculation and the default event are not taken into account either.
360. The regulations are intended to capture the entire credit loss, therefore EAD is identified with gross debt, i.e., the amount that the obligor legally owes. Thus the EAD does not take into account reserving, and contains the accrued interests as well as partial write-offs.

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<sup>246</sup> There are four approaches recognised in literature:

1) cohort approach: the observation period represented in the sample is subdivided into time windows (typically calendar years), and CF is determined for those periods (as the simple average of CFs measured on individual exposures defaulting in the period concerned), then the forecast is derived from the CFs for the individual periods. For the purpose of individual CF calculations, the drawn amount since the beginning of the year is related to the undrawn facility at the beginning of the year. That is, CF cannot be negative!

2) fixed-horizon approach: for each exposure, the drawn amount at default is related to the amount at a fixed time (typically 1 year – the one-year period is promoted by the GL 10 (as the base case)) before. This implies the (conservative as regards the size of the CF) assumption that all exposures that will default during the period will default at the end of the fixed horizon. The “natural” choice would be 6 months (or rather, the average time elapsed before default). i.e., drawings since the earlier date are related to the undrawn amount at that time.

3) variable-horizon approach: this is a generalisation of the previous approach. The drawn amount at default is compared with the drawn amounts at several reference times (e.g., at one month, two months, three months etc. before default), and the CF of the exposure is defined from the resulting CFs (by calculating averages, for example).

4) momentum approach: some institutions have traditionally expresses CFs as a percentage of the total outstanding limit rather than the undrawn amount. In this form, this is not in line with the CRD definition, but if the institution is able to provide an appropriate estimate for the ratio of the drawn amount at the time of estimation, the value adjusted with that figure may be temporarily acceptable as a CF estimate.

<sup>247</sup> It is possible to estimate how many instalments are usually paid, on average, prior to default.



## 11 DOCUMENTATION OF RATING SYSTEMS<sup>248</sup>, COLLECTION OF RATING INFORMATION<sup>249</sup>

361. The GL 10 states the purpose and also the level of detail of the documentation in the form of the principle of replicability. In order that the supervisors (or third parties engaged by them) may replicate all or part of the institution's validation (IRB List of Documents B 7), all development and validation steps (as well as the operation of the institution) must be documented in such a way that a third party would be able to understand the reasoning and procedures<sup>250</sup>.
362. Replicability, however, essentially defines only the minimum information content, and there are a number of areas (e.g. fundamental principles, policies, analyses) where documentation of the area does not necessarily follow from this principle. To avoid disagreements, the CRD and the DCRR explicitly mentions the important areas to be documented<sup>251</sup>.
363. As one special part of documentation, data must be collected and stored<sup>252</sup> about certain processes. The scope of data to be collected and stored is set out fundamentally under the heading "Data handling" in the CRD and under "Data maintenance" in the DCRR<sup>253</sup>. There are relevant requirements elsewhere in the regulations and the HFSA may also set requirements.
364. The documentation obligation of institutions is laid down in the Annex hereto, in the "Table of relations of the CRD, Validation Guidelines and IRB Lists of Documents".
365. The supervisory requirements concerning documentation (replicability and mandatory documentation) mostly relate to the content. Beyond this, the HFSA imposes no content-related, formal (structure, style, etc.) or technical (medium of storage) requirements, except for the ease of understanding, meaning that the reader should be able to comprehend the documents without possessing an in-depth knowledge of the institution's internal environment (traditions, rules, customs, technical parlance, etc.).

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<sup>248</sup> CRD Article 84 (2) e); ACI Article 76/B (2)-(3)

<sup>249</sup> CRD Annex VII, Part 4, paragraphs 36-39; DCRR Articles 65-66

<sup>250</sup> CRD Annex VII, Part 4, paragraph 17; DCRR Article 58 (1)-(4)

<sup>251</sup> CRD Annex VII, Part 4, paragraphs 31-35; DCRR Article 64

<sup>252</sup> Hereinafter "documentation" will always include this element as well.

<sup>253</sup> CRD Annex VII, paragraphs 36-39; DCRR Article 65-66



366. As validation is an ongoing process, and rating systems also change, documentation must also reflect the current status, and it must facilitate the reconstruction of the road leading to that status i.e., the history of the system.
367. The requirement of documentation does not mean that these documents should automatically be sent to the HFSA (due to volume constraints, we do not request the submission of the entire documentation even for approval purposes), but they must be made available to the HFSA (or a third party acting on its behalf) upon request.
368. The documentation to be submitted with the application for approval is not discussed in this chapter. The requirements on its contents and structure are set out in the chapter titled “Approval process”.
369. The quality of documentation (transparency, relevance, completeness, depth, consistency, etc.) is part of the evaluation criteria of the applications for approval<sup>254</sup>. In this approach, the assessment of the documentation is a key and independent assessment consideration.
370. Verification of the fulfilment of the documentation requirements: In the “Table of correlations of the CRD, Validation Manual and IRB List of Documents”, the institution must indicate which documents it has prepared along with the areas to be documented and for which it has prepared a description.

## 12 MODELS PURCHASED FROM THIRD-PARTY VENDORS (35)<sup>255</sup>

371. Purchased models are subject to the same requirements as any other (internally developed) rating system.
372. In order to meet the documentation and validation requirements, the institution either has to perform the related tasks itself, which requires the thorough knowledge of the procured system, or it must have the vendor perform them.
373. Most GL10 sections discussing models purchased from third-party vendors do not ease the requirements<sup>256</sup>. In addition to comprehending the applied methodology,

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<sup>254</sup> Not only as an end in itself, but also because high-quality documentation generally (though not necessarily) indicates high-quality work.

<sup>255</sup> CRD Annex VII, Part 4, paragraph 35; DCRR Article 64 (4)

<sup>256</sup> The institution should not be merely a user pressing keys. In this respect paragraph 336 of the GL 10 imposes the following requirements: “External vendors have to document ... their models in a way that permits third parties to gain a detailed understanding of the methodology applied and to assess whether the model is still performing adequately on their own customer bases...” “The institution has to prove that the in-house knowledge to do this is available.”



institutions are also required to be able to decide whether their data are correct/usable and how they can be used for the purposes of the model.

374. It is important that these requirements are not only fulfilled formally but in a meaningful manner. The most important point is to enable the buyer to have a relatively good overview of the operation, characteristics and weaknesses of the purchased model.<sup>257</sup> (IRB List of Documents D 19)

## 13 DATA

375. The GL 10 devotes a separate chapter<sup>258</sup> to the discussion of data in order to provide a uniform interpretation of data-related requirements set out in various parts of the regulations. Below we provide a summary of the main points of that chapter.

### 13.1 *Comments related to specific sections of the Directive*<sup>259</sup>

376. If statistical models or other mechanical methods of rating are used, the institution must have in place a process for vetting data inputs into the model which includes an assessment of accuracy, completeness and appropriateness of data (30b). This refers to input data used in actual rating (describing the rated exposures), not the data used in estimating the model or risk parameters<sup>260</sup>.

The GL 10 defines the individual requirements as follows:

- accuracy: the degree of confidence in the data
- completeness: all the data necessary for rating are available<sup>261</sup>
- appropriateness: data contain no biases.

377. The institution must demonstrate that the data used to build the model are representative of the actual population of the institution's debtors and exposures (30c) (IRB List of Documents D 9).

