EBA/GL/2019/03

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Final Report

Guidelines for the estimation of LGD appropriate for an economic downturn ('Downturn LGD estimation')

Contents

1. Executive summary

These guidelines (GL) specify how loss given default (LGD) appropriate for an economic downturn, which has been identified in accordance with the final draft Regulatory Technical Standards (RTS) on economic downturn, should be quantified. They supplement the Guidelines on PD estimation, LGD estimation and the treatment of defaulted assets (EBA/GL/2017/16)[1] of 20/11/2017 (GL on PD and LGD estimation) and provide specific guidance on how to estimate LGD appropriate for an economic downturn.

These GL are hence an addendum to the GL on PD and LGD estimation, which are part of the European Banking Authority's (EBA's) roadmap to reduce unwarranted variability of risk parameters and own funds requirements. As such, this publication completes the plan outlined in the report on the review of the Internal Ratings-Based (IRB) approach published in February 2016.[2,3] The policy for downturn LGD estimation builds on the notion of an economic downturn that is specified in the final draft regulatory technical standards on the specification of the nature, severity and duration of an economic downturn in accordance with Articles 181(3)(a) and 182(4)(a) of Regulation (EU) No 575/2013 (CRR), published on 16 November 2018.[4]

The RTS on economic downturn set out the requirements for the identification of an economic downturn for the type of exposures covered by a rating system. As a rating system may, however, cover exposures from different businesses, sectors and geographical areas, the notion of an economic downturn set forth in the RTS may comprise several distinct downturn periods. The GL for downturn LGD estimation provide guidance on how to calibrate downturn LGD appropriate for an economic downturn, taking into account the downturn period(s) identified in accordance with the RTS. To this end, the GL differentiate three types of approaches for calibrating downturn LGD:

(i) type 1 approaches, based on the observed impact on losses of a particular downturn period;

(ii) type 2 approaches, where such an impact on losses has not been observed (e.g. because the downturn periods identified in accordance with the RTS have occurred too long ago) but the impact can be estimated using a limited set of methodologies;

[1] https://eba.europa.eu/documents/10180/2033363/Guidelines+on+PD+and+LGD+estimation+%28EBA-GL-2017-16%29.pdf/6b062012-45d6-4655-af04-801d26493ed0

[2] https://www.eba.europa.eu/-/eba-sets-out-roadmap-for-the-implementation-of-the-regulatory-review-of-internal-models

[3] It should be noted that the work on the RTS on economic downturn (which was a single item in that plan) has been split into the specification of the notion of an economic downturn and these GL providing guidance on how to incorporate such a downturn into LGD estimates.

[4] https://eba.europa.eu/-/eba-publishes-final-draft-technical-standards-on-the-specification-of-an-economic-downturn

(iii) type 3 approaches, where neither type 1 nor type 2 approaches can be applied and therefore institutions may apply their preferred modelling approach but have to comply with a minimum margin of conservatism (MoC) requirement.

Although the downturn LGD estimates should optimally be quantified based on the observed loss data, this approach is permitted only where relevant and sufficient loss data to analyse the observed impact of the downturn period under consideration are available. If this is the case, downturn LGDs should be quantified based on observed data reflecting the impact of the downturn period under consideration. However, if no loss data are available to calibrate downturn LGD for a particular downturn period based on observed data, it may be possible to estimate the impact on the losses of this downturn period. Therefore, in the latter case institutions are required to calibrate downturn LGD through more prescriptive approaches. Two methodologies are allowed in this case, namely the extrapolation and haircut approaches (or a combination of the two). Under both methodologies and in line with paragraphs 37, 42 and 43 of the GL on PD and LGD estimation, an appropriate MoC to cover for the lack of data (Category A MoC) will in addition be required. Finally, a third approach is available in cases where no relevant loss data are available for the downturn periods under consideration and institutions can justify to the satisfaction of the competent authorities that they cannot apply the extrapolation and/or haircut approach or a combination of the two. In this case, institutions may apply their preferred modelling approach, but have to add MoC to cover for the methodological and data deficiencies, such that the downturn LGD estimates including MoC are equal or higher than the long-run average LGD plus 15 percentage points, capped at 105%.

Last, a reference value is introduced that acts as a non-binding challenger to the final downturn LGD estimation and as a guide for the supervisory assessment of the appropriateness of the resulting quantification. This means that the reference value acts as a challenger to the whole downturn LGD estimation, including the proper identification of the downturn period(s) pursuant to the RTS on economic downturn.

These GL provide requirements for the calibration of downturn LGD. Given this, they provide for a different calibration target next to the long-run average. Therefore, these GL do not touch upon issues related to model development.

The guidelines will support the appropriate quantification of downturn LGD. Like the GL on PD and LGD estimation, it is expected that these GL will lead to material model changes for a significant number of rating systems. In this context, it should be recalled that these GL are an addendum to the GL on PD and LGD estimation and that therefore the proposed phasing-in approach, as well as the deadline of at latest end-2020 for the final implementation, set out in the EBA's Opinion on the implementation of the review of the IRB approach,[5] published by EBA in February 2016, will apply.

[5] https://eba.europa.eu/documents/10180/1359456/EBA-Op-2016-01+Opinion+on+IRB+implementation.pdf

2. Background and rationale

2.1 Introduction

1. The quantification of downturn LGD has been challenging for competent authorities, industry and academics alike ever since the Basel II framework introduced this concept. The requirement for loss given default (LGD) and conversion factor (CF) estimates to reflect economic downturn conditions was introduced in the Basel II capital framework and stems from the general economic model that is used to derive the formula for calculating minimum own funds requirements. In the Basel II capital framework, unexpected losses are based on the conditional expected loss given a high confidence level for the single systematic risk factor leading to high credit losses. Whereas the risk weight formula includes a supervisory mapping function to derive conditional probabilities of default (PDs)[6] from unconditional long-run average PDs estimated by the institutions, it does not provide an explicit function that would transform long-run average LGDs and exposures at default (EADs) into conditional LGDs and exposure values (respectively CFs). Instead, it requires institutions to use LGDs that are appropriate for an economic downturn. The lack of explicit guidance and limited supervisory and industry consensus on how to incorporate the economic downturn component in model estimation has led to significant differences in practices and has given rise to unwarranted variability in risk-weighted exposure (RWE) amounts when own estimates of LGDs and/or CFs are used.

2. These guidelines (GL) understand downturn LGD estimation as an aspect of risk parameter quantification – in line with the specification of the respective requirements in Sub-Section 2, Section 6, Chapter 3 of Regulation (EU) No 575/2013 (CRR). This implies, most importantly, that the quantification of downturn LGD should refer to the same LGD model used for the assignment of facilities to facility grades or pools that is relevant to the long-run average LGD estimation. Thus, it is expected that the assignment to facility grades and pools within a given calibration segment should not change due to downturn LGD estimation. These GL do not apply to CF estimation appropriate for an economic downturn.

Context of downturn LGD estimation

3. In general terms, the European Banking Authority (EBA) is fully supportive of allowing a diversity of model practices. The strength of internal models lies in the ability of institutions to model on institution-specific data, which ensures a high degree of risk sensitivity and constitutes an important characteristic of own funds requirements that should be maintained. It is, however, also clear that this requires sufficiently granular data and specific guidance on the calibration targets. In this context, these guidelines focus on the calibration target, i.e. LGDs appropriate for an economic downturn (downturn LGDs), and not the calibration

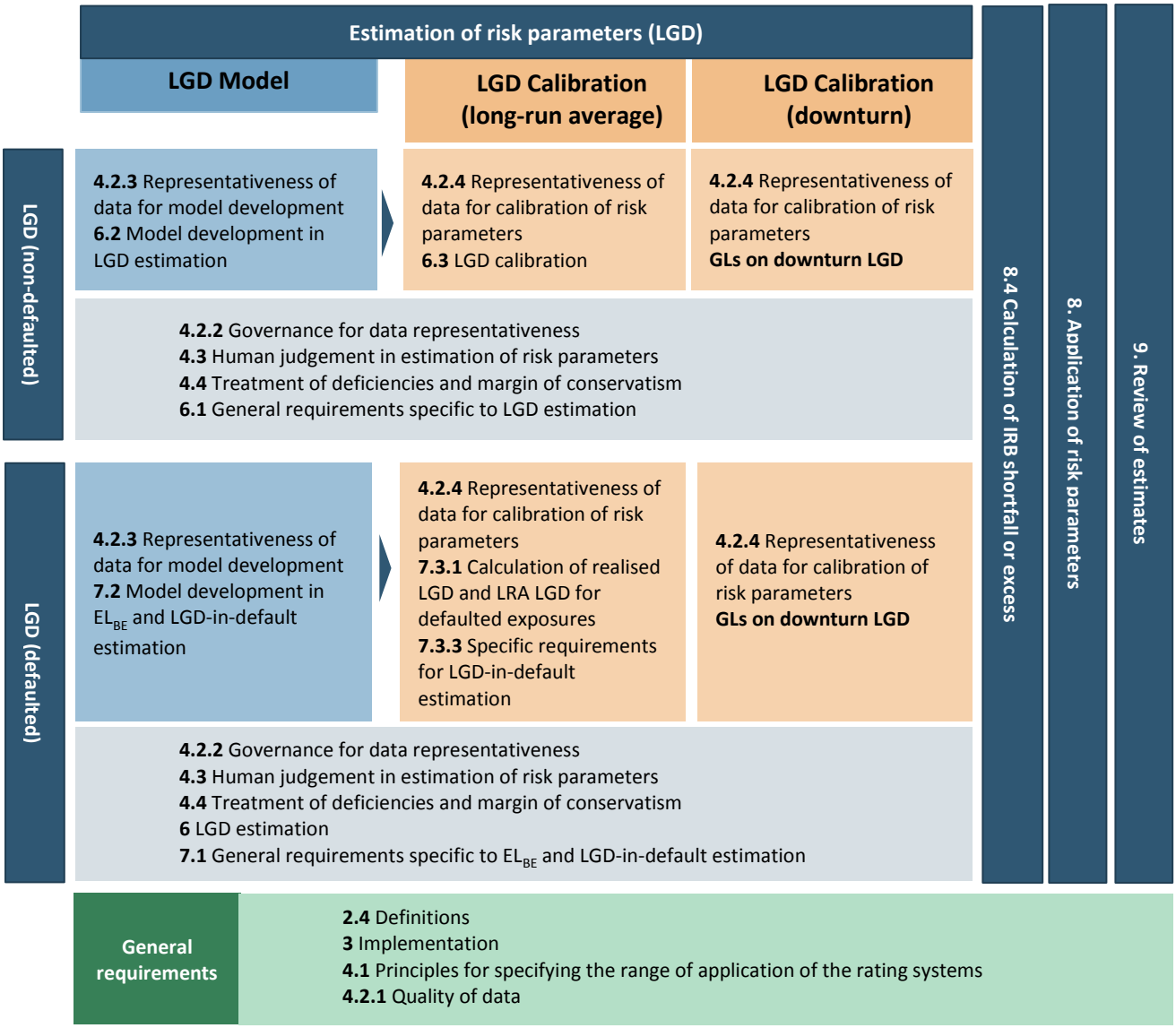
[6] That is conditional on a set value of the single systematic risk factor (i.e. based on the 99.9% confidence level).

