



EUROPEAN CENTRAL BANK
BANKING SUPERVISION

Feedback statement

Responses to the public consultation
on the draft ECB guide to internal
models – risk-type-specific chapters

BANKENTOEZICHT

July 2019

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This document is intended to give an overview of the comments received during the public consultation on the draft ECB guide to internal models – risk-type-specific chapters, and to provide an assessment of those comments. It also explains the amendments made to the ECB guide as a result of the public consultation.

1 Introduction and overview of responses

1.1 Context

On 7 September 2018 the European Central Bank (ECB) launched a public consultation on the ECB guide to internal models – risk-type-specific chapters (hereinafter the “guide” or “ECB guide”). The public consultation ended on 7 November 2018. While not being required, this consultation was conducted in order to collect responses from relevant parties and to enhance transparency. In addition to soliciting written comments, the ECB also gave industry participants and interested parties the opportunity to raise questions on the guide with representatives of the ECB at a public hearing on 17 October 2018 in teleconference format. While the comments made during the public hearing are not reflected in the figures below (see Section 1.3), they have nonetheless been taken into account. The ECB has thus given due consideration to all of the comments received during the consultation period.

1.2 Structure of the feedback statement

This feedback statement presents an overall assessment of the comments received during the public consultation and aims to address the most relevant issues raised by them. Amendments to the guide have been made as a result of the comments received.

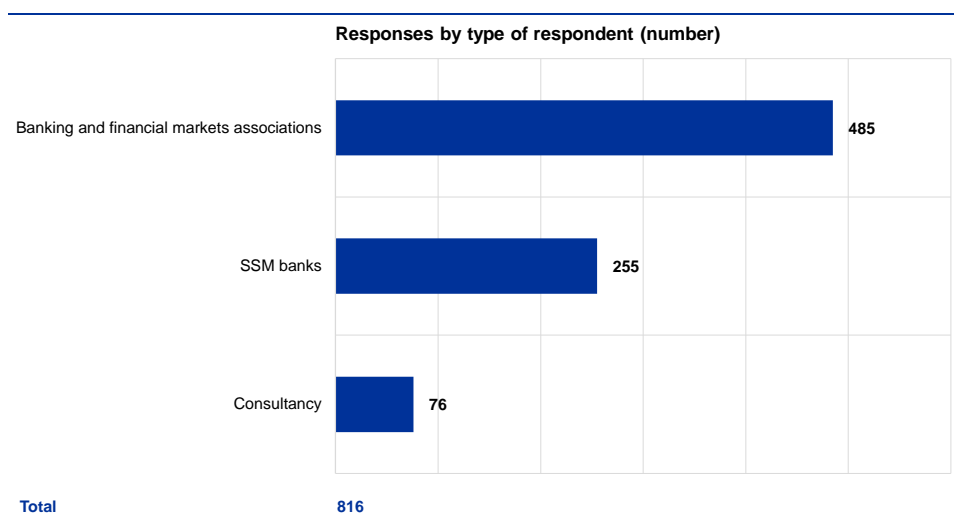
The remaining sections of this document summarise the key comments received on the different chapters of the guide and, where needed, the amendments applied as a result. However, it only lists the most relevant and frequent groups of comments and/or amendments. In several cases further minor changes have been incorporated in the document to clarify certain aspects that were raised during the public consultation.

1.3 Response statistics

In total, 816 responses were received from 16 relevant stakeholders. **Figure 1** gives a breakdown of the responses by category of respondent, while **Figures 2 to 5** provide breakdowns of responses by section of the guide and type of comment.

Figure 1

Responses by type of respondent (number)

**Figure 2**

Responses by section (number) and type of comment (percentages) – foreword and general comments

Foreword and general comments		Breakdown by type of comment (%)		
Section of the guide	Number of comments	Amendment	Clarification	Not classified
Foreword	6	33%	67%	0%
General comments	15	0%	0%	100%
Total	21	10%	19%	71%

Figure 3

Responses by section (number) and type of comment (percentages) – credit risk

Credit risk		Breakdown by type of comment (%)		
Section of the guide	Number of comments	Amendment	Clarification	Deletion
1 Scope of the credit risk chapter	0	0%	0%	0%
2 Data maintenance for the IRB approach	45	44%	56%	0%
3 Data requirements	45	42%	53%	5%
4 Probability of default	101	31%	65%	4%
5 Loss given default	127	43%	42%	15%
6 Conversion factors	58	43%	43%	14%
7 Model-related MoC	26	35%	65%	0%
8 Review of estimates	11	27%	73%	0%
9 Calculation of maturity for non-retail exposures	1	0%	100%	0%
Total	414	39%	53%	8%

Figure 4

Responses by section (number) and type of comment (percentages) – market risk

Market risk		Breakdown by type of comment (%)			
Section of the guide	Number of comments	Amendment	Clarification	Deletion	Not classified
1 Scope of the market risk chapter	1	0%	100%	0%	0%
2 Scope of the internal model approach	34	44%	41%	15%	0%
3 Regulatory back-testing of VaR models	20	55%	45%	0%	0%
4 Aspects of internal validation of market risk models	5	0%	100%	0%	0%
5 Methodology for VaR and stressed VaR	31	45%	23%	32%	0%
6 Methodology for IRC models focusing on default risk	31	87%	0%	13%	0%
7 Risks not in the model engines	96	68%	24%	7%	1%
Total	218	60.5%	27%	12%	0.5%

Figure 5

Responses by section (number) and type of comment (in %) – counterparty credit risk

Counterparty credit risk		Breakdown by type of comment (%)		
Section of the guide	Number of comments	Amendment	Clarification	Deletion
1 Scope of the counterparty credit risk chapter	0	0%	0%	0%
2 Trade coverage	47	62%	23%	15%
3 Margin period of risk and cash flows	22	90%	5%	5%
4 Collateral modelling	15	67%	33%	0%
5 Modelling of initial margin	8	62%	38%	0%
6 Maturity	11	100%	0%	0%
7 Granularity, number of time steps and scenarios	9	78%	22%	0%
8 Calibration frequency and stress calibration	9	78%	22%	0%
9 Validation	38	37%	60%	3%
10 Effective expected positive exposure	2	50%	0%	50%
11 Alpha parameter	2	100%	0%	0%
Total	163	65%	29%	6%

1.4 Adoption of the ECB guide

A complete draft proposal for the adoption of the ECB guide to internal models – risk-type-specific chapters was sent by the Supervisory Board to the Governing Council of the ECB on 27 June 2019. The guide, as adopted by the Governing Council on 4 July 2019, was published on the ECB website on 8 July 2019 together with this feedback statement.

2 Comments and amendments to the draft ECB guide to internal models – foreword and general comments

2.1 Foreword and general comments

	Comment	ECB response and analysis	Amendment
1	Respondents stressed that the ECB guide includes references to EBA level-2 texts which are not yet final or not adopted by the European Commission. However, institutions are not expected to be compliant with articles which are not legally binding.	In line with the Foreword to the ECB guide, the provisions of Final Draft Regulatory Technical Standards (RTS) that have not yet been adopted by the European Commission are referred to in the guide merely as good practice for interpretative purposes. Some parts of the guide might require revision once the Commission has adopted the RTS.	No change
2	Respondents stressed that the relationship between the ECB guide and the regulatory texts is unclear. In particular, it is not clear which texts should be considered as the reference ones.	The guide does not constitute a binding instrument. It provides transparency on how the ECB aims to apply the relevant regulatory provisions consistently across institutions subject to the ECB's direct supervision. In this regard, the guide should not be construed as going beyond the current existing applicable EU and national law; it is not intended to replace, overrule or affect applicable EU and national law.	No change
3	Respondents indicated that the time frame envisaged to implement the recommendations set out in the ECB guide raises concerns, given that: <ul style="list-style-type: none"> • some institutions already subject to on-site inspections are currently implementing remediation actions; • the current regulatory framework is evolving. 	The timing of the publication of the guide is well integrated with the overall TRIM timeline and with ongoing regulatory developments. The guide was initially drafted in preparation for the launch of the TRIM exercise and a revision was planned to take place in the course of the project. The timing and process through which institutions should implement remediation actions following on-site inspections is not set out in the ECB guide. Nevertheless, when applying the relevant regulatory framework to specific cases, the ECB takes into due consideration the particular circumstances of the institution concerned, giving it sufficient time to resolve the issues and to return to compliance with the regulatory provisions.	No change

3 Comments and amendments to the draft ECB guide to internal models – credit risk chapter

The paragraph numbers in this chapter of the feedback statement refer to the credit risk (CR) chapter of the ECB guide to internal models, unless noted otherwise.

3.1 General remarks and introduction

	Comment	ECB response and analysis	Amendment
1	Respondents asked for various aspects in the ECB guide to be placed on an operational footing. Questions included whether the audit trail (paragraph 6(e)) should include tracked changes of overrides with date stamp and user information, and which type of security the security tests should test (paragraph 9(c)).	The ECB guide does not constitute operational guidance. These aspects should be established and specified by the institution on the basis of its own organisational set-up and rating system specificities.	No change

3.2 Data maintenance for the IRB approach (CR Section 2)

	Comment	ECB response and analysis	Amendment
1	Respondents commented on the concept of the "data quality management framework (DQMF)". They stressed that: <ul style="list-style-type: none"> the implementation of such a framework is considered to be very burdensome for institutions; the wording of a DQMF is not mentioned in the regulatory texts; the concept should be aligned more closely with the Basel Committee principles (BCBS 239¹) by specifying that all requirements only apply to critical data elements. 	In accordance with Article 174(b) of Regulation (EU) No 575/2013 (CRR) ² , if an institution uses statistical models and other mechanical methods to assign exposures to obligors or facilities grades or pools, it must have in place a process for vetting data inputs to the model. This must include an assessment of the accuracy, completeness and appropriateness of the data. In addition, Article 76(2)(a) of the Final Draft RTS on assessment methodology for IRB (Final Draft RTS on AM for IRB) ³ provides further details on the policies, standards, procedures and criteria institutions should implement in assessing the quality of internal, external or pooled data which they use to support their credit risk measurement and management process. To comply with these requirements, it is the ECB's view that	No change

¹ Basel Committee on Banking Supervision "Principles for effective risk data aggregation and risk reporting", January 2013, referred to in this document as "BCBS 239".

² 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 (OJ L 176, 27.6.2013, p. 1), referred to in this document as the "CRR". For the purposes of this document the reader's attention is also drawn to the corrigendum published on 30 November 2013 (OJ L 321, 30.11.2013, p. 6).

³ Final Draft Regulatory Technical Standards on the specification of the assessment methodology for competent authorities regarding compliance of an institution with the requirements to use the IRB Approach in accordance with Articles 144(2), 173(3) and 180(3)(b) of Regulation (EU) No 575/2013 (EBA/RTS/2016/03), referred to in this document as "Final Draft RTS on AM for IRB".

		<p>an institution should establish and implement an effective DQMF to formalise these standards, policies and procedures. However, the term DQMF in this sense simply refers to the operationalisation of these standards, policies and procedures (see also paragraph 14 of the ECB guide). It is up to the institution to operationalise these aspects.</p> <p>The scope of the ECB guide is different from that addressed by BCBS 239, without contradicting it. In accordance with Article 144(1)(d) of the CRR, institutions must collect and store all relevant data to provide effective support to their credit risk measurement and management process. In addition, the ECB guide clarifies that the DQMF should be applied to all relevant data used in IRB-related processes. It also clarifies that the DQMF should ensure that reliable risk information is available to enable an institution's risk profile to be assessed accurately and drive sound decision-making within the institution and by external stakeholders, including competent authorities (see paragraphs 11 and 14 of the ECB guide).</p>	
2	<p>Respondents requested further clarification of the expectation to set up a dedicated and independent data quality unit and for further information on the operational details of this unit (e.g. organisational set-up, frequency of reviews).</p>	<p>As stated in paragraph 18 of the ECB guide, the ECB considers it good practice to have a dedicated independent unit with an overall view of and responsibility for the management of data quality. Where an independent unit is set up, the size of this unit should be proportionate to the nature, size and degree of complexity of the institution's business and organisational structure. However, it is up to the institution to decide on the optimal set-up and operational details for their organisation in such a way that independence is sufficiently guaranteed and no conflicts of interest arise between data handling activities and data quality management activities. Article 76(2)(b) of the Final Draft RTS on AM for IRB provides further guidance on this aspect: "there is adequate degree of independence of the data collection from the data quality management process, including a separation of the organisational structure and staff, where appropriate."</p> <p>Paragraph 26 of the ECB guide has been slightly amended to avoid a potential misunderstanding of the ECB guide as being prescriptive with regard to the solutions institutions should implement to ensure an adequate degree of independence.</p>	Amended
3	<p>Respondents asked for further clarification of the ECB's expectations as to whether institutions should keep an updated register of all current and past versions of a rating system. In particular, respondents pointed out that the length of time the documentation/information should be stored should be set at a maximum of three years, in line with the Final Draft RTS on AM for IRB.</p>	<p>To comply with the requirement to document its rating system and the rationale for its design, the institution should keep an updated register of all rating systems, including all current and past versions of rating systems, for a period of at least three years. This is also reflected in Article 33 of the Final Draft RTS on AM for IRB.</p> <p>In the ECB's view this minimum period should be extended whenever necessary. In any case, the institution should ensure that the elements mentioned in paragraph 6(a) to (e) for the current rating system are adequately recorded in the register and enable a clear understanding of all relevant data of the current rating system that must be stored by the institution.</p> <p>Paragraph 6 of the ECB guide has been amended to clarify this aspect.</p>	Amended

3.3 Use of data (CR Section 3)

	Comment	ECB response and analysis	Amendment
1	<p>Several respondents commented that the analyses mentioned in Section 3.2 for the use of external data might not be sustainable, since they entail a level of disclosure closer to the one expected for internal data (for example representativeness analysis expected in paragraph 35). In particular for shadow rating models the external data that are the target of the estimation are expected to be not perfectly representative, in structural terms, of the application portfolio. This disclosure level is usually not possible for data providers. Vetting data inputs to the model implies obtaining</p>	<p>The data representativeness requirement is established under Articles 174(c) and 179(1)(d) of the CRR, as further developed in the EBA GL on PD and LGD. In particular, paragraph 18 of the guidelines states that institutions should "... use the same standards and methods for the assessment of representativeness of data stemming from different sources, including internal, external and pooled data or a combination of these ..."</p> <p>In addition, in paragraph 37 of the guide, the ECB considers that when external data are used (for risk differentiation and estimation or review of estimates) and in relation to the information to be obtained from data providers, institutions should know the "... data sources and the most relevant data</p>	No change

