

# Guidance on use of the internal rating based approach (the IRB approach)

## Contents

1.	Introduction .....	3
1.1.	Connection with EU legislation etc. ....	4
2.	Initial Applications .....	4
2.1.	Generally about Initial Applications .....	4
2.2.	Submission of Documents Prior to the Final Application .....	5
2.2.1.	Parallel Reporting .....	6
2.2.2.	Reports from the Lines of Defence .....	6
2.3.	Self-Assessment .....	7
2.4.	Sample Review .....	7
2.5.	Implementation .....	8
3.	Changes .....	8
3.1.	General remarks on changes .....	8
3.1.1.	Scope of the RTS on changes .....	8
3.1.2.	Extent of notifications .....	9
3.1.3.	Models used for multiple purposes .....	10
3.1.4.	Changes to the validation method .....	10
3.1.5.	Validation of changes .....	11
3.2.	Applications for changes .....	11
3.2.1.	Governance in relation to applications .....	12
3.2.2.	Self-assessment .....	12
3.2.3.	Role of the validation function in relation to applications .....	13
3.2.4.	Role of Internal Audit in relation to applications .....	14
3.2.5.	Observations from the lines of defence .....	14
3.2.6.	Implementation .....	15
3.2.7.	Impact assessments .....	15
4.	Handling of underestimation .....	16
4.1.	Updates and previous versions of the guidance .....	16
4.2.	Connection between the guidance, the CRR and the EBA's guidelines .....	16
4.3.	Definitions .....	17
4.3.1.	Special considerations regarding Best Estimate (BE) .....	17
4.3.2.	Special considerations regarding material and statistically significant underestimation ....	18
4.4.	Relevant distinctions .....	18

4.4.1.	Special considerations regarding material subsegments .....	19
4.5.	Cyclical properties .....	20
4.5.1.	Specific considerations for LGD and CF .....	20
4.6.	New models .....	21
4.6.1.	BE model .....	21
4.6.2.	BE plus MoC .....	22
4.7.	Implemented models .....	22
4.7.1.	BE model .....	22
4.8.	Pillar 1, Pillar 2, and Changes .....	23
5.	Validation .....	24
5.1.	Connection with the EBA's validation handbook.....	24
5.1.1.	Direct application of the Handbook .....	25
5.1.2.	Relaxations in relation to the Handbook .....	25
5.1.2.1.	Representative sample.....	26
5.1.2.2.	Data for initial validation .....	26
5.1.2.3.	Additional testing for long durations .....	26
5.1.2.4.	Outsourcing of validation tasks .....	27
5.2.	The roles of the lines of defence .....	28
5.2.1.	On the role of Internal audit.....	28
5.3.	Initial vs. ongoing validation.....	29
5.4.	Ongoing validation .....	29
5.4.1.	On full vs. annual validation .....	30
5.4.2.	On ad hoc validation.....	30
5.5.	Level of detail.....	30
5.5.1.	Possible actions.....	32
5.5.2.	Special considerations regarding selected segments.....	32
5.6.	Comparison of estimated or observed values.....	32
5.7.	Representativeness .....	33
5.8.	Observations from the validation .....	33
5.8.1.	Reporting of validation observations .....	34
5.8.2.	Content of the validation observations .....	34
5.9.	When models are to be replaced .....	34
6.	REA developments and cyclical properties .....	35
6.1.	Long-term trend .....	36
6.2.	Technical changes.....	36

6.3.	Development over a business cycle.....	37
7.	Maturity .....	38
7.1.	Pillar 1 .....	38
7.2.	Pillar 2 .....	39
7.3.	Fixed maturity of 2.5 years .....	40
8.	Restructuring due to financial distress.....	41
8.1.	Method for NPV calculation .....	41
8.2.	Scope of the NPV calculation .....	43
8.3.	Monitoring of exposures under restructuring due to financial distress.....	43
9.	Other matters .....	44
9.1.	Use of external assistance .....	44
9.2.	Data confidentiality .....	44
9.3.	Consistency with accounting rules .....	44
9.4.	Internal audit .....	45
9.5.	Non-rated exposures and outdated ratings.....	45
9.6.	Conservatism add-on to internal estimates .....	46
9.7.	Conservatism add-on for a group of deficiencies.....	46
9.8.	Inclusion of the 1990s.....	47
9.8.1.	Challenges with data from the 1990s.....	48
9.9.	Third-party data and models.....	49
9.10.	LGD at facility level .....	49
	Annex 1: Self-assessment in relation to the RTS on assessment methodology in connection with initial applications.....	50
	Annex 2: Guidance on supplementary templates for institutions' own impact assessments .....	51
	Annex 3: Guidance on the handling of underestimation (Valid until July 2025) .....	53

## 1. Introduction

This guidance outlines the Finanstilsynet's practices regarding various matters related to the use of the Internal Ratings-Based Approach (IRB approach) by Danish institutions.

Where the term "shall" is used in this guidance, it means that institutions must act as described, as this follows from Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms, and amending Regulation (EU) No. 648/2012, as amended (the CRR Regulation). Where the terms "should" or similar are used, it implies that institutions may choose other forms of action or determine that no action is necessary. Therefore, this guidance is not exhaustive. This means that an institution may act within the bounds of the legislation even if it is outside the scope of the guidance. In such cases, Finanstilsynet will request that the institution explains how it remains in compliance with the legal requirements.

### **1.1. Connection with EU legislation etc.**

This guidance should be viewed in the context of:

- the extensive European legislation in the IRB area,
- the European Banking Authority's (EBA) products relating to the IRB approach.

The guidance is based on the legislation and EBA products applicable at the time of its publication. If there are subsequent changes to the legislation or EBA products, there may be uncertainty as to how the guidance should be interpreted. In such cases of doubt, institutions are encouraged to contact Finanstilsynet for clarification.

In most cases, the guidance is intended as a supplement to the above. Among other things, it describes aspects not addressed elsewhere. It also elaborates on areas that are only briefly covered in legislation etc., where it is therefore relevant to clarify Finanstilsynet's expectations. In general, the expectations set out by Finanstilsynet in this guidance reflect how institutions may structure their processes in order to ensure efficient supervisory processes. However, these are not explicit legal requirements (cf. the distinction between "shall" and "should" in section 1 above).

There are, however, certain exceptions. These exceptions all relate to the EBA's "Supervisory Handbook on the Validation of Rating Systems Under the Internal Ratings Based Approach" (EBA/REP/2023/29), which has a different legal status from the EBA's other products. Accordingly, Finanstilsynet has chosen to deviate in both more lenient and more restrictive directions in certain areas. The status of the handbook and Finanstilsynet's practice in relation to the handbook are described in section 5 on validation.

## **2. Initial Applications**

This section outlines Finanstilsynet's practices regarding initial applications for the use of the IRB approach.

An "initial application" should be understood as the first application to transition from the standardised approach for credit risk to the IRB approach. All subsequent applications will be considered applications for changes and thus fall under section 3, "Changes." This also includes applications to use the IRB approach for portfolios previously covered by exemptions or rollout plans.

### **2.1. Generally about Initial Applications**

An initial application is a significant task for both the applicant and Finanstilsynet. It is therefore advisable that potential applicants contact Finanstilsynet well in advance of the expected application date to initiate a dialogue about the upcoming process.

Engaging in early dialogue provides an opportunity to align expectations regarding the process and the content of the application. This preliminary dialogue, for example, allows emphasis to be placed on particularly important focus areas and discussion of potential challenges in the forthcoming application.

In many respects, institutions and Finanstilsynet share a common interest in identifying such focus areas and challenges early, in order to discuss how they can be addressed well before the application is submitted.

However, dialogue prior to an application cannot be used to obtain pre-approval of parts of the application. The project risk lies solely with the institutions, and Finanstilsynet will take a critical view on the final application. All prior communication is therefore non-binding.

An important factor in Finanstilsynet's assessment of the application will be whether the IRB area – including the application itself – is subject to appropriate governance. This will likely be a topic in the dialogue leading up to the final application. This guidance also highlights key elements that institutions should pay attention to. However, the guidance is not exhaustive.

## **2.2. Submission of Documents Prior to the Final Application**

As a general rule, Finanstilsynet does not wish to receive draft documentation before the institution submits the final application. Similarly, institutions should not submit components from the final application separately. It is important that the final application can be seen as a complete package, and that this package has been subject to appropriate governance within the institution.

However, Finanstilsynet is open to making limited exceptions to this general rule. Any exceptions should be explicitly agreed upon as part of the dialogue leading up to the application.

Such exceptions may be relevant in selected areas where they provide particular value in ensuring sufficiently high quality of the final application. The most obvious examples of potential exceptions include:

- parallel reporting
- reports from the lines of defence.

Sections 2.2.1–2.2.2 contain further considerations on these possible exceptions. In addition, Box 1 provides some reflections on the use of the term “lines of defence.”

### **Box 1: The Concept of “Lines of Defence”**

The term “lines of defence” is often used in the context of governance and risk management.

In the IRB area, the term is also widely used – both in this guidance and in general – and in most cases there will be no doubt as to its meaning. However, there may occasionally be situations where the meaning is not self-evident.

These situations generally relate to the concept of the “first line of defence.” By contrast, there is usually no doubt in practice that validation is part of the second line of defence, while the third line consists of Internal Audit.

Ambiguity around the term “first line of defence” arises because, in an IRB context, it typically refers to the department responsible for model development – regardless of where in the organisation this department is located.

In other contexts, the “first line of defence” is typically understood to mean all functions other than risk management and compliance (second line of defence) and Internal Audit (third line of defence).

### **2.2.1. Parallel Reporting**

The final application should include parallel reporting that shows the quantitative consequences of transitioning to the IRB approach.

However, it is advisable early in the process to ensure that institutions are able to provide the reporting required after transition to the IRB approach.

Likewise, the applicant and Finanstilsynet may have a shared interest in conducting a benchmarking to other IRB institutions relatively early in the process. This benchmarking should be based on parallel reporting, since it is difficult for the applicant to perform a reliable benchmarking independently. When benchmarking is based on parallel reporting, Finanstilsynet can make direct comparisons with other IRB institutions, which, all else being equal, provides the most accurate benchmarking. In addition, the quantitative consequences are of great importance in assessing the application. It would therefore be unfortunate if major deviations compared to comparable institutions are only discovered late in the application process.

Therefore, as part of the initial dialogue, the applicant and Finanstilsynet should agree on a form of parallel reporting, in which the applicant continues the mandatory reporting under the standardised approach supplemented by selected reports under the IRB approach.

The exact format of the parallel reporting can be agreed bilaterally. The same applies to the frequency of the reporting.

### **2.2.2. Reports from the Lines of Defence**

Finanstilsynet will also be open to conducting a general review of selected reports from the lines of defence. These may include reports from monitoring, validation, and audit functions.

In this context, institutions should be aware of Article 22 of the Regulatory Technical Standards (RTS) on assessment methodology<sup>1</sup>. It states that there must be sufficient documentation that the rating systems have functioned effectively for three years, and reporting from the lines of defence is specifically highlighted. There is therefore a requirement that the lines of defence have analysed and reported on the IRB area over an extended period prior to the application. Consequently, the area is expected to have a certain degree of maturity at the time of the initial application.

As previously mentioned, pre-approval of the material is not an option. However, both Finanstilsynet and the institutions share an interest in early identification of any material deficiencies in the reports. Finanstilsynet attaches great importance to the assessments of the lines of defence. Therefore, if material areas are not sufficiently analysed by the lines of defence, or if there is inadequate follow-up, it may result in a swift rejection or an unnecessarily complicated application process.

Similarly, both parties may benefit from discussing the content – and particularly the handling – of the most material observations made by the lines of defence. Among other things, it can be critical whether there are any major observations that have not been resolved prior to the submission of the application.

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<sup>1</sup> Commission Delegated Regulation (EU) 2022/439 of 20 October 2021 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council as regards regulatory technical standards specifying the assessment methodology competent authorities shall follow when assessing the compliance of credit institutions and investment firms with the requirements for using the Internal Ratings Based Approach.

As a general rule, there should be no open observations at the time of application. However, it cannot be ruled out that an application may still be approved despite open observations. In such cases, there should be a plan for how the observations will be resolved. In addition, compensating measures should be in place. This principle mirrors Finanstilsynet's approach to applications for changes, where approval may also be granted even if not all requirements are fully met, cf. section 3.

### **2.3. Self-Assessment**

In connection with both initial applications and applications for changes, institutions must comply with extensive legislation. Finanstilsynet therefore expects institutions to carry out a self-assessment.

Section 3 contains a description of Finanstilsynet's expectations regarding the self-assessment in connection with applications for changes. The majority of this description is also relevant to initial applications, where Finanstilsynet has the same expectations regarding methodology, documentation, governance, etc.

Similarly, Finanstilsynet expects both initial applications and applications for changes to include an assessment of each model in relation to all relevant requirements in the CRR and in the EBA's products in the IRB area.

However, there is an important difference between initial applications and applications for changes when it comes to the scope of the self-assessment. This is because certain requirements are of a general nature and are therefore not relevant to the assessment of individual models. On the other hand, these requirements are highly relevant in a self-assessment connected with an initial application.

In the case of an initial application, Finanstilsynet therefore expects a self-assessment of:

- the entire IRB chapter and the entire CRM chapter of the CRR (Articles 142–236)
- the majority of the EBA's RTS on the assessment methodology.
  - Annex 1 to this guidance includes certain exceptions.
- all relevant requirements in the EBA's other IRB-related products, cf. section 3.2.2.

### **2.4. Sample Review**

In connection with the initial application, it is considered good practice for a group of credit experts within the institution to review a number of cases as part of a sample review. This may, for example, be to assess whether the model-based ratings and the ranking of customers in the sample correspond to the experts' own assessments.

If there are major differences between the model-based ratings and the experts' assessments, this indicates potential for improvement. For example, this could involve the use of information that the credit experts consider important but that is not included in the model, or systematic differences between the experts' assessments and the model-based ratings. Conversely, minor or no differences help strengthen confidence in the models and their usefulness in risk management. The sample review should therefore result in clear conclusions regarding the readiness of the models for use.

Institutions may align expectations regarding the scope and frequency of the sample review in bilateral dialogue with Finanstilsynet. However, it is generally important that the number of cases is sufficient to ensure that the conclusions of the analysis are valid. It is also important that the selected cases are

sufficiently diverse to allow conclusions to be drawn across different parts of the portfolio. For example, institutions may consider whether the samples adequately reflect differences across sectors, geographic areas, and exposure sizes.

## **2.5. Implementation**

For both initial applications and applications for changes, certain practical questions will arise regarding documentation of the implementation — including testing to ensure correct implementation.

Finanstilsynet's practice in relation to applications for changes is described in Section 3. There are no material differences between initial applications and change applications in this regard. Institutions can therefore expect Finanstilsynet to apply the same practice when it comes to initial applications.