methodology applied to ensure that the calibration target is met. Therefore, the proposed policy leaves flexibility with respect to the actual estimation methodology but provides guidance on the types of approaches to be used for the quantification of the calibration target.

4. Because of this understanding, the level at which downturn LGDs are calibrated should be at least the same as the level at which long-run average LGDs are calculated for the purpose of calibration. In this context, it should be recalled that the GL on PD and LGD estimation define the notion of 'calibration segments' as a uniquely identified subset of the range of application of the LGD model that is jointly calibrated. The use of calibration segments does not, however, require institutions to calibrate LGDs at the level of calibration segments. Institutions may use calibration segments but calibrate LGD estimates at the level of each grade or pool (e.g. if, in the step of calibration, the portfolio under consideration is split by certain regions) within those calibration segments. However, regardless of whether an institution calculates the long-run average LGD at the level of calibration segments or at the level of grades or pools, both with the objective of providing LGD estimates by facility grade or pool, the quantification of downturn LGD estimates should follow the level considered by the institution for the purpose of calibrating LGD estimates to the long-run average LGD.

5. In line with the aspects covered by the CRR in the context of quantification of risk parameters, these GL provide, in addition, requirements on MoC related to downturn LGD estimation. Issues of representativeness have not been addressed, as these are covered by subsection 4.2.4 of the GL on PD and LGD estimation. Figure 1 illustrates (analogously to Figure 3 of the Background and rationale section of the GL on PD and LGD estimation) how the GL on downturn LGD estimation are embedded in the GL on PD and LGD estimation.

Figure 1: Illustration of GL on downturn LGD in the context of GL on PD and LGD estimation



Terminology used in these guidelines

6. The CRR sets out requirements on risk quantification in Section 6, Sub-Section 2 (Articles 178-184 of the CRR). This sub-section in the CRR covers aspects including representativeness, MoC and parameter estimations per grade or pool that lead to the quantification of the final parameters being applied in calculating RWE amounts. The CRR refers to parameter estimation where rules for quantification of PD and LGD estimates are set out (e.g. Article 180 of the CRR).

7. The term 'calibration target' is not used in the CRR. However, where it is used in this section it refers to the value that is considered for the purpose of calibration in accordance with paragraph 161 of the GL on PD and LGD estimation. It should be noted that the specification of a calibration target in this sense and the estimation might coincide where institutions use LGD models (in the sense of Article 174 of the CRR) that assign exposures to facility grades or pools without providing for individual estimates of loss. In this case, the LGD model just

provides a grading or pooling of facilities, and the calibration target (e.g. long-run average LGD per facility grade and pool) coincides with the estimation of LGD per facility grade and pool. As stated earlier, the quantification of LGD or downturn LGD covers, in addition, the application of an appropriate MoC.

8. In this context, it should be noted that the GL on PD and LGD estimation define the estimation of risk parameters as including risk differentiation and risk quantification, and that in this sense these GL on downturn LGD treat only the risk quantification part of downturn LGD estimation. The GL on PD and LGD envisage this interpretation of downturn LGD estimate by defining LGD calibration as:

*The part of the process of the estimation of risk parameters which leads to appropriate **risk quantification** by ensuring that the LGD estimates correspond to the long-run average LGD, or to the downturn LGD estimate where this is more conservative, at the level relevant for the applied method.* [7]

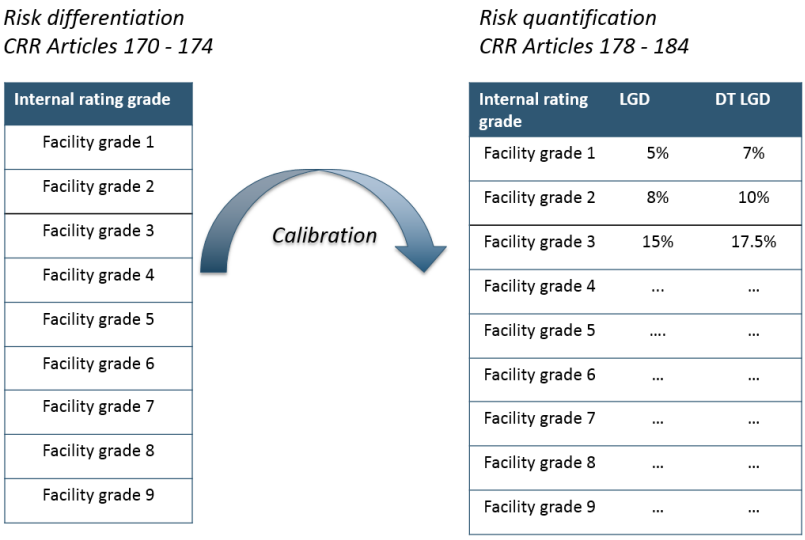


Figure 2 Illustration of notion of calibration

9. In order to improve clarity in the GL text where it refers to the calibration target used for downturn LGD estimation and where it refers to the downturn LGD estimates by facility grade or pool, the following terminology is used throughout the text:

Quantification of downturn LGD: the term quantification of downturn LGD covers all elements of the quantification of downturn LGD including the quantification of the calibration target, the quantification of the resulting downturn LGD estimates at grade and pool level and the quantification of MoC.

Calibration of downturn LGD: the term calibration of downturn LGD in the context of these GL refers to the quantification of the calibration target at the relevant level. Please note that some

[7] Depending on the estimation methodology used by an institution, risk differentiation and risk quantification may be interlinked and requirements relevant to the development of grades and pools and assignment to them may apply to risk quantification and vice versa.

requirements for the calibration of downturn LGD require the quantification and recognition of MoC to be added to the final estimates at the level of grades and pools.

Downturn LGD estimates: these are the LGD estimates appropriate for an economic downturn at the grade or pool level after calibration and before the application of MoC. These will generally be the best estimates. They are referred to only in the plural.

Three approaches to downturn LGD calibration

10. The centrepiece of the GL provides the policy for quantification of the calibration target for downturn LGD for one specific downturn period. However, the final RTS on economic downturn provides a notion of an economic downturn that might comprise several distinct downturn periods. Where more than one downturn period is identified, these GL specify that the downturn LGD has to be calibrated for each of those periods. The final downturn LGDs used for the calculation of capital requirements should then relate to the single downturn period leading to the highest average LGD (on a calibration segment) if the resulting estimates plus MoC are applied to the current non-defaulted portfolio at the time of calibration.

11. In line with the general principle of the internal ratings-based approach that the quantification of risk parameters should be based on observed data, the calibration of downturn LGD should be based on the observed impact of the downturn period on the relevant losses, where possible, and, where not, it should make use of certain methodologies. The GL therefore differentiate between three approaches, introduced in **paragraphs 23 to 25**, which are increasing in prescriptiveness and with regard to aspects that need to be covered by appropriate MoC:

    i. **Type 1: downturn LGD calibration based on observed impact.** Where sufficient (in terms of timespan covered and quantity of data, to arrive at stable estimates) loss data are available to assess the impact for the downturn period under consideration, which has been identified in accordance with the RTS on economic downturn, the institution should conduct a standardised impact assessment with a prescriptive minimum scope. The impact assessment requires that institutions analyse whether there is evidence of elevated realised LGDs, decreased annual recoveries, decreased number of cures (i.e. exposures that defaulted and returned to non-defaulted status) or prolonged time in default caused by the downturn period under consideration. Downturn LGD should then be calibrated for the downturn period under consideration in a way that it is coherent with the results obtained from that impact assessment, i.e. the institution is required to consider the results of the impact assessment and to model appropriately the loss components materially affected by the downturn period under consideration.

    ii. **Type 2: downturn LGD calibration based on estimated impact using historical loss data (haircut or extrapolation approach or a combination of the two).** Where loss data are not available to base the downturn LGD calibration on an observed impact for a considered downturn period, the downturn LGD should be calibrated using a haircut approach or an extrapolation approach. The approaches may also be

combined and be used for the downturn calibration of intermediate risk parameters (such as recovery rates or cure rates) and risk drivers.

iii. **Type 3: free modelling flexibility with minimum fixed add-on.** Where sufficient data are not available to quantify downturn LGDs for the downturn period under consideration based on observed or estimated impact using the approaches outlined in points (i) and (ii) above, the institution still has to provide downturn LGD estimates, given the explicit requirement in the CRR. However, in this case, the estimates also need to fulfil a minimum level of MoC, covering the lack of data and methodological deficiencies. Moreover, the institution must justify to the satisfaction of the competent authority that it can apply neither the approach outlined in point (i) nor the approach outlined in point (ii) above. Under this third approach, it is required that the final downturn LGD estimates plus an appropriate MoC be higher than the corresponding long-run-average LGDs plus 15 percentage points (capped at a final downturn LGD estimate level of 105%).