	<p>access to the data. This could be extremely difficult and expensive, as rating agencies disclose a description of their approach (including the main hypotheses) but do not publicly disclose the detailed formulae. Therefore, the ECB should take this limitation into account and limit its expectations to perform checks on external data. These expectations might, in practice, make it unlikely to adopt external data (unless through the systematic introduction of a material margin of conservatism not linked to a model deficiency, but only to the limited disclosure by external providers).</p> <p>Moreover, inconsistency arises with the top-down approach envisaged in the consultation paper on draft RTS on the conditions to allow institutions to calculate KIRB in accordance with the purchased receivables approach under Article 255 of the CRR (EBA/CP/2018/10), in which the methodological approach will rely predominantly on external data. This is because it is not possible to leverage internal data, as they are not representative of the scope of this model. Therefore, the analyses suggested by the ECB guide might limit the workability of the new securitisation framework which is intended to bring the securitisation business into line with the intentions of the Basel Committee.</p>	<p>processing operations of the variables acting as direct model inputs ...". This is considered to already entail a sufficient level of proportionality with regard to the level of disclosure required of data providers.</p> <p>Lastly, the ECB will continue to pay attention to international regulatory developments and help ensure that potential inconsistencies with other regulatory frameworks are addressed in the relevant discussions.</p>	
2	<p>Respondents stressed that information on the structure and nature of external scores and their key drivers is usually not reported by credit bureaus (giving as an example their use in shadow rating models).</p> <p>This would hinder the recourse to data sources for risk differentiation purposes. This would in turn limit both the accuracy of the estimates and the information completeness of the rating system (credit bureau information is usually relevant for rating assignment processes). Respondents suggested that a minimum set of information that should be disclosed with regard to external credit bureau scores or external ratings should be clarified and described in detail.</p>	<p>The ECB considers that, as for any other inputs in their rating models, institutions should have a good understanding of the external data that are used in those models, including credit bureau scores and external ratings. They should subject them to the same validation requirements as their internal data; this is even more important when these external ratings/scores are one of the main risk drivers in their rating model. To that end, and as referred to in paragraph 38(b), the ECB expects institutions to have a good understanding of the methodology of the credit bureaus whose scores are used. The ECB expects the scoring methodology documentation to include the key risk drivers used in the credit bureau scores, even though this methodology may not go into detail and may not provide the specific rating formula.</p> <p>It is also important to clarify that Section 3.3 on external bureau scores or external ratings is not relevant to shadow rating models, as introduced in Section 4.1.5. This is because considering the external bureau score as an input variable to the model is different from considering it as a target rating.</p> <p>To highlight the importance of institutions ensuring that they have a proper understanding of the structure and nature of the external scores or ratings, as well as an adequate understanding of the key drivers, paragraph 38(b) has been clarified.</p>	Amended
3	<p>One respondent asked for clarification of the reference to "other input variables", with regard to the expected validation requirements.</p>	<p>The ECB can clarify that "other input variables" refer to the internal and external inputs used in the development and application of the model.</p> <p>A slight amendment has been introduced in paragraph 38(c), referring to "other internal and external input variables".</p>	Amended
4	<p>Another respondent asked for clarification of why the use of external scores/ratings cannot be directly replicable, while the institution should make use of all relevant internal information regarding the creditworthiness of an obligor.</p> <p>In this context, another respondent asked for clarification of the concept of "relevant internal information" and whether it includes any expert/human judgement or opinion.</p>	<p>The ECB understands that, to qualify as an IRB model, an internal rating system should rely on at least a minimum of internal data, as required by Article 171(2) of the CRR ("... If an institution uses an external rating as a primary factor determining an internal rating assignment, the institution shall ensure that it considers other relevant information."). Therefore, even when the rating model essentially aims to replicate an external rating/score, it should embed the internal data available to the institution. In addition, the ECB can clarify that "all relevant internal information" is intended to include all types of information that an institution has available with regard to an obligor, and which should be taken into account in the rating assignment process.</p> <p>The wording of the ECB guide has been amended to reflect the principles to be verified when the external score or rating is the main (or one of the main) driver(s) of the internal rating. The new wording clarifies that institutions should demonstrate that any additional relevant internal information considered in the model and its weighting are sufficient to ensure that the internal rating does not merely incorporate the results of the external bureau scores or the external ratings used.</p>	Amended

5	<p>One respondent stressed that the expectation for an institution to ensure the consistent and comparable application of human judgement, including overrides, when using data that are pooled across institutions can be problematic in terms of providing assurance that institutions have similar processes.</p>	<p>The ECB considers that Article 179(2) of the CRR, which states that "Where an institution uses data that is pooled across institutions ... the rating systems and criteria of other institutions in the pool have to be similar to its own" is relevant to paragraph 40.</p> <p>In addition, it is the understanding of the ECB that, for the purpose of risk quantification, it is essential for institutions to ensure that the underlying data are built on common definitions and that human judgement is applied in a consistent manner. A slight amendment of the paragraph has been included in order to ensure a better alignment with the relevant CRR requirement.</p>	Amended
6	<p>One respondent stated that, in order to avoid bias in risk parameter estimates, multiple-rated counterparties should also be counted consistently in the numerator and denominator of the default rate in pool level analyses. The respondent stressed that this procedure would ensure that the pool used as a basis for developing and reviewing the (pool) model was structurally matched as fully as possible to the portfolios of the individual institutions using the pool model to value their portfolios. In particular, it would ensure that large counterparties were adequately represented in the data pool.</p> <p>The respondent considered the expectation as inappropriate, especially because the exclusion of multiple-rated counterparties in the light of the "single count only" expectation could lead to bias in many portfolios. One example is when the scope of the rating systems for the institutions in the pool includes clients of different company sizes (e.g. in the sense of different ranges of total assets or revenue). Excluding multiple-rated counterparties leads, therefore, to a structural change in the resulting "pool without double-counting". As a result of the less frequent occurrence of common obligor scenarios, the smaller counterparty scenarios are now significantly over-represented, not only in comparison with the "pool including double counting", but also in comparison with the portfolios of the individual institutions participating in the pool. The structure of the "pool without double counting" thus differs to a greater extent from the portfolios of the individual institutions than the "pool including double counting", precisely because of the exclusion of multiple-rated counterparties. This leads to increased risk as a result of the limited representativeness of the pool within the meaning of Article 179(2)(b) of the CRR.</p>	<p>The ECB understands that the principle is relevant primarily in the model calibration step, which is considered as independent of the rating assignment potentially considered by each institution participating in the pool. This also holds for the calculation of one-year default rates. As the comparison of realised default rates with estimated PDs for each grade needs to be performed at portfolio level, institutions should ensure that obligors are not "over-considered" in this assessment. They should ensure that no distortions are implied by considering these obligors at institution level. At pool level, they should be considered as a single obligor in order to avoid representativeness issues.</p> <p>The ECB also understands that the principle could apply when institutions use different data sources (including different external databases combined with internal data). Therefore, it could be included under a more generic section on use of external data. In addition, it is the ECB's understanding that institutions should develop the necessary processes to identify common obligors within these databases in order to ensure that each common obligor is only taken into account once in the calculation of one-year default rates. If common obligors cannot be identified, institutions should develop analyses in order to identify potential biases or double-counting effects in the calculation of one-year default rates. These should be analysed in the computation of both one-year default rates and long-run average default rates. These clarifications have been included in a new principle under Section 3.2 of the guide (new paragraph 34).</p>	Amended
7	<p>One respondent asked for clarification of the term "pool model" and, in particular, how this concept is distinguished from "pooled data".</p>	<p>The ECB considers a "pool model" as a model where institutions develop a shared or common rating model based on pooled data which is then applied by each participating institution to its portfolio(s). Institutions which pool their data may work very closely together, disclosing to each other more information than would be available merely from publicly available external data, and even sharing the same rating and validation processes.</p> <p>To enable a better understanding, footnote 21 has been slightly reworded.</p>	Amended
8	<p>Respondents pointed out that institutions participating in a pool model are expected to align their processes for managing distressed obligors. This is considered to be an intrusion into the business operations of the institutions participating in the pool.</p>	<p>The ECB considers that this principle addresses how the management of obligors in difficulties influences a default event. The ECB mentions the principle without specifying how institutions should manage their obligors. It considers that for the particular case of pool models, institutions should be aware of the model-relevant parts of these processes.</p> <p>Paragraph 42(c) has been amended to clarify that if the processes are not aligned among (pool) participating institutions, differences should be appropriately taken into account within the model or through an appropriate adjustment, in accordance with paragraph 37(a)(viii) of the EBA GL on PD and LGD.</p>	Amended
9	<p>Respondents expressed concerns over the application of the validation expectations "... including testing of discriminatory power and predictive power ..." by each institution with regard to its own portfolio, in the light of the</p>	<p>The ECB acknowledges that internal validation levels and responsibilities are set out in paragraphs 66 and 67 of the general topics chapter of the ECB guide to internal models. It therefore considered the information in the second sentence of paragraph 42(d) – highlighted by the respondents – to be</p>	Amended

	<p>expectations relevant for institutions belonging to the same banking group.</p> <p>In particular, respondents stressed the partial (and potentially biased) view that considering the measurement of rank ordering and predictive power at single legal entity level would provide. This is because for pooled models across legal entities of the same banking group (i.e. group-wide models), the perimeter of application is typically related to the entire group.</p>	<p>sufficiently covered.</p> <p>The ECB considered it important to highlight in the guide that models for which an institution has an approval on a consolidated basis as well as on a sub-consolidated and/or individual basis should satisfy the requirement to perform adequately at the sub-consolidated and/or individual levels, as these are considered material sub-ranges of application. This clarification has been included in paragraph 55 of the guide, through the addition of a footnote.</p>	
10	<p>One respondent pointed out that it is difficult to gain a complete understanding of the definition of default applied to external data, as rating agencies disclose a description of their approach but do not provide the public with the detailed formulae. This can be a limitation in the analysis of the differences between the internal and the external definitions of default.</p> <p>Another respondent stressed that meeting the equivalence expectations for external data with respect to the definition of default is onerous. The introduction of a margin of conservatism (MoC) is a disproportionate way of accounting for the adjustments included to achieve consistency between the internal and the external definition of default. Alignment with the ongoing EBA work should therefore be ensured.</p>	<p>The ECB's expectation is that institutions that want to use external data should establish the necessary processes to ensure that the required information is available. The ECB also considers that the definition of default will probably not depend on scores and models, but rather on processes and thresholds.</p> <p>In addition, the ECB considers that the paragraph is aligned with the ongoing EBA work, in particular the EBA GL on PD and LGD. Specifically, paragraph 23 of the EBA guidelines states that "... institutions should ensure that the definition of default underlying the data used for model development is consistent over time ..." and paragraph 30 states that "... in order to ensure that the definition of default underlying the data used for risk quantification from each data source is consistent with the requirements of Article 178 of Regulation (EU) No 575/2013, institutions should compare the definition of default applied by the institution currently with the definitions used for the observations included in the dataset used for risk quantification".</p> <p>In addition, paragraph 37(a)(i) of the guidelines states that in the case of "missing or materially changed default triggers in historical observations, including changed criteria for recognition of materially past due credit obligations", a deficiency should be identified in category A. Paragraph 38 of the guidelines further elaborates that "In order to overcome biases in risk parameter estimates stemming from the identified deficiencies referred to in paragraphs 36 and 37, institutions should apply adequate methodologies to correct the identified deficiencies to the extent possible." Paragraph 43(a) of the EBA GL then expects institutions to "quantify MoC for the identified deficiencies referred to in paragraphs 36 and 37, to the extent not covered by the general estimation error".</p>	No change
11	<p>One respondent asked for clarification regarding the principle of "replicability of the rating" by a third party in cases where human judgement is applied in the assignment of exposures to grades or pools. The respondent pointed out that replication might be a complex process to implement.</p>	<p>For human judgement to be applied in the assignment of exposures to grades or pools, it is the ECB's understanding that this should be documented in such a way that the rating assignment can be understood and replicated by a third party.</p> <p>To provide clarification regarding the principles designed to ensure that the rating assignment process can be applied in a consistent manner and replicated by a third party, the ECB has drawn up new expectations, which are set out in paragraph 45 of the guide. These establish, in particular, the elements constituting the basic structure of the model that should be applied consistently and not modified by human judgement. They also establish principles for the assessment of the consistency of the rating assignment process.</p> <p>The ECB has also set out further principles regarding the use of overrides (in accordance with Article 172(3) of the CRR) and has clarified the concept and the instances where overrides may be applied (new paragraphs 46 to 48). The new principles also clarify the distinction between overrides and qualitative variables to be input into the models.</p>	Amended
12	<p>Respondents stated that the proportionality principles set out in the guide (namely, the incorporation of human judgement should be proportionate to the number of available observations) create a burden for institutions and should be clarified. The expectation should instead concern the need to justify the application of human judgement.</p> <p>One respondent also asked for clarification of the concept of "relevant observations".</p>	<p>The ECB acknowledges that the use of human judgement is a key input in all models. However, the relative weight attached to this input should vary depending on the quantity of observations available. Specifically, as a corollary to Article 174(e) of the CRR, which states that "... Human judgement shall take into account all relevant information not considered by the model ...", the ECB understands that models with a higher number of underlying observations should rely on human judgement to a lesser degree. This is because relatively more information should be captured within the available observations/data on which the model will rely. Paragraph 49 of the guide elaborates further on this point, stating specifically that the "the higher the number of relevant observations, the more the institutions should rely on the outcomes of the statistical model". The ECB recognises that human judgement is a key input in all models.</p>	Amended