This means, among other things, that Finanstilsynet does not require extensive implementation testing in connection with an initial application. A high-level implementation plan is sufficient, and institutions can then expect any approval to include a condition requiring follow-up on the implementation.

## **3. Changes**

This section describes Finanstilsynet's practices concerning changes to the IRB approach.

The section is based on the premise that two key documents govern changes to the IRB approach:

- Regulatory Technical Standards (RTS) on changes<sup>2</sup>.
- The institutions' own internal policies on changes.
  - All institutions are required to have such a policy.
  - This is stated in Articles 83–84 of the RTS on assessment methodology.

These documents define the overall framework for changes to the IRB approach.

### **3.1. General remarks on changes**

There are several aspects regarding changes that this guidance does not cover. The guidance focuses primarily on changes that are sufficiently material to trigger a formal application to Finanstilsynet, cf. Section 3.2. Finanstilsynet has gained experience regarding the requirements for ensuring applications of sufficiently high quality, thereby also supporting efficient application processes. It is relevant to share this experience so that all stakeholders have the opportunity to consider it in connection with future applications.

Besides this, there are only a few further areas where Finanstilsynet finds it relevant to clarify the legal requirements and Finanstilsynet's expectations towards institutions, cf. Sections 3.1.1–3.1.5.

#### **3.1.1. Scope of the RTS on changes**

The scope of the abovementioned RTS on changes is broad and covers the vast majority of changes to the IRB approach. This means that most changes will result in one of the following:

- an application

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<sup>2</sup> Kommissionens delegerede forordning (EU) Nr. 529/2014 af 12. marts 2014 om supplerende regler til Europa-Parlamentets og Rådets forordning (EU) nr. 575/2013 for så vidt angår reguleringsmæssige tekniske standarder for vurdering af væsentligheden af udvidelser og ændringer af den interne ratingbaserede metode og den avancerede målemetode.



- an ex ante notification
  - to be submitted to Finanstilsynet at least two months prior to planned implementation
- an ex post notification
  - may be submitted to Finanstilsynet after implementation

However, recital 7 of the RTS mentions a few exceptional cases in which institutions may implement changes without involving Finanstilsynet.

A typical example is the correction of data errors. Institutions may, as part of their day-to-day operations, correct individual data errors without the RTS applying. In contrast, a broader clean-up of data would fall under its scope. There may be additional examples, but these will depend on a case-by-case assessment.

All models used in the IRB area fall under the RTS. Likewise, the materiality assessment requirements do not depend on the type of model. This applies regardless of whether the models are sub-models<sup>3</sup> or also used for other purposes. This also includes valuation models, cf. however Section 3.1.3.

In some cases, institutions use models or data from an external provider. Finanstilsynet recognises that institutions may require a certain degree of flexibility in such cases. It may be difficult for institutions to have full insight into — and control over — all changes made by the external provider. However, this flexibility must be justified by materiality and any practical challenges. In principle, the requirements are not more lenient simply because a task is outsourced. Institutions therefore remain responsible for ensuring that agreements with external providers are designed in a way that does not compromise legal compliance or sound and transparent governance of the model framework.

The RTS also covers changes to standards (often referred to as “frameworks”) used by institutions in the IRB area. However, such changes only fall under the scope of the RTS once they have an impact in production. Therefore, such changes will often be included in a separate application or notification — e.g. concerning a model change where the standard is used for the first time. As a general rule, this applies only to legally mandated standards. In many cases, institutions apply more standards than those required by law. These additional standards may also fall within the scope of the RTS<sup>4</sup> on changes, but this will depend on the individual case. Institutions should therefore assess changes to each standard in relation to the requirements of the RTS. In any case, the standards will often be relevant to the assessment of an application. In such instances, the standards — or changes to them — should be included in the application material.

### **3.1.2. Extent of notifications**

The broad scope of the RTS on changes does not entail a material administrative burden for institutions.

The RTS requirements regarding notifications mean that Finanstilsynet must be informed of the vast majority of changes, but a notification is not subject to extensive requirements. Institutions are therefore only required to meet certain minimum standards for documentation and governance.

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<sup>3</sup> For example, many LGD models consist of a “no loss” model and a “loss given loss” model.

<sup>4</sup> For example, they may be covered by “key procedures with a major impact on a rating system”, cf. Annex 1, Part II, Section 2, point 4 of the RTS.

Likewise, notifications do not trigger comprehensive processing at Finanstilsynet, and therefore do not constitute a bottleneck for implementing necessary changes. The option of ex post notifications is the clearest example that the notification requirement does not stand in the way of timely implementation of necessary improvements within the IRB area. Ex post notifications can be grouped into larger packages that institutions submit to Finanstilsynet once or several times a year.

If there is an urgent need to implement changes quickly that result in an ex ante notification, institutions may contact Finanstilsynet to make specific arrangements. In most cases, Finanstilsynet will be willing to show flexibility regarding the processing time. However, it must be clear that this concerns an urgent need.

### **3.1.3. Models used for multiple purposes**

As mentioned, all models used for IRB purposes are covered by the RTS – including valuation models. However, changes that are clearly unrelated to the IRB area are exempt from the RTS, although there will typically still be a process with Finanstilsynet.

For example, this may concern a property valuation model used both for IRB purposes and for exemption from the inspection requirement in mortgage institutions. If the institution only makes changes related to the exemption (e.g. a change to the model's area of application), this will not be covered by the RTS. For mortgage institutions, however, it may still be relevant to engage with Finanstilsynet if they have been granted such an exemption.

If, on the other hand, a change is relevant for the IRB area, a notification or application will be required. As a rule, such a notification or application will not differ from other notifications or applications. However, where an application is required, it is often beneficial for institutions to enter into a bilateral dialogue with Finanstilsynet well in advance of the intended application date. This allows expectations regarding the content and process of the application to be aligned.

### **3.1.4. Changes to the validation method**

The RTS states that ex post notifications are not permitted when it comes to changes to the validation method.

In some cases, an application is required, and the RTS specifies the criteria for this. In many cases, however, an ex ante notification will be sufficient.

Finanstilsynet expects institutions to continuously improve their validation methods. It is important that the process vis-à-vis Finanstilsynet does not hinder such improvements. At the same time, Finanstilsynet's experience shows that it is possible to strike a reasonable balance between regulatory processes and the need for ongoing enhancements of the validation method.

Where changes to the validation process are clearly unambiguous improvements, an application is therefore not required. In such cases, an ex ante notification will be sufficient. This will, for example, be the case where the scope of the validation process is expanded by adding new analyses without removing existing ones.

### **3.1.5. Validation of changes<sup>5</sup>**

Institutions' change policies must address the extent to which a change should be validated before implementation.

In this regard, institutions have a degree of flexibility. For example, they may tailor the scope of quantitative analyses and carry out only those that are relevant in the specific case. In some instances, institutions may even omit quantitative analysis entirely in favour of a more qualitative assessment.

Similarly, in certain situations, institutions may choose not to validate a change at all.

Despite this flexibility, Finanstilsynet's experience shows that validation prior to implementation is a key factor in achieving robust models. It is clearly unfortunate to implement changes that must be revised shortly thereafter, if this could have been avoided through appropriate validation. Moreover, validation often adds value to institutions' governance processes, as it enables stakeholders to make better-informed decisions when independent validation is included as part of the basis for decision-making.

Finanstilsynet therefore has a clear expectation that institutions validate changes before implementation to the extent that the validation contributes to the objective of maintaining robust models. The process towards Finanstilsynet (application, ex ante notification or ex post notification) should not determine whether a validation is performed. Likewise, the content and scope of the validation should not depend on the process towards Finanstilsynet.

In cases where institutions decide not to conduct a validation, this decision should be subject to appropriate governance. The governance process must also be documented and included in the material submitted to Finanstilsynet. This does not preclude institutions from setting fixed criteria in their change policies for when validation is required. However, such criteria must be clearly reflected in the documentation, so that all stakeholders can see that any decision not to validate is in accordance with the institution's change policy.

In all cases, the validation unit must be involved in the classification of the change, cf. Article 11(2)(d) of the RTS on assessment methodology<sup>6</sup>. This also applies where the institution opts not to validate the change.

### **3.2. Applications for changes**

Generally speaking, institutions should ensure that an application is complete before it is submitted. This includes compliance with all relevant requirements under both the CRR and the EBA's products. The requirements are extensive, making it a complex task in which it is important not to underestimate the implications for governance and documentation, cf. sections 3.2.1–3.2.7.

Since the application should be complete, institutions should not plan to submit additional material afterwards.

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<sup>5</sup> This topic is also addressed in the EBA's validation handbook. However, the handbook leaves some uncertainty in this area. Danish IRB institutions may therefore benefit from focusing on the present guidance and disregarding the handbook's descriptions of the topic. This mainly concerns points 24, 27, and 96 in the handbook.

<sup>6</sup> Commission Delegated Regulation (EU) 2022/439 of 20 October 2021 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards specifying the assessment methodology competent authorities shall follow when assessing the compliance of credit institutions and investment firms with the requirements to use the Internal Ratings Based Approach.

However, in some cases, institutions may wish to reduce the complexity in development projects and application processes by applying for changes that do not yet meet all regulatory requirements.

Finanstilsynet has a certain understanding for this and does not rule out that an application may be approved even if some requirements are not yet fulfilled. This is, however, subject to the following conditions:

- The deficiencies are clearly disclosed in the application.
- The application includes a plan for ensuring full compliance.
- The institution has mitigating measures in place until full compliance is achieved.

Institutions are encouraged to discuss such an application with Finanstilsynet well in advance of the intended submission date.

### **3.2.1. Governance in relation to applications**

To ensure high-quality applications – and thus efficient processing – it is essential that institutions have well-functioning governance processes.

This means that applications must be subject to critical review by the institution's lines of defence. It is also important that the institution has a thorough and complete internal approval process.

It is important that the reports from the lines of defence are available during the internal approval process and included as part of the approval documentation. This also applies to any committees or working groups that review the application prior to final internal approval.

### **3.2.2. Self-assessment**

To ensure compliance with the extensive regulatory framework, institutions must review the applicable requirements. Finanstilsynet therefore expects institutions to carry out a self-assessment when applying for changes, which reflects that the review has been:

- Systematic, so that it is evident the institution has considered all relevant requirements.
- Documented, so that it is clear how the institution meets each requirement.

With regard to the latter point about documentation, institutions may benefit from including references to other parts of the application (e.g. model documentation).

The self-assessment should cover all relevant parts of the CRR. As a general rule, this includes Articles 169–191. In practice, however, there will often be a number of articles that the institution can simply mark as “n/a” because they are not relevant to the specific application.

Institutions should also include a self-assessment of selected articles in the RTS on assessment methodology<sup>7</sup>. These are:

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<sup>7</sup> Commission Delegated Regulation (EU) 2022/439 of 20 October 2021 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards specifying the assessment methodology to be followed by the competent authorities when assessing the compliance of credit institutions and investment firms with the requirements to use the Internal Ratings Based Approach.

- Articles 27-29 for applications concerning changes to the definition of default.
- Chapters 4, 5 and 7<sup>8</sup> for applications concerning roll-out to portfolios previously subject to exemptions or roll-out plans<sup>9</sup>.
- Articles 31, 37 and 39 for applications concerning model changes.
- Article 34 for applications concerning changes to the rating scale.

The primary purpose of including a self-assessment of these selected articles in the RTS on assessment methodology is to ensure consistent documentation standards.

In addition, the EBA's guidelines and technical standards in the IRB area contain a number of requirements that the self-assessment should also address. The precise scope will vary depending on the application. For example, there are several requirements that apply specifically to LGD and CF.

The self-assessment should include an explicit position on all relevant articles and sub-points in order to meet the objective of a systematic review. Institutions may choose to provide a detailed assessment of one article and refer to it in the assessment of other articles. However, institutions should not group a large number of articles together, as this often results in overly general assessments.

Some of the legal requirements are general in nature and not specific to the model covered by the application – for example, requirements regarding the review of estimates and use of risk parameters<sup>10</sup>.

It is important that institutions do not exclude such general requirements from their self-assessment, as these are relevant to Finanstilsynet's overall assessment – including the completeness of the application.

Institutions may, however, wish to highlight where parts of the self-assessment are identical to a previous application. Similarly, it may be useful to point out where the institution has applied one or more standards that Finanstilsynet is already familiar with.

### **3.2.3. Role of the validation function in relation to applications**

Finanstilsynet expects all applications for changes to include a validation report. The only exception is applications that concern changes to the validation method itself.

The validation function has a number of responsibilities in connection with the report. This includes specific responsibilities in selected areas, cf. section 5. However, the validation function is also responsible for reporting on the institution's compliance with applicable legislation. The application should therefore include documentation of the validation function's assessment of each requirement in the institution's self-assessment (article by article).

The validation function should not exclude parts of the self-assessment. However, it may draw on work already performed elsewhere in the organisation, for example by model development. Finanstilsynet accepts that the validation function allocates most resources to the requirements where it adds the

<sup>8</sup> However, the first article in each of the three chapters is exempt.

<sup>9</sup> According to the RTS on assessment methodology, these chapters shall apply to rollout applications in accordance with the originally approved rollout plan. However, Finanstilsynet considers that the same conditions should apply if rollout becomes relevant for other reasons. This could, for example, be rollout on new portfolios that the institution has acquired through a merger or acquisition.

<sup>10</sup> According to sections 8 and 9 in the "Guidelines on the estimation of probability of default (PD), estimation of loss given default (LGD), and treatment of defaulted exposures" (EBA/GL/2017/16).

most value. In other words, Finanstilsynet does not expect the validation function to conduct an in-depth review of every requirement.

The validation function may also delegate tasks to other control functions in the second line of defence. This can often make sense if expertise in a specific area lies elsewhere in the organisation. However, all conclusions must be compiled in a single validation report, for which the validation function remains responsible.

#### **3.2.4. Role of Internal Audit in relation to applications**

Finanstilsynet expects all applications for changes to include an internal audit report. There are no exceptions to this. Hence, it also applies, for example, to applications concerning changes to the validation method.

In the audit report, Finanstilsynet expects Internal Audit to assess compliance with all relevant legislation. Internal Audit will often select certain areas for more detailed review, but in planning its work, it may draw on the work already carried out by the other lines of defence. Finanstilsynet recognises this and has no explicit requirements or expectations regarding the depth of Internal Audit's review.

However, Finanstilsynet does have clear expectations regarding the scope of the review. Internal Audit should not exclude any requirements and, as a minimum, Internal Audit should review the institution's self-assessment, including the validation function's assessment. For each requirement in the self-assessment, it should be explicitly stated whether Internal Audit agrees.

#### **3.2.5. Observations from the lines of defence**

As a general rule, observations from the lines of defence should be closed before an application is submitted. Each line of defence is responsible for closing its own observations. For example, it is insufficient if the model development function merely states that it has taken the validation function's observations into account.