Two types of models belong here:

- the rating model used to assign exposures to rating grades/pools<sup>262</sup> and

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<sup>257</sup> It should be noted that the adaptation or merely the implementation of models developed centrally in a banking group (or simply somewhere else) is essentially the same issue.

<sup>258</sup> GL 10 3.4

<sup>259</sup> All paragraph numbers refer to Part 4 of Annex VII.

<sup>260</sup> Though it seems to be justified to extent this at least to the data used for the estimation of the model.

<sup>261</sup> In some cases, especially in the initial period, the lack of data is unavoidable, but institutions should strive for minimising the number of these instances.

<sup>262</sup> The so-called direct models which provide an estimation directly of risk parameters values (mostly that of the PD) also belong here.



- statistical default prediction models<sup>263</sup> which allow the implicit determination of risk parameters from market data.

378. Concerning compliance with the requirement of representativeness, the following criteria should be taken into account<sup>264</sup>:

- the proper definition of representativeness says that within the sample, the solvency of exposures (loss given default, conversion factor, depending on what we are estimating) should be as dependent (or at least similarly dependent) upon the rating factors considered than in the actual portfolio. Institutions must evidence<sup>265</sup> the fulfilment of this requirement.
- Statistically, the fulfilment of requirements can be assessed only in retrospect (knowing the defaults in the portfolio in question). In practice, what is examined is whether the distribution of the portfolio according to key rating parameters is similar to the corresponding distribution of the sample<sup>266</sup>.
- the requirement of representativeness does not mean that the default/non-default ratio must be (close to) same in the sample used for the estimation as in the entire portfolio. In practice, defaulting exposures tend to be significantly over-represented in the sample<sup>267</sup>.
- the concept of representativeness must be interpreted identically for each data source (internal, external, pool). This issue is less frequently raised in the context of internal data (as if they were automatically representative), even though changes<sup>268</sup> may occur within an institution which may question the relevance of old data to the current portfolio. Therefore, representativeness must be demonstrated in respect of internal data as well.
- representativeness does not mean that the default definition used in the sample must be identical to the one used in the portfolio concerned (though obviously their dependence on key rating parameters must be similar)<sup>269</sup>.

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<sup>263</sup> Expectedly, these models will only be applied rarely in Hungary.

<sup>264</sup> The sections below are mostly (but not completely) based on the GL 10.

<sup>265</sup> Or at least supply convincing supporting arguments.

<sup>266</sup> Though, as the definition indicates, this is neither necessary nor sufficient for representativeness.

<sup>267</sup> Most model building procedures try to identify the differences between the characteristics of performing and non-performing exposures. In this respect, their ratio is irrelevant, the important thing is that sufficient numbers of both types are included in the sample.

<sup>268</sup> E.g., lending policy, as a result, the radical change of the portfolio composition, more sophisticated credit monitoring, introduction of counterparty relationship management.

<sup>269</sup> The CRD says nothing explicitly about the definition of default in the sample, but it is obviously a requirement that if for any reason we have to apply a different definition in the model building sample, we should arrive at a (nearly) identical order after rating the exposures than with the use of the original definition.



- wherever possible, it is advisable to use statistical methods (such as cluster analysis and similar techniques, test of the similarity of distribution) to demonstrate representativeness.

### Data requirements relating to risk parameter estimation

379. The institution must demonstrate that the estimates of risk parameters are representative of long run experience (50) (IRB List of Documents D 10). Not only does the estimate need to provide long-run (spanning several cycles) average (forward-looking) values (which is true in this form only for the PD), but during estimation the longest possible data series must be used (over and above the minimum data series required in the regulations).
380. The population of exposures represented in the data used for estimating risk parameters, the lending standards when the data was generated and other relevant characteristics must be comparable with the (present) population, standards and characteristics. It must also be demonstrated that the economic or market conditions underlying the data are relevant to current and foreseeable conditions (52)<sup>270</sup>.
381. The interpretation of “comparability” should be based on the following considerations:
- As risk parameters are estimated by rating grades or pools<sup>271</sup>, comparability should in fact also be required by grades/pools only.
  - Under “comparability” we require that the composition (distribution) of the sample and the portfolio concerned should be similar in terms of the main risk drivers<sup>272</sup>.
    - Some of these factors are explicitly taken into account as rating parameters when setting up the grades/pools. Comparability by rating parameters (in the above sense) must be required where the discriminative power of the rating system is not particularly high and/or the risk parameter bands covered by the rating grades/pools are not sufficiently narrow<sup>273</sup>. The better the discriminative power of the system and the narrower the PD bands covered by the grades/pools, the less important that this requirement is fulfilled. For in this event the grades/pools are homogenous in terms of risk both in the sample and in the actual portfolio, and the average figure

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<sup>270</sup> Under the general requirements on the estimation of risk parameters (PD, LGD, CF)

<sup>271</sup> And assignment to grades and pools is determined by rating.

<sup>272</sup> This is a precondition for regarding the parameters calculated from the sample as valid for the actual portfolio.

<sup>273</sup> In this case, the differences in composition may cause significant differences between values in the sample and that in the actual portfolio.



estimated from the sample will be applicable to the actual portfolio as well.

- Some other factors are not taken into consideration explicitly. These are typically “environmental” factors for which we regard both the sample and the portfolio homogeneous. As this second set of factors often remains unrecognised, efforts should be made to avoid differences of this nature.
  - The paragraph quoted actually specifies some significant factors that are generally not featured among the rating criteria: lending standards and economic or market conditions. Although it is not mentioned explicitly, obviously the applied definition of default is one of the key factors. The definition used in the sample<sup>274</sup> can differ from the one used in the actual portfolio only to the extent that it does not cause any significant distortion in the estimate<sup>275</sup>.
  - Within the same jurisdiction (country), the similarity of the definitions of default can easily be established by comparing the wording of the definitions. This method is not so simple where different jurisdictions are involved because the same terms (e.g., nonaccrual status) may have different meanings. (Or from the other side, different terms in different jurisdictions may have the same meaning).
  - The term must be used in the same sense in respect of every data source.
  - Wherever possible, some statistical method should be used for the demonstration of comparability.
382. If an institution uses data derived from a pool that is used jointly by several institutions, it must demonstrate that the pool is representative of its own portfolio (57).<sup>276</sup>

### ***13.2 Comments not directly relating to specific sections of the Directive***

383. The regulations require the collection, storage and use of data for several purposes (rating of exposures, estimation of model parameters, estimation of risk parameters,

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<sup>274</sup> This does not mean that if e.g. there are external data in the sample, a similar definition must be used in the data source. It only means that the data in the sample must be modified in accordance with the definition applied by the user.

<sup>275</sup> This requirement is declared explicitly in the CRD at all. Annex VII, Part 4, paragraph 46 only states that the adjustments to external data must (broadly) be in line with the definition of the CRD but it does not mention that the adjustments must also comply with the definition of the user.

<sup>276</sup> This is effectively the (redundant) repetition of the aforementioned requirements concerning use for model parameter estimation (representativeness, 31(c)) and risk parameter estimation (comparability, 52.), applied to data pools. What is new is the requirement imposed in GL 10 that the users of the pool must have similar definitions of default.



documentation of the results of rating, etc.). The data collected/stored for different purposes do not need to constitute separate databases.