		As referred to in Article 144(d) of the CRR, "relevant observations" can be taken to mean all data relevant to credit risk measurement for those exposures within the scope of application. Non-relevant observations are considered to mean data that are not representative of the institution's portfolio, in accordance with Chapter 4.2.3 or 4.2.4 of the EBA GL on PD and LGD.	
		The ECB has clarified the guide by mentioning, in particular, model development, which is the phase to which the proportionality principle should be applied. The regulatory references have also been reviewed.	
13	Respondents suggested that the last sentence of paragraph 51 "To this end, where human judgement is used to greater extent because of the low number of available internal observations, institutions should apply a higher MoC to their estimates to account for additional uncertainty" should be deleted. They argued that the application of an MoC is set out in detail in the EBA GL on PD and LGD and do not consider the use of human judgement as a deficiency, but an additional input to complement the modelling effort.	Paragraph 51 of the ECB guide links the use of human judgement to the potentially low number of available observations. In this context, the application of a higher MoC is restricted to cases where it is used to address a lack of data (and not limited to the use of human judgement in general). This principle is interpreted as using human judgement as an "adjustment" to address the lack of data. Consequently, an appropriate MoC should be applied. The ECB considers that this principle follows on from Article 179(1)(a) of the CRR, which states that "the less data an institution has, the more conservative it shall be in its estimation". In addition, paragraph 37 of the EBA GL on PD and LGD identifies and classifies all the deficiencies related to the estimation of risk parameters that can lead to a bias in the quantification of those parameters (in particular, those related to category A – identified data and methodological deficiencies). Finally, it is worth noting that the lack of relevant available observations is a situation typically found in portfolios characterised by a low number of observations or defaults. The paragraph has been slightly amended to refer to "relevant available observations".	Amended

3.4 Probability of default (CR Section 4)

	Comment	ECB response and analysis	Amendment
1	One respondent asked for clarification of paragraph 54, pointing out that it addresses some specific methodological issues that could lead to overfitting, while ignoring others. A broader scope for this paragraph is suggested.	Paragraph 54 of the guide does not try to address all specific methodological issues that could lead to overfitting. It aims to express the expectation that institutions take appropriate measures against model misspecification with regard to overfitting, clarifying that this risk is "particularly relevant" in the case of portfolios characterised by a scarcity of internal data (low-default portfolios).	No change
2	One respondent stressed that, by expecting models to perform adequately on economically significant and material sub-ranges of application, the guide seems to favour a model granularity that could lead to low volumes of data on the sub-range. This would apply especially to portfolios covering exposures of financial institutions and large corporates.	The ECB does not think that this expectation could encourage an excessive proliferation of models, as suggested by the comment. Indeed, a reference to the materiality of the sub-range was included in order to avoid that situation.	No change
3	Another respondent asked for the list of risk drivers to be harmonised with the one included in the EBA GL PD and LGD.	The ECB's understanding is that Section 5.2.2 in the EBA GL on PD and LGD sets out an a priori list of potential risk drivers to analyse during the development of the model. The ECB's expectation is that models should perform adequately a posteriori on sub-ranges of application identified by potential drivers for risk differentiation. However, in order to clarify the point, paragraph 55 has been amended to specify that the list of drivers is non-exhaustive.	Amended
4	Several respondents asked for additional clarification of the economic significance and materiality of sub-segments, especially considering the relationship with internal segmentation practices. They also asked for flexibility in deciding how to assess their model performance and define sub-ranges. Respondents suggested that the performance of models be assessed on the full range of application of rating systems. Finally, some	The ECB considers that a model should perform adequately on the population as a whole as well as on sub-ranges of application. The latter are defined as material and economically significant and identified by splitting the range of application according to the relevant drivers. Under these conditions, the ECB's view is that the underperformance of the model on a sub-range might bring the model construction and the selection of risk-drivers into question. Institutions are responsible for assessing the materiality of the underperformance and for testing other relevant risk drivers.	No change

	respondents expressed concern over lower performance being recorded in the event of analysis at sub-range level.		
5	Respondents asked for clarification on the need for documentation in cases where risk driver(s) are considered but not used for assessing the appropriateness of obligor/transaction assignment to a rating system.	Paragraph 56 of the guide has been clarified.	Amended
6	Some respondents asked for clarification regarding the sample to be used to ensure a meaningful differentiation of risk (i.e. use of an equivalent sample to that used for risk differentiation or the whole calibration sample used for the risk quantification).	The ECB expects the expectations of paragraph 57 to be followed over time. Paragraph 57 of the guide has been clarified.	Amended
7	One respondent asked for clarification of the definition of a grade or pool in such a way as to account for the behavioural element of grade or pool assignment. The principles of risk differentiation need to be broader and not defined just in numerical terms.	The ECB's point of view is that expectations need not undermine the use of master scales. There are various ways to include risk drivers in a rating system, as described in paragraph 57. At the same time, the right balance needs to be found between homogeneity, heterogeneity and rating grade distribution.	No change
8	Some respondents asked for clarification that institutions should assess the severity and materiality of the deviation from the target level of the metrics (together with the respective tolerance level) as that should drive their efforts to implement remedial actions.	In the understanding of the ECB there is no need for the implementation of an automatism. Where tolerance levels are exceeded, the need for a correction should be considered. Paragraph 58(a) has been amended accordingly.	Amended
9	Some respondents asked for clarification of the reference to "loss rates" in the guide.	For clarification purposes paragraph 58(b) has been reworded and "realised loss rates" deleted.	Amended
10	Respondents asked for confirmation that separate targets and tolerances can be set for initial development and ongoing performance and that they can be applied to different models/portfolios.	Expectations are formulated at model level. The last sentence of the paragraph mentions different targets and tolerances for initial development and ongoing performance.	No change
11	Some respondents asked for clarification of the expectation on reasonably similar default rate expressed in paragraph 61 of the guide.	The applied PD (used for own funds calculation) should be representative for the grade/pool. To ensure that no potential bias is introduced, systematic concentrations (e.g. at either ends of the PD or score band) should be avoided. The distribution of the exposures within a grade/pool should be analysed.	No change
12	Some respondents asked for confirmation that the existence of one alternative ranking model is not enough to provide evidence of the lack of homogeneity of a rating grade.	If the grades or pools are divided into subsets of obligors or facilities with the help of an additional risk driver or a different discretisation and the default rates of these subsets significantly and systematically differ from the default rate of the actual grade, this indicates that there might be problems with homogeneity requiring careful analysis and action.	No change
13	Some respondents asked for clarification regarding the analyses to be performed in order to assess homogeneity within rating grades/pools and differentiation across rating grades/pools for low-default portfolios. Respondents also pointed out that the principles established in the guide could encourage banks to aggregate adjacent rating grades; this could lead to potential problems of excessive concentration or problems concerning stability across the years.	The guide does not suggest any methodology or technique to assess the requirement of homogeneity within grades/pools of rating systems and heterogeneity across grades/pools, as this is deemed to belong to the modelling choices inherent to the IRB approach. When defining the methodologies/techniques to be used for low-default portfolios, institutions should take into account the peculiarities of such portfolios. The ECB does not consider that paragraph 61 of the guide encourages banks to aggregate adjacent grades or pools, thus leading to overly high grade/pool concentration or poor grade/pool stability over time. The CRR sets out additional requirements on the distribution of obligors across grades or pools. If an institution decides to follow these supervisory expectations, this would prevent any perverse incentive from arising.	No change
14	Some respondents asked how the longer time horizon, expressed in paragraph 64, should be embedded in the modelling framework.	The ECB considers that a wide variety of techniques may exist with regard to the implementation of a longer time horizon when assigning grades. It is not the aim of the ECB to set in advance the exact modelling technique that institutions should apply. Different techniques are potentially compliant. In particular, the use of the one-year target for default in the dependent variable of the risk differentiation function is not disallowed. It may be a valid option, provided that the model adequately reflects risks over the longer horizon.	No change
15	Some respondents asked for additional clarification as to what would be understood as an appropriate balance between drivers that are predictive only over a short time horizon	The ECB considers that the adequate balance is implicitly expressed by the extent to which the risk differentiation is adequate over the longer time horizon, as mentioned in the first part of paragraph 64, i.e. the appropriate balance aims to	No change

	and drivers that are predictive over a longer time horizon.	ensure adequate discriminatory capacity over the whole (longer than one year) rating horizon. If the weight of the drivers which are only discriminant in the short term is excessive, the model will tend to discriminate poorly with respect to defaults occurring over the longer term. If the opposite is true, the model may fail to adequately discriminate defaults occurring in the short term.	
16	Some respondents suggested that the explicit mention of two to three years should be dropped, as it is not justified and could depend on the type of portfolio.	A horizon of two to three years is considered to be appropriate for most portfolios. However, Institutions may deviate from this if they have a good rationale/justification for doing so.	No change
17	Some respondents suggested clarifying what constitutes good practice in the event of conflict between the targets (one-year horizon vs multiple-year horizon), for instance when assessing or monitoring the performance of the model.	In the ECB's view there should be no conflict, as the adequate horizon is explicitly set out in paragraph 64. When assessing a model's discriminatory ability, performance in the subsets of defaults occurring in the first year after the grade assignment is definitely a relevant input. However, additional analysis is expected over a longer time horizon as well.	No change
18	Some respondents expressed concerns about potential undesirable effects of the guidance provided in paragraph 64, for instance incentivising the development of multi-geography models or the exclusion of relevant drivers.	The ECB believes that the combination of all expectations expressed within guide would not give rise to such effects. For instance, models are expected to perform adequately in relevant sub-populations, including geographical ones. In addition, all relevant drivers are expected to be included in the models. Paragraph 64 deals with the rating horizon and the adequate weight to be given to the drivers to ensure performance over this horizon.	No change
19	One respondent asked for clarification of paragraph 64, in particular whether there should only be idiosyncratic migrations between grades and no trend in such migrations would therefore be expected.	The ECB understands that the implications of the longer rating horizon in the dynamics of the grade assignments cannot be read in such a straightforward way. Paragraph 64(a) states that all relevant drivers should be included and if there is a change in these drivers, the grade assignment should change. Paragraph 64 has been clarified.	Amended
20	Some commenters requested clarification of whether a specific rating philosophy is intended.	The ECB decided not to use the terms rating philosophy, point-in-time (PIT) or through-the-cycle (TTC) models when setting out the expectation in the guide, as there was no common understanding of these terms among the relevant stakeholders. Instead, paragraph 64 is intended to provide further clarity on what is considered to be an adequate risk differentiation.	No change
21	Some respondents asked for clarification of paragraph 65, which suggests that certain principles on grade rate dynamics should be applied in the specific situations mentioned in it. In particular, one respondent asked whether the wording "if necessary" at the end of paragraph 65(b) implies that institutions can choose to rely wholly on external ratings rather than on their own. Other respondents asked for clarification regarding the analyses to be performed when comparing external and internal grade assignment dynamics and the adjustments to be made to compensate for any differences between the grade assignment dynamics of internal and external ratings.	To improve the clarity of the guide, some amendments have been made to paragraphs 65(b) and 65(c). With regard to paragraph 65(b), the ECB has clarified that the necessary measures are expected to be taken in all instances where there is a risk of the own rating dynamics not being preserved. Institutions are not expected to rely on the external rating dynamics only. In order to assess grade assignment dynamics (for both internal and external ratings), institutions are generally expected to analyse transition matrices, the stability of default rates at grade level (compared with the stability of the default rate at portfolio level) and the behaviour of the chosen risk drivers. As regards the situation mentioned in paragraph 65(c), if there are differences between the internal and external rating assignment dynamics, the text clarifies that institutions should include the necessary adjustment as part of their risk quantification. For example, institutions may adjust the external default rates taking into account the differences between the internal and external grade assignment dynamics and the current economic situation.	Amended
22	One respondent asked for clarification as to whether a guaranteed party experiencing financial difficulty, whose obligations are met in full by its guarantor, should be considered to have defaulted.	On the definition of default, institution should refer to Article 178 of the CRR and to the EBA Guidelines on the definition of default.	No change
23	One respondent asked for clarification of the analyses expected to be conducted on shadow rating models for counterparties that switch from externally rated to unrated status.	The ECB acknowledges the relevance of this expectation for the purposes of risk quantification and, in particular, when institutions map internal grades to external grades and use the default rates of the external grades provided by the organisation. For the purpose of using shadow rating models, the ECB considers it sufficient that institutions understand the impact of any differences between the various data sources used and establish appropriate procedures to ensure that these differences are adequately addressed (in the sense that model bias should be avoided).	Amended