Structure of the guidelines

12. As a precondition for applying these GL, institutions need to have identified the relevant downturn periods for the type of exposures covered by the rating system under consideration.

13. The GL for downturn LGD estimation are structured as follows:

4. General requirements on downturn LGD estimation

This section clarifies, inter alia, **at which level institutions should calibrate downturn LGDs for the purpose of providing downturn LGD estimates per grade or pool.** Moreover, it provides guidance on how to select the finally relevant downturn period(s) in case **multiple downturn periods** have been identified when applying the RTS on economic downturn.

4.1 Requirements that apply to the final downturn LGD estimates

This subsection contains requirements to ensure that **downturn LGDs are more conservative than the long-run average LGD** as required by Article 181(1)(b) of the CRR. Moreover, it provides guidance on how to ensure that LGD models containing **risk drivers sensitive to the economic cycle** are appropriately calibrated to downturn conditions. Last, it contains the requirement that the final downturn LGDs are to be **compared with a non-binding challenger (reference value),** which should be calculated as set out in section 8 of the GL.

4.2 Downturn LGD estimation for defaulted exposures

This subsection provides guidance on how to estimate the downturn component of LGD for defaulted exposures.

4.3 Downturn LGD estimation for one considered downturn period

This subsection sets out the requirements on how to calibrate downturn LGD when **considering a single downturn period** using the methodologies set out in section 5, section 6 or section 7.

5. Downturn LGD estimation based on observed impact

   This section contains requirements on how to calibrate downturn LGD when the institution **has observed loss data reflecting the impact of the downturn period under consideration**.

6. Downturn LGD estimation based on estimated impact

   This section contains requirements on how to calibrate downturn LGD when the institution has **no observed loss data** reflecting the impact of the downturn period under consideration available **but when it can reliably estimate the impact of the downturn period under consideration** using a limited set of methodologies.

7. Downturn LGD estimation where observed or estimated impact is not available

   This section sets out a minimum aggregate MoC requirement when downturn LGD cannot be calibrated using either of the methodologies set out in section 5 and section 6.

8. Reference value

   This section lays down how to calculate the reference value to be used as a non-binding challenger of the final downturn LGDs.

2.2 General requirements on downturn LGD estimation

14. **Paragraph 13** of these GL clarifies that the GL should be understood as an amendment of the GL on PD and LGD estimation. Therefore, all definitions and all relevant requirements of section 4 on general estimation requirements, section 6 on LGD estimation, section 7 on LGD-in-default estimation, section 8 on the application of risk parameters and section 9 on the review of estimates of the GL on PD and LGD estimation equally apply to downturn LGD estimation.

15. This means in particular that the concept of the MoC laid down in the GL on PD and LGD estimation should also be applied to downturn LGD estimation. Therefore, the MoC for downturn LGD estimation should be assessed in accordance with the requirements set out in subsection 4.4 of the GL on PD and LGD estimation. In particular, this means that institutions should:

    a. identify all deficiencies related to the estimation of downturn LGDs that may lead to a bias in the quantification of the estimates or to an increased uncertainty which is not captured by the general estimation error specifically related to the downturn LGD estimation in accordance with the guidance set out in subsection 4.4.1 of the GL on PD and LGD estimation;

    b. apply appropriate adjustments (as described in subsection 4.4.2 of the GL on PD and LGD estimation) to overcome the identified deficiencies in order to provide a more accurate downturn LGD estimation; and

c. reflect the uncertainty of the downturn LGD estimation (including appropriate adjustments) by quantifying an MoC subdivided into three categories:

   i. Category A: MoC related to data and methodological deficiencies identified under Category A as referred to in paragraph 36(a) of the GL on PD and LGD estimation;

   ii. Category B: MoC related to relevant changes to underwriting standards, risk appetite, collection and recovery policies and any other source of additional uncertainty identified under Category B as referred to in paragraph 36(b) of the GL on PD and LGD estimation; and

   iii. Category C: MoC related to the general estimation error.

16. The GL clarify in **paragraph 14(a)** that downturn LGD should be calibrated at least at the same level as that at which the long-run average LGD is calculated for the purpose of calibrating LGD in accordance with paragraph 161 of the GL on PD and LGD estimation. The rationale for this is that downturn LGD estimation should be understood as risk quantification of LGD estimates appropriate for an economic downturn, i.e. that the downturn LGD calibration just provides a different calibration target from long-run average LGD and sets out additional requirements regarding the applicable MoC. Thus, if an institution considers the long-run average LGDs by grades or pools (in line with paragraph 161(a) of the GL on PD and LGD estimation) with the objective of calibrating LGD estimates for these grades or pools, it needs to consider the same level for quantifying downturn LGD. If an institution considers long-run average LGDs calculated at the level of calibration segments for the purpose of LGD calibration (in line with Article 161(b) of the GL on PD and LGD estimation), it needs to quantify downturn LGDs for the purpose of downturn LGD calibration at least by calibration segment.

17. In addition **paragraph 14(b)** provides guidance on the use of calibration segments in downturn LGD estimation analogous to paragraph 97 of the GL on PD and LGD estimation, which provides guidance on the use of calibration segments for PD estimation. An institution should identify subsets of the type of exposure under consideration as calibration segments, where exposures in these subsets are covered by the same LGD model for assignment to facility grades but on average show significantly different loss profiles, and where exposures in these subsets are affected differently by downturn periods. At a minimum, banks are required to consider material subsets of exposures covering different geographical areas/jurisdictions or industry sectors or, in the case of retail, product types as calibration segments. The rationale for this minimum requirement is that economic factors in the RTS are required to be customised to each relevant jurisdiction and sector. A typical example of where the use of calibration segments should be considered is the situation when an LGD model is rolled out to a different jurisdiction. The drivers for LGD might be the same in a different jurisdiction and thus the LGD model might provide a reasonable risk differentiation in a different jurisdiction, but the overall loss profile might be significantly different due to, for example, different legal processes in the context of collateral liquidation. It may, however, also turn out that loss characteristics and levels are independent from, for example, jurisdictions or industry sectors, in which case the differentiation of calibration segments might not be necessary.

18. The provision set out in **paragraph 15** of the GL ensures that, as a general concept, an institution needs to estimate downturn LGDs appropriate to each downturn period identified in accordance with the RTS on economic downturn. As the approach in the RTS can lead to the identification of multiple downturn periods, institutions need to calibrate downturn LGD and provide the resulting LGD downturn estimates in relation to different downturn periods. Consequently, this may require institutions to calibrate downturn LGD based on different types of approaches (as described in section 2.5 of this Background and rationale), as loss data might be available for some identified downturn periods, but not for others.

19. Given that, in the case of multiple downturn periods, institutions may have to use different approaches in order to set the calibration target, it is important to specify in detail how this interaction should work, which will in turn specify which final downturn LGD estimates should be selected. Therefore, three principles are laid down in the policy:

    i. First, the proposed policy requires that the final downturn LGD estimates relate to one downturn period per calibration segment.

    ii. Second, where for one of the downturn periods identified downturn LGD is calibrated using a type 3 approach and for another downturn period downturn LGD is calibrated using a type 1 or type 2 approach, then the latter shall be taken into account for the final LGD downturn estimates and an MoC needs to be added for the lack of analysis of one downturn period. In brief, downturn LGD estimation subject to the minimum add-on is disregarded where downturn LGD estimation is possible based on observed or estimated impact for any other downturn period subject to an additional appropriate MoC. Under no circumstances should this principle be abused to circumvent the obligatory use of type 2 approaches where their application is possible. Indeed, it is expected that type 3 approaches will be considered only in exceptional cases. Therefore, the waiver for downturn periods that require a type 3 approach as set out in paragraph 15(a)(iv) of the GL will be revised by the EBA, should there be indications of excessive or misuse of this waiver.

    iii. Third, where LGD estimates are quantified for several downturn periods, institutions should choose as the finally relevant downturn period the period that results in the highest average downturn LGD for the calibration segment under consideration. It is important to note that this refers to the average downturn LGD of the latest available snapshot of the current non-defaulted portfolio at the time of calibration.

20. The rationale for the first principle is that, where different calibration segments cover exposures from, for example, different jurisdictions, industry sectors or even product types for retail exposures, the multiple downturn periods will have different impacts on these calibration segments. The second principle is justified by the fact that the LGD estimates based on type 3 approaches are not based on observed or estimated impact on loss data and are therefore considered less reliable. The third principle ensures that the estimation is based on the downturn period that leads to the highest expected impact when applying the final downturn LGD estimation. In this context, it should be noted that theoretically an institution might have to apply a type 3 approach for several downturn periods and might not be able to

quantify downturn LGD for any downturn periods based on a type 1 or type 2 approach. In this case, the second principle would not be applicable and the third principle would provide guidance for the choice of the finally relevant downturn period.

21. It is important to note that the downturn LGD estimates for the grades and pools of one calibration segment refer to the same downturn period, although the actual downturn LGD estimates per grade and pool will be different.

Example 1

As an example, consider an obligor-based retail rating system covering three types of facilities: mortgages, consumer credits and overdrafts on current accounts. For the purpose of long-run average LGD calculation, the system differentiates between two calibration segments:

(A) mortgages; and (B) consumer credits and overdrafts on current accounts. In accordance with Article 1(2) of the final draft RTS on economic downturn, the economic downturn should be identified for each type of exposure, where the latter should be understood in the sense of Article 142(2) of the CRR (i.e. as exposures that are homogeneously managed).