Despite this general rule, Finanstilsynet recognises that there may be certain exceptions. These can be grouped into three categories:

- First, there may be observations that, by their nature, cannot be closed before the application is submitted. For instance, the most appropriate course of action for the institution may be monitoring.
- Second, there may be observations that are more in the nature of recommendations than identified deficiencies in the application<sup>11</sup>. There should be room for such recommendations without unnecessarily delaying an application. However, this flexibility should only apply where the observation does not relate to an actual deficiency.
- Third, there may be disagreement between the lines of defence. This is not a problem in itself, as the second and third lines of defence provide value by independently challenging the application. The lines of defence are therefore not expected to negotiate agreement. Instead, the decision on how to handle the observation should be escalated to the appropriate level within

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<sup>11</sup> Institutions may find it useful to differentiate between observations and recommendations within their internal categorisation.

the organisation. The exact level depends on the institution's governance structure. The decision process should be documented and included in the application.

In addition to the above, as stated in the introduction to section 3.2, there may be cases where an institution submits an application even though not all regulatory requirements are fulfilled. This, however, does not necessarily relate to the observations of the lines of defence, as such issues should be identified prior to their review.

### **3.2.6. Implementation**

Finanstilsynet does not require extensive implementation testing in connection with an application. It is sufficient for institutions to include a high-level implementation plan as part of the application. Institutions can then expect Finanstilsynet's decision to include a condition requiring follow-up on the implementation.

The implementation plan must describe how the institution will ensure correct implementation. The actual implementation may take place after Finanstilsynet has made its decision. Institutions may also conduct the necessary implementation testing after Finanstilsynet's decision has been made.

Although the plan can be high level, it must enable an informed assessment of the application. Therefore, material decisions regarding implementation must not remain unresolved at the time of application. An example of such a material decision might be a situation where an application for a new model requires changes to the institution's override guidelines<sup>12</sup>. In that case, the application must include the updated guidelines, whereas details such as internal communication can wait until implementation.

In general, there should not be changes made after approval but before implementation. However, in exceptional cases, this may occur. In such instances, Finanstilsynet expects the same internal governance as would apply if the model was already in production. This means that institutions must follow their change policy for IRB models. In addition, Finanstilsynet must be involved before the change is implemented – regardless of how the institution classifies the change. The material submitted to Finanstilsynet must not differ from what would have been submitted had the model already been in production.

### **3.2.7. Impact assessments**

An application for changes must describe the quantitative effects of the change. This is already stipulated in the RTS on changes, and it also represents important information for the institution's management.

As a general rule, Finanstilsynet has only limited requirements with respect to impact assessments. It is the institution's responsibility to ensure that all relevant effects are identified, and in many cases, the institution's management will likely have at least as strong a need as Finanstilsynet to obtain an accurate picture of the consequences of the change.

However, to enable comparisons across institutions, Finanstilsynet wishes to receive a limited data set with standardised information in the form of supplementary templates, cf. Annex 2 to this guidance.

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<sup>12</sup> Overrides refer to situations where an employee overrides input or output involved in the rating process, cf. Article 172(3) of the CRR.

The purpose of both the institution's own impact assessment and Finanstilsynet's standardised templates is not to produce an exact calculation, but rather to provide a qualified estimate of the magnitude of the changes. Finanstilsynet therefore recognises that certain effects may be omitted due to materiality or practical constraints. This may, for example, include the effects of overrides or knock-on effects via the institution's stress testing. However, if the institution anticipates material effects in these areas, such effects should at least be described qualitatively.

#### **4. Handling of underestimation**

IRB institutions must establish well-founded internal guidelines for situations where actual values for probability of default (PD), loss given default (LGD), and conversion factors (CF) deviate to such an extent from the expected values that the validity of the estimates is called into question. This follows from Article 185(1)(e) of the CRR<sup>13</sup>.

This section describes Finanstilsynet's supervisory practice regarding the handling of underestimation.

The section applies only to the risk parameters used for capital adequacy purposes.

##### **4.1. Updates and previous versions of the guidance**

This guidance was last updated in July 2025. The updated version describes the handling of underestimation for models developed in accordance with the EBA's guidelines on estimation<sup>14</sup>.

During a transitional period, however, Danish institutions will still have models that do not comply with the guidelines. For these models, it remains possible to use the version of the guidance on underestimation that applied until July 2025. That version is included as Annex 3.

##### **4.2. Connection between the guidance, the CRR and the EBA's guidelines**

The background for the update in July 2025 is that the EBA's guidelines introduce new requirements for models – and therefore also new concepts that the previous version of the guidance did not take into account. These concepts are described in section 4.3. Finanstilsynet has found it necessary to update the guidance to reflect these concepts.

Apart from that, the connection between the guidance and the EBA's guidelines is limited, as the guidelines only address underestimation at a relatively general level and only for implemented models, cf. section 9 of the EBA guidelines on the review of estimates.

Hence, although the EBA has issued comprehensive guidelines and technical standards in the IRB area, the common European rules on the handling of underestimation are limited to the relatively general wording in Article 185 of the CRR, section 9 of the EBA guidelines, and the EBA validation handbook<sup>15</sup>. Finanstilsynet therefore finds that it is still relevant to issue guidance so that IRB institutions are aware of Finanstilsynet's supervisory practice and can align their practices accordingly.

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<sup>13</sup> Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (the CRR Regulation).

<sup>14</sup> Guidelines on the estimation of the probability of default (PD), the estimation of loss given default (LGD), and the treatment of defaulted exposures (EBA/GL/2017/16).

<sup>15</sup> The handbook addresses the handling of underestimation only to a very limited extent. For example, there is a very general description in point 46 of the handbook.



### 4.3. Definitions

As previously mentioned, the EBA's guidelines introduce concepts that are important for this guidance. Models developed in accordance with the guidelines will thus result in estimates that can be divided into<sup>16</sup>:

- Best Estimate (BE) – the best estimate of PD and LGD<sup>17</sup> without the inclusion of conservatism.
- Margin of Conservatism (MoC) – an add-on that reflects:
  - data and methodological deficiencies (MoC A)
  - changes in lending policy, risk appetite, and other sources of uncertainty (MoC B)
  - general estimation errors (MoC C)

In addition, the EBA guidelines introduce the concept of<sup>18</sup>:

- Conservatism in Application (CiA) – conservatism applied in the use of models, e.g. due to missing data.

Finally, it is relevant to define various forms of underestimation:

- Absolute underestimation
  - Any deviation where observed values are higher than expected values.
- Material underestimation
  - The underestimation is not necessarily statistically significant but large enough to warrant action.
  - Based on a qualitative assessment, possibly supported by internal guidelines.
- Statistically significant underestimation
  - The underestimation is large enough to fall outside the confidence bands or test thresholds defined by the institution.
  - Statistically significant underestimation must always be considered material.
- Repeated underestimation
  - The underestimation occurs two or more years in a row.
  - The size of the underestimation is generally not decisive.

#### 4.3.1. Special considerations regarding Best Estimate (BE)

As previously mentioned, BE represents the best estimate of the parameters without the inclusion of conservatism. The most obvious example of such conservatism is the MoC, which, by its very nature, is an add-on to the BE.

However, there are other examples of conservatism. For example, the legislation in the area includes various minimum values, such as minimum PD values, cf. Article 160 of the CRR. In principle, it would be most correct to adjust the BE to reflect these minimum values, so that no conservatism is included in the estimate. Finanstilsynet is, however, open to allowing institutions a degree of methodological discretion in this area in relation to the handling of underestimation. Finanstilsynet takes a different view, however, when it comes to the level of detail required in validation, cf. section 5.5.

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<sup>16</sup> According to points 38 and 42 in the guidelines.

<sup>17</sup> The guidelines currently do not cover CF. However, EBA expects guidelines for CF to be developed as well. Institutions that already split CF estimates into BE and MoC may advantageously use the guidance. For other institutions, Annex 3 applies.

<sup>18</sup> According to section 8.1 in the guidelines.

Similarly, Finanstilsynet can accept that institutions' analyses do not necessarily include a separate quantification of CiA. In practice, CiA will therefore often be included in the BE.

However, Finanstilsynet expects institutions to make a more qualitative assessment of how significant CiA is in relation to the evaluation of both the BE model itself (excluding the MoC) and the final estimate (including the MoC).

It should not, therefore, be CiA which ensures that a model does not underestimate.

For LGD and CF, there may also be uncertainty about the meaning of the BE model, because institutions use both estimates based on long-run averages and downturn-adjusted estimates, cf. Article 181(1)(b) and 182(1)(b) of the CRR. In relation to this guidance, it is decisive which estimates are used for capital adequacy purposes. For example, if institutions use downturn-adjusted LGD for capital adequacy purposes, then the BE model should be understood as the downturn-adjusted LGD prior to the inclusion of conservatism.

#### **4.3.2. Special considerations regarding material and statistically significant underestimation**

Institutions may use statistical methods to assess underestimation. However, these methods should always be supplemented by a more qualitative assessment, and statistical methods should not be applied mechanically.

This is because statistical confidence intervals can, in some cases, be very wide. Therefore, institutions should assess whether the applied statistical methods produce meaningful results.

Conversely, Finanstilsynet acknowledges that there are significant advantages to using well-defined metrics. Among other things, such metrics help ensure consistent assessments over time and across the organisation.

Finanstilsynet can therefore accept that institutions base their assessment of underestimation on statistical measures. The supplementary qualitative assessment may be supported by internal guidelines that also contain objective thresholds (e.g. deviations measured in percentage points). The qualitative assessment – and any internal guidelines – should be designed to capture situations in which material underestimation occurs, even if it is not statistically significant.

#### **4.4. Relevant distinctions**

As will become clear in the following, Finanstilsynet considers it relevant to distinguish between newly developed models and implemented models.

In addition, it is relevant to distinguish between:

- the model as a whole (considered across the entire observation period and selected parts of the observation period)
- material subsegments (considered across the entire observation period and selected parts of the observation period).

Institutions should therefore analyse their models for underestimation along all of the above dimensions. The analyses should be carried out for both newly developed and implemented models, and with and without the inclusion of MoC. When analysing selected parts of the observation period, particular attention should be paid to the most recent years.

#### **4.4.1. Special considerations regarding material subsegments**

If a portfolio is broken down into sufficiently small subsegments, there will always be areas exhibiting underestimation. However, some subsegments are so material that underestimation should not occur.

It is, as a general rule, up to each individual institution to define what constitutes a material subsegment. This will vary from institution to institution and may, among other things, depend on group structure and the number of markets in which the institution operates. It may also depend on whether the institution uses many specialised models or a few general ones.

Regardless of the above, Finanstilsynet considers it always relevant to analyse different levels of credit quality. For example, it is problematic if a PD model underestimates the risk for customers in the best end of the rating scale, even if the model as a whole does not underestimate. However, it is not necessary to define every rating grade as a material subsegment – particularly because this may result in segments with very few customers. Instead, institutions may choose to work with groups of rating grades and define these as material subsegments.

The same applies to LGD and CF models, even though institutions do not necessarily apply LGD and CF classes. Institutions should thus ensure that the models function adequately at a minimum for exposures with both high and low LGD and CF estimates.

Credit quality is the only dimension that Finanstilsynet expects to be a fixed element in the definition of material subsegments. Often, there may be several material subsegments, but institution-specific circumstances play an important role here, cf. box 2.

#### **Box 2: Considerations when defining material subsegments**

The following are examples of considerations institutions may take into account:

- Does the model cover exposures in multiple countries?
- Does the model cover customers across all of Denmark?
  - Are there regional differences?
- Does the model cover exposures across different entities?
  - For example, does it cover both banking and mortgage lending?
- Does the model cover many different industries?
  - Are there industries with very different characteristics?
  - For example, are there different accounting principles or industry-specific risks?
- Does the model include multiple calibration segments?

The size of the exposure is a factor in all of these questions. For example, a model may cover several countries without each country constituting a material subsegment in itself if the exposure size is limited.

The list is not exhaustive. Institutions should therefore consider whether there are other relevant factors that affect the definition of material subsegments. In addition, institutions should consider whether it is relevant to analyse different combinations of subsegments, e.g. the combination of credit quality and geographical characteristics. This is particularly relevant for models intended to cover a broad scope.

#### **4.5. Cyclical properties**

The estimates from a PD model cannot always be directly compared with observed default rates. This is due to the cyclical properties of the models, where many PD models are designed to produce dampened fluctuations over the course of an economic cycle. Similarly, LGD and CF estimates cannot always be compared with observed loss and conversion rates, because the models are designed to capture downturn or long-term levels and are therefore relatively stable.

For the purpose of assessing and addressing underestimation, Finanstilsynet therefore expects institutions to make a specific adjustment either to the model estimates or to the observed values<sup>19</sup>. This adjustment should ensure that estimated and observed values are comparable.

Finanstilsynet recognises that such an adjustment involves a degree of uncertainty. It may therefore be necessary to supplement with a qualitative assessment. However, this should not be a purely qualitative assessment. It is difficult to ensure consistent assessments over time and across the organisation without an objective basis for the assessment.

##### **4.5.1. Specific considerations for LGD and CF**

As outlined above, the preceding section on cyclical properties applies to PD, LGD and CF alike. However, certain specific aspects apply to LGD and CF that may complicate both the assessment and any adjustment.

These aspects include:

- Varying recovery periods.
  - Cash flows occurring after the point of default are distributed across both favourable and adverse economic conditions and may be subject to varying discount rates.
  - Cyclical properties are difficult to quantify at segment level.
  - Loss rates for the most recently closed cases do not necessarily reflect the current economic situation.
- Data from recent years include a high proportion of unresolved cases.
  - Conclusions regarding recent cases are subject to considerable uncertainty.
- Downturn estimates are typically calculated at portfolio level.
  - It may be difficult to translate these into suitable downturn levels for assessing underestimation in sub-segments.

Against this background, Finanstilsynet acknowledges that institutions may require a degree of flexibility when assessing LGD and CF. However, this flexibility must be justified by the practical challenges that may arise. Institutions should therefore strive to establish the most objective possible basis for assessment – regardless of whether the assessment concerns PD, LGD, or CF. Likewise, institutions should

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<sup>19</sup> This is supported by the response to question 6747 in EBA's Q&A system.

ensure that any observed issues are addressed in a timely manner and that the uncertainty associated with the assessment is handled with sufficient prudence.

Provided these aspects are addressed, Finanstilsynet is, in turn, prepared to accept that institutions' guidelines do not necessarily reflect a data-driven and theoretically robust approach. The guidelines may instead be based on expert judgement.

In practice, Finanstilsynet is prepared to be flexible in one or more of the following areas:

- Institutions do not fully test the downturn component during favourable or neutral economic conditions.
  - However, institutions should ensure that long-term averages are analysed adequately.
  - This could involve removing the downturn component from the estimates.
- Institutions do not carry out an actual adjustment of either the model estimates or the observed values.
  - In such cases, institutions should ensure an objective and sufficiently conservative basis for the assessment in other ways.
  - For example, guidelines might stipulate that the observed LGD must be at least a certain number of percentage points below the downturn estimate.
- Institutions apply relatively lenient criteria for determining when underestimation in recent years (characterised by a large number of unresolved cases) should be considered material.
  - However, the criteria must still ensure timely action in cases of material issues.
- Institutions apply relatively lenient criteria for determining when underestimation in sub-segments with very few data points should be considered material.