24	<p>One respondent pointed out that paragraph 83 could be read as meaning that banks are expected to use external data, even if sufficient internal data are available.</p> <p>In addition, some respondents stressed that, when analysing differences between external and internal observed average default rates, divergent observed default rates are not necessarily a reason to add a MoC.</p> <p>Another respondent asked for clarification of the meaning of a separate calculation. The respondent stressed that for the calculation at pool level there should be no expectation that the data of the institution should be artificially excluded from the data pool.</p>	<p>The ECB does not expect external data to be used in all cases. Paragraph 83 has been amended to avoid any potential misunderstanding.</p> <p>In addition, the ECB considers that a MoC should be included whenever the external data are not fully representative of the Institution's portfolio. Paragraph 83 has been amended to increase transparency in this regard.</p> <p>The ECB considers that, as part of the representativeness analysis, institutions should ensure that the average observed default rates from the external part of the pooled data are calculated separately from, and compared with, those based on internal data. This has been clarified in the text as well. In a complementary manner, and in order to apply a degree of proportionality in this principle, the ECB also considers that if the internal data constitute just a small fraction of the pooled data and are not considered material in relation to the pooled data, for the purposes of this analysis the institution may perform a separate calculation of the average observed default rates with pooled data and a comparison with those calculated based on internal data only. This has been added in a footnote. In line with this rationale, the last sentence of paragraph 78 was deleted.</p>	Amended
25	<p>One respondent asked for clarification of the reference to Section 4.1 in paragraph 85(b) of the guide.</p> <p>Another respondent proposed that the reference to specific risk drivers (geographical composition, sectoral distribution and the ones listed in Section 4.1 of the guide) in paragraph 85 should be removed. This respondent also asked for clarification that the economic indicators selected by the bank to verify the presence of bad years within the historical observation period should be macroeconomic indicators with a significant impact on the application scope of the model.</p>	<p>The reference to Section 4.1 in paragraph 85(b) has been removed from the text as it was not considered necessary.</p> <p>In the ECB's view, to ensure that the selected indicators are relevant for the considered type of exposure, the geographical composition and sectoral distribution of the portfolio as well as other relevant risk drivers should be considered. The ECB considers it unnecessary to clarify that the indicators should be macroeconomic.</p>	Amended
26	<p>Respondents asked for clarification as to how the mapping between internal and external ratings is expected to be performed.</p> <p>In addition, they stressed that no full disclosure is available regarding the criteria used by the external organisations. The set of "common obligors" could be very small and the sample of common obligors could be non-representative of the application portfolio.</p> <p>Respondents also asked for clarification as to whether the mapping should be based on a comparison between the observed default rates for the internal and the external rating grades or on the general consistency of the two evaluations.</p> <p>Respondents pointed out that a certain degree of human judgement (expert-based approach) should be expected, in particular if the sample under evaluation is small or with few defaults.</p> <p>Respondents asked for clarification of whether this section (i.e. paragraphs 88-89) is also relevant if the mapping between internal and external rating classes is used by institutions not for quantification but for management purposes or process-related phases (e.g. override process).</p> <p>Respondents asked for clarification as to whether, in cases where internal and external grade assignment dynamics are different, mapping that evolves over time is considered appropriate or, conversely, mapping is expected to remain stable across time.</p> <p>One respondent also asked for clarification as to how the analysis mentioned in paragraph 89(b) should be carried out.</p>	<p>The ECB considers that sufficient in-house knowledge of the methodology underlying external ratings should be available to ensure compliance of the method applied by the institution. It also considers that the set of common obligors should be representative in order to extract conclusions about the mapping. If it is not representative, the mapping should not be based on such a comparison of common obligors. The text has been reworded to add further clarity on this.</p> <p>The mapping should be based on a comparison of rating criteria (as stated in Article 180(1)(f) of the CRR). In addition, the external data representativeness assessment is expected to be based on a comparison of default rates.</p> <p>The ECB's intention is not to prevent the use of a certain degree of human judgement when mapping the internal scale against the external one.</p> <p>The section "PD quantification based on mapping to external grades" is relevant when the institution follows the approach described in Article 180(1)(f) of the CRR, which concerns requirements for the regulatory estimation.</p> <p>In the ECB's view, dynamic mapping (different mapping being applied depending on the reference date) is theoretically possible and is already being considered, as reported in paragraph 65(c).</p> <p>Finally, the text of paragraph 89(b) has been revised to enhance clarity.</p>	Amended
27	<p>One respondent proposed that the reference to paragraph 75 of the EBA GL on PD and LGD be removed as that paragraph refers to counterparties without a rating at the start of the relevant observation period. However, paragraph 89(e) refers to "withdrawn" rating,</p>	<p>The ECB understands that the bias in the default rate calculation stemming from withdrawn ratings has the following two main causes.</p> <ol style="list-style-type: none"> 1. The withdrawal of an exposure rating occurs in the observation period for the default rate calculation at a reference date for which the exposure has an informed 	No change

<p>i.e. counterparties with a rating at the start of the observation period which, over the period, were moved to unrated status by the rating agencies.</p>	<p>rating. In this case the external agency might not monitor a default occurring after the rating withdrawal. The default rate could therefore be biased as a result of the default not being captured.</p> <p>2. The rating has been withdrawn shortly after the observation period for the default rate calculation at a reference date.</p> <p>The expectation in paragraph 89(e) is that institutions should adjust the external default rates accordingly, if necessary, and also take into consideration the provisions of paragraph 75 of the EBA GL on PD and LGD. This guidance is intended to address the two possible causes of bias in the default rate calculation. Institutions are still expected to analyse the default behaviour of entities with withdrawn ratings for a (limited) period after the withdrawal.</p>	
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3.5 Loss given default (CR Section 5)

	Comment	ECB response and analysis	Amendment
1	The mere existence of a large proportion of external data should not be treated through a higher category A MoC, as the MoC should be applied to cover deficiencies. When external data are used, the institution should analyse their representativeness. Only if this is limited should appropriate adjustments to the external data be applied in conjunction with a higher category A MoC.	The ECB agrees that the use of a high proportion of external data should not lead by itself to a higher category A MoC, as the latter should be connected to the issue of representativeness. The text has been revised to clarify this.	Amended
2	One respondent pointed out that it is neither effective nor appropriate to demonstrate representativeness on the basis of non-relevant dimensions. If a dimension has no influence whatsoever on credit risk, it is also irrelevant in terms of representativeness.	The expectation set out in the paragraph 94(a) is not that institutions should demonstrate representativeness on non-relevant dimensions. It is intended to clarify that representativeness with regard to region and product type should in any case be analysed. Generally, a dimension can be relevant for representativeness even though it has not been identified as a relevant risk driver. For example, in the case of a portfolio from just one region, the region is not a risk driver (as it is the same for all). However, in terms of representativeness for external data it is of course relevant.	No change
3	Some respondents asked for clarification of how, when the exceptional treatment is applied in accordance with paragraph 99 (i.e. where realised LGD is calculated at a different level from individual facility), this calculation should be included in the calculation of the long-run average LGD.	Paragraph 99 has been amended to take into account the comparability of the long-run average LGD between institutions and ensure that the LGD is estimated for each facility.	Amended
4	Some respondents asked for clarification on how the use of artificial cash flow (referred to in paragraph 100(b)) is economically justified in cases where there are no delays in payment, but the facility is in default as a result of a contagion effect. In addition, an amendment was requested to account for the possibility of assigning no loss after the facility returns to a non-default status when the obligor pays all due amounts.	In accordance with paragraph 135 of the EBA GL on PD and LGD, the artificial cash flow should be discounted whether there are delays in payment or not.	No change
5	Some respondents asked for a consistent approach for the treatment of additional drawings between LGD and CCF where additional drawings should be discounted both in LGD and CCF.	Paragraph 100(a) has been amended to take into account consistency between CCF and LGD where additional drawings should be discounted for CCF purposes.	Amended
6	Some respondents asked for clarification of the following. <ul style="list-style-type: none"> That the restructuring only involves previously defaulted facilities or cases where the measures granted determine the default of the customer and not commercial practices where the bank modifies the contractual conditions without classifying the 	The restructuring expectations in paragraph 101 have not been changed, for the following reasons. <ol style="list-style-type: none"> They refer to economic loss as defined in Article 5(2) of the CRR where it applies to defaulted exposures. Furthermore, the treatment of restructuring for the calculation of realised LGD, as one source of LGD non-comparability across the SSM area, is clearly defined in paragraph 136 of the EBA GL on PD and LGD. 	Amended

	<p>client as being in default.</p> <ul style="list-style-type: none"> The specific reference to paragraph 51 of the EBA Guidelines on the definition of default, since the amount by which the financial obligation has diminished is a loss component for the LGD calculation. In that calculation, it should be specified that delta NPV is related solely to modifications of contractual terms, without envisaging debt forgiveness. This would be captured in the lower outstanding exposure at the moment of the cure corresponding to the artificial cash flow. Including the debt forgiveness in the delta NPV would introduce double counting (forgiveness will be present in both NPV and artificial cash flow). The relationship between economic loss, which in accordance with Article 5(2) of the CRR should include material discount effects, and the loss specified in the EBA Guidelines on the definition of default, which does not include material discount effects. 	<p>2. The calculation of the amount of the diminished financial obligation, as specified in the EBA Guidelines on the definition of default, is essential to recognising this amount as observed loss at the date of its occurrence, where the facility remains in default. Artificial cash flow, on the other hand, is a concept used at the end of the recovery process as additional recovery cash flow added to the calculation of economic loss. This is done as if a payment had been made by the obligor equating to the amount outstanding at the date of the return to non-defaulted status. However, no double counting of debt forgiveness (through the diminished financial obligation and the artificial cash flow) is intended.</p> <p>To avoid misinterpretation of the calculation of the economic loss between the EBA GL on PD and LGD and the EBA Guidelines on the definition of default in the case of credit obligations being sold, the paragraph has been changed, since the price agreed for the sold credit obligations should be considered as a recovery flow and should be discounted like all other cash flows, as set out in paragraph 132(b) of the EBA GL on PD and LGD).</p>	
7	<p>Some respondents asked for clarification on the treatment of multiple defaults, specifically with respect to the following:</p> <ul style="list-style-type: none"> the same treatment across risk parameter estimates; the analysis of whether both (or more) subsequent defaults are independent, since this is perceived as too burdensome on a case-by-case basis; the analysis of the curing process to assess the degree of independence of subsequent defaults, which is considered to overlap with the analysis of the probation period used for monitoring the requirements of the EBA Guidelines on the definition of default; the scope of application of the expected time between the time of the exposure's return to non-defaulted status and the subsequent classification as default if the historical data used a different definition of distressed restructuring or equivalent or if the institution applied a longer period. 	<p>Paragraph 103 is already aligned with paragraph 14 of the EBA GL on PD and LGD where the same treatment of multiple defaults of the same obligor or exposure should be applied across internal, external and pooled data, and not across risk parameters (where only the definition of default should be the same).</p> <p>The purpose of paragraph 103(a) is to clarify when the ECB considers it appropriate for a period of longer than the nine months envisaged in the EBA GL on PD and LGD. The paragraph has been redrafted in order to avoid misunderstandings.</p> <p>On the definition of a significant proportion of subsequent default, the ECB does not consider it appropriate to lay down a threshold.</p> <p>Paragraph 103 applies to the reference dataset (all historical data where economic loss occurred) used for estimation. Therefore, the reference to historical data has been removed from paragraph 103(b) in order to avoid misunderstandings. Nevertheless, it has been further clarified that the expectations are also relevant to institutions which have adopted an equivalent or longer probation period.</p>	Amended
8	<p>Some respondents expressed the view that institutions should be able to decide on the best way to assess their model performance and have flexibility when defining sub-ranges.</p>	<p>Paragraph 106 has been changed.</p>	Amended
9	<p>Some respondents asked for clarification of the expectation of independence regarding the LGD model components in paragraph 108(b) and the previous paragraph 115(a) of the ECB guide.</p>	<p>The ECB's understanding is that institutions should adequately analyse possible dependencies of the components (through relevant risk drivers) and reflect them in their LGD model. The expectation in paragraph 108(b) has been clarified. In addition, the previous paragraph 115(a) has been deleted, since it was a repetition of 108(b). Furthermore, it has been clarified in paragraph 118 that, for models based on components, a calibration at grade or calibration segment level (i.e. after aggregation of the different components) should also be performed.</p>	Amended
10	<p>Some respondents requested an amendment of paragraph 111 so that the minimum period of observation of the default that is expected for it to be considered in the calculation of the observed average LGD would also be applied to models based on components. For example, under this amendment facilities with limited information from the beginning of the litigation phase would be excluded. A related request was for the minimum time-period requirement to be removed.</p>	<p>Paragraph 111 refers to the calculation of observed average LGD of all defaulted facilities. Therefore, no reference to components is made. Institutions should define a period that is appropriate but, in principle, shorter than 12 months.</p>	No change
11	<p>Some respondents were of the view that methodological freedom should not be limited through the approaches presented in paragraph 112. They also asked whether the change in the time-to-workout would trigger material model change.</p>	<p>Paragraph 112 has not been amended, since changes to the definition of the maximum period of the recovery process are subject, like any changes of the internal ratings-based approach, to Commission Delegated Regulation (EU) No 529/2014. The approaches presented in points (a) to (e) do not provide alternative approaches but complementary aspects to be taken into account in defining the maximum period of the recovery process (time-to-workout).</p>	No change

12	Some respondents asked for clarification, in paragraph 113(b), of whether defaults arising from vintages refer to the year of default or the number of years of observation of default, while others raised concerns that this approach limits modelling freedom.	Paragraph 113(b) has been changed to improve clarity regarding vintages. In addition, the paragraph has been aligned with paragraph 159(a) of the EBA GL on PD and LGD where, for the purpose of estimating future costs and recoveries, institutions should analyse the costs and recoveries realised on these exposures until the moment of estimation, in comparison with the average costs and recoveries realised during a similar period of time on similar exposures.	Amended
13	Some respondents expressed concern that applying the 100% haircut, as referred to in paragraph 114(b) of the guide, would be overly conservative, since in most cases repossession of assets falling under the "other non-credit obligation assets" category pursuant to Article 156 CRR would be 100% risk-weighted. Respondents also pointed out that Section 5.3.3 seems to combine the concept of incomplete recovery processes with repossession. However, even if the repossessed asset has not yet been sold, this does not prevent the case from being treated as closed.	Paragraph 114(b) has been changed to clarify that the application of a 100% haircut is only one of the expected approaches to performing the sensitivity analysis. In addition, Section 5.3.3 has been split into two sections to improve clarity.	Amended
14	The majority of respondents expressed the opinion that both options in paragraph 116 (a) should be kept. However, they were slightly in favour of the first option and viewed the second as being useful in only a limited number of situations. A smaller number of respondents expressed concerns over the second option not being compliant with the EBA GL on PD and LGD. Referring to paragraph 116, some respondents expressed concerns that flooring the negative values of realised LGDs at zero is not consistent with the requirement not to cap extremely high values of realised LGDs that are much above 100%.	Regarding paragraph 116(a), different options to compute the average are available. The ECB's understanding is that a best practice approach to estimating the loss at obligor level within a facility grade or pool is to first take the exposure-weighted average realised LGD at the obligor level and then take the arithmetic average LGD weighted by the number of defaulted obligors within the facility grade or pool. Paragraph 116(c) has not been changed, since it merely clarifies paragraph 162 of the EBA GL on PD and LGD on high values of realised LGDs much above 100%. Paragraph 162 states: "Where institutions observe extremely high values of realised LGDs much above 100% ... they should identify relevant risk drivers to differentiate these observations and adequately reflect these specific characteristics in the assignment to grades or pool and where institutions use a continuous rating scale in the LGD estimation, they may create a separate calibration segment for such exposures." Replacing the observed value by a pre-defined value or excluding these facilities is not considered to be an appropriate treatment.	Amended
15	Some respondents requested further clarification of whether the LGD estimates calibrated to the long-run average LGD calculated for each grade or pool should be similar to the ones calibrated to the long-run average LGD calculated at calibration segment level. In addition, respondents asked for further clarification of whether LGD estimates are expected to be stable, as is the case with PD estimates.	The purpose of paragraph 117 of the ECB guide is to provide further clarification of the additional calibration tests that are expected to be performed by institutions using calibration at calibration segment level in accordance with paragraph 161(b) of the EBA GL on PD and LGD. Paragraph 117 does not set out any expectations regarding the stability of long-run average LGD estimates.	No change
16	Some respondents requested clarification of the expectation for retail exposures where institutions do not need to give equal importance to historical data if more recent data are a better predictor of loss rates, given that the current Basel III text allows this possibility only for own-EAD estimates for retail exposures.	Paragraph 119 is already aligned with current regulation and with the EBA GL on PD and LGD. Basel III has not yet been transposed into EU law.	No change
17	Some respondents requested clarification of the expectation in paragraph 121 to take into account "... any changes to the structure of the portfolio that are expected to happen in the foreseeable future". Respondents also asked for the paragraph 121(c) to be deleted because past economic and market conditions only characterise part of an economic cycle and therefore may not provide a representative set of economic conditions for the evaluation of the long-run average (LRA).	The purpose of paragraph 121 is to provide further clarification regarding paragraph 164 of the EBA GL on PD and LGD, which specifies that "In the analysis of the representativeness of the data ..., institutions should take into account not only the current characteristics of the portfolio but also, where relevant, the changes to the structure of the portfolio that are expected to happen in the foreseeable future due to specific actions or decisions that have already been taken." The ECB guide further clarifies that: a) "The adjustment should be based on a comparison of the data used in risk quantification with the institution's application portfolio ..."; b) "In the event of changes in lending or recovery policies, institutions should make only conservative adjustments until they are able to provide empirical evidence concerning the impact of the new policies ..."; c) "All economic and market conditions experienced in the past and reflected in historical observations should be considered by institutions as part of foreseeable economic and market conditions ... They are not, therefore, a reason to perform adjustments."	No change