Therefore, in this example (where it is assumed that all three products are homogeneously managed), for both calibration segments the institution should analyse the impact of downturn periods identified in accordance with the RTS by considering the following economic factors:

i. GDP growth and unemployment rate, which are relevant economic factors for all exposure categories, according to Article 2(1)(a) of the final draft RTS on economic downturn;

ii. house price index, which according to Article 2(1)(b)(i) of the final draft RTS on economic downturn is relevant to the exposure category 'corporate and retail residential real estate';

iii. household debt [1], which according to Article 2(b)(i) of the RTS on economic downturn is relevant to the exposure category 'retail other than i., ii. or iii'.

The final downturn LGD estimates for the calibration segment under consideration refer to the single downturn period leading to the highest downturn LGD estimates (on average), as set out in paragraph 15 of the GL text.

Example 1 – cont.

Furthermore, assume that GDP growth, unemployment rate and total household debt define one common downturn period lasting from 2008 to 2010 and the housing price index defines a second downturn period lasting from 1990 to 1991 (all identified in accordance with the final draft RTS on economic downturn). In this case, the institution would need to provide the following downturn LGD estimates:

Example	Calibration Segment A: Mortgages	Calibration Segment B: Consumer credits and overdrafts
Downturn Period 1 (DTP_1) 1990 – 1991 Trough on house price index	LGD downturn estimation related to downturn period 1: LGD_DT(A, DTP_1) (incl. MoC)	LGD downturn estimation related to downturn period 1: LGD_DT(B, DTP_1) (incl. MoC)
Downturn Period 2 (DTP_2) 2008 – 2010 Trough in GDP Growth and peak in unemployment rate and total household debt	LGD downturn estimation related to downturn period 2: LGD_DT(A, DTP_2) (incl. MoC)	LGD downturn estimation related to downturn period 2: LGD_DT(B, DTP_2) (incl. MoC)

Moreover, this implies, for the example above, that the institution should estimate two downturn LGDs for the calibration segment (A) mortgages, one relating to downturn period 1 (1990-1991, specified based on the house price index) and another related to downturn period 2 (2008-2010, defined on the basis of GDP growth, unemployment rate and total household debt), and pick as the relevant downturn period the period that results in the higher of the two downturn LGD estimates, considered as averages at calibration segment level. This comparison is necessary because, otherwise, different grades could refer to different downturn periods, which would result in undue complexity and would lack economic rationale.

If the institution does not have, or is not able to estimate, an impact on loss data for the downturn period 1990-1991 and, therefore, the downturn LGD is subject to the minimum MoC requirement as set out in section 7, the latter will not be used when comparing it with the downturn LGD estimated for the downturn period 2008-2010 even if higher (unless the LGD for 2008-2010 is also estimated in accordance with methodologies described in section 7). However, an appropriate MoC should be added to the final downturn LGD estimate to cover the downturn period not analysed. Conversely, if the institution does not have data to estimate downturn LGDs based on observed impact related to the downturn period 1990-1991, but it is able to estimate downturn LGDs based on the estimated impact and in accordance with the methodologies described in section 6, then this estimation might be compared with the downturn LGD estimated for the downturn period 2008-2010. In this example, this is justified because it could be expected that the impact from the drop in the house price index observed in 1990-1991 characterises the more relevant downturn period for calibration segment A.

22. **Paragraph 15(b)** of the GL lays down that, where institutions can provide evidence that a downturn period is not relevant to one of the calibration segments, that downturn period can

be disregarded for that calibration segment. For this purpose, institutions should provide evidence that the economic factors underlying the downturn period under consideration are not relevant to the calibration segment under consideration. This will be the case mainly when downturn periods are defined based on sectoral or industry-specific factors and the calibration segments are also defined in terms of sectors or industry segments. In these cases, the downturn period defined based on economic indicators related to industry A will not be relevant to the calibration segment related to industry B. However, if the downturn period is defined based on economic indicators related to both industries A and B, this will also be relevant to the calibration segment related to industry B. Thus, in Example 1 above, the downturn period 1990-1991 may be disregarded for calibration segment B, consisting of consumer credits and overdrafts, when properly justified.

2.3 Requirements that apply to the final downturn LGD estimates

23. The requirements set out in section 4.1 apply only to the final downturn LGD estimates, which are related to the finally relevant downturn periods that have been chosen in accordance with paragraph 15 for each calibration segment.

24. The policy proposed in **paragraph 16** of the GL provides guidance related to the first sentence of Article 181(1)(b) of the CRR, which requires that institutions use LGD estimates that are appropriate for an economic downturn **if those are more conservative than the long-run average LGD (LRA)**. The GL clarify how this requirement should be interpreted in the context of calibration of downturn LGD. It should be noted, however, that this requirement to compare downturn and long-run average LGD used for calibration is without prejudice to the requirement in Article 181(1)(b) of the CRR to ensure that the actual downturn LGD estimates are used (in application) if they are more conservative than long-run average LGDs. In general, and technically speaking, downturn LGD may be calibrated in either of the following ways:

a) directly, independently of the long-run average LGD estimation or

b) by an adjustment to the long-run average LGD.

25. For the purpose of providing guidance on the CRR article in question, it seemed helpful to differentiate the two different technical approaches. In order to comply with the requirement that the higher of the long-run average and the downturn LGD estimate constitutes the final LGD estimate, paragraph 16 requires that the long-run average LGD plus the corresponding MoC be compared with the corresponding downturn LGD plus the corresponding MoC at the level relevant to the calibration. Although paragraph 14 allows downturn LGDs to be calibrated on a more granular level than the long-run average LGD, it is expected that generally the level of calibration for long-run average LGD and downturn LGD will be the same. In exceptional cases, however, where banks use a more granular level for the calibration of downturn LGD, institutions need to provide a meaningful aggregation in order to compare the downturn and long-run average LGDs used for calibration.

However, where a downturn adjustment is applied to the long-run average LGD, this requirement implies that the MoC applied to the final LGD estimate (i.e. LRA + downturn adjustment + MoC) needs to account for both (i) the uncertainty related to the estimation of long-run average LGD and (ii) the uncertainty related to the calculation of the downturn adjustment.

Example 2

If the downturn LGD is calibrated at grade level and the long-run average LGD is calculated at calibration segment level for the purpose of calibration, here is one example of how this comparison could be done in practice.

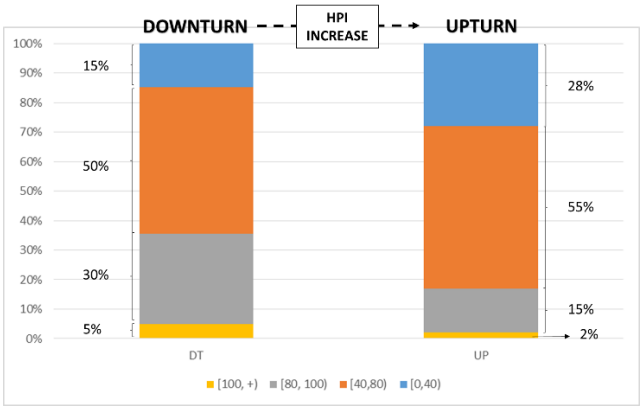
The institution could calculate the resulting downturn LGD estimates plus their corresponding MoCs for all facilities in the reference data set (specific to the calibration segment under consideration and on which the long-run average LGD is calculated) and compare the resulting (case-weighted) average downturn LGD with the long-run average LGD used for calibration.

26. **Paragraph 17** of the GL relates to the second sentence of Article 181(1)(b) of the CRR, which requires that institutions make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn if a rating system is expected to deliver realised LGDs at a constant level by grade or pool over time. The EBA considers that this provision is meant to ensure that the capital impact that stems from the migrations between facility grades and pools (e.g. in cases where risk drivers sensitive to the economic cycle are used) does not lead over time to an over- or underestimation of the LGDs appropriate for an economic downturn. This provision, however, targets migrations caused by changes in the economic cycle. Structural changes over time in a portfolio under consideration (which might also be caused by changes in economic conditions, e.g. due to tightened underwriting standards) are a matter of representativeness and should be treated in accordance with section 4 of the GL on PD and LGD. This entails in particular that institutions should assume that no exposures would have been newly added to a calibration segment and that no exposures would have left a calibration segment due to orderly termination of the contract, when considering the likely distribution of the current portfolio affected by the relevant downturn period.

Example 3

As an example, a simplified LGD model for a retail mortgage portfolio with just one risk driver, in this case the loan-to-value ratio (LTV), could be considered. Thus, the LTV buckets define the pools of the LGD model under consideration. It is assumed that this LTV is defined as an updated LTV, i.e. an LTV metric where house price index (HPI) variations affect the value of the collateral and hence the denominator of the LTV metric. Thus, this risk driver is sensitive to the economic cycle (as defined by the economic factor HPI).

In order to illustrate the impact of migrations caused by the economic cycle via such a risk driver on the distribution of facilities over grades and thus the final downturn LGD estimation, it is assumed that the composition of the portfolio remains constant[1]. In this case, when moving into an upturn, house prices might increase (HPI increase) and, since the LTV is affected by such increases, facilities tend to migrate to better LTV grades (i.e. LTVs tend to decrease). In the illustration below, the yellow band represents LTVs of 100% or higher, the grey band represents LTVs between 80% and 100%, the red band represents LTVs between 40% and 80%, and the blue band represents LTVs between 0% and 40%:



In this example, it is also assumed that the downturn LGD estimates for the LTV buckets are quantified using the methodologies described in section 5, i.e. based on the impact on loss data available for the downturn period under consideration.

LTV BUCKET	% # FACILITIES	DT LGD
[0,40)	15%	10%
[40,80)	50%	25%
[80, 100)	30%	35%
[100, +)	5%	43%
PORTFOLIO DT LGD		**26.65%**

The column 'LTV Bucket' represents the grades of the considered LGD model and the column 'DT LGD' represents the realised LGD, affected by an economic downturn, for each facility grade of the LGD estimation model under consideration. The column '% # FACILITIES' illustrates the percentage of facilities that were observed in each LTV band at the time when the economic downturn affected the portfolio.