In all cases, institutions should supplement their assessment with analyses of the stability of downturn estimates over time (i.e. whether these estimates in fact reflect a downturn scenario).

#### **4.6. New models**

In general, Finanstilsynet has higher expectations for new models than for those already implemented. This is because institutions can and should address known issues before implementing a new model.

##### **4.6.1. BE model**

More specifically, Finanstilsynet finds that the BE model should not underestimate overall over time. This means that even absolute underestimation is problematic.

As noted in section 4.4, institutions should also analyse material sub-segments and selected parts of the data period. However, there is a little more flexibility in this regard, as the BE model is by definition not conservative. For example, there will be years where the model underestimates.

Nevertheless, repeated underestimation in the most recent data points should at the very least trigger further analysis – and the same applies in cases of material underestimation in the most recent year of the observation period. Such underestimation creates uncertainty as to how the model will perform immediately after implementation. The model may still be approved if the institution's analyses can provide a satisfactory explanation of the observed trend.

A similar approach applies in cases of underestimation in material sub-segments. This type of underestimation indicates potential for improving the BE model, and institutions should explore the possibilities for doing so. It may be difficult to eliminate underestimation entirely, but material underestimation should not occur.

As a general rule, necessary adjustments should be made directly in the BE model. However, Finanstilsynet does not rule out the possibility that, in some cases, institutions may use MoC as a fallback solution.

#### **4.6.2. BE plus MoC**

As Finanstilsynet expects that the overall BE model will not underestimate, there should, by definition, also be no underestimation after the inclusion of MoC.

There should be no absolute underestimation in material sub-segments after the inclusion of MoC. Institutions should not implement a model with known issues when those issues can be resolved before implementation. As noted above, institutions should have addressed any issues of material underestimation directly in the BE model, and after MoC has been applied, no known issues should remain. If issues do persist, institutions do – as a last resort – have the option of increasing the MoC.

A similar principle applies to the most recent years in the observation period. Finanstilsynet will take a skeptical view on underestimation in these years. However, if the underestimation is not material, it may still be acceptable.

### **4.7. Implemented models**

It is to be expected that already implemented models may over time begin to show signs of weakness, such as underestimation. Finanstilsynet's expectations are therefore somewhat more lenient for models that are already implemented than for new models for which institutions are applying for approval.

#### **4.7.1. BE model**

Specifically in relation to the BE model, Finanstilsynet considers that underestimation does not in itself constitute an urgent problem. This applies both to the overall model, material sub-segments and selected parts of the observation period.

However, underestimation in the BE model can be viewed as a warning sign, and it should lead to reflections within the institutions<sup>20</sup>. For example, institutions should consider whether the problem can be explained and whether it can be resolved immediately. Similarly, institutions should consider whether it may be appropriate to redevelop or re-estimate the model. It may also be the case that increased monitoring is needed for a period.

However, there is not necessarily a need for an immediate reaction from the institutions. As a rule, institutions may implement the necessary measures as part of their ordinary prioritisation of tasks in the IRB area.

#### **4.7.2. BE plus MoC**

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<sup>20</sup> This is consistent with section 5.5.1. The section describes how the institution has different courses of action depending on the severity of the identified issues.

Finanstilsynet can accept that absolute underestimation may also occur after the inclusion of MoC. However, there should not be repeated underestimation in the most recent period or material underestimation in the most recent year. If this is the case, Finanstilsynet expects the institutions to take concrete action in accordance with section 4.8 below.

This expectation applies both to the overall model and to significant sub-segments.

It is important that there is no underestimation at the model level. This also applies even if, for the models as a whole, the institutions are not allocating too little capital. This is, among other things, because the results from the models are used in the institutions' business.

Underestimation for one model therefore cannot be offset by overestimation in another. Underestimation for one parameter (PD, LGD, or CF) within a segment, such as retail customers, also cannot be offset by overestimation for another parameter within the same segment.

Notwithstanding the above, Finanstilsynet is prepared to accept that underestimation in a sub-model does not necessarily require a rapid response from the institutions if the overall model does not underestimate. This may, for example, be the case in an LGD model that is composed of a "no loss" model and a "loss given loss" model.

#### **4.8. Pillar 1, Pillar 2, and Changes**

In the version of the guidance that was in place until July 2025, it was possible to temporarily address underestimation with a Pillar 2 add-on, cf. Annex 3. As mentioned, Annex 3 may still be relevant for models that do not comply with EBA's guidelines.

For other models, there is generally no need to address underestimation in Pillar 2. The division into BE and MoC makes it possible to use Pillar 1 for both long-term and temporary handling of underestimation.

When institutions have identified a need to address underestimation, they should therefore initiate work to adjust or redevelop the BE model. Since such an adjustment or redevelopment is often time-consuming, institutions may temporarily address the underestimation by introducing a MoC or increasing an existing MoC.

The introduction of a MoC and subsequent changes to the MoC must follow the same process as all other changes<sup>21</sup>. In most cases, this means that the change must be categorised as an application, ex ante notification, or ex post notification in accordance with the RTS on changes.

Finanstilsynet expects that in most cases, these changes will be categorised as notifications.

However, Recital 7 in the RTS on changes allows for certain changes to fall entirely outside the scope. It cannot be ruled out that some institutions may have a process that is so well-defined that it is covered by Recital 7. In practice, this would mean that the process is entirely mechanical and thus independent of qualitative assessments.

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<sup>21</sup> Cf. section 3, which elaborates on Finanstilsynet's practice regarding changes.

Questions may also arise regarding the size of the MoC that institutions introduce when there is a need to address underestimation. If a model underestimates in a backtest, it can reasonably be assumed that the underestimation will also apply going forward. Institutions should therefore set the MoC by scaling the estimate from the backtest, where the underestimation was identified, to the observed level in the same backtest after adjustment, so that estimated and observed values are comparable, cf. section 4.5. Institutions cannot set the MoC based on a comparison of the observed level from the backtest and the current estimates, even if the estimates have increased since the backtest was prepared. If institutions have made adjustments to the BE model since the backtest to address the underestimation, this can of course be included in the overall assessment of the model's underestimation and MoC. Until institutions have found a solution in the BE model, the MoC should be adjusted up or down as the observed underestimation changes in newer backtests.

Notwithstanding the above, Finanstilsynet accepts that institutions may, for a short period, choose to address underestimation in Pillar 2 or as a block reservation in Pillar 1. This may be relevant, for example, if institutions wish to monitor developments for a short period before underestimation is addressed in Pillar 1 via MoC.

## **5. Validation**

This section describes Finanstilsynet's practices regarding the validation of IRB models.

To begin with, it is worth noting that the validation function plays a crucial role in ensuring a well-functioning model framework and in establishing sound governance in the IRB area.

It is therefore important that the validation function has the necessary resources and expertise. Likewise, it is important that the validation function performs its work in effective interaction with other stakeholders within the institutions.

The target audience for this section is thus not limited to the validation function itself. The content is also highly relevant for the other lines of defence, other control units in the second line of defence, and for the institutions' management. The latter may, among other things, be involved in receiving and approving validation reports. In addition, the institutions' management is responsible for ensuring that the validation function has the necessary resources and competencies to fulfil its role.

### **5.1. Connection with the EBA's validation handbook**

As mentioned in section 1.1, this guidance is in most cases a supplement to the European legislation and the EBA's products in the IRB area.

This also applies to validation, although there are certain exceptions here. These exceptions all concern the EBA's Validation Handbook (hereinafter "the Handbook")<sup>22</sup>, where Finanstilsynet has chosen to deviate in some areas both in a more lenient and in a more restrictive direction, cf. below.

The Handbook has a special status compared to the EBA's other products. Unlike most of the EBA's products, the Handbook is aimed at supervisory authorities and not at institutions. Furthermore, the Handbook is not legally binding, and it is clearly stated that supervisory authorities may deviate from

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<sup>22</sup> Supervisory Handbook on the Validation of Rating Systems Under the Internal Ratings Based Approach EBA/REP/2023/29.



it<sup>23</sup>. There are no specific requirements for supervisory authorities to deviate, and it is thus sufficient justification that the supervisory authorities find a deviation relevant.

Finanstilsynet uses this possibility to deviate from the Handbook, but this possibility is used selectively in cases where it provides sufficient value.

It is therefore important to emphasise that Finanstilsynet enforces the majority of the content of the Handbook. This means that institutions should follow the Handbook unless otherwise explicitly stated in this guidance.

It should also be emphasised that deviations from the Handbook occur both in a lenient and in a restrictive direction.

Sections 5.1.1 - 5.1.2 describe the cases where Finanstilsynet considers the Handbook directly applicable, and the cases where Finanstilsynet is prepared to allow relaxations compared to the Handbook.

The rest of section 5 contains a number of further references to the Handbook. Many of the references concern areas where Finanstilsynet finds it necessary to deviate in a restrictive direction. However, there are also areas where the Handbook leaves some ambiguity. Here, the guidance clarifies Finanstilsynet's practice in the area, but this cannot be categorised as deviations in either a lenient or restrictive direction.

#### **5.1.1. Direct application of the Handbook**

Finanstilsynet finds that the Handbook may be directly applied in the following areas<sup>24</sup>:

- defaulted exposures (including paragraphs 50-53 in the Handbook)
- credit risk mitigation techniques (including paragraphs 54-62 in the Handbook)
- the slotting method<sup>25</sup> (including paragraphs 63-70 in the Handbook)
- data quality (including paragraphs 72-74 in the Handbook)
- implementation (including paragraphs 75-76 in the Handbook)
- use of external data (paragraphs 119-125 in the Handbook)
- limited data (paragraphs 136-140 in the Handbook).

#### **5.1.2. Relaxations in relation to the Handbook**

Sections 5.1.2.1-5.1.2.4 describe the areas where Finanstilsynet is prepared to grant relaxations compared to the Handbook.

However, institutions should explicitly consider whether the points in the handbook are relevant in the specific situation. They should also be able to document the considerations they have made and the basis for the final decision.

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<sup>23</sup> Paragraph 4 in the handbook.

<sup>24</sup> References to the handbook concern the content of the validation in the respective areas. Several of these areas are also addressed elsewhere in the handbook, as there are some differences between initial and ongoing validation.

<sup>25</sup> I.e. the assignment of risk weights for specialised lending, cf. Article 153(5) of the CRR.

In cases of doubt, institutions may benefit from contacting Finanstilsynet for a bilateral dialogue well in advance of an application. This allows institutions to reduce the risk of a rejection or an unnecessarily complicated application process.

#### **5.1.2.1. Representative sample**

The Handbook states that for new rating systems there must be a representative sample of customers who have gone through the entire rating process<sup>26</sup>. This is relevant in situations where the rating process is not fully automated, such as when there is the possibility of overrides.

However, Finanstilsynet considers that in some cases it may be acceptable to submit an application for a new model even if a representative sample has not been conducted in accordance with the Handbook. This can occur if the application only accounts for the automated part of the rating process. Alternatively, institutions may create a sample that only covers parts of the rating process.

In both cases, Finanstilsynet's willingness to deviate from the Handbook applies solely to the quantitative aspects of an application (e.g., quantitative analyses of model performance, validation of consequence calculations, etc.). A qualitative assessment of criteria for overrides and other elements of the rating process that are not automated will still be relevant.

As mentioned, institutions should be able to document the basis for the final decision. In this context, institutions should have weighed the advantages and disadvantages of conducting a sample.

#### **5.1.2.2. Data for initial validation**

The Handbook states that the validation function should itself extract data in connection with the initial validation<sup>27</sup>.

Finanstilsynet agrees that this can be regarded as best practice, as it ensures a high degree of independence. Institutions should therefore strive for the validation function to generally extract data independently.

Conversely, in practice situations may arise where it is most appropriate for the validation function to rely on data from the CRCU<sup>28</sup>. Finanstilsynet is therefore prepared to accept that institutions may need some flexibility in this area and may thus need to deviate from the Handbook.

In cases where the validation function does not extract data itself, there should be compensating measures, such as the validation function performing adequate checks on the data it receives from the CRCU.

#### **5.1.2.3. Additional testing for long durations**

In connection with model development, it is necessary to delimit development data to a specific period (a cutoff date is set). In some cases, the period from the cutoff date until the time of the initial validation may be relatively long. The Handbook states that in such cases, the validation function must perform its own independent tests of the model based on the most recent data<sup>29</sup>.

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<sup>26</sup> "Focus box 8" in the handbook.

<sup>27</sup> "Interaction box" 10.

<sup>28</sup> Credit Risk Control Unit, i.e., the unit responsible for model development.

<sup>29</sup> Point 84b in the handbook.

Finanstilsynet agrees that it is important to carry out supplementary tests when a long time has passed since the cutoff date in the development data. However, Finanstilsynet does not place critical importance on who performs these supplementary tests.

In some cases, institutions may find it most appropriate for the CRCU to perform the supplementary tests and draw its conclusions. Subsequently, the validation function can incorporate the CRCU's work into the initial validation of the model.

Finanstilsynet is thus prepared to accept that institutions may require some flexibility in organising the work in this area.

Finanstilsynet's position on this issue also applies more generally than just in the situation described in the Handbook. In some cases, there may be a long time between the cutoff date in the development data and the final implementation date. This can be due to various factors – including a lengthy governance process within institutions or complications in the application process. In these cases, it is at least equally important that institutions perform additional tests of the model. Again, however, Finanstilsynet is prepared to accept that institutions need some flexibility in organising the work.

#### **5.1.2.4. Outsourcing of validation tasks**

The Handbook contains relatively detailed points regarding the outsourcing of validation tasks. These include the types of outsourced tasks, access to inspection, and the ability to bring outsourced tasks back in-house.

It is relevant here to distinguish between two types of outsourcing:

- Outsourcing of validation tasks to a third party, e.g., a consultancy firm or a data provider
- Outsourcing of validation tasks within a group, typically where a central validation unit performs tasks on behalf of the individual companies within the group

Regarding outsourcing to a third party, Finanstilsynet generally agrees with the points in the Handbook. Institutions should therefore organise themselves according to these points.

When it comes to outsourcing within a group, Finanstilsynet is prepared to accept that institutions may choose to organise the work in different ways, as long as there is a minimum level of institution-specific governance.

This institution-specific governance must ensure clarity about who is responsible for validation in the individual companies. This should be understood broadly, so it is not only clear who is responsible for performing the work. It is also important to have a clear distribution of responsibilities concerning approval of validation reports, follow-up on observations, and similar tasks.

Finanstilsynet is, however, open to this being achieved in ways other than those described in the Handbook. For example, the Handbook describes that there should be a separate validation function in each company within a group. It is possible to achieve sufficient institution-specific governance without having such separate validation functions.