		In addition, paragraph 121(c) has not been deleted, since it only refers to adjustments in line with paragraph 164 of the EBA GL on PD and LGD, as explained above. It does not refer to expectations regarding the historical observation period necessary for the LRA LGD calculation as specified in Section 6.3.2.1 of the EBA GL on PD and LGD.	
18	Several respondents asked for clarifications regarding Section 5.3.6 of the guide given recent developments at EBA level (consultation papers on the RTS on the specification of the nature, severity and duration of an economic downturn and on the EBA Guidelines for downturn LGD estimation).	Section 5.3.6 of the guide has been amended taking into consideration the final draft RTS on the specification of the nature, severity and duration of an economic downturn and the EBA Guidelines for downturn LGD estimation.	Amended
19	Some respondents asked for clarification regarding the inclusion of an expected downturn over the period of the recovery process in the ELBE, since it is important to avoid, as far as possible, excessive volatility in the RWAs and therefore the adjustments to the ELBE should not be based on an excessively PIT logic.	The ELBE should refer to expected loss given current economic circumstances and exposure status. Paragraph 124 sets out the ECB's understanding of how institutions should comply with this requirement, which is that institutions should take into consideration the economic conditions expected over the period of the recovery process. The downturn conditions should be reflected in the ELBE if and only if current economic conditions are in a downturn or a downturn is expected over the period of the recovery process. Otherwise, downturn conditions should be reflected in the LGD in default.	No change
20	Some respondents asked what should be understood by the "constant charge" referred to in paragraph 125.	"Constant charge" has been replaced by "constant value" in order to clarify this paragraph.	Amended

3.6 Conversion factors (CR Section 6)

	Comment	ECB response and analysis	Amendment
1	Some respondents pointed out potential misalignments of the guide with the BCBS paper "Basel III: Finalising post-crisis reforms". Others pointed out that CCF is covered in the EBA GL on PD and LGD and therefore the guide may go beyond regulatory text requirements.	The guide provides transparency on how the ECB understands the current applicable European Union (EU) and national law, and how it intends to apply this law when assessing whether institutions meet these requirements. It is the ECB's understanding that clarity on the expectations regarding CCF models is needed in order to ensure comparability and consistent treatment across institutions. This guide should not be construed as going beyond, and is not intended to replace, overrule, or affect, the current existing applicable EU and national law. Similarly, the guide does not internalise international agreements that have not yet been incorporated into EU law.	No change
2	Several respondents argued that a strict link between the aggregation of CCF and LGD is not fully meaningful. Aggregation as regards LGD might be driven by the level at which the recovery process is performed, whereas aggregation as regards CCF might be driven by potential interconnections among facilities affecting the behaviour relating to the drawing of the unused credit line. Examples include the case of current accounts with connected advance facilities and multipurpose credit lines where a credit limit can be shared among several credit facilities. Respondents therefore suggested that the wording be amended to refer to the possibility of aggregation on the basis of the characteristics of the facilities rather than aggregation valid on the LGD side.	It is up to institutions to define facility. If two credit lines are highly interlinked, they should constitute a single facility.	No change
3	Regarding paragraph 131(c), one respondent suggested that the same default window considered for LGD should also be adopted for the EAD parameter, including the treatment of the independence period.	It is the ECB's understanding that the treatment envisaged in paragraph 101 of the EBA GL on PD and LGD refers specifically to the estimation of LGD and is intended to ensure that the economic loss is calculated accurately. It is not therefore relevant to other risk parameters.	No change
4	Several respondents requested clarifications on or changes to paragraph 132. Some requested the deletion of paragraph 132(a), since "customer product mix"	Regarding paragraph 132(a), the ECB considers that product transformations that occur between the reference and the default dates could lead to different treatments across institutions within the estimation process and ultimately introduce significant biases. Thus, model-relevant changes in	Amended

	<p>is not mentioned in the CRR. Others requested clarification on the application of this paragraph.</p> <p>Some respondents seem to have interpreted paragraph 132(b) as an expectation regarding risk quantification.</p>	<p>the product type should also be taken into account when analysing the risk parameters. An example would be two calibration segments separated by two product types. In each calibration segment the same risk drivers are used but lead to a different risk quantification of the CCF. In the case of intra-year changes to the product type it would be possible to systematically underestimate the CCF by assigning facilities to the calibration segment with the lowest CCF values. To avoid this potential bias, institutions should analyse and assess the impact of model-relevant product-changes (e.g. during validation) in order to ensure robust CCF estimates.</p> <p>Paragraph 132(b) has been redrafted in order to avoid misunderstanding.</p>	
5	Several respondents asked for realised CCF values to be capped, in order to avoid biases arising from raw CCF and after an in-depth investigation of the reason for such high values.	The ECB recognises the need for an appropriate treatment of extremely high values of realised CCF. However, the capping of CCF is not seen as an appropriate technique. Institutions are expected to investigate the triggers of these high values and then address them appropriately (e.g. segmentation in a separate bucket when they are driven by economic factors).	No change
6	Several respondents argued that the use of an arithmetic average of the yearly averages of realised CCFs is not compliant with Article 182(1)(a) of the CRR.	The ECB's understanding is that Article 182(1)(a) of the CRR does not exclude the interpretation reflected in paragraph 134(c), i.e. the use of the arithmetic average of the yearly averages of realised CCF. The comparison with LGD is also not deemed a valid argument. The rationale for the use of a number-weighted average for LGD is that this parameter captures the losses across the recovery process, which covers multi-year periods.	No change
7	Several respondents claimed that paragraph 136 is redundant, given the requirement under Article 182(1)(b) of the CRR for the CCF estimates to be appropriate for an economic downturn.	In accordance with Article 182(1)(a) and (b) of the CRR, institutions should provide both LRA and downturn CCF estimates. The reference to Article 182(1)(b) of the CRR has been deleted from paragraph 134 in order to express more explicitly that this paragraph is relevant for the purposes of LRA and CCF estimation. The expectations on downturn CCF estimation are reflected in paragraph 136.	Amended
8	One respondent requested more clarity on the downturn period selection.	In accordance with the EBA RTS on economic downturn, the downturn period is expected to be identified by type of exposures. It should therefore be the same for LGD and CCF, as long as the models cover the same type of exposures. Paragraph 136 has been updated following the publication by the EBA of the final draft RTS on the specification of the nature, severity and duration of an economic downturn (EBA /RTS/2018/04).	Amended
9	Some respondents claimed that the wording of paragraph 137(b) is not clear. They suggested that in specific cases, such as scarcity of data and low materiality of the scope of application, institutions should receive a fixed yet conservatively specified CCF, which they suggest should be 100%.	The purpose of paragraph 137(b) is to define those cases where the institution's option to predefine a fixed CCF value can be deemed to be an appropriate estimate.	No change

3.7 Model-related MoC (CR Section 7)

	Comment	ECB response and analysis	Amendment
1	Some respondents asked for clarification of the term "each year's default rate" in paragraph 140(a). It seems confusing, especially in cases where default rates are calculated from overlapping windows.	Paragraph 140(a) has been amended and this term has been deleted.	Amended
2	Some respondents expressed concerns about the level at which the MoC for the general estimation error should be estimated. In particular, they claimed that the quantification of the category C MoC at grade/pool level might produce undesirable effects such as changes in the rank ordering of exposures/obligors within a calibration segment. They asked the ECB to clarify that this MoC should be quantified at the level relevant for each calibration methodology	In accordance with paragraph 43(b) of the EBA GL on PD and LGD, the general estimation error should be computed at least for every calibration segment. This will be the case when the statistical uncertainty/sampling error is similar across grades. When the statistical uncertainty/sampling error of one grade might be significantly different from other grades as a result, for instance, of the number of observations per grade, it is the ECB's understanding that the MoC should be quantified at grade/pool level (information at other levels could be used for the quantification of each	Amended

	and/or at least at the calibration segment level.	grade's MoC as long as the resulting MoC adequately reflects the uncertainty of each grade). In line with paragraph 99 of the EBA GL on PD and LGD, it is the ECB's understanding that the margin of conservatism should not affect the rank ordering. With regard to potential changes in rank ordering, the ECB understands that institutions should be able to ensure monotonicity in their final estimates while still reflecting the uncertainty at grade/pool level. Paragraph 140(a) has been amended accordingly.	
3	Many respondents understood that variability of default rates across time is the main input for MoC calculation. This generated concerns about unintended effects, such as the incentive to use more PIT rating systems or to use shorter periods to calculate the LRA.	It was not the ECB's expectation that institutions use the variability of default rates across time as the main input for the MoC calculation. Paragraph 140(a) has been amended to clarify this.	Amended
4	Some respondents proposed that the quantification of the MoC should be in relation to the differences between estimation and observation.	The ECB considers that this is not the objective of the MoC, given that the estimation will always be subject to several sources of uncertainty, as described in the amended text of paragraph 140(a).	No change
5	Some respondents asked for clarification regarding the concept of "other estimates" in paragraph 140(b).	Paragraph 140(b) has been clarified.	Amended
6	Some respondents asked for clarification or even the deletion of paragraph 140(c), given that any reference to the uncertainty arising from the risk differentiation function (called "rank order estimation error" in the consultation paper on the EBA GL on PD and LGD) has been dropped from the final version of the EBA GL on PD and LGD. This would therefore be an additional expectation that is seen as inappropriate, since uncertainties regarding coefficient estimates, especially in multivariate models, do not reflect model output uncertainty.	Paragraph 140(c) has been deleted. Additional clarification on what should be considered in the MoC when using direct estimates is now included in paragraph 140(a).	Amended

3.8 Framework for review of estimates (CR Section 8)

	Comment	ECB response and analysis	Amendment
1	Several respondents asked for clarification of the expectations regarding the annual review of estimates, namely whether the intended outcome of this process is to necessarily update risk estimates (i.e. modify risk parameters) so as to ensure that new information is explicitly incorporated in the estimates	The objective of paragraph 141 is that institutions review their estimates whenever new information comes to light but at least on an annual basis. The re-estimated parameters are expected to come into play in the event of adverse results of the review, depending on the severity of the deficiency.	No change
2	Several respondents asked for clarification on the interlinkage between the requirements for the annual review (paragraph 218 of the EBA GL on PD and LGD), the full review of rating systems (paragraph 220 of the EBA GL on PD and LGD) and paragraph 144 of the guide. Respondents also requested additional guidance on the definition of materiality.	The full model review expectations are not fully independent of the deterioration evidence in terms of model performance analyses which are already covered within the regular annual review of estimates. For situations where the performance of the model in the sense of paragraph 218(b) GL on PD and LGDs is deteriorating, the need to conduct a full model review may be inevitable. In any case a regular cycle for the full model review of the rating system should be established, in accordance with paragraph 220 of the EBA GL on PD and LGD. Paragraph 144 of the guide provides clarity on the analysis expected to be conducted under specific circumstances, namely where the assignment of the grade is based on a statistical model and where there is a risk that slight changes in the ranking of the obligors, or in the boundaries between grades, could lead to significant changes in the risk-weighted exposure amounts (RWEA) in that portfolio. The ECB has clarified its expectations regarding the materiality of rating systems in Section 4.1 of the General Topics chapter of the ECB guide to internal models.	No change

4 Comments and amendments to the draft ECB guide to internal models – market risk chapter

The paragraph numbers in this chapter of the feedback statement refer to the market risk chapter of the ECB guide to internal models, unless noted otherwise.

4.1 Scope of the market risk chapter (MR Section 1)

No key comments are included in this feedback statement on Section 1 of the market risk chapter.