384. In order to minimise the effects of human error, all material processes should be automated, and IT systems should be reliable, adequately documented, protected against both intentional and unintentional data distortions and audited. (IRB List of Documents B 7). They must support institutional processes as well as assure that the previous states of databases can be restored<sup>277</sup> and prior calculations can be replicated for validation purposes<sup>278</sup>.
385. Data quality must be reviewed at least annually by internal audit or a similar independent function. A “map” and corrective action plan must be prepared about data or IT deficiencies encountered during this or any other review (e.g. insufficient automation) (IRB List of Documents B 7).
386. The quality of data can be assured by tools such as monitoring of outliers or implausible values, significant changes and missing data in the inputs, as well as reconciliation with accounting data. A separate policy must be devised for the acceptance of missing data and their conservative treatment. Institutions must establish (and continuously maintain) their own data quality standards and continuously monitor compliance with them. Standards must assure the adequate quality of risk management and capital calculation. In order to facilitate the dialogue between institutions and the supervision concerning data standards, institutions should prepare the following documents (IRB List of Documents B 7):
- data policy, statement of responsibility. Institutions must have an explicit data policy to ensure the quality related requirements. They are responsible for ensuring the quality of their data and should be able to demonstrate that their IT systems are adequate..
  - data directory (it may also be a part of database descriptions)
  - database descriptions, e.g.
    - general description (data model, procedures, performance data, security, responsibilities)
    - data sources
    - procedures for data loading
    - access, consistency etc. controls

### **Data quality management**

387. The institution must establish data quality management systems (i.e. create and document rules of data quality, measurement systems and related processes, etc.) to

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<sup>277</sup> It does not have to mean online availability.

<sup>278</sup> See the requirement of replicability also in the chapter “Documentation”.



measure and improve the quality of data. The organisational framework for data quality assurance must also be established (data quality supervisor, data quality manager, data quality analyst, data owners, data handlers, data quality group), along with the dimensions of data quality measurement (completeness, timeliness, availability, accuracy, interpretability, etc.).

388. The responsibilities of the data quality management organisation includes the following:
- Handling and keeping an inventory of day-to-day data quality problems, enforcement of data quality considerations in development, regular checking and monitoring of data quality, establishment of various standards concerning data quality, provision of status information to management on data quality regularly.
  - Monitoring of internal inconsistencies, elimination of discrepancies. Quantitative and qualitative measurement of data quality. Maintenance of the institution's data quality standards, permanent measurement and strict control of compliance with internal requirements and the fulfilment thereof.
389. It is recommended to set up objective indicators for the measurement of data categories that are in line with both the institution's registration and Basel II (client master data, rating, default, collaterals, retail, etc.). This indicator (showing the ratio of erroneous items in the population of a certain data category) equals 1 for an error-free population, meaning that the error percentage is 0. The use of objective indicators provides a comprehensive view of the magnitude and extent of errors in a certain data category which can be used as a basis of data cleaning measures. The objective is to achieve error-free status.
390. In addition to monitoring data quality, it is also advised to take proactive action in data quality management (data quality audit of system developments, rationalisation of banking systems/processes from a data quality viewpoint, data quality training, etc.). In order to ensure the effectiveness of data quality management in the long run, actions, activities and processes need to be organised and documented (handling of data errors and changes that impact data quality, identification of data quality reports and data categories, modification of IT development processes).

### **Data reconciliation**

391. In addition to local indicators, data quality must also be managed regularly (monthly) through reconciliation tools that focus on completeness and measure conformity with accounting data, authenticity, reliability and consistency (completeness check). The reconciliation procedures of the institution must ensure accuracy, completeness, integrity and sufficient performance. Data reconciliation must harmonise



with the regular monthly closing business activities of the accounting function. These reconciliations are part of the steps that immediately precede capital requirement calculation and apply to the full range of balance sheet and off-balance sheet items.

392. As part of the completeness check, the exposures as per the general ledger data of accounting must be reconciled, at least at the end of each month, with the analytic exposure records compiled for capital calculation (in the data warehouse or by risk management, and in the dimension chosen by the institution, per transaction type or product, etc.). The deviation of exposures should be examined both in terms of absolute value and percentages.
393. A tolerance limit of error<sup>279</sup> must be set for deviations. It could be derived from unacceptable and unexplainable deviations. In case the institution identifies exposures separately for the banking book and the trading book upon reconciliation, the thresholds should also be set separately<sup>280</sup>.
394. Institutions are suggested to monitor the impact of differences resulted from the difference between the deadline of closing the books for the month and of data processing for capital calculation. If the elementary data for capital calculation are processed after the closing based on the last day of the month while the accounting closing will be performed on a later date, it is recommended to examine the aggregate impact of adjustments and other transaction items.

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<sup>279</sup> As much as possible, the materiality threshold should not be higher than 1-2%. In the course of reconciliation, it is advised to examine the conformity of balance sheet and off-balance sheet item groups as recorded by accounting with the analytic data (kept in the data warehouse by risk management), then aggregate deviations should be compared to total exposures.

<sup>280</sup> If the threshold is not defined separately [for the banking and the trading book], the % value of the deviation in the banking or trading book may decrease as the threshold is compared to the aggregate exposure in the books.



## 14 VALIDATION

395. Article 84 sets out the framework of the IRB calculation of capital requirements<sup>281</sup>:

- Competent authorities may permit credit institutions to calculate their risk-weighted exposure amounts using the Internal Ratings Based Approach (IRB Approach). Explicit permission is required in case of each credit institution.
- Permission may be given only if the competent authority has ascertained that the credit institution's systems for the management and rating of credit risk exposures are sound and implemented with integrity and that they meet the minimum requirements set out in Part 4 of Annex VII.
  - The credit institution's rating systems provide for a meaningful assessment of obligor and transaction characteristics, a meaningful differentiation of risk and accurate and consistent quantitative estimates of risk;
  - Internal ratings and default and loss estimates used in the calculation of capital requirements and associated systems and processes play an essential role in the risk management and decision making processes, and in the credit approval, internal capital allocation and corporate government functions of the credit institution;
  - The credit institution has a credit risk control unit that is responsible for ensuring that its rating systems are independent and free from undue influence;
  - The credit institution collects and stores all relevant data to provide effective support to its credit risk measurement and management process;
  - The credit institution documents its rating systems, the rationale for their design and validates its rating system<sup>282</sup>.

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<sup>281</sup> The framework for capital requirement calculations based IRB approach are set out in Article 84 of the CRD. The regulations therein are then supplemented and occasionally specified and/or explained by certain sections of Annex VII. (CRD Articles CRD 85 through 89 also belong here, along with the first three parts of Annex VII which address the technical details of capital requirement calculation. The sections discussing risk mitigation tools and certain interim measures also fall in this category.) The interpretation of the regulations is assisted by the six principles and GL 10 which provides further guidance thereto. (The six principles were defined by the AIG working group of the Basel Committee. GL 10 also includes the AIG principles with supplements).