## **5.2. The roles of the lines of defence**

As mentioned in the introduction to section 5, validation plays a key role in achieving a well-functioning model framework and sound governance in the IRB area. The same applies to other control functions in the second line of defence and to the other lines of defence, which also have a responsibility for identifying errors and deficiencies in the model framework.

It is also important to emphasise that the work of the lines of defence is highly relevant to supervisory activities. Finanstilsynet will often attach significant weight to the assessments made by the lines of defence. In this respect, the institutions and Finanstilsynet largely share common interests, as well-functioning lines of defence contribute both to sound model governance and to effective supervisory processes.

However, this places certain demands on the lines of defence, and in relation to validation Finanstilsynet places particular emphasis on ensuring that it is comprehensive and provides adequate oversight. It is considered good practice that responsibility and reporting are, as far as possible, anchored within the same unit in the second line of defence.

The above in no way precludes the validation function from basing its conclusions on work performed by other units within the same line of defence (i.e. the second line of defence). Finanstilsynet acknowledges that there may be tasks where the validation function needs to draw on resources and expertise from other units. This is not in itself problematic, as long as it does not lead to fragmented reporting, where relevant stakeholders (e.g. the institution's management, internal audit, and Finanstilsynet) can only gain sufficient insight by piecing together conclusions from multiple sources.

Similarly, there is nothing to prevent the lines of defence from benefiting from each other's work. The Handbook provides relatively detailed descriptions of how this can be done<sup>30</sup>, and Finanstilsynet generally agrees with the descriptions in the Handbook.

However, Finanstilsynet has certain comments regarding the role of internal audit, cf. section 5.2.1.

Finally, it should be emphasised that each line of defence – and each unit within the lines of defence – is individually accountable for its conclusions, regardless of who has carried out the work in practice.

### **5.2.1. On the role of Internal audit**

As a general principle, control tasks should not be assigned to the third line of defence. This does not mean that the other lines of defence must carry out a thorough review in all areas. However, when planning its work, Internal audit should be able to take as its starting point the work already performed by the other lines of defence. Based on this, Internal audit can then select the areas where it adds the most value to conduct a more in-depth review.

This principle is consistent with the general approach in the Handbook. For example, point 22 of the Handbook states that Internal audit should carry out a detailed review of areas where validation has not been conducted in depth. Nevertheless, the Handbook contains a few exceptions to this general principle.

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<sup>30</sup> Among other places, in section 2.2 of the handbook and "Interaction box" 12.

One such exception concerns the Handbook's description of the assignment of ratings. According to the Handbook, the responsibility for controlling this process may lie with Internal audit<sup>31</sup>.

However, Finanstilsynet finds that this responsibility should not rest with Internal audit. There may be differences between institutions, but the responsibility may, for example, lie with a credit control function that is generally responsible for monitoring compliance with procedures and similar matters within the credit area.

Finanstilsynet is therefore not prepared to deviate from the general principle. Danish institutions should thus not be organised in such a way that control tasks are assigned to internal audit.

### **5.3. Initial vs. ongoing validation**

The Handbook describes how there may be differences between:

- the first validation of a new rating system (initial validation)<sup>32</sup>
- the ongoing validation that must be conducted thereafter<sup>33</sup>.

Finanstilsynet generally agrees that there can be differences between these two types of validation. This is primarily because ongoing validation can draw on insights from previous analyses and thereby be targeted at the areas where continuous follow-up adds the most value.

Finanstilsynet also agrees with the Handbook's description of the differences between initial and ongoing validation.

However, an initial validation should always include a systematic self-assessment of the regulatory requirements relevant to the model in question. Finanstilsynet's expectations regarding this self-assessment are described in section 3.2.2.

### **5.4. Ongoing validation**

As mentioned, the Handbook distinguishes between initial and ongoing validation. In addition, the Handbook divides ongoing validation into:

- full validation<sup>34</sup>
  - a broader set of analyses that are not required annually (good practice suggests conducting them every three years).
- annual validation<sup>35</sup>
  - a more limited set of analyses.
  - often based on calculations that can be automated.
- ad hoc validation<sup>36</sup>
  - analyses carried out as needed.

Finanstilsynet generally agrees with the Handbook's descriptions of the three types of ongoing validation. However, there is a need to clarify certain aspects, which are described in sections 5.4.1–5.4.2.

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<sup>31</sup> Among other places, the handbook's "Interaction box" 4.

<sup>32</sup> Section 4 of the handbook.

<sup>33</sup> Section 5 of the handbook.

<sup>34</sup> Point 100 of the handbook.

<sup>35</sup> Cf. paragraph 98 of the handbook.

<sup>36</sup> Paragraph 99 of the handbook.

#### **5.4.1. On full vs. annual validation**

There may be differences between full and annual validation. One such difference concerns the possibility of basing a significant part of the annual validation on automated calculations. However, Finanstilsynet finds it important to clarify the conditions under which such a validation based on automated calculations is considered sufficient. Finanstilsynet places emphasis on several aspects in this regard.

A particularly important aspect is that the readability of the validation report must not be negatively affected by a focus on automated calculations. This is already stated in the Handbook, but Finanstilsynet attaches decisive importance to this point. It must therefore be emphasised that it should not be left to the recipients of the report to draw their own conclusions about the individual analyses or the model as a whole. Validation reports should always include clear observations, regardless of how the underlying analyses have been produced, cf. also section 5.8.

Another key aspect is that the content of the annual validation should depend on the extent and nature of known issues. If problems have previously been identified in a model, subsequent validation reports should follow up on the status – including whether the issues still exist and whether the situation has improved or deteriorated. This kind of follow-up cannot always be included in automated calculations, and institutions must therefore adapt the annual validation to the circumstances.

In addition to the above, Finanstilsynet's position on annual validation should be viewed in connection with sections 5.5 and 5.6.

#### **5.4.2. On ad hoc validation**

In addition to the regular validation activities (i.e. full and annual validation), institutions will need to conduct supplementary analyses on an ad hoc basis. The Handbook describes the situations in which ad hoc analyses may be relevant, and Finanstilsynet generally agrees with the descriptions in the Handbook. However, two points are worth clarifying.

First, the Handbook states that the validation policy should specify ad hoc analyses to the extent possible. It is generally good practice for institutions to describe ad hoc analyses to the best of their ability in the validation policy. However, there will be cases that institutions cannot reasonably be expected to foresee. Similarly, some analyses may only need to be performed once, and these are not well suited to include in a policy. Finanstilsynet is therefore prepared to show considerable flexibility in this area.

Second, the Handbook mentions follow-up on conclusions, recommendations, etc., from validation reports as an example of ad hoc validation. In isolation, this makes sense, as the relevant analyses are by nature not conducted regularly. However, there is a risk that the very brief text in the Handbook's section on ad hoc validation may give a misleading impression. It is therefore important to emphasise that Finanstilsynet regards follow-up on validation reports as a core activity of great importance, cf. also section 5.8.

### **5.5. Level of detail**

Validation reports should have an appropriate level of detail. In isolation, this may be seen as stricter demands than those in the Handbook, which in some respects describes detailed validation as best

practice<sup>37</sup>. However, the benefits of having a sufficient level of detail in validation are so material that Danish institutions should strive to meet best practice.

A suitable level of detail helps ensure that problems are identified in a timely manner, and that institutions can take appropriate action. In many cases, it allows institutions to address observed issues through less intrusive measures than would be required if the problems had been allowed to grow.

In some cases, the findings of a detailed validation may be seen more as opportunities for improvement than as actual problems. However, this does not make detailed analyses less relevant. On the contrary, the fact that institutions continuously identify opportunities for improvement can help strengthen trust in the models and their usefulness in risk management.

Finally, as mentioned in section 5.4.1, it is possible to partially automate the annual validation. This is another reason why validation should be sufficiently detailed.

The precise design of the validation may vary from model to model. However, in most cases, the validation should include analyses of how well a model performs along the following dimensions:

- the overall model
- the individual input factors
- new vs. existing customers (for PD)
- individual rating grades (for PD)
  - alternatively, groups of rating grades
  - for LGD and CF, there should be analyses of both high and low estimates
- sub-models
  - e.g. in cases where LGD is calculated by combining two sub-models (“no loss” and “loss given loss”)
  - this may also include valuation models and haircut models, where such models are used to estimate input values<sup>38</sup>
- before and after overrides (if relevant)
- before and after margin of conservatism (MoC)
- before and after minimum values<sup>39</sup>
- before and after conservatism in application
  - may be analysed qualitatively if quantitative analysis is not practically feasible
- selected segments
  - see, however, section 5.5.2 below.

As a general rule, institutions should perform analyses for both discriminatory power and calibration. Furthermore, they should consider relevant combinations of the above dimensions. For example, it may be relevant to analyse whether the model performs well both before and after MoC within a selected segment.

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<sup>37</sup> For example, in paragraph 37 and 45 of the handbook.

<sup>38</sup> Often, however, institutions prepare separate validation reports for these models.

<sup>39</sup> For example, statutory “PD floors”, cf. Article 160 of the CRR.

### **5.5.1. Possible actions**

As mentioned, the expectations regarding the level of detail should be seen in light of the fact that institutions have different actions to choose from depending on the severity of the issues identified during validation. In particular, it is worth highlighting the connection to section 4, which focuses specifically on situations where such serious issues are identified that a capital add-on is required in the form of a margin of conservatism (MoC) or a Pillar 2 add-on.

However, in the context of this section, institutions have a wider range of possible actions, and for most of the analyses mentioned above, it is likely that less intrusive measures will be sufficient. Examples include:

- enhanced monitoring
- increased use of manual customer reviews
- rescheduling recalibration or redevelopment.

The list is not exhaustive. Institutions should consider which types of actions may be appropriate. These considerations should also be documented in a relevant policy.

### **5.5.2. Special considerations regarding selected segments**

In section 4, the term "material subsegments" is used, while in the preceding text, the term "selected segments" is applied. The two terms are related – and can likely be easily confused – so it is relevant to clarify the differences.

Fundamentally, the difference between the two terms can be explained by the fact that section 4 and section 5 have different purposes.

In relation to this section, part of the purpose of a relatively detailed validation, as mentioned, is that institutions can detect problems (and opportunities for improvement) in a timely manner and take appropriate action. Therefore, it can be relevant to analyse a "selected segment," even though underestimation for that segment does not necessarily lead to a capital add-on.

Conversely, it is only relevant to define a "material subsegment" if underestimation for the segment would be unacceptable and could lead to a capital add-on in accordance with section 4.

## **5.6. Comparison of estimated or observed values**

Section 4.5 describes how institutions should address the fact that estimated and observed values are not directly comparable.

The same considerations are relevant for validation. This means that institutions, in the validation process, should ensure an objective basis for comparing the model estimates with the observed values. Finanstillsynet acknowledges that there is a certain qualitative element in the assessment of the estimates, and that institutions may use guidelines that are not necessarily data-driven or theoretically well-founded. However, an objective starting point is necessary.

This applies generally to all types of validation. It is particularly important when the annual validation is wholly or partly based on automated calculations, cf. section 5.4.1. Finanstillsynet will be highly sceptical towards full or partial automation of the validation if it is not based on an objective starting point.



Finally, it should be emphasised that institutions, both in the initial and ongoing validation, should validate their assumptions regarding the cyclical properties of the models.

For a PD model, for example, institutions may work with an assumption that the model is 50 percent “Point In Time” (PIT)<sup>40</sup>. This assumption should be supported with data in the initial validation and subsequently tested in the ongoing validation.

### **5.7. Representativeness**

It is stated several places in the Handbook that validation should include analyses of representativeness. This includes comparisons between the development portfolio and the application portfolio<sup>41</sup>.

Finanstilsynet generally agrees with the handbook's descriptions in this area. However, there are some particular issues that apply regarding LGD and CF.

In relation to LGD and CF, challenges around representativeness may arise. This is often because the LGD and CF models are developed on data from defaulted facilities but are used on the live portfolio. In practice, this can result in the factors (input variables) included in the models not being sufficiently able to capture the risk in the live portfolio. This can be the case, for example, in situations where the variables only become apparent once the customer is already in default (e.g., variables such as arrears over 90 days).

It is relevant to clarify here that representativeness and the ability of the factors to capture risk should also be examined by the validation function with respect to the live portfolio. This also applies to investigating whether the estimates generated by applying the models to the live portfolio correspond to the long-term levels or downturn levels that institutions have historically observed for defaulted facilities.

For the sake of clarity, it should be emphasised that a one-to-one correspondence between the estimates for the live portfolio and the observed levels for defaulted facilities is not necessary.

Differences are a risk signal and indicate potential problems with using the model on the live portfolio. Therefore, such differences should trigger further analysis. It may then turn out that there is a satisfactory explanation for the observed differences, and in that case, no further action is required.

### **5.8. Observations from the validation**

Finanstilsynet's experience shows that an appropriate process for handling observations from the validation is crucial to achieving a well-functioning model framework and sound governance in the IRB area. However, legislation and the handbook address this topic only at a relatively high level<sup>42</sup>. It is therefore relevant to outline Finanstilsynet's expectations in this area.

The description can be divided into reporting of the validation's observations and the content of the observations, cf. sections 5.8.1 and 5.8.2.

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<sup>40</sup> That is, the model is expected to display fluctuations only half as large as the actual default rates.

<sup>41</sup> For example, in points 35(d) and 40(d) of the Handbook.

<sup>42</sup> For example, there is a brief mention in points 46 and 99 of the Handbook.

### **5.8.1. Reporting of validation observations**

Institutions can achieve effective reporting of validation observations in various ways.

Some institutions will prefer to include as much as possible directly in the validation report itself, which may mean that a relatively long time passes before the report can be finalised. This is due to the need to allow time for consultation with relevant stakeholders, approval by relevant decision-makers (e.g. committees), and other aspects of the institution's governance.

Other institutions will prefer to finalise the validation report itself relatively quickly. In such cases, there will still be a process following the approval of the validation report. It will typically be necessary to supplement the validation report with one or more additional documents – for example, to document decisions on appropriate actions on the validation observations.

Finanstilsynet is open to institutions organising the reporting of validation observations in different ways. Institutions thus have considerable flexibility, provided they can demonstrate that the reporting process is generally well-functioning.

### **5.8.2. Content of the validation observations**

Just as institutions have considerable flexibility in how they report validation observations, the same applies to the content of the observations themselves. What matters is that there is no doubt about what needs to be done and who is responsible.

However, in most cases, institutions should include the following in validation reports or other documentation:

- A brief and clear description of each observation
- What is the recommended action?
- What is the deadline for the action?
- Who is responsible for the action?
- Does the responsible unit have any comments on the action?
- Are mitigating actions needed?

In addition, institutions may benefit from including a brief summary with an overall assessment of the model and a status on the observations from the most recent validation report.

The above should be regarded as a non-exhaustive list. Institutions should consider whether additional elements are relevant to include.