4.2 Scope of the internal model approach (MR Section 2)

	Comment	ECB response and analysis	Amendment
1	Respondents commented on the types of instruments, transactions and positions which are expected to be included in the regulatory trading book and in the banking book. In particular, respondents asked for further clarification on the expectations regarding equity investments in a fund and regarding cases where an institution is aware of the underlying investments of a fund on a daily basis.	Paragraphs 6 and 7 of the ECB guide set out a general presumptive list of types of instruments, transactions and positions in the trading book and banking book. While institutions may deviate from those lists, they are expected to justify such deviations. The guide has been amended (paragraph 7(f)) to clarify that equity investments in a fund for which the institution cannot obtain daily price quotes are expected to be included in the banking book. It also clarifies that, if look-through is possible, the underlying investments of a fund should be classified depending on the characteristics of the underlyings, irrespective of the availability of daily price quotes for the fund itself.	Amended
2	One respondent pointed out that for each risk category referred to in Article 363(1) of the CRR and for each type of instrument, transaction or position category referred to in paragraphs 6 and 7, some parts could be covered by the internal model approach (IMA) and others by the standardised approach (SA).	The respondent's remark is correct and paragraph 8 of the guide has been amended accordingly. Institutions should be able to indicate, for the categories referred to in paragraphs 6 and 7, to what extent the positions are in the scope of the IMA.	Amended
3	One respondent questioned the understanding expressed in paragraph 9 that internal transactions which are within both the regulatory trading book and the scope of the internal model should not contribute to the own funds requirements obtained using the internal model.	It is the ECB's understanding that an internal transaction which is both (i) within the trading book (i.e. both sides of the transaction belong to the institution's trading book) and (ii) within the scope of the IMA should not contribute to the risk exposure amount if the internal model is conceptually sound and implemented with integrity as required by Article 368(1) of the CRR.	No change
4	One respondent asked for clarification of paragraph 13, regarding the relation between banking book foreign exchange (FX) positions and the RNIME framework.	As stated in paragraphs 14 and 23 of the guide, where excluded from the internal model the banking book FX positions must be subject to own funds requirements calculated according to the SA. The RNIME framework is not a substitute for applying the SA for such positions. Instead, the RNIME framework serves to identify, quantify, and manage risks not captured by the risk engines of the positions in the scope of IMA.	No change
5	Respondents asked for further guidance on paragraph 15, regarding the processes and methodologies in place for determining FX positions. They pointed out that consolidation	Paragraph 15 is not intended to lay down or require the application of a particular standard to obtain FX positions. It states that institutions should have documented processes and methodologies in place for determining their FX	No change

	practices for FX exposures are not homogeneous in the industry and suggested that further guidance should be provided for the consolidation of FX positions.	positions. The consolidation of FX positions was not selected as a topic to be covered in the ECB guide to internal models.	
6	Respondents expressed concerns regarding paragraph 23 and the need to demonstrate that the level of own funds requirements under the SA is commensurate with the risks of positions excluded from the scope of the IMA.	Paragraph 23 refers to positions that an institution has deliberately excluded from the scope of the internal model. The paragraph has been amended to clarify that for such positions, institutions should be able to demonstrate that the level of own funds requirements under the SA is commensurate with their risks and that positions were not excluded for the sole purpose of reducing the own funds requirements for market risk.	Amended
7	Some respondents stated that unusual underlyings could not be hedged and asked if paragraph 24, which states that unusual underlyings could be included in the scope of the IMA, could be deleted from the guide.	The ECB considers that there is no restriction in the CRR on derivatives on unusual underlyings as mentioned in paragraph 24, and no restriction on applying the IMA to such derivatives.	No change
8	Respondents stated that the inclusion of defaulted debt in VaR and sVaR appeared unnecessary, because market factor volatility would no longer be relevant for these securities.	The ECB considers that, in principle, positions in defaulted debt have a price risk which should be captured where material. Therefore, paragraph 32 is considered to be appropriate.	No change
9	One respondent suggested that if the mandate of a collective investment undertaking (CIU) does not allow for positions bearing specific risk of debt instruments, the capital add-on charge for specific risk of debt instruments should not apply.	The additional own funds requirement for specific risk of debt instruments referred to in paragraph 40(a) of the guide, calculated by applying the SA according to Articles 348 to 350 of the CRR, may not result in additional own funds requirements in the situation described by the respondent.	No change

4.3 Regulatory back-testing of VaR models (MR Section 3)

	Comment	ECB response and analysis	Amendment
1	Some respondents proposed that paragraph 49 regarding the inclusion of banking book positions in regulatory back-testing should only apply to fair value instruments in the banking book.	The ECB acknowledges that a P&L calculation for non-fair-valued items in the banking book may be challenging and may require individual approaches. However, the P&L related to such foreign exchange and/or commodity risk positions in the banking book belonging to the scope of the internal model should be included in the regulatory back-testing P&Ls in order to ensure the alignment of the positions in the scope of the IMA and regulatory back-testing.	No change
2	One respondent commented on the definition of business days and the discretion of institutions to define their local business days. In particular, the respondent mentioned local holidays and the case of staff solely present for "firefighting" while no regular trading or similar operation is taking place.	The ECB understands that a trading unit of an institution being "in operation" means that the institution is conducting planned business operations, e.g. client servicing, re-balancing or re-hedging. Paragraph 57 has been amended to better clarify this aspect.	Amended
3	One respondent asked for additional clarification of the meaning of the last sentence in paragraph 60, regarding the "decomposition of economic, actual and hypothetical P&L into their elements".	The last sentence of paragraph 60 regarding the provision of detailed decompositions of economic, actual and hypothetical P&Ls into their elements refers to potential data requests for the purpose of analysing the differences between the P&Ls described in the first part of the paragraph.	No change
4	Some respondents asked for additional clarification as to which valuation adjustments or reserves should be documented.	Paragraph 66 has been amended to clarify that the documentation requirement refers to both valuation adjustments and reserves.	Amended
5	Respondents asked for additional clarification as to which adjustments could be considered within or outside the scope of market risk, especially with respect to different types of valuation adjustments (often referred to as XVAs).	Paragraph 67 has been aligned with paragraph 66 to clarify that it refers to valuation adjustments or reserves. Depending on the business model, trading strategy and specific circumstances of the institution, that institution should define the scope of market risk applicable in its internal models.	Amended
6	One respondent suggested that the last footnote in paragraph 75 on the use of market prices that incorporates all risks in the hypothetical P&L should be better aligned with the second sub-paragraph of paragraph 75.	The footnote has been amended as proposed by the respondent.	Amended

7	Some respondents highlighted that an overshooting of only the actual P&L and not of the hypothetical P&L might not result from intraday changes but could, for example, result from valuation adjustments. They suggested that an analysis of the difference between the actual and the hypothetical P&L be required.	Intraday changes are an important effect to consider, but they are not the only possible cause for an overshooting of the actual P&L in cases where there was no overshooting of the hypothetical P&L, as highlighted by the respondents. Paragraph 85 of the guide asks for an analysis of the intraday changes in the portfolio that affected the actual P&L change in order to assess the intraday effect. The verb "affect" does not rule out other causes for an overshooting of the actual P&L. In line with Section 3.7 of the MR chapter of the guide, institutions are free to include additional analyses, such as the one proposed by the respondents, in the analysis of overshootings; an amendment of the guide to require such a further analysis was not considered necessary.	No change
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4.4 Aspects of internal validation of market risk models (MR Section 4)

	Comment	ECB response and analysis	Amendment
1	One responded expressed concerns that Section 4 specified a number of tests to be performed in internal back-testing, such as the ones described in paragraphs 92(a) and (b) and 93(d) and (e), and pointed out that the CRR did not contain requirements for such tests.	In accordance with Article 369(1)(b) of the CRR, institutions must carry out their own internal model validation tests, including back-testing. While the CRR does not give further details, the ECB deems it appropriate to provide transparency as to what it considers to be best practice in this regard, i.e. the most appropriate manner in which to meet the requirements of the CRR. Following the best practice of the guide will help institutions ensure that they meet the requirements of the CRR. However, this does not prevent institutions from using additional tests that they deem necessary, or using other tests instead of those mentioned, provided they can justify their use.	No change
2	Respondents asked for additional clarification on the requirement to use hypothetical portfolios in the internal model validation for sVaR and IRC models.	In accordance with Article 369(1) of the CRR, institutions must have processes in place to ensure that all their internal models for market risk have been adequately validated. Therefore, the requirement of Article 369(1)(c) to use hypothetical portfolios in the internal model validation refers in particular to VaR, sVaR, and IRC models. Section 4.5 of the MR chapter of the guide explains that internal back-testing could be used to fulfil the validation requirements of Article 369(1)(c) of the CRR for VaR models. For sVaR or IRC models, validation methods involving hypothetical portfolios other than (internal or) any form of back-testing might be more suitable. As indicated in the section heading "Aspects of internal validation of market risk models", Section 4 of the MR chapter of the guide is not intended to comprehensively cover internal validation.	No change

4.5 Methodology for VaR and stressed VaR (MR Section 5)

	Comment	ECB response and analysis	Amendment
1	Respondents expressed concerns that the concept of "observable data" was not used in the CRR, observability criteria were not defined in the CRR, and the guide might front-load future regulation on the basis of the Fundamental Review of the Trading Book (FRTB).	The guide is based on the current applicable regulation. The ECB recognises that the term "observable data" is not defined in the CRR and could be perceived as already reflecting the FRTB. The guide was amended by replacing "observable data" with "objective data" in the MR chapter, as that is a term used in the CRR.	Amended
2	Some respondents questioned why institutions using a Monte Carlo simulation method should	The ECB acknowledges that the historical simulation method for VaR or sVaR has statistical error, as has the Monte Carlo	No change

	<p>have to demonstrate that the number of simulations used to compute the VaR and sVaR is sufficient. They pointed out that historical simulation-based VaR or sVaR models would also have a statistical error stemming from their finite sample size.</p>	<p>method.</p> <p>The statistical Monte Carlo error is a quantity that depends on the number of Monte Carlo realisations, a parameter set by the institution. For the Monte Carlo method, this does not depend on the historical observation period. Thus, the ECB considers that institutions should demonstrate that the number is sufficient in the case of VaR or sVaR models using the Monte Carlo method, as stated in paragraph 103.</p> <p>This does not express any preference on the part of the ECB regarding institutions' choice of a specific VaR or sVaR model methodology.</p>	
3	<p>One respondent noted that best practices and most common practices should not be confused and, in particular, that a better technique or practice may be fairly uncommon. In that sense, the respondent questioned the need for describing the ECB's view on best practices for return as in VaR or sVaR models in paragraph 104.</p>	<p>The ECB deems it appropriate to provide transparency as to what it considers to be best practice, i.e. the most appropriate manner in which to meet the requirements of the CRR. Following the best practice of the guide will help ensure that the requirements of the CRR are satisfied. However, it does not prevent institutions from using other assumptions, provided they can justify the use of those assumptions.</p>	No change
4	<p>One respondent pointed out that the request to "duly justify why the data points interpolated owing to the reduced granularity should not be considered as proxies" may be in contradiction with Article 367(2)(a) and (e) of the CRR.</p>	<p>As stated in paragraph 122 of the guide, a particular granularity of the set of risk factors for interest rates compliant with Article 367(2)(a) of the CRR does not necessarily lead to a proxy.</p> <p>If a granularity reduction does give rise to a proxy in accordance with paragraph 122 of the guide, Article 367(2)(e) of the CRR applies. Article 367(2)(e) of the CRR requires that a granularity reduction giving rise to a proxy should only be performed where the available data are insufficient or are not reflective of the true volatility of a position or portfolio.</p> <p>The guide has been amended by giving an example of interpolated data points that should not be considered as proxies.</p>	Amended
5	<p>Respondents noted that the modified hypothetical P&L data referred to in paragraph 128 for the assessment of proxies are not described in the CRR, could be operationally challenging, and could be perceived as front-running the FRTB.</p>	<p>On the basis of Article 10 of Council Regulation (EU) No 1024/2013 of 15 October 2013 (the SSM Regulation), the ECB can require institutions to provide all information that is necessary for supervisory purposes. In this context, paragraph 128 does not require the establishment of processes for the whole scope of the IMA on a permanent basis. Instead, in order to assess that proxies are appropriately conservative and reflective of the true volatility, for a selection of sub-portfolios, business days, and material proxies a calculation of the hypothetical P&L with the same proxied data used by the VaR and sVaR risk engine could be requested in the context of investigations or horizontal analyses. Ad hoc solutions in test environments are acceptable.</p> <p>The ECB is aware that it might not be possible to produce such data for all positions and/or that this could be operationally challenging. In such cases, institutions should justify why they are not able to produce the data and alternative ways of assessing proxies should be employed.</p> <p>The ECB could, on a case-by-case basis, provide more specific details on how to calculate the data when they are actually requested after assessing the specific situation, e.g. during an on-site inspection.</p> <p>The guide is based on the current applicable regulation. As explained in paragraph 128, the data are requested in order to assess whether proxies are appropriately conservative and reflective of the true volatility on the basis of the SSM Regulation and the CRR. Therefore, the guide does not front-run any future regulation originating from the FRTB.</p>	No change
6	<p>Some respondents pointed out that providing the modified hypothetical P&L data referred to in paragraphs 131 and 135 for the assessment of omitted risk factors and pricing functions, respectively, could be operationally challenging. It could also lead to non-meaningful results in the case of a VaR or sVaR engine using a reduced granularity on a curve (e.g. yield curve) compared with the economic P&L pricing.</p>	<p>The ECB acknowledges that there could be specific positions or situations that would require more specific considerations than the generic descriptions provided in paragraphs 131 and 135 of the guide. One example is using a reduced granularity of a yield curve in the VaR or sVaR engine described by a respondent.</p> <p>On a case-by-case basis the ECB could provide more specific details on how to calculate the data when the test is actually requested after assessing the specific situation, e.g. during an on-site inspection.</p>	No change
7	<p>Some respondents commented that "outstanding notional" as a materiality metric, as mentioned in paragraph 132(c), may be intuitive in some cases. For some derivatives, however, this metric may be ambiguous and could be operationally challenging to calculate across asset classes.</p>	<p>The ECB acknowledges the point raised by the respondents regarding the use of outstanding notional for the purpose of providing a meaningful indication of the materiality of positions priced with the corresponding pricing function. Paragraph 132(c) of the guide has been amended accordingly.</p>	Amended

8	Some respondents asked if a certain unit dedicated to the validation of pricing functions used for economic P&L and for their implementation in the VaR and sVaR engine could perform validation activities as described in paragraph 134.	In the public consultation the ECB does not provide assessments of specific organisational structures. In addition, the guide cannot cover all possible institution-specific organisational structures. Section 2.5 ("General principles for internal validation") of the general topics chapter of the ECB guide provides guidance intended to ensure the effective independence of the internal validation function from the model development process.	No change
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4.6 Methodology for IRC models focusing on default risk (MR Section 6)