<sup>282</sup> According to Article 84 of the CRD, the rating system of an institution provides for a meaningful assessment of obligor and transaction characteristics, and of the related risk and the accurate and consistent quantitative estimate of risks (2a). These are used in the calculation of capital requirements, and the various decisions of the institution relating to risk assumption and management (2b). According to (2c), the institution must have a unit responsible for the IRB system that is appropriately independent and free from undue influence. (2 d) requires the institution to collect and store all relevant data that is necessary for its credit risk man-



396. The first requirement is clearly the most important one, the remaining four constitute, in a sense, pre-requisites of the first requirement, safeguards for its fulfilment. The verification of the fulfilment of the first requirement is called “validation” in the original (narrow) sense of the word. However, as the verification of the fulfilment of the first requirement must also cover the remaining four, a broader interpretation of the term “validation” has evolved, referring to the joint examination of the five requirements.

397. The regulations<sup>283</sup> stipulate the following about validation:

*“Institutions must have reliable systems in place to validate the accuracy and consistency of their rating systems, processes and risk parameter estimates. Institutions must demonstrate to their respective supervisory authorities that their internal validation procedures enable consistent and meaningful performance assessment in respect of their internal rating and risk estimation systems.”*

The remaining paragraphs on validation (110, 111)<sup>284</sup> provide that the ratings and calculations should regularly be checked by back-testing and benchmarking. The remaining relevant sections of Annex VII require that the estimates of the institution should be accurate and consistent, that they assure consistency of data and methods, and document any changes, and that they take into account unexpected changes in the economic environment affecting the IRB system. Institutions must fulfil the validation requirement for each rating system and each risk parameter estimated in any manner<sup>285</sup>.

398. We discuss the definition of validation and the key principles relating to validation in accordance with GL 10<sup>286</sup>. The GL 10 took over these items from the AIG that we mentioned earlier.

## ***14.1 High-level principles on validation***

399. According to the AIG’s definition, “In the context of rating systems, the term ‘validation’ encompasses a range of processes and activities that contribute to an assessment of whether ratings adequately differentiate risk and whether estimates of risk

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agement process. The latter point appears to be redundant in the light of (2 e) which says that the institution should validate and (naturally) document its system, including the rationale for choosing the system and implementing it the way it actually operates.

<sup>283</sup> CRD Annex VII, Part 4, paragraph 110; DCRR Article 88 (1)-(2)

<sup>284</sup> CRD Annex VII, Part 4, paragraphs 110-111; DCRR Article 88 (1)-(5)

<sup>285</sup> Thus not only the models and statistical estimations are subject to validation!

<sup>286</sup> You can find further details and considerations on our home page, in the document titled “Areas to be examined in the course of approval of advanced approaches”.



components (such as PD, LGD, EAD) appropriately characterise the relevant aspects of risk.”<sup>287</sup>,

400. The main point of the IRB system is to classify the various exposures of the institution, or at least the vast majority of them in a way that the same probability of default can be assigned to all exposures in a group<sup>288</sup>.
401. The institution (may) apply different IRB systems that are based on different parameters to the various groups or types of exposures. Actually, based on the requirements on the IRB system, it must necessarily be so in the case of an institution that is engaged in diverse lending operations.
402. The role of the IRB system should not be limited to capital requirement calculation. It is also expected to be applied in credit decisions, loan pricing, risk management, capital allocation and, when IRB approaches are used, in the governance of the institution as discussed in the chapters on use tests and experience tests.
403. The purpose of validation is to demonstrate that the system adequately differentiates and classifies risks, that it correctly estimates their quantitative characteristics and to demonstrate that these and any other outcomes of the system are integrated into the other uses of the IRB system which go beyond the calculation of capital requirement but are inseparable from it.
404. Validation is essentially an assessment (through the system) of the predictive power of the institution’s risk estimates; that is, that the IRB system provides for the meaningful capturing and discrimination of transaction risks and supplies accurate and consistent quantitative estimates of risks. The latter relate to future events (as compared to the time of calculations)<sup>289</sup>.

The required key characteristics of estimates applied during validation are as follows:

- forward-looking (even when based on historic data<sup>290</sup>),
- accuracy, where two requirements are emphasized usually:
  - good discrimination of risks
  - accurate estimation of risks (calibration).

### **Discriminatory power**

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<sup>287</sup> In fact this definition says that validation is a set of procedures and activities that facilitate the assessment of how the requirements set out in CRD Article 84 (a) (see above) are fulfilled. This is called validation in the narrow sense. It is clear even from this comparison to the CRD that validation in the narrow sense is only one element of approval.

<sup>288</sup> In the case of the Advanced IRB Approach, the probability of default is also accompanied by the expected value at risk (exposure) and the definition of the recovery rate.

<sup>289</sup> First AIG principle

<sup>290</sup> It is an inappropriate approach to take historic averages as estimates without any further consideration.



405. Discriminatory power is the measure of a system's ability to discriminate good and bad risk, i.e. the frequency of rating a bad risk as good or vice versa. Therefore a rating system can be deemed to have good discriminatory power if there are few defaults in good rating grades (both inside and outside the sample), and defaults concentrate in the worst rating grades.
406. There are no generally accepted solutions for measurement<sup>291</sup>, but there are widely used measures, such as the Gini coefficient. The Gini coefficient, however, depends not only on the discriminatory power but also, for instance, on the homogeneity of the portfolio (the width of the PD band relating to the elements of the portfolio) and the number of elements in the sample<sup>292</sup>. Therefore, the Gini coefficient is a relative indicator that can be used primarily to compare different rating systems used to the same portfolio. Thus the Gini coefficient should be used only with due care, in conjunction with other known techniques (examination of the entire curve, bootstrap, confidence intervals, etc.)<sup>293</sup>.

### Calibration

407. An estimate is accurate (“well calibrated”) if there is “little” difference between the estimated and actual risk parameters (PD, LGD, CF). Calibration (quantification) is an estimate, not simply a registration or accounting operation. Its purpose is to estimate future PDs, LGDs and CFs, not to calculate historic ones. Historical data are important but only as the starting point for forward-looking estimates. (IRB List of Documents D16)
408. The uncritical acceptance of actual figures as estimates is dangerous as it disregards factors such as changes in the economic environment, the portfolio structure or the legal environment, or the limited nature of the sample. Therefore sound, creative forecasting methods are important, and they can even mitigate the lack of data in certain cases<sup>294</sup>.
409. The verification of the accuracy of risk parameter estimates is far more difficult in the case of rating models than for market risk models. In the latter case, the technique of backtesting can be used, where the adequacy of the model is assessed by comparing

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<sup>291</sup> If we could measure discriminatory power, we could use it as a basis for defining levels of supervisory acceptability.

<sup>292</sup> Even different curves may have the same Gini coefficient.

<sup>293</sup> Incidentally, there are several techniques equivalent to the Gini coefficient: the ROC curve and EUROC, Accuracy Ratio, Mann-Whitney statistics, Wilcoxon-Mann-Whitney statistics. The widely used Kolmogorov-Smirnov (K-S) statistic also relies on similar principles (using the distance between the curves), and struggles with similar problems. These techniques, many of which originate in biological research, are explained in detail in the Austrian paper.

<sup>294</sup> This may have significance especially in the case of low default portfolios.



the forecasts of the model to the actual situation<sup>295</sup>. This solution has limited applicability here mainly because there are orders of magnitude less data available: daily measurements are not possible, only longer periods (typically years) can be covered; furthermore, at least upon implementation, long data series are not available for this purpose either. This does not mean that backtesting should not be performed here<sup>296</sup>, only that its outcome should not be considered conclusive evidence.