## **5.9. When models are to be replaced**

When institutions have decided to replace a model, a practical question arises concerning the validation of the existing model. In this context, it may be relevant to consider:

- How long should the validation of the existing model continue?
- What should the validation of the existing model include?

As a general rule, all models should be validated for as long as they are in production. Furthermore, the models should be validated in accordance with the institution's general setup.

However, Finanstilsynet is open to exceptions. This may be the case, for example, if the institution has already submitted an application for a new model. Exceptions may also be relevant in situations where the institution has an extensive development programme involving the replacement of a larger complex of models.

An exception requires that the institution contacts Finanstilsynet to make a specific agreement.

Such an agreement will typically involve the institution conducting a form of “light” validation until the new model is ready for implementation. The content of this “light” validation may vary from model to model but will usually focus on selected quantitative analyses and the status of known issues.

Only in exceptional cases may it be agreed that a model is not validated at all. This may apply, for example, in cases where Finanstilsynet is very close to making a decision on the new model.

## **6. REA developments and cyclical properties**

This section describes Finanstilsynet’s practice in relation to the REA development in IRB institutions.

IRB institutions should continuously analyse their REA developments. In practice, this should mean that the analyses are updated quarterly.

The analyses should ensure that institutions have a good understanding of the factors driving the REA development. Hence, it is important that institutions are able to explain the development to both internal and external stakeholders.

A sound understanding of REA developments is also important as it supports key decision-making within the institutions. In particular, institutions should continuously assess whether the REA development gives rise to mitigating actions. In this context, it is important to ensure:

- REA development in line with the long-term trend
- appropriate effect of technical changes
- appropriate development across the business cycle.

These aspects are elaborated in sections 6.1–6.3.

It should be emphasised at the outset, however, that fluctuations in REA – both upward and downward – are natural. In addition, institutions have the opportunity to address certain matters through their capital planning.

Nevertheless, this does not change the fact that institutions should ensure that unduly large fluctuations in REA do not occur. This is particularly relevant in cases where institutions have large-scale development projects involving numerous model changes over several years. In such cases, institutions have an important task – and not least an own interest – in ensuring that REA developments remain under control.

### **6.1. Long-term trend**

As a general principle, institutions should ensure that REA develops in line with the long-term trend. Most institutions can expect increasing REA due to regulatory requirements, large-scale development projects, and other factors. Finanstilsynet finds that institutions should prepare accordingly.

A material drop in REA followed by a sharp increase would lead to unnecessary volatility. Instead, institutions should incorporate the expectation of rising REA into both capital planning and the planning and prioritisation of model changes and similar initiatives.

If REA nevertheless declines significantly, institutions should be prepared to introduce mitigating measures. Such measures may be implemented either directly in the individual models or in the form of block reservations. There are advantages and disadvantages to both approaches.

One advantage of implementing mitigating measures directly in the models is that REA can thereby be allocated to specific exposures. However, Finanstilsynet considers block reservations to be a useful tool that all institutions should consider. Block reservations provide a simple and operational means of managing the overall REA development. These reservations can later be reduced as institutions become capable of making appropriate adjustments directly in the models.

As a rule, block reservations should be made within Pillar 1 so that they impact REA.

For the sake of clarity, it should be emphasised that Finanstilsynet – notwithstanding the above – does not rule out that, in some cases, a reduction in REA beyond natural fluctuations may be justified. However, this should be limited to exceptional cases and must be supported by sound arguments. For example, a decline in volume may justify a decrease. Similarly, the rollout of a more advanced approach will often result in a drop in REA.

### **6.2. Technical changes**

Technical changes should not lead to a reduction in REA at IRB institutions. Technical changes should be understood broadly and include, for example, changes to models, data, and code. This reflects the fact that such changes do not alter the underlying risk and therefore should not affect capital levels.

The above does not in any way prevent institutions from making ongoing improvements and corrections. Nor is it excluded that REA may decrease in certain areas and in individual quarters.

However, Finanstilsynet places emphasis on the principle that the cumulative effect of technical changes over time should not result in a decrease in REA. The basic principle should therefore be that any REA reduction resulting from technical changes is offset by other changes leading to REA increases. Overall, the REA increases should match the REA reductions.

This principle supports an appropriate incentive structure regarding which technical changes institutions prioritise and contributes to ensuring a controlled REA development in line with the long-term trend, cf. the preceding section.

Nevertheless, Finanstilsynet does not rule out that specific circumstances at individual institutions may justify certain deviations from the above.

For example, this may be the case where institutions have adjusted their models to comply with the requirements of EBA guidelines and technical standards. In such situations, it may be acceptable to reduce margins of conservatism (MoC) without necessarily having to offset this with increases elsewhere. However, this requires that it is clear that the underlying issues or uncertainties that originally triggered the MoC no longer exist. Furthermore, this does not change the fact that it remains appropriate to calculate the cumulative effect of technical changes<sup>43</sup>. Additionally, the possibility of reducing MoC should not influence which changes institutions choose to prioritise.

Finanstilsynet also does not rule out that institutions may, after a number of years, "reset" the calculation of the cumulative effect of technical changes – even if that effect amounts to a slight REA reduction. However, this should only occur following prior agreement with Finanstilsynet.

### **6.3. Development over a business cycle**

IRB institutions should have a good understanding of the models' sensitivity to the business cycle. Finanstilsynet's expectations in this area are described in section 4.5 and section 5.6.

In addition, Finanstilsynet considers that institutions should seek to ensure that changes in economic conditions only result in limited fluctuations in REA. It is thus in the institutions' own interest to avoid undue volatility in REA.

Moreover, dampened fluctuations over the business cycle will help support sound, long-term lending practices. Lending should not be based solely on short-term risk, which may appear very low during periods of favourable economic conditions.

Finanstilsynet has observed a tendency among IRB institutions to incorporate dampening cyclical properties in their models. Several institutions are actively working to ensure that changes in the economic cycle only to a limited extent affect REA.

This is a positive trend, and Finanstilsynet encourages all IRB institutions to incorporate dampening cyclical properties in their models.

Furthermore, Finanstilsynet considers that institutions should monitor the development of REA and risk weights over the course of the business cycle. Such monitoring should enable institutions to intervene if REA and risk weights are driven disproportionately low levels during favourable conditions.

As one example, Finanstilsynet has observed that risk weights for mortgage loans to private customers in growth areas<sup>44</sup> have in some cases been very low during favourable economic conditions. Based on Finanstilsynet's experience, well-functioning models will generally assign a minimum risk weight of 10 percent to such loans. If the risk weight falls below this level, institutions should implement mitigating measures. As a general rule, such measures should be in Pillar 1.

The above is only an example. Institutions should define for themselves which other areas they need to monitor, and they should be prepared to intervene if risk weights are driven to unduly low levels.

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<sup>43</sup> Although the approach is not identical, this reflects the same fundamental principle as in the Supervisory Handbook On The Validation Of Rating Systems Under The Internal Ratings Based Approach (EBA/REP/2023/29). It is stated here in Focus box 9 that the full validation (typically conducted every three years) should include an assessment of the overall effect of all changes implemented since the last full validation.

<sup>44</sup> Defined as Copenhagen and the surrounding area, as well as Aarhus.

Monitoring should not be too high-level, as aggregate developments may conceal very different patterns across geographical areas, product types, industries, etc.

## **7. Maturity**

This section describes Finanstilsynet's approach regarding IRB institutions' calculation of maturity.

For exposures where institutions are permitted to use their own estimates of LGD (hereinafter "AIRB exposures"), the institutions must also calculate the maturity (M) for each exposure, cf. Article 162(2) of the CRR.

For exposures where institutions are not permitted to use their own LGD estimates (hereinafter "FIRB exposures"), the institutions may choose to calculate M in accordance with Article 162(2)<sup>45</sup>.

For many exposures, the calculation of M is straightforward and follows directly from Article 162(2). In practice, however, a number of questions may arise. This is because the capital requirement must be risk-sensitive, and therefore M must reflect the credit risk associated with each individual exposure. Risk can vary between exposures due to, for example, differences in contractual terms, the individual institution's risk management, the ability to terminate an exposure, and – crucially – the customer's financing needs.

At the same time, the provisions in Article 162(2) and the EBA's interpretation of these provisions<sup>46</sup> can, in some cases, lead to an underestimation of risk in Pillar 1. Finanstilsynet therefore finds that institutions must assess whether there is a need for a Pillar 2 add-on, cf. section 124(2) of the Danish Financial Business Act<sup>47</sup>.

The need for a Pillar 2 add-on must always be based on a concrete and individual assessment of the institution's risk profile.

These matters are further elaborated in sections 7.1-7.3.

### **7.1. Pillar 1**

Finanstilsynet finds that the requirements for calculating maturity in Pillar 1 can be briefly summarised as follows<sup>48</sup>:

- If a payment schedule has been agreed, it must be used to calculate maturity in accordance with Article 162(2)(a).
- If the instrument falls under Article 162(2)(b) to 162(2)(e) or 162(2)(j), maturity must be calculated as described in those provisions.
- For other instruments, maturity must be determined as the maximum time to expiry, cf. Article 162(2)(f). However, institutions may instead apply the time until the next renegotiation, if the exposure can be terminated in connection with that renegotiation.

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<sup>45</sup> This option is provided for in Article 162(1) of the CRR.

<sup>46</sup> EBA's Q&A system includes a number of questions related to Article 162. In relation to this guidance, Q&A 686 and 687 are particularly relevant.

<sup>47</sup> Consolidated Act No. 1731 of 05/12/2023.

<sup>48</sup> This guidance does not cover all aspects related to maturity. Hence, Article 162 describes a number of specific issues concerning maturity (e.g., the use of the Internal Model Method and CVA), which are not further addressed in this guidance.

- If no maturity date has been agreed and no renegotiation with termination option has been agreed, maturity must be set to 5 years.

These points are elaborated in the following.

In some cases, the actual maturity may be longer than the contractual maturity. This is the case, for example, with exposures that are routinely renewed even though the contractual remaining maturity is relatively short. This may occur if the customer is expected to have a material funding need beyond the expiry of the current contract.

In Pillar 1, however, institutions may use the contractual maturity for such exposures and are thus not required to account for the longer actual maturity.

The above applies regardless of the type of instrument. In addition, questions may arise in cases where no payment schedule has been agreed (as assumed in Article 162(2)(a)), and where the instrument is not subject to specific rules (as described in Article 162(2)(b) to 162(2)(e) and 162(2)(j)).

For such instruments, maturity must be calculated in accordance with Article 162(2)(f), which defines maturity as "... the maximum remaining period (measured in years) that the borrower is permitted to take to fully discharge its obligations. M must be no less than one year."

Finanstilsynet considers that this should be understood as the remaining part of the originally agreed maturity. In some cases, however, such a calculation is not possible because no maturity date has been agreed with the customer. In those cases, institutions should set maturity to the maximum value of 5 years.

In both situations – i.e. where a maturity date has been agreed and where it has not – institutions may have agreed on a renegotiation date with the customer, at which point the institution has the right to terminate the exposure. In these cases, the institution may use the period up to the renegotiation date as the maturity in Pillar 1. This is permitted even if the termination right is unlikely to be exercised in practice.

However, Finanstilsynet finds that a termination right (e.g. in the form of contractual clauses) does not in itself justify the use of a reduced maturity. Only when such a right is combined with an agreed renegotiation date may a reduced maturity be used in Pillar 1 due to a termination right.

## **7.2. Pillar 2**

As previously mentioned, institutions may in some cases underestimate the risk under Pillar 1.

This is partly due to exposures that formally mature at a given point in time but are routinely renewed without further assessment. This means that the actual maturity is longer than the contractual maturity.

Furthermore, in the case of renegotiation that includes an option for the institution to terminate the exposure, the termination option is often not exercised.

It may therefore be necessary under Pillar 2 to take into account that the actual maturity may be longer than reported under Pillar 1. In this context, it may be relevant to distinguish between exposures to creditworthy customers and exposures to less creditworthy customers.

For less creditworthy customers, institutions will in many cases be unable to avoid renewing the agreement or to exercise the termination option at renegotiation without also incurring a loss.

Institutions should therefore consider whether it is necessary to apply a Pillar 2 add-on corresponding to using the maximum maturity of five years for less creditworthy customers.

For creditworthy customers, institutions will likely not wish to exercise the termination option at renegotiation. Finanstilsynet therefore considers that institutions, under Pillar 2, should assess whether it is appropriate to disregard the termination option. If so, the maturity must be set to the remaining part of the initially agreed maturity or – if no initial maturity has been agreed – to the maximum of five years, as described in section 7.1.

However, Finanstilsynet considers that institutions may take the termination option into account for creditworthy customers if they can document that the option is used actively. By "used actively", Finanstilsynet understands that institutions provide evidence of substantial use of the termination option over an extended period. In addition, Finanstilsynet considers the documentation to be adequate if institutions continuously analyse the use of the termination option in connection with their solvency need assessments. Institutions should be able to present the analyses performed upon request from Finanstilsynet.

Furthermore, as stated in the introduction to section 7, considerations regarding a Pillar 2 add-on must always be based on a specific and individual assessment. It may, for example, be relevant to assess whether there are circumstances indicating that – even if maturity is underestimated in isolation – sufficient capital has already been set aside for the exposures in question. This could include other Pillar 2 add-ons, block reservations under Pillar 1, the level of margin of conservatism (MoC), the level of impairments, or a binding output floor<sup>49</sup>. It may also be relevant to consider whether the exposures are FIRB exposures with fixed LGD values, if these can be regarded as conservative relative to the institution's actual loss experience.

### **7.3. Fixed maturity of 2.5 years**

As mentioned in the introduction to section 7.1, Article 162(1) of the CRR requires institutions, for FIRB exposures, to either:

- apply a fixed maturity of 2.5 years (for most exposures), or alternatively
- calculate the maturity in accordance with Article 162(2).

Similarly, Article 162(4) allows institutions to apply a fixed maturity of 2.5 years for most AIRB exposures<sup>50</sup>.

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<sup>49</sup> Pursuant to Article 92(3) of the CRR Regulation.

<sup>50</sup> The option in Article 162(4) is limited to corporate exposures within the EU that are not large undertakings.



The legislation does not contain any criteria for when institutions may use a calculated maturity or a fixed maturity. The general rule under the legislation is that fixed maturities are used for FIRB exposures, whereas the general rule for AIRB exposures is the use of calculated maturities.

The option to choose between a fixed or a calculated maturity is thus available to all institutions. However, Finanstilsynet considers that when deciding to use this option, institutions should weigh proportionality and:

- the benefits associated with reduced complexity in the calculation of capital requirements, and
- the drawbacks associated with reduced risk sensitivity.

Hence, in Finanstilsynet's view, the use of a fixed maturity may entail practical or operational advantages, as institutions then do not need to implement relatively complex calculations of M.

On the other hand, institutions should consider whether using a fixed maturity of 2.5 years leads to a misleading capital requirement. As mentioned, all institutions may make use of the option to apply a fixed M of 2.5 years. For some institutions, however, this may not accurately reflect the actual risk.