Example 3 – cont.

If one assumes that the current state of the economic cycle is different from the one observed during the economic downturn, i.e. that the economy is currently in an upturn, then the downturn LGD estimations applied to the current portfolio result in the following picture, where the column 'DT LGD' represents the downturn LGD estimates per grade and the column '% # FACILITIES' illustrates the current percentage of facilities that are observed in each LTV band.

LTV BUCKET	DT LGD	% # FACILITIES (ONLY HPI INCREASE)
[0,40)	10%	28%
[40,80)	25%	55%
[80, 100)	35%	15%
[100, +)	43%	2%
PORTFOLIO DT LGD		**22.66%**

27. In summary, Example 3 illustrates that, in cases of LGD models based on risk drivers sensitive to the economic cycle, the impact on the current capital requirements of an upcoming economic upturn (or downturn) is twofold: (i) the impact stemming from the expected lower (or higher) realised economic losses per facility (in the event of a downturn, this is covered by the downturn LGD estimation by grade) and (ii) the impact stemming from the migrations of facilities to lower (or higher) LTV bands.

28. It is indeed true that the loss rates in the higher LTV bands already reflect the expected realised LGDs under upcoming downturn conditions. The expected realised loss (in contrast to the loss rates) will, however, be higher, due to the higher proportion of facilities that migrate to the higher LTV bands.

29. The provision in paragraph 17 serves the purpose of ensuring that those LGD models that are based on risk drivers sensitive to the economic cycle appropriately estimate the economic loss (appropriate for an economic downturn) in the current state of the economic cycle at the time of calibration. The provision thus contains an expectation that for those LGD models an adjustment to the downturn LGDs should be applied that is higher in a favourable economic state of the economic cycle (at the time of calibration or recalibration) and smaller in an adverse state of the economic cycle (at the time of calibration or recalibration). If, however, the institution applies a downturn estimation methodology that incorporates this expectation (e.g. where the risk drivers are adjusted to reflect downturn conditions), then there is no need for additional adjustments. Indeed, the application of paragraph 17 of the GL should in no case lead to a double incorporation of the impact of an economic downturn. In this context, institutions should take into account that the underlying LGD model has to provide for

sufficient homogeneity of exposures assigned to the same grades or pools in accordance with Article 38 of the RTS on assessment methodology.

30. In this context, it should be recalled that section 9 of the GL on PD and LGD also applies to downturn LGD estimation and that in the light of paragraph 17 it might be necessary in the review of downturn LGD estimates to consider the effects of recent changes in the economic conditions on the current portfolio and where necessary recalibrate the final downturn LGD estimates.

31. **Paragraph 18** sets out the requirement to compare the resulting downturn LGD at the level of calibration segments (on the reference data set, RDS) with a reference value, which should be calculated following the rules set out in section 8 of the GL. The reference value is a challenger value; in the event of a material difference between the reference value and the downturn LGD estimates, this should be justified based on the guidance laid down in paragraph 19.

32. In fact, the reference value can be driven by other issues than the impact of an economic downturn period (e.g. low number of defaults, changes in the portfolio composition, fraud or operational risk cases, or even natural disasters such as an earthquake). Even if the reference value is driven by an economic downturn period, the reference value itself should not be considered an appropriate quantification of downturn LGD (as it may not comply with all the requirements laid down in these GL). Therefore, specifically if downturn LGD estimation is based on type 1 approaches, institutions may use the evidence gathered from the impact assessment set out in paragraph 27 of the GL for the justification of the material difference. On the other hand, the selected years of the reference value might also point to a previously unidentified downturn period.

33. It is important to stress the non-binding character of the reference value. In fact, as stated before, the reference value will generally not comply with the rules set out in these GL and should therefore not be used as a calibration target for downturn LGD estimation. In addition, it should be noted that the result of the re-assessment required by paragraph 19 may (and will in many cases) be that the downturn LGD estimation is appropriate.

34. The reference value is nevertheless considered to be a meaningful supervisory tool, which supports the supervisory assessment of the resulting downturn LGD estimates and can support institutions in understanding the dynamics of their realised LGDs over time.

2.4 Downturn LGD estimation for defaulted exposures

35. Section 4.2 of these GL provides guidance on the downturn LGD estimation for defaulted exposures. As a precondition to apply the policy laid down in this section, the institution should have identified the finally relevant downturn period per calibration segment for the non-defaulted exposures. As a general rule, for defaulted exposures, institutions should apply the GL for downturn LGD estimation for each reference date, but only in relation to the downturn period identified as relevant to the respective non-defaulted exposures. This will ensure that both LGD in default and LGD for non-defaulted exposures are based on the very same downturn period.

36. As an exception, institutions may, for the purpose of estimating downturn LGD for defaulted exposures for a specific reference date, build on the estimation of downturn LGD at the time of default, if the institution can convincingly explain that this is a conservative estimate of downturn LGD in default for the specific reference date. In this context, it should be noted that the GL text in paragraph 21(b) refers to the downturn component for defaulted exposures at the moment of default. This is relevant, as in the event of partial write-offs at the moment of default the loss related to these write-offs will be relevant to the downturn LGD for non-defaulted exposure, but might not be taken into account for downturn LGD for defaulted exposure at the moment of default where compliant with paragraph 179 of the GL on PD and LGD estimation.

37. The rationale for the exemption is that the LGD in default converges by construction to 100% and therefore the additional amount that can be lost due to an economic downturn decreases over time.

38. Moreover, it should be noted that the policy for downturn LGD estimation for defaulted exposures relies on paragraph 193 of the GL on PD and LGD estimation, where it is clarified that the final LGD for defaulted exposure appropriate for economic downturn conditions should also include an appropriate MoC and where necessary potential additional unexpected losses during the recovery period referred to in Article 181(1)(h) of Regulation (EU) No 575/2013.

2.5 Downturn LGD estimation for one considered downturn period

39. The requirements in section 4.3 set out the rules of how downturn LGD estimates should be calibrated for one specific downturn period under consideration. Paragraphs 22 to 25 of these GL specify how the relevant approach for the quantification of the calibration target for downturn LGD should be chosen. Basically, if an institution has observed data to specify the impact of the downturn period under consideration on the institution's relevant loss data (which may also be external data), the downturn LGD should be calibrated based on the observed impact (i.e. section 5 should be applied). If, however, such observed data are not available, institutions should apply a type 2 methodology (i.e. the requirements in section 6 should apply). In exceptional cases where an institution can justify to the satisfaction of the

competent authority that a type 2 approach cannot be applied, the institution should use a type 3 approach, as described earlier in this chapter.

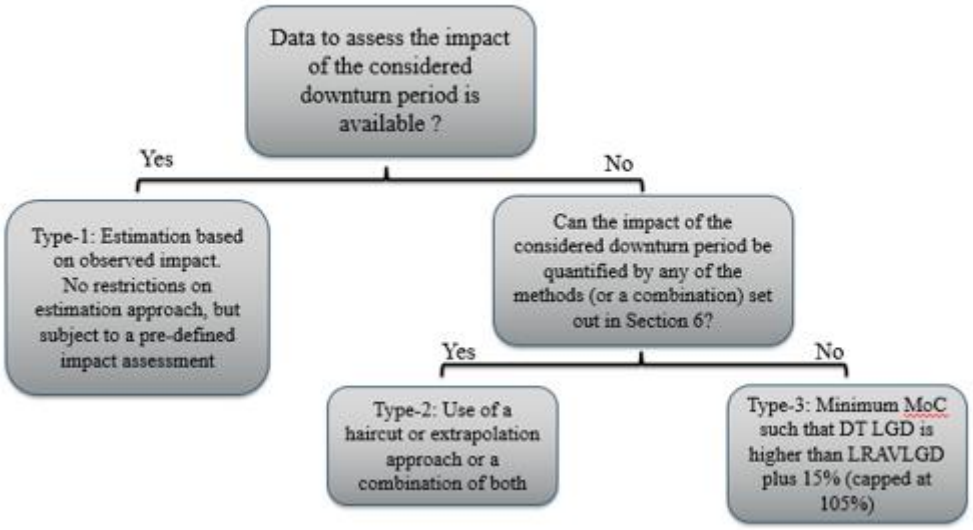


Figure 3: Downturn LGD estimation for one considered downturn period

40. Regardless of which of the approaches outlined above is used to quantify downturn LGD, there are two principles that institutions should take into account:

Principle 1:

> *"Where the approach used involves the estimation or analysis of different intermediate parameters, the aggregation of these intermediate parameters for the purpose of calibrating downturn LGD should start with the parameter where the highest impact is observed in accordance with paragraph 27 or estimated in accordance with paragraph 30 and any additional impact observed or estimated on other parameters should be added where necessary."*

41. The rationale for this principle is that it may be necessary under both type 1 as well as under type 2 approaches to aggregate the impact of a considered downturn period on different intermediate parameters, such as cure rate or recovery rate. The principle ensures that offsetting effects are not taken into account and provides more guidance related to the requirement that institutions should quantify downturn LGDs in a way that is coherent with the evidence found in the impact assessment for type 1 methodologies. The highest impact in this context should, for type 1 methodologies, refer to the highest relative change when comparing the evidence found in the impact assessment with the average value of each component.

42. It should be noted that the principle only determines the starting point of the institution's considerations for the quantification of downturn LGD where impact on different components needs to be aggregated.

Principle 2:

> *"The downturn LGD estimates should not be biased by observed or estimated cash flows that are received with a significantly longer time lag than the period referred to in paragraph 156 of the GL on PD and LGD estimation and which might rather reflect an upturn or improved economic conditions following the considered downturn period."*

43. The rationale for this principle is that in fact, where realised LGDs are computed with respect to the time of default but with long recovery processes, compensation effects might absorb a potential downturn impact. Indeed, it could be the case that, whereas the date of default reflected downturn conditions, the assets may be sold for a higher price once economic conditions have recovered – effectively leading to an economic loss reflecting economic upturn rather than downturn conditions.