	Comment	ECB response and analysis	Amendment
1	Respondents suggested that institutions choosing the one-year constant position assumption in an IRC model should not be required to demonstrate that this choice was appropriate to reflect the risk of their portfolio. They argued that this assumption could be considered as conservative.	In accordance with Article 367(1)(a) of the CRR, any internal market risk model must capture accurately all material price risks. As stated in paragraph 138, the ECB therefore considers that the institution should be able to demonstrate that the chosen assumption for the liquidity horizon appropriately captures the risk of its portfolio. This applies regardless of which of the two alternatives contemplated in Article 374(4) of the CRR is used for the liquidity horizon in an IRC model (constant level of risk over the one-year time horizon or one-year constant position assumption). The ECB acknowledges that when a constant level of risk over the one-year time horizon is used, higher validation efforts may be necessary than for the assumption of a one-year constant position, because the latter case could be viewed as simpler. However, even in the latter case, at least the validation requirements specified in paragraph 139 apply.	No change
2	Respondents expressed concerns about the need for a quantitative assessment of how maturity mismatches – which may lead to imbalanced positions within the modelling horizon – impact the IRC and the default risk in the IRC amounts.	In accordance with Article 376(3)(c) of the CRR, as part of the annual independent review and the initial and periodic validation of its IRC model, an institution must apply appropriate quantitative validation. Paragraph 139 does not lay down how the validation should be performed and each institution can employ to this end the methods and tests that it deems adequate. However, as stated in paragraph 139, the ECB considers that in accordance with Article 376(3)(c) of the CRR, the assessment should include a quantitative assessment of how maturity mismatches – which may lead to imbalanced positions within the modelling horizon – impact the IRC and the default risk in the IRC amounts. While some of the effects of maturity mismatches could be visible in the migration risk through the difference in the credit spread value change of one basis point (CS01) of instruments of different maturities, as stated by the respondents, other potential sources of risk underestimation could exist.	No change
3	Respondents also expressed concerns that according to some paragraphs in Section 6 of the MR chapter of the guide, impact studies, sensitivity analyses and monitoring should be carried out both for IRC and default risk in IRC (switching off migration risk). This would lead to additional calculation effort and was deemed by the respondents as being of limited value. They suggested that the calculations for default risk in IRC should be optional until the regulation based on the FRTB becomes applicable.	The ECB considers that impact studies, sensitivity analyses and monitoring should be carried out both for IRC and for default risk in IRC, as described in Section 6 of the MR chapter of the guide. The aim is to analyse whether one of the two risks is the dominant driver of the IRC number and requires special scrutiny.	No change
4	Respondents commented that in paragraph 151 the number of flat correlation values was too high and suggested reducing it by one half.	The ECB considers that the number of flat correlation values in paragraph 151 is appropriate because the series of values spans the theoretical range from 0 to 1, while having less dense values at very high flat correlations.	No change
5	Some respondents expressed concerns over the guide's interpretation of the term "greater than zero" in paragraph 158 as meaning greater than, or equal to, one basis point. They argued that a zero probability of default resulted from calibration based on observations	The ECB considers that the clarification in paragraph 158 that a probability of default (PD) "greater than zero" means greater than, or equal to, one basis point, ensures a level playing field across institutions. Moreover, the ECB considers that the absence of default observations in a certain time range for an obligor or set of	No change

	in the absence of a default occurrence in the data history.	obligors does not necessarily mean that the probability of default is zero.	
6	Some respondents suggested that paragraph 161 be changed by replacing the unweighted approach for the fallback PD calculation with a weighted one.	The application of an unweighted average provides an appropriate, simple and robust method of obtaining a possible fallback PD for obligors for which a reliable PD assignment is not possible, as described in paragraph 161, considering that transferring PDs from the rated to the unrated portfolio is a strong assumption.	No change
7	Some respondents suggested that institutions should be allowed to exclude defaulted issuers from the fallback PD calculation of paragraph 161(b) if they had established processes to ensure that unrated obligors did not contain defaulted obligors.	The ECB acknowledges that the fallback PD as described in paragraph 161(b) may be over-conservative in cases where an institution can demonstrate that the population of unrated obligors to which the fallback PD is applied does not include defaulted obligors. Paragraph 161 has been amended accordingly.	Amended
8	One respondent expressed concerns about Section 6.6 of the MR chapter of the guide, noting that Article 376(3) of the CRR did not explicitly mention groups of connected clients. The respondent asked for additional clarification of the relationship between issuer concentrations and groups of connected clients.	As explained in paragraph 167 of the guide, the ECB considers that groups of connected clients are relevant for modelling issuer concentrations. Therefore, such groups should be appropriately reflected in the IRC model and their treatment in the model is subject to the same requirements as any other component of the model, in particular documentation and validation. This understanding by the ECB is supported by Recital (53) of the CRR, which states that "... excessive concentration of exposures to a single client or group of connected clients may result in an unacceptable risk of loss".	No change

4.7 Risks not in the model engines (MR Section 7)

	Comment	ECB response and analysis	Amendment
1	<p>Respondents understood that the RNIME would be an IMA engine like VaR, SVaR, IRC and CRM, which would require RNIME to have the same standing as these components (e.g. initial approval, application of model change RTS). They suggested reverting to the 2017 concept of RNIME and avoiding any extension of the current IMA. Respondents were concerned that defining RNIME as part of the IMA might exceed the CRR requirements around the completeness of the price risk capture.</p> <p>One respondent was concerned that many banks already have a risks not in VaR (RNIV) framework in place or set up as prescribed by the initial ECB guide from February 2017. The respondent felt that it would be desirable to allow some flexibility in following ECB guidance while also retaining a consistent global framework for identifying and quantifying RNIME.</p>	<p>The risks not in the model engines (RNIME) framework does not constitute an additional engine in the sense of a risk measurement model like the VaR, sVaR, IRC, or CRM model. The ECB understands that the RNIME framework complements the IMA model engines, especially to address their deficiencies. Paragraphs 170, 173 and 186 of the guide were amended to better convey that the RNIME framework is a compilation of processes as outlined in the RNIME section.</p> <p>The ECB considers that work done by institutions on risks not in the model engines on the basis of the 2017 draft version of the guide is still useful in meeting the expectations of this version of the guide.</p>	Amended
2	Respondents suggested that it should be possible to discard back-testing overshootings in cases where the overshooting resulted from an RNIME which had been sufficiently capitalised through an RNIME add-on. They were concerned that a double penalty might otherwise occur whereby an RNIME could be capitalised through an RNIME add-on and through an increased back-testing addend to the VaR and stressed VaR multiplication factor according to Article 366(2) of the CRR. To prevent this issue from arising, some respondents argued that RNIME add-ons that could be aggregated with the VaR on the basis of robust correlation assumptions, such that the resulting risk metric was risk sensitive, should be taken into account in the regulatory back-testing in the same way as "satellite components" are.	<p>Under Article 366 of the CRR, it is not possible to discard single overshootings. The ECB is aware that in rare cases back-testing overshootings may be caused by certain risks not being captured in a VaR engine, leading to an increase in the back-testing addend to the multiplication factor, while an RNIME add-on might be in place at the same time covering the same risk. However, the RNIME add-on is a temporary measure, until the related risk not captured is incorporated in the model engine(s). Consequently, the RNIME add-on is not included in the VaR number that is compared with the regulatory P&Ls in accordance with Article 366 of the CRR.</p> <p>Moreover, the ECB understands that RNIME can be incorporated into the relevant engine in different ways if all the relevant CRR requirements are fulfilled. This could also be in the form of satellite components.</p>	No change
3	One respondent asked for clarification of whether RNIME add-ons are part of the IMA own fund requirements and how this relates to	Figure 4 in paragraph 171 of the guide has been amended to better explain the relationship between RNIME add-ons, on the one hand, and market risk own funds requirements and	Amended

	the IMA own fund requirements as stated in Article 364 of the CRR.	risk exposure amounts, on the other. A footnote has been introduced to clarify in which COREP field the RNIME add-ons should be reported.	
4	Some respondents suggested that the differences between RNIME add-ons and satellite components should be clarified. They explained that both encompass risks not modelled in the "main component".	For both the satellite component and the RNIME add-on, further explanations have been added to paragraph 171 of the guide to better explain the difference between the two.	Amended
5	Respondents expressed concern that the list of risks in paragraph 174 which may potentially give rise to RNIME was very broad and included items that are outside the scope of day-to-day risk monitoring activities, which are designed to ensure that any material price risks are identified. They argued that most of the risks mentioned under paragraph 174(b) would be better captured under the Model Risk Framework, which could be subject to Pillar 2 capital requirements, and that items such as "weaknesses and limitations in the stochastic modelling of risk factors" were not strictly "price risks". These risks should be subject to a periodic internal review and validation process, leading, if deemed material, to model adjustments or improvements. The respondents were also concerned that proxies are specifically mentioned in paragraph 174(a) of the guide as a potential source of RNIME, while Sections 5 and 6 of the guide specifically deal with handling such proxies within model engines. Moreover, banks with specific risk approval are already required to model basis risk as a result of proxying.	<p>The list of potential risks not in the model engines in paragraph 174 of the guide is intentionally broad, but still not exhaustive. The listed items should be treated in accordance with paragraph 175 of the guide. Paragraph 175 further explains that not all items mentioned in paragraph 174 necessarily give rise to a risk not captured in an engine and requiring further action by the institution. As the RNIME framework is based on the CRR requirements for the IMA as laid out in paragraph 170 of the guide, treatment under Pillar 1 is required.</p> <p>The ECB considers the use of a proxy to be a potential source of a risk not captured in an engine. However, if the validation confirms that the proxy use is compliant with the CRR and the principles laid out in this guide and does not lead to a risk underestimation, that use does not give rise to an RNIME.</p> <p>The ECB considers that monitoring weaknesses and limitations in the stochastic modelling of risk factors periodically in an internal review and validation process that could lead to a model improvement if the weakness or limitation is deemed material may be in line with the expectations expressed in the guide regarding RNIME management.</p>	No change
6	<p>Some respondents welcomed the introduction of an incremental risk number method for the quantification of the RNIME as a more accurate method than the stand-alone risk number method in the February 2017 version of the guide. However, they mentioned that in some cases data availability may be limited and stress-based RNIME calibrations should be allowed as part of the incremental risk number method. They highlighted that appropriate approximations and assumptions should be allowed in order to estimate the incremental risk number in cases where full time series of data were not available.</p> <p>Some respondents also highlighted that institutions may rely on a stress test approach based on expert judgement (as mentioned in paragraph 180 of the guide) to quantify RNIME. This approach would be more conservative than a loss at 99% confidence level and a holding period of ten days for VaR or sVaR or a 99.9% confidence level over a time horizon of one year for IRC.</p>	<p>The ECB considers that approximations are possible in the quantification of the RNIME. Paragraph 178 of the guide has been amended to clarify that the RNIME estimation methodology can use appropriate approximations, assumptions, or a stress methodology when this is duly justified and documented. The ECB understands that approximations are also possible in the stand-alone VaR quantification. Therefore, paragraph 179 of the guide has also been amended in line with the amendment to paragraph 178.</p> <p>However, the ECB does not share the respondents' view that a stress test approach based on expert judgement (as referred to in paragraph 180) is necessarily more conservative than a loss at the relevant confidence level and holding period.</p>	Amended
7	Respondents suggested that, whenever possible, institutions should be given the flexibility to recognise diversification between different RNIME instead of the simple arithmetic sum that in their view would result in an overstated cumulative impact quantification. They argued that a quadratic formula (square root of the sum of squared RNIME impacts) might be a more suitable way of aggregation. Some respondents also pointed out that the 2017 version of the guide allowed two options in the event of an RNIME cumulative impact higher than the 10% threshold (paragraph 176(b)): "the setup of an action plan by the institution to include one or more RNIME or the demonstration that the effect of the RNIME is not material, while taking into account the diversification benefit". They noted that the latter of the two options is no longer available, while in their view it had been a reasonable approach.	<p>The version of the guide on which the consultation took place envisages the possibility of quantifying RNIME using an incremental risk number that is typically significantly smaller than a stand-alone risk number as set out in the 2017 version of the guide.</p> <p>The ECB understands that the stand-alone impact quantification of a single RNIME may already be demanding. As such risks are not in an engine in the first place, many respondents mentioned that the calculation of an incremental risk number is even more challenging. Therefore, the ECB considers that the diversification effect between the different RNIME cannot reasonably be estimated. Consequently, this effect should not be recognised in the cumulative impact quantification. In order to benefit from risk diversification, risks need to be incorporated in the relevant engine. Thus, the possibility of demonstrating that, when diversification is taken into account, the cumulative effect of RNIME is below the threshold has been removed.</p> <p>In addition, it should be noted that a single RNIME does not necessarily correspond to a single risk factor in accordance with paragraph 174.</p>	No change
8	Some respondents were concerned about the (at least) quarterly frequency for quantifying	The quarterly monitoring refers to RNIME that are already identified and have a quantification method and not to the	No change