Institutions using a fixed maturity should therefore assess whether a Pillar 2 add-on is appropriate. As stated in section 7.2, this should be based on a specific and individual assessment, and it may be relevant to consider whether there are circumstances indicating that the institution has already set aside sufficient capital for the exposures in question.

## **8. Restructuring due to financial distress**

This section describes Finanstilsynet's supervisory practice regarding IRB institutions' calculation of the net present value for exposures subject to restructuring due to financial distress.

The EBA's guidelines on the definition of default<sup>51</sup> require that, for exposures subject to restructuring due to financial distress involving material forgiveness or postponement of repayments, interest, or fees, institutions must carry out a net present value (NPV) calculation. This is to determine the materiality of any reduction in the financial obligation. A material reduction in the financial obligation must trigger default, cf. Article 178 of the CRR.

This section sets out parameters for handling key aspects of the NPV calculation. It does not provide a detailed description of how NPV calculations are to be performed.

### **8.1. Method for NPV calculation**

Customers are subject to restructuring due to financial distress when the definition of "forbearance" is met, cf. paragraph 49 of the EBA's guidelines on the definition of default and Article 47b of the CRR<sup>52</sup>. Institutions must therefore comply with the guidelines' requirements for managing customers undergoing restructuring due to financial distress, when the criteria for forbearance are fulfilled.

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<sup>51</sup> EBA/GL/2016/07.

<sup>52</sup> Article 47b was added to the CRR through an amending regulation: Regulation (EU) 2019/630 of the European Parliament and of the Council of 17 April 2019 amending Regulation (EU) No 575/2013 as regards minimum loss coverage requirements for non-performing exposures.

For customers subject to restructuring due to financial distress as defined in paragraph 51 of the EBA's guidelines on the definition of default, institutions must carry out the NPV calculation required by the guidelines in order to assess whether the financial obligation has been materially reduced. According to paragraph 51, this includes situations involving material forgiveness or postponement of repayments, interest, or fees. If the NPV calculation results in a reduction in the financial obligation exceeding the threshold value of 1 percent, the institution must classify the customer as in default, cf. paragraphs 51-52 of the EBA's guidelines on the definition of default.

The maximum threshold of 1 percent has been established to ensure that the classification of defaulted exposures is due to a material reduction in net value and cannot be attributed to technical aspects related to discounting and rounding<sup>53</sup>. Since this is a maximum limit, institutions may set a lower threshold than 1 percent.

The NPV calculation must be based solely on contractual cash flows – both before and after restructuring due to financial distress – and not on the institution's own expectations of future cash flows<sup>54</sup>.

According to the EBA's guidelines, the NPV calculation both before and after restructuring must be based on the customer's original effective interest rate. The calculation of the effective interest rate used to discount future cash flows must comply with applicable accounting standards and the institution's accounting practices. This applies to both fixed-rate and variable-rate loans<sup>55</sup>. Annex 10, point 74 of the Executive Order on Financial Reports clarifies which effective interest rate institutions must use. Institutions may apply either a customer-level approach or a facility-level approach to the NPV calculation. Under the facility approach, institutions should include in the NPV calculation only those facilities that are subject to restructuring due to financial distress.

If the NPV calculation covers multiple facilities for the same customer, institutions may choose to apply a consolidated approach using a weighted average of the original effective interest rates of the respective facilities. If, in cases involving multiple facilities, it is not evident which original effective interest rate to use for discounting, institutions should apply a prudently determined original effective interest rate for the facilities.

Where the original effective interest rate is not available, an approximate effective interest rate may be used. It is up to the individual institutions to demonstrate that the approximation does not provide a misleading representation of the actual credit risk.

If the reduction in net present value does not exceed the threshold, institutions must assess whether there are other grounds for classifying the exposure as defaulted, cf. paragraph 53 of the EBA's guidelines on the definition of default (UtP assessment<sup>56</sup>). This is particularly important if the institution uses a customer-level approach and the calculation shows a decline in the present value of the customer's obligation.

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<sup>53</sup> EBA/GL/2016/07 "Background and rationale" page 10: [... the threshold should be set by institutions but it captures mainly those situations where the change in the net present value (NPV) of the contract results from technical discounting aspects and rounding of the amounts ...]

<sup>54</sup> EBA/GL/2016/07 "Accompanying documents" side 97: The formula for NPV both before and after the restructuring arrangements is based only on the contractual schedules of payments and not on the cash flows that are actually expected, where they are different.

<sup>55</sup> EBA/GL/2016/07 "Accompanying documents" side 96: [... any approximation of such rate or treatment of variable rates that is used for accounting purposes should also be used in the calculation of NPV for the purpose of default identification.]

<sup>56</sup> Unlikelihood to pay.

Institutions should perform the NPV calculation as soon as the future payment streams are known, i.e. immediately after all changes to the affected loan agreements have been approved by the customer.

In practice, questions will arise regarding the treatment of the market interest rate in the NPV calculation. Finanstilsynet therefore finds it necessary to clarify that the market rate should not be excluded from the NPV calculation<sup>57</sup>. This applies to both standard bank loans and mortgage loans. Accordingly, the market rate may be decisive for whether an exposure must be classified as defaulted.

### **8.2. Scope of the NPV calculation**

Institutions must perform the NPV calculation for all exposures subject to restructuring due to financial distress, in accordance with the EBA's guidelines on the definition of default. In the case of material forbearance, i.e. forbearance that triggers default, the NPV calculation must also be included in the reference dataset, cf. paragraph 109 of the EBA's guidelines on IRB estimation<sup>58</sup>.

However, Finanstilsynet may, in certain cases, accept that institutions defer the NPV calculation – and thereby the recording of default and the inclusion of the NPV calculation in the reference dataset – for a reasonable period of time. Such deferral should not exceed one month and must not result in errors or inconsistencies in risk management, cf. paragraph 108 of the EBA's guidelines on the definition of default. Regardless of any deferral, institutions must always be able to document the exact date of default, cf. paragraph 109(b) of the EBA's guidelines on IRB estimation.

Institutions may defer the NPV calculation if they automatically classify an exposure under restructuring due to financial distress as defaulted. In addition, institutions may defer the NPV calculation in the presumably rare cases where they assess that a material reduction in the financial obligation is highly unlikely. These cases are to be considered exceptional, and institutions must be able to document that the NPV calculation would not result in a material reduction in the financial obligation.

In all other cases, institutions should carry out the NPV calculation in connection with the processing of the exposure under the restructuring due to financial distress.

It is also important to note that even if institutions choose to apply a threshold lower than 1 percent, they are not permitted to forgo the NPV calculation.

For exposures where customers already in default become subject to restructuring due to financial distress, institutions may omit the NPV calculation.

In special cases of restructuring due to financial distress where institutions are initially unable to calculate the size of the reduction in the financial obligation using an NPV calculation, they should adopt a conservative approach that ensures a default classification in the event of a materially reduced obligation.

### **8.3. Monitoring of exposures under restructuring due to financial distress**

There is a risk of misclassifying cases involving restructuring due to financial distress if institutions automatically categorise such exposures as defaulted without using the NPV calculation to identify default.

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<sup>57</sup> This approach is in accordance with the response to question 6045 in EBA's Q&A system.

<sup>58</sup> EBA/GL/2017/16.

This may lead to challenges, including in model development, if too many exposures are registered as defaulted and subsequently return to the non-defaulted portfolio.

As part of the monitoring pursuant to paragraph 76 of the EBA's guidelines on the definition of default, institutions should therefore monitor whether the automatic classification leads to defaults where there has been no material reduction in net present value.

## **9. Other matters**

This section describes Finanstilsynet's practice in relation to a number of topics that have not already been addressed in the preceding sections. While the preceding sections cover a range of specific topics, section 9 includes matters that Finanstilsynet has not found it appropriate to address in separate sections.

### **9.1. Use of external assistance**

Institutions may choose to use external assistance in relation to tasks within the IRB area. Such assistance can serve various purposes and may be used to a greater or lesser extent.

As a general rule, Finanstilsynet does not have any opinion on institutions' use of external assistance. However, Finanstilsynet emphasises that the use of such assistance must not compromise the independence of the lines of defence.

As a general principle, institutions should therefore avoid using the same consultancy firm across multiple lines of defence.

### **9.2. Data confidentiality**

In connection with the development and operation of IRB models, questions may arise regarding data confidentiality. This particularly concerns questions related to the GDPR Regulation<sup>59</sup>, where the legal situation in certain areas remains unclear, potentially giving rise to practical challenges.

The Danish Data Protection Agency is the competent authority in this area, and Finanstilsynet is therefore not in a position to answer questions regarding the enforcement of GDPR rules.

Notwithstanding the above, institutions cannot use the IRB rules as justification for disregarding the absence of consent<sup>60</sup>. There is no legal obligation to exchange information in the absence of consent. It is initially the responsibility of the institution, as data controller, to assess whether it may nonetheless be justified to disregard the lack of consent.

### **9.3. Consistency with accounting rules**

The accounting and capital adequacy treatment of credit risk differ in certain respects. However, such differences should be well justified and based on the premise that the different regulatory frameworks serve different purposes. At the same time, there are areas where no such differences should exist.

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<sup>59</sup> European Parliament and Council Regulation (EU) 2016/679 of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

<sup>60</sup> In order to exchange information between group companies (e.g., a bank and a mortgage institution within the same group), a legal basis for processing in accordance with GDPR is required. In principle, this legal basis can be established in several ways, but in practice it typically occurs through customers providing consent for the exchange of information. However, there may be customers who have not given their consent.

One particularly important area is the treatment of weak customers. Here, there should be a close alignment between the accounting and capital treatment.

To a wide extent, this already follows from the legislation, as customers in Stage 3 are automatically considered to meet the definition of default<sup>61</sup>.

Finanstilsynet considers that a similar alignment should apply to other weak customers – that is, customers with objective evidence of impairment (OIK) who are classified as Stage 2, weak<sup>62</sup>. These customers should be placed in the lowest rating grade for performing exposures.

#### **9.4. Internal audit**

The tasks of Internal Audit in relation to the IRB area are addressed in several places in legislation, in the EBA's products, and in this guidance. This includes a description of Finanstilsynet's practice regarding Internal Audit in selected areas in Sections 3 and 4.

It is also worth emphasising that Internal Audit plays an important role as the third line of defence within the IRB area. In this context, it often adds substantial value if Internal Audit prepares a status report that provides recipients – not least the institution's board of directors – with an overall view of the audit's assessment of the IRB area.

Thus, it contributes to good governance when Internal Audit both reports specific observations and provides a broader picture of the situation in the IRB area.

Finanstilsynet therefore considers that Internal Audit should, at a minimum, prepare such a status report once a year in line with the above.

#### **9.5. Non-rated exposures and outdated ratings**

Institutions should pay particular attention to exposures where:

- no rating is assigned
- the rating is old or outdated
- the rating is based on old or outdated information.

This issue is addressed in several places in the legislation<sup>63</sup>, and Finanstilsynet does not impose any explicit requirements beyond those already set out elsewhere.

However, for the types of exposures mentioned above, institutions should:

- be able to demonstrate specifically how they ensure a sufficiently conservative treatment
- monitor and report on the extent
- actively work to address the underlying issues that give rise to such exposures.

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<sup>61</sup> There are a few exceptions to this general rule in Article 39 of the Guidelines on the Application of the Definition of Default under Article 178 of Regulation (EU) No 575/2013 (EBA/GL/2016/07).

<sup>62</sup> Jf. § 53, stk. 3, og § 54, stk. 2, i bekendtgørelse om finansielle rapporter for kreditinstitutter og fondsmæglerselskaber m.fl. (BEK nr. 516 af 17/05/2024).

<sup>63</sup> Including Article 171 of the CRR Regulation, Article 25 of the RTS on assessment methodology, and section 8.1 in the GL on estimation.

### **9.6. Conservatism add-on to internal estimates**

According to the EBA Guidelines, IRB institutions must apply a Margin of Conservatism (MoC) to their estimates<sup>64</sup>.

The requirement to apply a MoC applies to the estimates used for capital adequacy purposes. However, section 8.3 of the Guidelines states that, as a general rule, institutions should use the same estimates for capital adequacy and for internal purposes such as risk management and decision-making.

Nonetheless, the Guidelines allow for deviations from the general rule and the use of different estimates for internal and external purposes, provided a number of conditions are met.

Finanstilsynet has no explicit requirements for deviating from the general rule beyond what is already stated in the Guidelines. However, it is important that institutions only use less conservative estimates for internal purposes than for external purposes when this is well-founded and well-documented.

In many cases, the uncertainties that have led to the MoC will also be relevant for internal purposes. If institutions disregard these uncertainties, there is often a risk of making wrong decisions.

In cases where institutions wish to disregard the MoC for internal purposes, they should therefore be able to demonstrate that the use of less conservative estimates does not have adverse consequences for credit granting, pricing, or other aspects of day-to-day risk management.

### **9.7. Conservatism add-on for a group of deficiencies**

As mentioned, the EBA Guidelines on IRB estimation require institutions to apply a Margin of Conservatism (MoC) to their estimates. There are three MoC categories, which are described in the Guidelines and in section 4.3. Two of the categories (Category A and B) relate to specific deficiencies and uncertainties, while the third category (Category C) relates to general estimation error.

In some cases, institutions may have identified several specific deficiencies and uncertainties under Category A and B but have assessed that each individual issue is not material enough to warrant an MoC.

This is acceptable in isolation. However, it should be supplemented by a more general assessment of the overall uncertainty. It is possible that the individual deficiencies and uncertainties may be immaterial in isolation, but the total number of issues may still warrant the application of an MoC.

This requires that institutions maintain a list of all identified deficiencies and uncertainties, regardless of materiality. Since these relate to specific deficiencies and uncertainties, they generally cannot be covered by MoC C, which, as mentioned, is intended to address general estimation error.

Nevertheless, Finanstilsynet does not rule out that some institutions may have set MoC C so conservatively that it can reasonably be assumed to cover more than just the general estimation error. However, this must be regarded as an exception to the general rule, and it is up to the institutions to demonstrate that such an approach is sufficiently conservative.

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<sup>64</sup> According to paragraph 42 in EBA's guidelines on estimation (EBA/GL/2017/16).

### 9.8. Inclusion of the 1990s

When institutions develop IRB models, some material questions will arise regarding the cyclical conditions in the data used for model development and calibration.

The CRR and EBA products include a range of requirements concerning the data and the analyses that institutions must carry out in this context. In a Danish context, some material questions often arise regarding the inclusion of the following periods:

- the financial crisis of the 2000s
- the crisis in the early 1990s

In this regard, certain differing—and partly conflicting—considerations must be weighed against one another.

The most important consideration is that the models are calibrated to an appropriate level. This is crucial for both the capital adequacy of the individual institution and for financial stability. A key purpose of capital adequacy is to ensure that institutions hold sufficient capital to survive, with high probability, even a severe economic downturn. This requires that the models are based on data that adequately reflect the extent of the cyclical fluctuations institutions may be exposed to.