Example 4

The requirement to add additional impact where necessary is meant to ensure that all impact observed or estimated on different components is covered by the final downturn LGD estimation. One way of how institutions could ensure this in case of type 1 methodologies can be illustrated by the following simplified example:

Assume the institution found evidence of:

i. an increase of about 2% in realised LGDs due to the downturn period under consideration;

ii. a decrease of about 15% in annual recoveries due to the downturn period under consideration.

For simplicity, assume that no evidence was found on the other components. In order to comply with paragraph 28 (to provide a downturn LGD estimate coherent with the results of the impact assessment), the institution could transfer the observed decrease in annual recoveries as a result of the downturn period to all facilities in the reference data set (as defined in the EBA GL on PD and LGD) that were not affected by the downturn period, and recalculate downturn LGD. The resulting downturn LGD might already cover the impact observed on the realised LGDs. If not, the additional impact observed should be added. There are, however, other possible ways institutions could ensure that that all impact observed or estimated on different components is covered, e.g. the institution could choose a model for calibrating downturn LGD based on model components and set the level of the component under consideration to the impact observed or estimated and check whether the resulting downturn LGD estimates cover for the impact observed on realised LGD.

2.6 Downturn LGD estimation based on observed impact

44. It is worth noting that the guidance laid down in these GL builds on the general presumption of the advanced IRB approach (i.e. where the institution uses own estimates of LGDs) where risk parameters are quantified based on observed data. Therefore, as a first step and in line with the hierarchy of approaches, an institution needs to assess whether for a type of exposure under consideration sufficient loss data are available to assess the impact of a considered downturn period identified in accordance with the RTS on economic downturn. If that is the case, the institution follows the guidance for downturn LGD estimation based on observed impact laid down in this section.

45. In order to ensure that all relevant aspects of the economic loss calculated in accordance with subsection 6.3.1 of the GL on PD and LGD estimation are covered appropriately, the minimum components of such an impact assessment are prescribed in **paragraph 27** of the GL. In detail, the proposed impact assessment requires institutions to analyse whether there is evidence of impact of the downturn period under consideration on the four following components, namely (i) elevated realised LGDs; (ii) decreased annual recoveries; (iii) decreased number of facilities returned to non-defaulted status in a predefined time horizon, which should be appropriate for the type of exposure and reflect the usual time to cure; and (iv) prolonged time in default.

46. Regarding the first two components, the required analysis touches upon the issue on whether the impact of an economic downturn should be considered with respect to the date of default or with respect to the date of receiving the material share of the recovery cash flows. On the one hand, considering the realised LGDs with respect to the time in default is more consistent with the calculation of RWE amounts, where the expected loss is expressed as the product of PD and LGD, i.e. implying that it refers to the same reference point in time. On the other hand, considering the impact on annual recoveries per source of cash flow (regardless of the dates of default) might better reflect the economic loss appropriate for an economic downturn. Indeed, it could be the case that, although the date of default reflected downturn conditions, collateral may be sold for a higher price once economic conditions have recovered – effectively leading to collateral prices reflecting economic upturn rather than downturn conditions. Because of these considerations, the proposed impact assessment requires both types of analyses in paragraph 27(a), points (i) and (ii).

47. Moreover, for the analysis in paragraph 27(a)(i) the data need to be split into two subsets. One set should contain all facilities which have reached their maximum time to recovery as defined in paragraph 156 of the GL on PD and LGD estimation or which have been closed before they reached this point in time. The other set should contain all incomplete recovery processes that have not reached their maximum time to recovery. In a second step, evidence of impact of the downturn period under consideration should be analysed separately for the set containing complete recovery processes and those that have reached their maximum time to recovery, and for the set containing incomplete recovery processes. For the latter set, the impact on the recovery pattern for each vintage of default should be analysed and may provide input for, in particular, the downturn LGD estimation for defaulted exposure.

48. The analysis of the additional components set out in paragraph 27(a), points (iii) and (iv), namely the decreased number of facilities returned to non-defaulted status and the prolonged time in default respectively, ensures the inclusion of the potential impact of a considered downturn period which may not be measurable at the level of the average realised LGD or annual recoveries. Indeed, if, for example, an impact is measurable only with respect to a material increase of observed time in default, this analysis will ensure the incorporation of the downturn impact into the LGD estimation, for example by applying the increased time in default to the observations. The same principle applies to facilities returned to non-defaulted status.

49. Paragraph 27(b) of the GL accounts for situations in which one or several of the outlined analyses cannot be meaningfully conducted due to insufficient coverage of loss data during one year of a multi-year downturn period. This should not be confused with a situation in which no data are available for the considered downturn period because of this period being too far back in time. However, in order to account for the issue of scarce data, the policy allows the merging of consecutive years of observations as long as it is deemed of benefit for the analysis.

50. Finally, the last paragraph on the impact assessment requires that any lag between a downturn period and its potential impact on the relevant loss data has to be taken into account. Due to the individual situations regarding data availability as well as the specifics of a considered type of exposure, no guidance is set out regarding the length of the time lags that should be considered.

51. The guidance regarding the calibration of downturn LGD for cases in which loss data are available to assess the impact of a considered downturn period on a considered calibration segment is laid down in section 5 of the final GL. **Paragraph 28** clarifies that the resulting LGD estimation needs to be coherent with the outcome obtained from the impact analysis. In other words, the final downturn LGDs should appropriately account for the material impacts of a considered downturn period on (i) the realised LGDs; (ii) the annual recoveries; (ii) the facilities returned to non-defaulted status; and (iv) time in default. The policy leaves flexibility to institutions with respect to the detailed methodology applied for the purpose of calibration of downturn LGD based on results of the impact assessment. The rationale for this is that the EBA considers that there is no one-size-fits-all aggregation scheme for the results obtained from the analyses required in paragraph 27. Depending on the risk profile of the considered type of exposure it might be appropriate to choose the average LGD by vintage of defaults affected by the considered downturn period where this best reflects the results obtained from the impact assessment laid down in paragraph 27(a), points (i) to (iv). In another case, in particular where the average LGD would incorporate significant catch-up effects due to late recoveries when economic conditions improved (as outlined in paragraph 45 above), it might be more appropriate to base the downturn LGD estimation on the impact observed on annual recoveries per source of cash flow. The flexibility to select an appropriate methodology to calibrate downturn LGD includes the ability to use the 'haircut approach', outlined in section 6 in the GL, as a methodology under section 5 of the GL.

52. In order to reflect the material aspects addressed in the impact assessment in paragraph 27(a), points (i) to (iv), institutions should aim to continue reflecting the credit risk profile of the

considered type of exposure. For example, setting a downturn haircut (based on observed loss data) on only the best-quality collateral based on materiality, in order to reflect the results obtained from the impact assessment, may not be a compliant approach, as it could lead to incentives to use less good-quality collateral.

53. The impact analysis is particularly important to ensure that the long-run average LGD may be deemed appropriate as a downturn LGD estimate only when no impact of a considered downturn period can be observed on the relevant loss data and realised LGDs. The detailed conditions under which the long-run average LGD including the corresponding MoC may be appropriate for the final downturn LGD appropriate for an economic downturn are laid down in **paragraph 29**. It should be noted that only if observed data are available for a considered downturn period may the long-run average LGD (under certain conditions) be considered an appropriate downturn LGD estimate. In particular, it is required that the MoC under consideration cover for all additional elements of uncertainty related to the identified downturn periods, including deficiencies identified under Category A in accordance with paragraph 37(a) of the GL on PD and LGD estimation, and under Category B in accordance with paragraph 37(b) of the GL on PD and LGD estimation.

2.7 Downturn LGD estimation based on estimated impact

General description

54. If no sufficient data are available to calibrate downturn LGD in accordance with the proposed policy described above, institutions should aim to calibrate their downturn LGDs based on the estimated impact of the downturn period under consideration. However, institutions should estimate that impact by applying either a haircut or an extrapolation approach. Where institutions have observed data for only a certain intermediate parameter or risk driver reflecting the impact of the downturn period under consideration, institutions should estimate the realised historical LGDs (which they have not observed) affected by the downturn period under consideration by combining the observed impact on the intermediate parameter or risk driver with the estimated impact of other intermediate parameters resulting from a haircut and/or extrapolation approach. As stated above, both approaches can be used to estimate unobserved realised LGDs or intermediate parameters or risk drivers from the past.

55. The haircut approach provides an estimate indirectly by adjusting (i.e. applying a haircut to) the input variables of the LGD model. Thus, a haircut approach relies on the functional relationship that is established in the model between realised losses and certain input parameters. In particular, in order to apply a haircut approach, this functional relationship needs to describe the dependency of the LGD estimate on several risk drivers, of which at least one is an economic factor. This might especially be the case when collateral values are used as risk drivers . The downturn LGD estimate is then computed by applying the LGD model where the above-mentioned economic factor (or even factors) is/are adjusted to reflect the level observed in the downturn period under consideration. The haircut approach may equally be applied to intermediate risk parameters or risk drivers.

56. The extrapolation approach is a methodology to enable the institution to estimate downturn LGDs based on estimated historical loss data (based on backward extrapolation). This approach estimates 'realised' historical LGDs, intermediate parameters or even risk drivers that serve as an input into the LGD estimation model under consideration, by extrapolating them backwards in time based on the statistical dependency between the realised LGDs, intermediate parameters or risk drivers and the relevant economic factors. It is worth noting that this dependency needs to be established using the observed loss data.

57. The main difference from the haircut approach is that the extrapolation approach derives the calibration target for downturn LGD based on the RDS and a statistical model for the dependency between realised LGDs (aggregated at different points in time) and economic factors, whereas the haircut approach derives the calibration target for downturn LGD by applying an existing LGD estimation model to the current exposures using input variables adjusted to reflect downturn conditions.