	and monitoring RNIME. They argued that there was no basis in the CRR that would require institutions to capitalise RNIME add-ons in the own funds requirements in Pillar 1. The reference to Article 99 of the CRR for RNIME quantification was therefore not feasible and the frequency of quantification should be “at least annually” instead of “at least quarterly”.	update of the RNIME inventory in line with paragraph 176 of the guide. The ECB considers that a quarterly monitoring of RNIME is appropriate in order to assess whether all material risks are captured in the quarterly reporting of own funds requirements. Thus, the ECB considers the reference to Article 99 of the CRR to be appropriate.	
9	Some respondents asked for clarification that the cumulative impact quantification only includes non-capitalised RNIME in the numerator of the ratio for cumulative impact calculation.	The ECB considers that the purpose of the cumulative impact assessment is to check whether enhancements or improvements of the relevant model engines are needed. Therefore, all RNIME, regardless of whether they are already subject to an RNIME add-on, should be included. A clarification has been added to paragraph 183 of the guide.	Amended
10	One respondent asked for an amendment to footnote 145 of the guide, which states that the comparison of RNIME numbers should be performed using the 60-day (or 12-week) averages of VaR or sVaR. The respondent argued that the comparison of the RNIME numbers should be with the VaR or sVaR of the same date and explained that the RNIME numbers are based on the positions as at a certain date, while the averages take different positions into account.	The use of the 60-business-day (or 12-week) average risk numbers for comparison purposes is intended to increase stability and make it possible to use the same basis (denominator) for all comparisons in the monitoring. The RNIME impact numbers, however, may pertain to different dates.	No change
11	One respondent was concerned that paragraph 183 stipulated that the RNIME numbers should be capitalised by applying the VaR or sVaR multiplication factors (m_v and m_s). These include a back-testing addend that is determined on the basis of back-testing of VaR where RNIME add-ons are not included.	As the RNIME add-ons are not included in the VaR or sVaR numbers, the multiplication factors of the RNIME add-ons do not need to take into account the back-testing addend resulting from the VaR back-testing. Paragraph 183 of the guide has been amended accordingly. This also mitigates the potential double-counting effect (see item 2 of this feedback list) of RNIME add-ons, as raised by some respondents.	Amended
12	One respondent was concerned that the RNIME framework did not specify any transition to the non-modellable risk factor (NMRF) concept that will be established in the upcoming FRTB. The respondent asked whether the proposed RNIME framework is only seen as a temporary framework which will no longer be used once the NMRF framework is in place. The respondent also asked how an efficient transition towards FRTB could be achieved.	The ECB guide to internal models expresses the ECB's understanding of the relevant current legislation, in particular CRR requirements, and not future FRTB requirements. Consequently, the RNIME framework is based on the CRR requirements mentioned in paragraph 170 of the guide. These include the requirement that all model engines should be conceptually sound and capture all material price risks. The RNIME framework helps to ensure that those requirements are met.	No change
13	Respondents were concerned that a regulatory model change process treatment for RNIME would congest the model change process of supervisory approvals even further. In their view, this was already considered to be a bottleneck to normal model maintenance operations. They proposed regular (e.g. quarterly) reporting of the status of the RNIME framework as an alternative. They also proposed that a model change process should only be triggered to initially validate the overall framework or in the event of major organisational changes to the validated framework.	The ECB understands that changes to the RNIME framework (including the initial set-up) should be notified ex ante, rather than the application for material model changes requiring prior permission from the competent authorities. While the consideration of new types of RNIME or a change in the impact quantification methodology are considered to be a change to the RNIME framework, the identification of an individual RNIME of an already known type (i.e. which does not need new methodologies or processes to be implemented) should not be considered a change to the RNIME framework. Paragraph 186 of the guide has been amended to better explain in which cases regulatory ex ante model changes might need to be triggered.	Amended
14	One respondent suggested that the first section of paragraph 186 should be removed. It explains that changes to the RNIME framework should be assessed in accordance with Commission Delegated Regulation (CDR) on the materiality of extensions and changes of the IMA. The respondent explained that the CDR sets thresholds for changes in terms of VaR or sVaR numbers, which by definition do not include RNIME.	The CDR on materiality of extensions and changes of the IMA covers all model changes. It classifies them with regard to the need for ex post or ex ante notifications and applications for material model changes requiring prior permission from the competent authorities using different criteria (including qualitative criteria). As explained in paragraph 186, changes to the RNIME framework should be notified ex ante. The introduction of an RNIME add-on based on the current RNIME framework does not constitute a model change and thus does not require a quantitative assessment (as outlined in paragraph 187 of the guide).	No change

5 Comments and amendments to the draft ECB guide to internal models – counterparty credit risk chapter

The paragraph numbers in this chapter of the feedback statement refer to the counterparty credit risk chapter of the ECB guide to internal models, unless noted otherwise.

5.1 Scope of the CCR chapter (CCR Section 1)

No key comments are included in this feedback statement on Section 1 of the counterparty credit risk chapter.

5.2 Trade coverage (CCR Section 2)

	Comment	ECB response and analysis	Amendment
1	A large number of comments referred to the identification of price differences and the thresholds to be applied.	The order of paragraphs has been amended to provide more clarity. Set thresholds are no longer proposed, but banks should apply their own thresholds to identify transactions whose pricing in the IMM differs significantly from benchmark systems. Paragraph 12 has been amended accordingly.	Amended
2	One respondent proposed the deletion of the carve-out measure.	The order of the paragraphs has been changed and paragraph 13 amended to clarify that carve-outs are only one possible measure which institutions can implement to address the issue of significant pricing model deficiencies. Other measures can also be adopted for the same purpose.	Amended
3	Some respondents recommended that the business days on which differences are observed should be consecutive.	It is seen as good practice that significant pricing differences, identified ten times in a quarter, are taken to be relevant, even if these days are interrupted by periods of better alignment. Institutions can pre-determine another criterion for the persistence of price differences. This criterion will then require documentation, justification and validation. Paragraph 13 has been amended accordingly.	Amended
4	Some respondents deemed one-sided adjustments of exposure profiles for transactions remaining in the IMM to be overly conservative and operationally burdensome.	In the event of unacceptable performance by pricing models, adjustments are possible in both directions. However, effective EPE (EEPE) after corrections should not be lower than EEPE without any adjustment. This has been clarified in paragraph 16.	Amended
5	Most respondents voted for option 2 regarding alternative exposure calculations.	The methods mentioned under option 2 can be applied subject to more refined conditions, for example only if it can be demonstrated that their valuation would otherwise lead to performance issues. Furthermore, they should be subject to strict validation rules. This has been reflected in paragraph 17.	Amended

5.3 Margin period of risk and cash flows (CCR Section 3)

	Comment	ECB response and analysis	Amendment
1	Numerous comments have been received on cash flow spikes and add-ons, most of them in favour of the general add-on methodology and opposed to the effectivisation of spikes.	The spike annex will not be part of the final guide (see paragraph 21).	Amended
2	Some comments were received regarding trade-related cash flows after the beginning of the margin period of risk (MPOR). Respondents argued that the modelling can be appropriate without the assumption of "no cash flows received" and that trade-related cash flows depend strongly on the default assumption of the counterparty during the MPOR.	Paragraph 20 has been amended to clarify that an institution may assume that trade-related cash flows can be received after the beginning of the MPOR only if it can justify its modelling assumptions, for example regarding the default time of the counterparty.	Amended

5.4 Collateral modelling (CCR Section 4)

	Comment	ECB response and analysis	Amendment
1	The wording of the paragraphs on FX risk in the context of volatility adjustments (haircuts) was confusing for some participants.	The paragraphs have been revised to reflect the different underlying steps and to clarify how the FX risk during the MPOR should be accounted for in cases where volatility adjustments are used.	Amended
2	A number of respondents asked for clarification and more guidance on how to model or estimate the future collateral composition.	The guide has been amended to mention explicitly the use of comparable counterparty information and similar collateral characteristics as a proxy. Another treatment taking into account the institution's own collateral policies is now also possible.	Amended
3	A few respondents asked for the CRR reference regarding the collateral split between synthetic netting sets.	The CRR reference has been added; the guide also clarifies in paragraph 28 that other approaches to assign the margin collateral can be chosen if justified and prudent.	Amended

5.5 Modelling of initial margin (CCR Section 5)

	Comment	ECB response and analysis	Amendment
1	Respondents suggested that the complexity and diversity of initial margin (IM) methodologies should be reflected more fully in the guidance for IM modelling.	Paragraphs 38 and 39 have been amended to better explain that changes in the netting set composition are one key element of forward variability that has to be reflected. The amendment also acknowledges that a different treatment can be considered when it is prudent and justified.	Amended
2	Respondents asked for greater clarity regarding the scope of initial margin in the IMM for which the modelling guidance should apply.	The wording of paragraph 38 has been amended to better highlight that only IM in the IMM is addressed. The section does not provide an interpretation of the CRR that would clarify whether or not certain specific contracts with IM clauses qualify for treatment under the IMM as this is dependent on the contracts' individual specificities.	Amended

5.6 Maturity (CCR Section 6)

	Comment	ECB response and analysis	Amendment
1	Respondents remarked that the list of instruments mentioned as part of securities financing transactions (SFTs) in the guide was misaligned with Article 162(2) of the CRR.	The list of instruments referred to in paragraph 43 has been refined to align more closely with the CRR, specifically for the case of SFTs in the IMM.	Amended
2	A number of respondents commented on the transaction maturity of open term repos, in particular those with a termination right.	Paragraph 44 has been revised to consider a maturity as being the higher of the MPOR and the contractual first date at which the transaction can be terminated.	Amended
3	Some respondents remarked that the mandatory early termination clauses (ETCs) should be applied consistently to calculate M and EEPE following the example established in the principle with respect to the transaction maturity for open term SFTs.	Paragraph 45 has been changed, i.e. now it addresses how the transaction maturity is used to calculate both M and EEPE.	Amended
4	Respondents suggested that risk reductions due to optional ETCs should be recognised.	Only mandatory ETCs are relevant for the M parameter and EEPE calculations, because optional ETCs would require a modelling of exercise probabilities and would make the framework overly complex.	No change

5.7 Granularity, number of time steps and scenarios (CCR Section 7)

	Comment	ECB response and analysis	Amendment
1	Regarding the grid point density, respondents remarked that the effect of the Monte Carlo error should be accounted for when performing the grid density impact assessment.	Paragraph 50 has been clarified to reflect that the impact of any numerical error resulting from the number of scenarios can be taken into consideration to avoid potential double counting in the impact assessment.	Amended
2	Respondents also noted that the impact assessments for the grid density and the Monte Carlo error could be performed either on the full scope or on a subset of representative portfolios as defined in the glossary of the guide.	Paragraphs 50 and 51 have been amended to clarify that the impact assessments can be performed on representative sub-portfolios as defined in the counterparty credit risk glossary.	Amended

5.8 Calibration frequency and stress calibration (CCR Section 8)

	Comment	ECB response and analysis	Amendment
1	Respondents noted that the proposed calibration frequency of the model used for internal risk management purposes was higher than the minimum requirement set out in the CRR.	Paragraph 55 has been modified to highlight that the ECB considers the monthly (or higher) calibration frequency as being good practice to minimise the risk of non-compliance with Article 292(2) in conjunction with Article 289(5) of the CRR. An outdated calibration might no longer adequately reflect market conditions or the exposure profile.	Amended

5.9 Validation (CCR Section 9)

	Comment	ECB response and analysis	Amendment
1	A number of comments asked for further clarification of the requirements regarding the independence of validation, in particular the ownership of certain parts of the validation framework/task split between model development and model validation.	Paragraph 59 has been amended to make the interpretation of the requirements slightly less strict and demand "only" an effective, thorough review by the independent validation function. Hence, sub-paragraph (a) has been deleted and sub-paragraph (c) has been modified accordingly.	Amended
2	Respondents questioned the ECB's stance on the mandatory levels of back-testing and asked that it be taken into account that the CRR clearly allows for hypothetical or actual portfolio back-testing.	Paragraph 62 has been aligned with the CRR and states that back-testing at both hypothetical and actual portfolio level is seen as good practice.	Amended
3	A couple of commenters felt that a definition of the term "risk factor" is needed.	A generic definition of risk factors is not considered necessary; furthermore, footnote 205 already provides the necessary information.	No change
4	With respect to the back-testing coverage ratios, there were proposals to remove the "number-based" approach as well as the pre-defined 50% threshold.	The simple number-based approach (which can be calculated easily) has been kept in order to provide and report numbers that can be compared with, for example, a sensitivity-weighted approach. The pre-defined threshold of 50% has been dropped, i.e. validation functions can set their own internal thresholds. However, on request, institutions should always be able to provide justification of any of the respective reported coverage ratios. Paragraph 64 has been amended to reflect the above changes.	Amended
5	Some comments highlighted the effort required to maintain consistency between predictions and realisations within the actual portfolio back-testing; problems relating to collateral were also mentioned.	Consistency of predictions and realisations in back-testing is seen as a key factor for sound and adequate methodologies. Therefore, all efforts in this regard are regarded as important and indispensable. Furthermore, the principle is not written in a restrictive way, i.e. all approaches that take possible portfolio changes into account and that handle them appropriately are considered reasonable. As regards back-testing of collateralised portfolios, the ECB is aware of difficulties in reflecting collateral. However, it should be up to the institutions to establish a proper back-testing methodology or alternative validation activities in this regard.	No change
6	Regarding the back-testing of different risk measures, a more precise definition of exposure was requested.	A more precise definition of exposure is provided in the updated footnote of paragraph 68.	Amended
7	One respondent commented that back-testing at transaction level is too time-consuming and unnecessary.	Back-testing at transaction level is seen as good practice; it can also be conducted only on a representative (possibly even hypothetical) subset of the full IMM portfolio.	No change
8	Some respondents asked for clarification as to the level or sample on which the validation of approximated pricing functions were expected to be performed and on which alternative ways to calculate exposure should be applied.	As written, the paragraph does not specify on which sample the assessment should be conducted. It has been kept open deliberately in order to give institutions some flexibility. However, samples should always be constructed to be fit for purpose and institutions should be able to justify their chosen approaches.	No change
9	One respondent claimed that approximated pricing functions should be acceptable if they do not lead to an exposure underestimation bias.	The effect of approximated pricing functions should be assessed mainly in terms of market value/market value changes. The ECB's view is that the price should be as precise as possible (cf. also the benchmarking requirements and the expectation to adjust the exposure resulting from detected price differences). The fact that the relationship between long versus short positions is subject to frequent change should also be taken into account.	No change
10	Some respondents raised doubts regarding the requirement to compare exposures calculated using alternative exposure methods with those calculated using a non-IMM method.	Paragraph 71 has been amended. A comparison with non-IMM methods is no longer expected.	Amended

5.10 Effective expected positive exposure (CCR Section 10)

	Comment	ECB response and analysis	Amendment
1	A number of comments were received on the EEPE formula rescaling for netting sets with the maturity of their longest transaction less than one year.	The corrigendum to regulation (EU) No 575/2013 of 25 January 2017 has been inserted in paragraph 74, together with a clarification of the time unit in paragraph 75.	Amended

5.11 Alpha parameter (CCR Section 11)

No key comments are included in this feedback statement on Section 11 of the counterparty credit risk chapter.

5.12 CCR glossary

	Comment	ECB response and analysis	Amendment
1	Respondents remarked that the definition of representative sub-portfolios was too restrictive.	The definition of representative sub-portfolios has been refined.	Amended

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For specific terminology please refer to the [SSM glossary](#) (available in English only).