410. Therefore it is difficult to establish a practicable (not too broad) margin of error for estimates of parameters, especially in certain special cases (e.g., low default portfolio), thus other means must be used (comparison with data of rating agencies, external data, benchmark, etc.)<sup>297</sup>.

### Overall adequacy

411. In order to assess a rating system's ability to generate predictions in the above sense based on historical data and experiences, the first step of validation must be an assessment of overall adequacy (IRB List of Documents D 15). In respect of the IRB system's "overall adequacy", the GL 10 sets out two requirements: first, the use of policies and standards that are designed to assure certain characteristics and, second, expectations concerning the philosophy of the IRB system.

412. The following features are required for the overall adequacy of the IRB system:

- it should be objective, i.e., assignments and estimates of the system should be implemented objectively: they should yield similar results for similar exposures and the system should contain elements to manage the use of judgement, which is often unavoidable;
- it should be accurate, i.e., the accuracy of its expected performance, inputs and their use should be assured<sup>298</sup>;
- it should be stable, i.e. the rating system should ensure that ratings and estimates are broadly unchanged when the underlying risk has not changed and the philosophy of the system has not changed either;
- it should be conservative, i.e. the system should treat the uncertainties in its ratings and estimates with a degree of conservatism (and assume that worse scenarios will happen).

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<sup>295</sup> An analogy of this is the comparison of estimated and actual PDs.

<sup>296</sup> Quite on the contrary: as we will see, it is a mandatory requirement in the directive.

<sup>297</sup> See also principle 4.

<sup>298</sup> It is a general view that quantitative approaches can be used only on good data, and only quantitative analyses relying on good data are worth using. As good data are not always available, it is probably better to say that we should always have a clear view of the accuracy of our data. Naturally, generally more effort is needed and poorer results are to be expected if we are forced to work with insufficiently accurate data.



413. In addition to the presence of the aforementioned characteristics, the assessment of overall adequacy must also address the philosophy of the IRB system. The philosophy of the system is manifested in whether it treats a rating grade as homogenous based on the Point In Time (PIT) or Through The Cycle (TTC), that is, average (or downturn) PD. This is reflected mostly in the “mobility” of obligors. In a PIT system, in the upswing of the cycle, re-assignment into higher rating grades is typical due to the mostly declining PDs (in the downward cycle, the movement is in the opposite direction). TTC rating systems are not sensitive to cycles in that sense, migration among rating grades is less frequent (and it may be triggered by changes in relative creditworthiness).
414. In the course of the assessment of overall adequacy, validation must demonstrate that the institution is perfectly familiar with the rating philosophy of the IRB system and also that the quantification of risk is in line with that philosophy<sup>299</sup>. It must also be demonstrated that the institution is perfectly familiar with the characteristics of risk rating and quantification (including the dynamics of rating) and, last but not least, that it is perfectly aware of the effects of each philosophy on capital requirement.
415. If an institution uses several IRB systems with different philosophies, it must also demonstrate in the course of the assessment of overall adequacy that their consistency (consistency of use) or the understanding of their differences is assured<sup>300</sup>. (Institutions must be particularly mindful when using data originating in an IRB system based on a different philosophy; only the understanding of differences can assure their correct use.) In such cases, the assessment of overall adequacy must also address the effects of the combination of data from different systems on the calculation of capital requirements.
416. The (adequacy of) validation is primarily the responsibility of the institution<sup>301</sup>, this is the most important principle from the aspect of implementation. Validation is performed by the institution, but the responsibility of the HFSA also emerges upon the approval of validation.<sup>302</sup>
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<sup>299</sup> Based on the above it is easy to see that short-run PD “suits” PIT systems, while long-run PD suits TTC systems (if we expect PD related to one rating grade to be relatively stable), but this is not necessarily so. It is also clear that the determination and assignment of long run average PDs applied in capital calculation is a more complex task in the case of PIT systems.

<sup>300</sup> It may cause problems if we do not know the “laws of movement” related to the different philosophies, or if we do not know the philosophies of our systems, e.g., we want to map a PIT system for a fundamentally TTC system of ECAI.

<sup>301</sup> Second AIG principle

<sup>302</sup> Thus, we must distinguish validation (the bank’s responsibility) and its review and approval by the supervisor. It does not mean that supervisors should play a passive role when reviewing the bank’s validation. Naturally, they may choose to rely on the validation performed by the bank, but they are also entitled to request additional information, initiate consultation, carry out on-site reviews or even replicate the bank’s ratings (on a random sample basis).



417. Validation is an ongoing, iterative process in the sense that the institution and the HFSA repeatedly come into contact in the course of the validation of a system (which is never complete)<sup>303</sup>.
418. Validation is a process that can be implemented in many ways, and there is no single validation method<sup>304</sup>. The most expedient methods depend to a large extent on the available data and the rating approach; these, in turn, tend to depend on the portfolio.
419. For quantitative validation itself, other techniques, in addition to the aforementioned discriminative power and examination of the accuracy of estimates, may also be used (IRB List of Documents D 16), such as:
- backtesting (the comparison of estimated and actual parameters)
  - benchmarking (comparison with other estimates, for instance ones performed on a similar portfolio)
  - stability and sensitivity tests (how estimates are influenced by changes in the sample/portfolio/assumptions)
  - replication (of the rating by others)
420. Validation should encompass both quantitative and qualitative elements.<sup>305</sup>
421. Therefore quantitative tests in themselves are not sufficient. Any uncertainties remaining after quantitative tests should be reduced to the minimum through qualitative means.
422. Thus validation must also encompass the following qualitative tests:
- assessment of the components of the rating system (data, models, etc.), such as
    - quality of input data (accuracy, completeness, appropriateness),

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<sup>303</sup> Third AIG principle. First, because validation (and many other parts of the BII regulation) cannot be regulated in the “usual” normative manner. Second, because the ongoing control of the IRB system’s operation is part of validation due to the regulations. This is partly because the market conditions and, more generally, the operating conditions of the institution and the validation tools themselves will always be changing.

<sup>304</sup> AIG principle 4, which emphasises differences from the market risk models, where backtesting is an outstandingly important, even if not the only, validation tool. This claim is fairly easy to accept: even if we disregard the diversity of institutions and portfolios and consider a step where the calculated and actual results are compared, it is apparent that this can generally be performed with many different statistical methods as long as there is sufficient data for their application.

<sup>305</sup> AIG principle 5. Even if rating is thought of as a purely mathematical/statistical application, we cannot exclude elements which are definitely not quantitative, like the user himself. As this is not a “simple” mathematical/statistical application, however, even though it will certainly play a major part in validation, the principle is even easier to accept. Another example is the fact that it will not always be possible to mechanise the adjustment of the IRB system to changing circumstances.



- quality of the model/rating procedure (appropriateness of the approaches used, acceptability of assumptions, weaknesses),
  - quality of implementation (including IT),
  - assessment of integration into institutional processes (use test),
  - assessment of control processes and governance
  - appropriateness and quality of documentation.
423. Validation must be subjected to independent review (within the organisation)<sup>306</sup>.