58. Finally, it is worth noting that, when the haircut or extrapolation approach is applied, a strictly positive Category A MoC[8] needs to be applied to reflect the related uncertainty with respect to the estimated impact. This is laid down in paragraph 35 of the GL.

Haircut approach

59. **Paragraph 31** of these GL describes the haircut approach and sets out the conditions under which institutions should apply this approach. Under this approach, the impact of a considered downturn period on the realised LGDs, intermediate parameters or risk drivers of a considered type of exposure is estimated by applying the LGD model using adjusted input parameters. Therefore, a precondition for the applicability of this approach is that the LGD model takes one or several economic factors as direct or transformed input. Then, when the LGD model is applied, these economic factors are adjusted to reflect the values of the economic factors observed in economic downturn conditions instead of applying the current values of these economic factors).

60. More formally, given an LGD model as a function f where $LGD_{est} = f(x_1, x_2, \dots, ec_1, ec_2, \dots)$, where:

- LGD_{est} is an estimation of the realised LGDs given current values of the input variables;
- $ec_1, ec_2, \dots$ are risk drivers for realised LGD that are economic factors;
- $x_1, x_2, \dots$ are other risk drivers for realised LGD.

In order to estimate the impact of a particular downturn period on realised LGDs for a calibration segment under consideration and related to a set of economic factors ec_i, all economic factors that are inputs for the application of the LGD model are adjusted to reflect

[8] See section 4.4 of the GL on PD and LGD estimation for a description of Category A MoC.

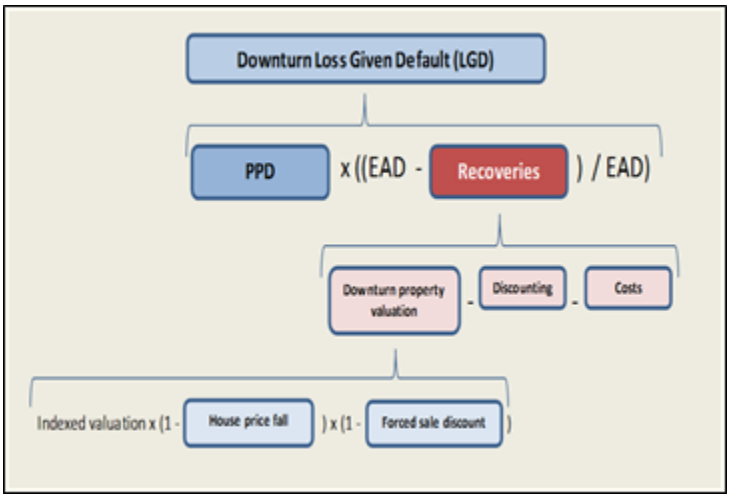
the levels observed during the downturn period under consideration, when applying the model $LGD_{DT} = f(x_1, x_2, \dots, \widehat{ec_1}, \widehat{ec_2}, \dots)$, where:

- LGD_{DT} is the downturn LGD estimate for a given exposure;
- $\widehat{ec_1}, \widehat{ec_2}, \dots$ are economic factors adjusted to downturn conditions (i.e. after applying the haircut);
- $x_1, x_2, \dots$ are other risk drivers.

For simplicity, no time dimension has been introduced in the example above. It should, however, be noted that the risk drivers $x_1, x_2, \dots$ relate to the point in time when the model is applied[9] (and the specification of the corresponding risk driver), whereas $\widehat{ec_1}, \widehat{ec_2}, \dots$ relate to the point in time when the downturn conditions have been observed on these factors. Note that the type of LGD model described above does not need to be a regression model. As an example of how to apply the haircut approach, for illustration purposes the following simplified model design for a mortgage portfolio could be considered (Example 5).

[9] Please note that this is possible only if they are not material components of economic loss, because otherwise paragraph 30(b) of the GL requires that they reflect a potential downturn impact.

Example 5



The above example could relate in more detail relate to Example 1 where the institution would have identified two downturn periods to be analysed for the considered type of exposure:

Example	Mortgages – Portfolio
Downturn Period 1 (DTP_1) 1990 – 1991 Trough on house price index	LGD downturn estimation related to downturn period 1: LGD_DT(A, DTP_1) (incl. MoC)
Downturn Period 2 (DTP_2) 2008 – 2010 Trough in GDP Growth and peak in unemployment rate	LGD downturn estimation related to downturn period 2: LGD_DT(A, DTP_2) (incl. MoC)

In this example the institution has no observed loss data related to this downturn period in 1990-1991. As the house price index is a transformed input into the institution's model for LGD estimation, and is also a relevant economic factor related to a type of collateral for the considered type of exposure, the institution would need to apply a haircut approach according to the policy in paragraph 30 of the GLs.

In more detail the institution may have a LGD model which differentiates facilities by their risk of loss in case of a default using the following scoring formula:

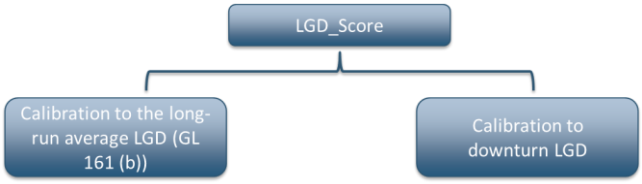
i. $LGD\ Score = PPD \cdot \left[{(EAD - min(EAD, RR \cdot current\ Mkt\ Price))}/{EAD} \right]$ where the current market price is achieved by an indexed valuation which adjusts the market price validat at the time when the according mortgage has been granted (or at another more recent point in time where the market value has been individually (re-)assessed) to reflect a current market price.

Example 5 – cont.

The recovery rates could be estimated dependent on certain risk drivers, e.g. the location of the underlying property:

LTV	City-Area	Suburb-Area	Country-Side
<20%	90%	85%	75%
20% - <50%	80%	75%	65%
50% - <60%	70%	70%	55%
60%- < 80%	60%	65%	45%
>80%	56%	50%	35%

As previously pointed out, downturn LGD estimation is part of the risk quantification, thus the institution would need to provide two calibrations in relation to the considered LGD model:



For the purpose of quantifying downturn LGD (LGD_DT) the institution would now estimate downturn LGD by way of applying the formula for the LGD Score, however using 'downturn market prices' instead of current market prices:

$$LGD\ Score = PPD \cdot \left[{(EAD - \ min(EAD, RR \cdot downturn\ Mkt\ Price))}/{EAD} \right]$$

Where the $downturn\ Mkt\ Price$ is achieved by adjusting the $current\ Mkt\ Price$ according to the severity that has been identified in accordance with the RTS on economic downturn, which in this case could be the house-price index drop observed in 1990:

$$downturn\ Mkt\ Price = \ current\ Mkt\ Price \cdot \boldsymbol{Haircut}$$

It should be noted that, although detailed, this example is still simplified, as, for example, according to paragraph 30 of the final GL the institution would need to ensure that the applied methodology for downturn LGD estimation appropriately reflects a potential downturn effect on all relevant components of economic loss. The example above, however, considered only recoveries. Where necessary the institution could for example estimate the impact on the cure rate (i.e. the rate of exposures returning to the performing portfolio) by applying an extrapolation approach.

61. The policy in paragraph 30 requires the use of a haircut approach if both of the following conditions are fulfilled:

    i. There are not sufficient data to calibrate downturn LGDs based on observed impact on loss data (i.e. the policy laid down in paragraph 24 applies).

    ii. An economic factor that has been identified as a relevant economic factor in accordance with Article 2 of the RTS on economic downturn relates to a relevant type of collateral for the type of exposure under consideration and is a direct or transformed input of the institution's model for LGD estimation.

62. Two remarks are important to make. First, it should be noted that the mandatory use of the haircut approach is related to the situation where the LGD estimation model takes as one of its inputs the economic factor related to a relevant collateral type for the type of exposure under consideration (e.g. market values or a market index). In this case, the policy prescribes that the actual haircut (i.e. the adjustment of the economic factor which serves as input into the model to reflect downturn conditions) should be based on the most severe observed value of the market price, or market price index, in accordance with the specification of the severity of an economic downturn in accordance with Article 3 of the RTS on economic downturn. Second, institutions may also apply a haircut approach where applicable, i.e. where an economic factor is a direct or transformed input to the LGD model and is not related to the relevant collateral types to calibrate downturn LGD estimates. If for example the GDP is a direct or transformed input into the LGD model, a haircut approach may be used as well, but it is not mandatory.