This is reflected in IRB legislation, which, among other things, requires that long-run averages must be based on an appropriate mix of good and bad years<sup>65</sup>. It is also a requirement that institutions must go back 20 years when identifying downturn periods. Institutions must go back even further if necessary in order to ensure that the data reflect the “likely range of variability”<sup>66</sup>.

It is not self-evident that including data from the financial crisis ensures compliance with these requirements. Consequently, it is also not self-evident that including data from the financial crisis results in a sufficiently high level of capital adequacy.

This is partly due to the fact that the crises did not affect all segments in the same way. In particular, for Danish retail customers, it is questionable whether data from the financial crisis represent a sufficiently severe downturn to serve as the basis for model calibration. For Danish corporate customers, it is also important that institutions assess whether including the 1990s would provide a more accurate reflection. In this context, there may be differences across industries or other segmentations.

As a general rule, institutions should therefore include data from the 1990s in the calculation of the long-run average for PD, LGD and CF. However, institutions may – and should – use another period if it is more conservative.

Likewise, institutions should include data from the 1990s when adjusting LGD and CF estimates to reflect a downturn period<sup>67</sup>.

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<sup>65</sup> In accordance with sections 5.3.4 (for PD) and 6.3.2 (for LGD) in EBA GL 2017/16. There is no explicit requirement for an appropriate mix of good and bad years for CF. However, Finanstilsynet considers that, in all material respects, the same requirements should apply as for the other risk parameters.

<sup>66</sup> According to Article 3 of Commission Delegated Regulation (EU) 2021/930 of 1 March 2021 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards specifying the nature, extent, and duration of an economic downturn period as referred to in Article 181(1)(b) and Article 182(1)(b) of the same Regulation.

<sup>67</sup> It is a requirement under the CRR that LGD and CF be adjusted to reflect a downturn period if this results in more conservative estimates than those based on the long-term average, cf. Articles 181(1)(b) and 182(1)(b).

In practice, this means that data from the 1990s should be included in institutions' analyses for identifying downturn periods. However, it cannot be assumed in advance that the 1990s crisis is the relevant downturn period for all segments. If another period results in higher LGD estimates, the institution must use that period instead<sup>68</sup>.

Nonetheless, using data from the 1990s may also present certain challenges, cf. section 9.8.1.

#### **9.8.1. Challenges with data from the 1990s**

Data from the early 1990s will often be of lower quality than more recent data. Likewise, in some cases institutions will argue that such data are not representative of the portfolios for which the models are intended. It may also be the case that data from the 1990s are not available.

If data from the 1990s are not available, institutions may use alternative methods to incorporate the 1990s crisis<sup>69</sup>. Similarly, it is possible to make adjustments if there are issues relating to data quality or representativeness.

In other words, using data from the 1990s can indeed pose challenges, but it does not constitute an insurmountable obstacle. Moreover, the consideration of appropriate calibration carries considerable weight. Data-related challenges should therefore never result in institutions using data that lead to an unduly low level of calibration.

Nevertheless, Finanstilsynet is prepared to show some flexibility to accommodate the challenges that may arise when using data from the 1990s. This will likely concern one of the following situations:

- The institution uses data from the financial crisis, supplemented with an add-on or similar adjustment that ensures the final risk parameters are at an appropriate level.
- The institution uses data from the 1990s, but when determining the MoC, uncertainty regarding the data is assessed in light of the overall conservatism and therefore given less weight.

In the first case, the institution has placed such a strong emphasis on data quality that data from the 1990s are excluded from development and calibration. The institution then bears an important responsibility to ensure – and not least to document – that this does not result in risk parameters being set too low. This may be managed in a relatively straightforward way through some form of add-on, such that the final risk parameters reach an appropriate level (i.e. close to the level of a model that includes data from the 1990s).

In the second case, the institution has used data from the 1990s, which in itself should lead to a relatively high level of calibration. At the same time, the institution has had to address issues such as missing data, lack of representativeness, etc. As a rule, this should result in a high MoC due to uncertainties in the data and methods. However, the combination of a high level of calibration and a high MoC results in final risk parameters that are disproportionately high. In such a situation, Finanstilsynet will be prepared to show a degree of flexibility when determining the MoC.

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<sup>68</sup> Cf. section 4 in EBA/GL/2019/03.

<sup>69</sup> In practice, this involves extrapolation or a so-called haircut method, cf. section 6 in EBA/GL/2019/03.



Institutions are encouraged to contact Finanstilsynet well in advance of a planned application to discuss the potential for flexibility in line with the above.

#### **9.9. Third-party data and models**

Section 3.1 describes how institutions in some cases use models or data from an external provider, and that this can pose certain practical challenges.

It is worth reiterating here that Finanstilsynet recognises that institutions need a certain degree of flexibility in this area. A lack of full insight into third-party data and models does not in itself constitute an insurmountable issue.

However, the lack of transparency does increase uncertainty, and institutions should therefore assess the need for a MoC. As a minimum, this assessment should take into account materiality and data quality considerations.

#### **9.10. LGD at facility level**

The IRB legislation states that LGD must be applied at facility level<sup>70</sup>.

In some cases, however, institutions wish to estimate LGD at a more aggregated level. This might, for example, be at customer or property level and will typically be linked to the recovery process. It may therefore occur that institutions only observe economic losses at a higher level, while losses on individual facilities cannot be directly observed.

It is acceptable – and in line with the legislation – to estimate LGD at a more aggregated level. However, this is conditional on the LGD being converted to facility level for the purpose of use.

In addition, certain further conditions should be met. Institutions should explain why estimation at a higher level is the most appropriate approach.

This explanation must demonstrate that estimation at the higher level does not lead to an underestimation of risk. Institutions should also explain how the more aggregated approach aligns with their recovery processes.

*Finanstilsynet, 1. July 2025*  
LOUISE CAROLINE MOGENSEN

/Lars Stage

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<sup>70</sup> This is stated many places in the legislation and in the EBA's publications, including Article 181 of the CRR Regulation.

## **Annex 1: Self-assessment in relation to the RTS on assessment methodology in connection with initial applications**

As a general rule, the self-assessment in connection with initial applications should cover all provisions of the RTS on assessment methodology.

However, a number of exceptions apply:

- In Chapter 1, Articles 1–2 and 5 are excluded.
  - This means that the self-assessment should only address Article 3 on documentation and Article 4 on third-party models.
- In Chapter 2, Articles 6 and 7(3) are excluded.
  - This means that the self-assessment should not address general provisions, including those on mandatory and optional assessment methods.
  - Nor should the self-assessment address changes to the original roll-out plan.
- The entire Chapter 8 on risk quantification is excluded.
  - This topic is sufficiently addressed through the self-assessment of the EBA GL on estimation (EBA/GL/2017/16).
- The entire Chapter 13 on internal models for equity exposures is excluded.
- The first article in each of Chapters 3–7, 9–12 and 14 is excluded.
  - This means that the self-assessment should not address general provisions, including those on mandatory and optional assessment methods.

## **Annex 2: Guidance on supplementary templates for institutions' own impact assessments**

### **Supplementary templates**

The supplementary templates correspond to template C 08.03/CR IRB 3 in COREP<sup>71</sup>, where institutions take into account the changes covered by the application. The supplementary data should reflect how the templates will look after implementation of the proposed change. Institutions should not reflect any changes other than those included in the application in question.

Template C 08.03 consists of a consolidated template covering the total IRB portfolio and a number of templates in which the IRB portfolio is broken down by sub-portfolios. Institutions should complete and submit templates for the sub-portfolios affected by the application. Institutions should not submit the consolidated template covering all IRB portfolios.

Annex 2a contains a template for the supplementary reporting. Institutions may choose to complete the template as provided. However, Finanstilsynet does not require a highly detailed breakdown by PD bands. As an alternative, institutions may therefore choose to aggregate all rows and report a single row containing the totals for the relevant portfolio.

### **Level of consolidation**

In COREP, institutions report template C 08.03 at both group and solo level. Institutions should submit supplementary templates corresponding to these levels.

If the model covers both Danish exposures and a substantial share of foreign exposures, the templates at group and solo level should be supplemented with templates showing only the Danish exposures.

### **Technical details**

The reporting date should correspond to a regular COREP reporting date (end-of-quarter) to Finanstilsynet. Moreover, it should match the date used for the institution's own impact assessment.

Institutions should submit the report in an Excel file.

### **IRB-related add-ons**

In addition to the supplementary data based on template C 08.03, institutions should include the template in Annex 2b, which allocates IRB model-related add-ons to sub-portfolios. Institutions should complete the template so that it shows the size of the add-ons after taking into account the changes resulting from the application in question.

The template should be submitted for the same levels as described in the section on levels of consolidation.

Columns 1 and 3 should show IRB model-related Pillar 1 and Pillar 2 add-ons. Columns 2 and 4 should show the portion of the add-ons allocated to defaulted exposures. The Pillar 2 add-ons in columns 3 and 4 should be converted to REA (risk exposure amount) levels. For this purpose, institutions should use a capital requirement percentage of 8 plus buffer requirements.

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<sup>71</sup> Pursuant to Implementing Regulation (EU) 2024/3117 of 29 November 2024 on implementing technical standards for the application of Regulation (EU) No 575/2013 of the European Parliament and of the Council concerning institutions' reporting for supervisory purposes and repealing Commission Implementing Regulation (EU) 2021/451.

The add-ons in this template should, for example, include non-compliance add-ons and any applicable floor requirements under Article 458 of the Capital Requirements Regulation, to the extent they are not already included in template C 08.03. Institutions should allocate the add-ons to the relevant portfolios to the best of their ability.

The template should be accompanied by a brief description of which Pillar 1 and Pillar 2 add-ons are included.

## **Annex 3: Guidance on the handling of underestimation (Valid until July 2025)**

### **Guidance on the handling of underestimation**

According to Article 185(1)(e) of the Capital Requirements Regulation (CRR), IRB institutions must establish sound internal guidelines for situations where the actual values of probability of default (PD), loss given default (LGD), and conversion factors (CF) deviate so significantly from the expected values that it raises concerns about the validity of those estimates<sup>72</sup>.

Finanstilsynet has assessed a need to develop guidance that primarily addresses long-standing practices within the IRB area regarding the handling of underestimation. It should generally be emphasized that this is guidance, and deviations from it may be accepted if they are well justified, taking into account overall context and materiality.

This guidance outlines Finanstilsynet's expectations of IRB institutions if underestimation is identified in PD, LGD, or CF models. If an institution uses a Through-the-Cycle (TTC) approach for PD models that are based on underlying Point-in-Time (PIT) models, the expectations in this guidance also apply to the underlying PIT models. Specific requirements for TTC models can be found in the note "Cyclical Sensitivity of Rating Systems" published on Finanstilsynet's website, which also contains definitions of TTC and PIT approaches.

The guidance outlines Finanstilsynet's expectations both for already implemented models and for models not yet implemented but submitted for approval for use in capital requirements. The expectations also apply to material subsegments of the individual PD, LGD, and CF models.

#### **General considerations**

To begin with, it is relevant to outline a few overarching considerations important for interpreting the subsequent sections. Finanstilsynet wishes to clarify the following:

- If a portfolio is broken down into sufficiently small subsegments, there will always be areas with underestimation. Conversely, there are subportfolios that are so material that underestimation is unacceptable. This guidance only concerns material subportfolios.
- It is, in principle, up to each institution to define what constitutes a material subportfolio. This may vary from institution to institution and can depend on group structure and the number of markets the institution operates in. The number of specialized versus general models may also play a role.
- Institutions may apply statistical methods to assess underestimation. However, this should always be supplemented by a qualitative assessment, and statistical methods should not be applied mechanically.
- As a general rule, Finanstilsynet expects issues with underestimation to be addressed within the model itself, particularly if the model is used directly in daily risk management or for capital requirement purposes. However, Finanstilsynet does not exclude deviations from this rule, pro-

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<sup>72</sup> Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (the CRR Regulation).

vided that a conservatism adjustment or similar is applied to the model estimates before they are used for risk management or other purposes.

### **New models**

New models for which the institution is applying for approval can only be expected to be approved if they perform adequately at implementation. Finanstilsynet therefore expects no underestimation when the model is implemented. This applies even if the underestimation is not statistically significant. Furthermore, at implementation, Finanstilsynet expects new models to address all known issues in the areas covered by the models.

### **Implemented models**

It is expected that already implemented models may, over time, begin to show signs of weakness, such as underestimation. For these models, Finanstilsynet's requirements are somewhat more lenient than for new models. However, Finanstilsynet does not accept multiple consecutive years of underestimation, even if the observed values lie within a statistical confidence interval. Nor is significant underestimation in a single year acceptable.

Finanstilsynet considers it important that no underestimation occurs at model level, even if the institution, on an aggregated level, does not under-allocate capital. This is particularly relevant because model outputs are used in the institution's business operations.

Finanstilsynet holds that underestimation in one model cannot be offset by overestimation in another, and underestimation in one parameter (PD, LGD, or CF) within a segment, e.g. retail customers, cannot be offset by overestimation in another parameter in the same segment.

Therefore, Finanstilsynet expects that in the case of underestimation, the institution initiates work to find a Pillar 1 solution, either by adjusting the existing model or developing a new one. Until such a solution is in place, underestimation should be covered by a Pillar 2 add-on.

If a model underestimates in a backtest, Finanstilsynet considers it reasonable to assume that this underestimation will persist going forward. Therefore, the Pillar 2 add-on should be determined by scaling the model estimate in the backtest (where underestimation was observed) to the observed outcome in the same backtest. The institution cannot base the Pillar 2 add-on on a comparison between the observed value from the backtest and the current estimate, even if the estimate has increased since the backtest. However, if model adjustments have since been made to address the underestimation, this may be taken into account when assessing the model and the Pillar 2 add-on.

Until a Pillar 1 solution is implemented, the add-on should be adjusted upward or downward in line with changes in observed underestimation in newer backtests.

### **Specific considerations for PD models**

Finanstilsynet considers it important that the model performs reasonably across all areas of the rating scale. Thus, in addition to a high-level comparison of expected and observed defaults, institutions should focus on the model's ability to predict PD at the individual rating grade level.

For implemented models, Finanstilsynet emphasizes that repeated underestimation in the same rating grades year after year must be avoided – even if the underestimation is not statistically significant.

Regardless of whether a model is new or already implemented, underestimation in a large number of rating grades should not occur. Underestimation in one or a few grades can be accepted if the model otherwise performs well. In contrast, underestimation in many grades signals more fundamental issues that should be addressed.

When assessing underestimation at the rating grade level, institutions should consider the number of customers and the EAD share in the affected grades. Finanstilsynet therefore expects a faster reaction from institutions where there are relatively many customers or a large EAD share in an underestimated grade.

Conversely, Finanstilsynet recognizes that in some cases there may be too few customers in a rating grade to make a meaningful assessment. In such cases, it may be relevant to assess several rating grades together.