## 14.2 *Backtesting and benchmarking*

424. As a specific validation method, the comparison of realised risk parameters to estimated ones (i.e. backtesting) is mentioned in the regulations first and foremost, with the note that institutions must specify (in advance) the expected range. If the realised rates are outside that range, the reasons for the deviation must be analysed. The regulations declare that the comparison must be based on historical data covering as long a period as possible (i.e. deviations should be seen for as many years as possible), it has to be documented and be performed at least annually (111). (IRB List of Documents D 16)
425. According to the “emergency scenario” version of the procedure, internal standards must be defined for situations where deviations in realised risk parameters from expectations are significant enough to call the validity of the estimates into question. These standards must take into account business cycles and similar systematic variances in default experience. Where realised values continue to be higher than expected values, estimates must be revised upward (114)<sup>307</sup>.
426. When evaluating the results of back-testing, the institution must take into consideration the philosophy of the IRB system (especially where multiple systems exist), as well as the procedures to be applied by the institution if something needs to be changed due to the outcomes of back-test. The institution should also consider procedures to be used if back-testing is performed without sufficient numerical information, as well as the consequences of deviations between calculated/estimated values and actual values, and, finally, the procedures relating to the objective and internal logic of the entire backtesting activity.

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<sup>306</sup> AIG principle 6, where independence refers to independence from the parties responsible for designing and executing the validation process. At first glance, this may be an unnecessary safeguard, as the approval or rejection of the supervisor itself is the result of an independent review. It is advised that such complex systems and procedures are also checked within the institution before they are subjected to supervisor assessment.

<sup>307</sup> CRD Annex VII, Part 4, paragraph 114; DCRR Article 89 (3)-(4)



427. Benchmarking is the procedure whereby the institution tries to establish the extent to which its own calculated/estimated values harmonise with the outcomes of other methods and/or of other data sources, if such harmony is expectable at all despite the differences (IRB List of Documents D 16). Regarding benchmarking, the GL 10 lists the requirements listed above in relation to backtesting as the minimum requirement.



### 14.3 *Low default portfolios*

428. The reason for introducing the concept of low-default portfolios is to enable the use of IRB methods also with portfolios where only few defaulting exposures have been observed.
429. Low-default portfolios are categorised as follows:
- long term versus short term, the former meaning portfolios consisting of high-quality borrowers or few borrowers, while the latter referring to portfolios with borrowers who are new entrants into the market (i.e. low population portfolios)
  - systematic versus institution-specific where the former means portfolios for which no data is available at any of the institutions, while the latter includes portfolios for which data is unavailable only/at least at the institution concerned.
430. Systematic low-default portfolios should not necessarily be excluded from the IRB approach simply because of the absence of sufficient data for estimates on a statistical basis if the institution can demonstrate that the method(s) applied during estimation and validation are sound, effective and employed in a consistent way<sup>308</sup>. In these cases, institutions are required to employ appropriate conservatism in estimation. Information such as ratings, prices, etc. may also be used in the estimation process, and the validation method applied in these instances do not need to be completely different from the regular validation exercise<sup>309</sup>.

### 14.4 *Legal regulation of validation*

431. Compared to the former (BI) approaches or to the BII standard approaches, the BII advanced approaches offer considerable discretion in selecting certain specific methods. This is because of the philosophy underlying the Basel II and the CRD, which only sets a wide framework (requirements) (in connection with the internal rating systems, the advanced operational risk measurement and the management of market risks), and considers acceptable any system (satisfying the minimum requirements) for which the institutions can demonstrate to the supervisors that it appropriately manages the risks in question.
432. This principle-based regulation is justified by the fact that there are a number of (more or less equivalent) methods for the management of these issues, and regulators did not want to force a “one size fits all” approach on institutions (especially so that institutions in the vanguard of risk management are not forced to radically overhaul their

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<sup>308</sup> We should note that the estimation of LGD and CF is an even more serious problem than PD estimation, but if this is the only issue (i.e. there is an acceptable solution for PD estimation), FIRB can still be used.

<sup>309</sup> In this case the institution should use different benchmarking techniques instead of the statistical tools of back-testing.



existing system in the interest of an abstract uniformity). In practice, this means that if institutions use solutions which are widely accepted in the sector (in a generally accepted manner), the HFSA will not raise objections<sup>310</sup>. In other words, the HFSA generally accepts best practice solutions (and mostly also good practice solutions).

433. Of course, this does not make the life of institutions or that of the HFSA any easier because, in addition to the so-called explicit discretion (alternatives clearly stated in the CRD) they must also handle so-called implicit discretions (alternatives resulting from intentionally ambiguous wording). All supervisors strive for narrowing the scope of interpretation (depending on the philosophy of the jurisdiction, the traditions of supervision, etc.) but just these very attempts highlight the (generally) existing limits of such narrowing. Therefore, institutions as well as supervisors will have to settle with the notion that there are several issues in relation to capital requirement calculations which they will only be able to judge along generally accepted industry principles and rules.
434. For the approval of validation, however, the institution must demonstrate that all sensitivity tests have been performed (documented and replicable) that may influence the calculated capital requirement<sup>311</sup>.

## 15 CAPITAL CALCULATION

435. The GL 10 does not address capital calculation. Still, based on our experiences with pre-validation and validation, the HFSA believes it is necessary to present in brief guidelines the main issues related to this topic which the supervisor will consider material elements in the course of subsequent validation procedures.
436. Most Hungarian banks are subsidiaries of a foreign parent bank. In the majority of cases, their capital calculation system is developed centrally (and mostly calculation itself is performed centrally, too). In these cases, the validation of systems is primarily the responsibility of the home supervisor – the HFSA principally examines compliance with requirements that are specific to Hungary. Naturally, it does not mean that the documentation requirements of the system do not need to be fulfilled, or that the HFSA would not check the documentation and validation of central systems.
437. Like for any other function, the institution must have appropriate resources, regulated procedures and responsibilities for capital calculation, including the assurance of data quality which the Validation Guidelines discuss in a separate chapter.

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<sup>310</sup> Of course, this is only so with the proviso that the institutions fulfil the conditions declared explicitly in the CRD.

<sup>311</sup> An important point in this section is that it is about the impact on capital requirement as opposed to the impact on its decisive elements (although they also have to be addressed of course), for this is the only way to handle each issue in line with their actual weight.



438. The division of responsibilities is significant from the aspects of specific capital calculation functions and procedures. It has to be specified who performs which task and when, with whom he has to keep contact and what data and information is to be supplied to those counterparts. Regarding their main elements, procedures consist of the following elements: data identification, posting and loading, controls, execution of calculation and reporting (List of Documents D21)
439. During capital calculation, the most important output of the system, the capital requirement is derived from available exposure and coverage data and risk parameters. Complexity is caused by the fact that the calculation of the capital requirement for specific exposures may be quite different (diverse risk weighing formulae, credit risk mitigation methods, non-standard treatments, etc.).
440. Where the regulations allow a choice, the institution must clearly specify which methods it applies for individual exposure classes and collaterals, etc. The HFSA expects the institution to analyse the impact of and provide a valid explanation for the method it has chosen, especially if the institution is required by law to do so. We have found in many instances that due to some IT problem, institutions apply some simplification compared to the statutory requirements, typically by not exploiting the opportunities rendered by the chosen methods (e.g. they handle an exposure along the rules of a portfolio that would result in a higher capital requirement, neglecting the impact of certain risk mitigating factors, etc.). These deviations must be documented and they will be assessed by the HFSA on a case-by-case basis. As long as these deviations are “conservative” (i.e. increase the capital requirement) and insignificant, the HFSA usually considers them acceptable, otherwise it requires measures to eliminate them (List of Documents D23).
441. One fundamental requirement concerning the capital calculation method is that it should calculate the required capital accurately and in compliance with all applicable rules. The audit includes, on the one hand, the usual IT tests (quality of the specification, is the program operating in line with the specification), and, on the other hand, user and business tests, i.e. specific examples for which we calculate results outside the system as well. Due to the diversity mentioned above, a full user audit (covering all options) would be impossible, we can only strive for checking a “sufficient quantity” of and “sufficiently diverse” test scenarios. Another important consideration regarding the operational test of the capital calculation module is the comparison of capital requirements calculated at different times at least per category, and the examination of potential outstanding values.
442. Like with other topics, it is the institution’s responsibility to prove the correctness of the system. The institution’s ability to demonstrate to the HFSA their tests in an easily understandable and illustrative manner will be decisive, along with the quality of the



documentation of their capital calculation system. It is quite frequent that institutions use the systems of independent vendors (usually in some adapted form). The vendor that developed the system usually tested it extensively, too. It is the task of the institution applying for approval to harmonise the presentation of the system with the vendor (or without the vendor but possessing all his knowledge about the system) to ensure that the HFSA obtains a comprehensive picture of it (List of Documents D24).

443. Based on a case-by-case evaluation, the HFSA may deem it necessary to use its own supervisory test scenarios to test the capital calculation module<sup>312</sup>. The way of these tests is determined on the basis of institution-specific criteria.
444. So far we have discussed capital calculation in a narrow sense, assuming that the data on exposures (including assignment to portfolios) are correct and are linked to the exposure concerned. Looking at the entire capital calculation process, it is obvious that there is quite some room for errors in the process of classifying exposures, assigning debtors, ratings, the PD, the LGD and the CF, handling collaterals and assigning them to exposures, i.e. in the preparation for the actual capital calculation exercise.
445. Preparation is usually performed by a complex system of programs consisting of many elements and operating on a number of data warehouses. The individual steps within the process mostly encompass the assignment of data or recoding, thus testing (which is naturally the bank's responsibility) can usually be broken down to a series of transparent steps. (List of Documents D22) In addition to reviewing the own tests of the bank, the HFSA examines the "history and lifecycle" of randomly selected transactions to check the institution's preparation system.
446. The submitted documents must reveal the structure of the IT system (data warehouses sub-systems and their interworkings) used for capital calculation (in a broad sense). (List of Documents D22) The institution must be able to demonstrate how data consistency is ensured if data are stored in multiple core systems simultaneously and in the case of manual data transfers<sup>313</sup> between sub-systems. Revealed discrepancies and errors must be documented along with the schedule and results of subsequent corrective actions targeted at eliminating the discrepancies. The documentation must present the results of batch runs, the archiving function for storing and modifying them and reconciliation with the general ledger and other systems of the institution. (List of Documents B7-B8)
447. Regarding the use test and experience test of capital calculation, the HFSA wishes to point out the importance of various reports. The mere availability of the reports is

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<sup>312</sup> There are closed systems which do not enable manual data entry for testing. In these instances, we do not use our own examples but select similar ones from the institution's exposures.

<sup>313</sup> Although data multiplication and manual data transfers should be avoided as much as possible, experience shows that they are not rare in actual operating environments due to "historical reasons".



not sufficient. The usage of reports must function as a planned shaping force and control over the lending process, thus the appropriate reports must be utilised both in the governance and the day-to-day operation of the institution.



## Relevant documents of international organisations

### Committee of European Banking Committee (CEBS)

“Guidelines on the implementation, validation and review of Advanced Measurement (AMA) and Internal Ratings Based (IRB) approaches”, (April 2006,) CEBS GL10 revised  
<http://www.c-ebs.org/pdfs/GL10.pdf>

“Guidelines for Co-operation between Home and Host Supervisors” (January 2006) CEBS GL09  
<http://www.c-ebs.org/pdfs/GL09.pdf>

### Basel Committee on Banking Supervision

“International Convergence of Capital Measurement and Capital Standards - A Revised Framework (Updated November 2005)  
<http://www.bis.org/publ/bcbs118.pdf>

“Studies on the Validation of Internal Rating Systems” (May 2005) WP 14,  
[http://www.bis.org/publ/bcbs\\_wp14.pdf](http://www.bis.org/publ/bcbs_wp14.pdf)

“Update on work of the AIG related to validation under the Basel II Framework” - Newsletter No. 4 (Jan 2005),  
[http://www.bis.org/publ/bcbs\\_nl4.pdf](http://www.bis.org/publ/bcbs_nl4.pdf)

“Home-host information sharing for effective Basel II implementation” (November 2005), Consultative Document,  
<http://www.bis.org/publ/bcbs120.pdf>

“Validation of low-default portfolios in the Basel II Framework” (September 2005) Newsletter No. 6.  
[http://www.bis.org/publ/bcbs\\_nl6.pdf](http://www.bis.org/publ/bcbs_nl6.pdf)

“Guidance on the estimation of loss given default (Paragraph 468 of the Framework Document) (July 2005)  
<http://www.bis.org/publ/bcbs115.pdf>

“Sound credit risk assessment and valuation for loans” (November 2005), Consultative Document,  
<http://www.bis.org/publ/bcbs121.pdf>

“Enhancing corporate governance for banking organisations” (February 2006),  
<http://www.bis.org/publ/bcbs122.pdf>

“The treatment of expected losses by banks using the AMA under the Basel II Framework” (November 2005) Newsletter No. 7.  
[http://www.bis.org/publ/bcbs\\_nl7.pdf](http://www.bis.org/publ/bcbs_nl7.pdf)

“Principles for the home-host recognition of AMA operational risk capital” (January 2004)  
<http://www.bis.org/publ/bcbs106.pdf>

“High-level principles for the cross-border implementation of the New Accord” (August 2003),  
<http://www.bis.org/publ/bcbs100.pdf>

“Sound Practices for the Management and Supervision of Operational Risk” (February 2003),  
<http://www.bis.org/publ/bcbs96.pdf>



## Guidelines of supervisory authorities<sup>314</sup>

### HFSA documents

Technical papers on the new rules concerning the capital requirements of credit institutions and investment firms (CRD) (2<sup>nd</sup> revised version) - The principles of the transposition in Hungary of the new capital requirements directive, the proposed legal structure, the discretions to be applied and the legal issues of transposition  
[http://www.pszaf.hu/engine.aspx?page=pszafhu\\_szab\\_bazel2](http://www.pszaf.hu/engine.aspx?page=pszafhu_szab_bazel2)

Areas to be examined for the approval of advanced approaches  
[http://www.pszaf.hu/engine.aspx?page=pszafhu\\_szab\\_bazel2](http://www.pszaf.hu/engine.aspx?page=pszafhu_szab_bazel2)

### Financial Services Authority UK:

*Report and first consultation on the implementation of the new Basel and EU Capital Adequacy Standards* (Jul 2003), FSA CP189  
<http://www.fsa.gov.uk/pubs/cp/cp189.pdf>

*Strengthening Capital Standards (January 2005), FSA CP05/03*  
[http://www.fsa.gov.uk/pubs/cp/cp05\\_03.pdf](http://www.fsa.gov.uk/pubs/cp/cp05_03.pdf)  
[http://www.fsa.gov.uk/pubs/cp/cp05\\_03\\_appendix1.pdf](http://www.fsa.gov.uk/pubs/cp/cp05_03_appendix1.pdf)

*Application Pack for IRB Individual Guidance (July 2005)*  
[http://www.fsa.gov.uk/pubs/international/app\\_pack\\_irb.pdf](http://www.fsa.gov.uk/pubs/international/app_pack_irb.pdf)

*Application Pack for AMA Individual Guidance (July 2005)*  
[http://www.fsa.gov.uk/pubs/international/app\\_pack\\_ama.pdf](http://www.fsa.gov.uk/pubs/international/app_pack_ama.pdf)

AMA soundness standard  
[http://www.fsa.gov.uk/pubs/international/orsg\\_soundness.pdf](http://www.fsa.gov.uk/pubs/international/orsg_soundness.pdf)

*Minutes of the meeting of the OPERATIONAL RISK STANDING GROUP*  
[http://www.fsa.gov.uk/pubs/international/orsg\\_meeting20.pdf](http://www.fsa.gov.uk/pubs/international/orsg_meeting20.pdf)

Expert Group paper on Low Default Portfolios: June CRSG.  
Appendix A: PD estimates for low default portfolios based on confidence levels.  
[http://www.fsa.gov.uk/pubs/international/crsg\\_portfolios.pdf](http://www.fsa.gov.uk/pubs/international/crsg_portfolios.pdf)

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<sup>314</sup> The documents of peer supervisors are undergoing revision and expansion continuously. This list is not comprehensive, but we tried to include the most important validation-related papers.



## US supervisory authorities:

*“Retail credit risk for regulatory capital; internal ratings-based systems use” (Oct 2004), US supervisory authorities*

[http://www.access.gpo.gov/su\\_docs/fedreg/a041027c.html](http://www.access.gpo.gov/su_docs/fedreg/a041027c.html)

*“Draft Supervisory Guidance on Internal Ratings-Based Systems for Corporate Credit” (Jul 2003), US supervisory authorities*

<http://www.ots.treas.gov/docs/4/480004.pdf>

## Deutsche Bundesbank/Bafin:

Of the documents on the

[http://www.bundesbank.de/bankenaufsicht/bankenaufsicht\\_basel\\_irbazulassung.php](http://www.bundesbank.de/bankenaufsicht/bankenaufsicht_basel_irbazulassung.php) web page, the following ones are available in English, though several important documents (e.g. application package) are available in German only.

The [http://www.bundesbank.de/bankenaufsicht/bankenaufsicht\\_basel\\_nationaleumsetzung.en.php](http://www.bundesbank.de/bankenaufsicht/bankenaufsicht_basel_nationaleumsetzung.en.php) web page includes the German-language memoranda of work groups focusing on specific subjects.

*“Approval for banks to use Internal Ratings Based (IRB) approaches to calculate regulatory capital requirements in Germany” (June 2005)*

[http://www.bundesbank.de/download/meldewesen/bankenaufsicht/formular/pdf/ratingsysteme\\_en.pdf](http://www.bundesbank.de/download/meldewesen/bankenaufsicht/formular/pdf/ratingsysteme_en.pdf)

*“Guidelines for applications to use the IRBA for calculating minimum capital requirements” (July 2005)*

[http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba\\_merkblatt\\_zulassung\\_en.pdf](http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba_merkblatt_zulassung_en.pdf)

*“Explanatory notes on the implementation plan” (July 2005)*

[http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba\\_erlaeuterungen\\_umsetzungsplan\\_en.pdf](http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba_erlaeuterungen_umsetzungsplan_en.pdf)

*“Explanatory notes on the checklist” (July 2005)*

[http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba\\_erlaeuterungen\\_konkordanzliste\\_en.pdf](http://www.bundesbank.de/download/bankenaufsicht/pdf/irba/irba_erlaeuterungen_konkordanzliste_en.pdf)

*“New capital requirements for credit institutions (Basel II)”, (Sept 2004), Monthly Report p. 73-98*

[http://www.bundesbank.de/download/volkswirtschaft/monatsberichte/2004/200409mb\\_e.pdf](http://www.bundesbank.de/download/volkswirtschaft/monatsberichte/2004/200409mb_e.pdf)

AMA approval procedure

[http://www.bundesbank.de/bankenaufsicht/bankenaufsicht\\_basel\\_zulassungama.en.php](http://www.bundesbank.de/bankenaufsicht/bankenaufsicht_basel_zulassungama.en.php)

Specialist sub-committee on operational risk

[http://www.bundesbank.de/bankenaufsicht/bankenaufsicht\\_basel\\_nationaleumsetzung.en.php?print=no&](http://www.bundesbank.de/bankenaufsicht/bankenaufsicht_basel_nationaleumsetzung.en.php?print=no&)

## Dutch National Bank:

The <http://www.dnb.nl/dnb/pagina.jsp?pid=tcm:13-51359-64> web site features consultation papers of the central bank of the Netherlands,

*“Notes to application form for use of internal solvency system”, (August 2005)*

[http://www.dnb.nl/dnb/bin/doc/Notes%20to%20application%20form%20for%20use%20of%20internal%20solvency%20system\\_tcm13-60595.pdf](http://www.dnb.nl/dnb/bin/doc/Notes%20to%20application%20form%20for%20use%20of%20internal%20solvency%20system_tcm13-60595.pdf)



### **National Bank of Austria:**

“Rating Models and Validation” (Nov 2004) ONB  
[http://www.oenb.at/de/img/rating\\_models\\_tcm14-22933.pdf](http://www.oenb.at/de/img/rating_models_tcm14-22933.pdf)

### **Swedish supervisory authority:**

“Request for review of IRB approach” (July 2005), Finansinspektionen  
[http://www.fi.se/upload/30\\_Regler/50\\_Kapitaltackning/10\\_Kreditrisk/Req\\_review\\_IRB\\_approach\\_050701\\_1515.doc](http://www.fi.se/upload/30_Regler/50_Kapitaltackning/10_Kreditrisk/Req_review_IRB_approach_050701_1515.doc)  
[http://www.fi.se/upload/30\\_Regler/50\\_Kapitaltackning/10\\_Kreditrisk/Draft\\_regulation\\_IRB\\_approach\\_050718\\_1020.pdf](http://www.fi.se/upload/30_Regler/50_Kapitaltackning/10_Kreditrisk/Draft_regulation_IRB_approach_050718_1020.pdf)

### **Hong Kong Monetary Authority:**

“Proposals for the Implementation of the New Basel Capital Adequacy Standards (“Basel II”) in Hong Kong”  
<http://www.info.gov.hk/hkma/eng/basel2/>

### **Other**

Estimating Probabilities of Default for Low Default Portfolios (Katja Pluto and Dirk Tasche)  
[http://www.defaultrisk.com/pp\\_score\\_45.htm](http://www.defaultrisk.com/pp_score_45.htm)  
<http://www.gloriamundi.org/detailpopup.asp?ID=453057431>  
[http://www-m4.ma.tum.de/pers/tasche/low\\_defaults.pdf](http://www-m4.ma.tum.de/pers/tasche/low_defaults.pdf)