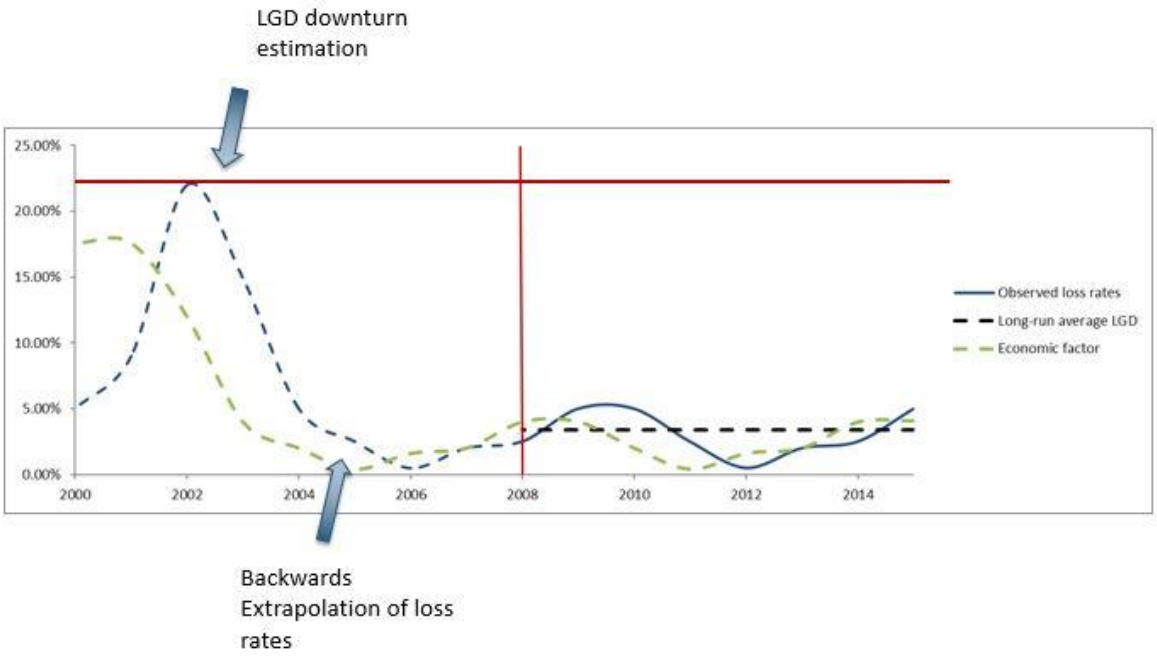
63. Finally, it should be mentioned that institutions that have to quantify LGD based on the observed impact of an economic downturn on loss data, as set out in paragraph 23 of the GL, are not prohibited from using haircut approaches for the purpose of calibrating their LGD model to the quantification of downturn LGD estimations achieved in accordance with paragraph 23 of the GL. An institution that has observed loss data affected by an economic downturn for a type of exposure under consideration needs to calculate haircuts such that the resulting downturn LGD estimates reflect the observed impact from an economic downturn (i.e. to reach the calibration target) in accordance with paragraph 28 of the GL, whereas an institution that does not have such data needs to consider haircuts in accordance with the downturn severities observed in respect of the corresponding economic factors in accordance with paragraph 31 of the GL, and add an additional MoC.

Extrapolation approach

64. **Paragraph 32** of the final GL describes the extrapolation approach and sets out requirements for the application of this approach. For the purpose of these GL, 'the extrapolation approach' refers to a methodology to estimate realised LGDs, intermediate parameters or even risk drivers that serve as an input into the LGD estimation model under consideration. These estimated realised LGDs (or intermediate parameters or risk drivers) are extrapolated backwards in time based on the dependency of the realised LGDs (or intermediate parameters

or risk drivers) on relevant economic factors. This dependency should be established based on observed loss data. The graph in Example 6 illustrates the concept of the extrapolation approach, where the red vertical line illustrates the time from which onwards the institution has reliable data, and the red horizontal line illustrates the resulting downturn LGD estimation.

Example 6



As an example of an extrapolation approach, an institution could develop a statistical model for the dependency of

i. average yearly realised LGD values $\overline{Y_t}$ and

ii. economic factors $e_t^1, e_t^2, \ldots$ which should be identified according to the RTS on economic downturn, for the considered type of exposure, e.g. using a linear regression:

$$\overline{Y_t} = \boldsymbol{\alpha} + \boldsymbol{\beta_1^1 e_{t-l_1}^1} + \boldsymbol{\beta_2^1 e_{t-l_2}^1} + \boldsymbol{\beta_n^k e_{t-l_n}^k} + \boldsymbol{\varepsilon}$$

where $e_s^j, j = 1, \ldots, , \ldots, k$ describe the value of the *j*th economic factor in years. Possible time lags are considered with a lag of t minus $l_1 \ldots . l_n$ (where t is the point in time at which the realised LGD rate is assessed).

65. The extrapolation approach has, however, been perceived as potentially leading to less conservative results and might also suffer from uncertainty about whether or not the derived dependency will also apply under non-observed downturn conditions. Therefore, a requirement is added in paragraph 35 to cover the additional uncertainty related to the use of the extrapolation approach with an additional MoC.

Example 7

Considering the previous example, it could be assumed for simplicity that the methodology applied for the regression discards all but one economic factor, e.g. GDP of the past year. In this case, the error of this model could be assessed as $\widehat{Y_0} - Y_0$ for a chosen point in time t_0 (where the internal loss would need to be extrapolated) and the following could be used as an estimator for the variance of the residuals (under the assumption that the residuals are normally distributed), where *n* denotes the number of observations (points in time) used for the regression:

$$s_Y^2 = Var\left(\hat{Y}_0 - Y_0\right) = \frac{1}{n-2}\sum_{i=1}^{n}\left(Y_i - \hat{Y}_i\right)^2$$

A confidence interval for the extrapolated realised LGDs in year 0 based on the regression could be derived as follows:

$$s_Y^2 = s_\epsilon^2\left(1 + \frac{1}{n} + \frac{(GDP_{-1} - \overline{GDP})^2}{\sum_{i=1}^{N}(GDP_i - \overline{GDP})^2}\right)$$

The confidence interval around the extrapolated realised LGDs could be assessed as (only upper interval shown):

$$I = \left(Y_0 + s_Y \cdot t_{1-\frac{\alpha}{2},n-2}\right)$$

where $t_{1-\frac{\alpha}{2},n-2}$ denotes the $1-\frac{\alpha}{2}$ percentile of the Student *t*-distribution, which would then have to be taken into account in the quantification of a Category A MoC for that extrapolation.

66. It may be the case that only for a major share of economic loss the impact of a considered downturn period can be estimated by a haircut or extrapolation approach. There may, however, be other, less significant (but not immaterial), components of economic loss where the impact of the downturn period under consideration can be estimated by neither a haircut nor an extrapolation approach. In order not to push these cases under the scope of application of section 7, the EBA considers it appropriate to allow an estimation of the impact on these less significant components based on observed data from a different period than from the downturn period under consideration, yet still with the objective of estimating the impact of the downturn period under consideration. This is included in paragraph 32(b)(ii) of the draft GL.

67. The approach described in paragraph 32(b)(ii) of the GL should be limited to specific cases. Therefore, the policy sets out several restrictions on the use of this approach, clarifying that the approach may be followed only:

    i. for intermediate parameters and risk drivers (e.g. cure rates or recovery rates) and

    ii. where the major shares of economic loss are covered already by a haircut or extrapolation approach and

    iii. where no statistically significant dependency can be established on the intermediate parameter or risk driver under consideration and

    iv. where the intermediate parameter or risk driver under consideration shows low volatility over the time period for which it has been observed.

68. However, where this version of the extrapolation approach is used, institutions should quantify the Category A MoC taking into account the relation between the value(s) of the economic factor(s) underlying the downturn period under consideration identified in accordance with Article 3 of the RTS and the value of these economic factors observed under other adverse economic conditions as referred to in paragraph 32(b)(ii).

Example 8

As an example, to quantify a category A MoC, institutions could:

i. calculate the average of the observed realisation of the parameter or risk driver under consideration for the period identified in accordance with paragraph 32(b)(ii);

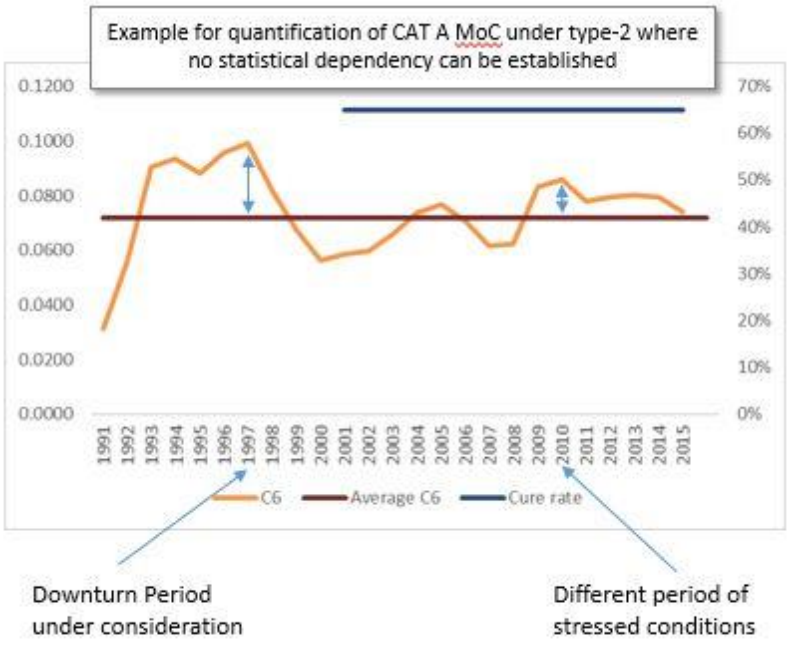
ii. calculate the ratio between

- the most severe value(s) of the economic factor(s) underlying the considered downturn period identified in accordance with Article 3 of Regulation xx/xxx [RTS on economic downturn] and
- the most severe value(s) of the relevant economic factor(s) observed in the period referred to in paragraph 32(b)(ii);

iii. quantify the Category A MoC based on the (absolute) difference between:

- the value obtained when multiplying the average of the observed realisation of the parameter or risk driver under consideration as referred to in sub-point (i) by the ratio specified in sub-point (ii) and
- the estimation of the parameter under consideration in accordance with paragraph 32(b).

Example 8 – cont.



2.8 Downturn LGD estimation where observed or estimated impact is not available

69. Section 7 (**paragraph 36**) of these GL allows for exceptional cases: where neither the approach outlined in section 5 nor the approach laid down in section 6 can be applied, and where institutions can justify to the satisfaction of the competent authority that none of the approaches is applicable, the institution may apply any alternative methodology to calibrate downturn LGD estimates. Where this approach needs to be applied, the institution can rely only on observed loss data during favourable economic conditions for the type of exposure under consideration (as otherwise the approach set out in section 5 would be applicable). As the institution applies a calibration methodology which might be more favourable than those outlined in section 6, it needs to quantify an MoC in relation to this downturn LGD estimation such that the final downturn LGD estimate including MoC is higher than or equal to the long-run average LGD plus 15 percentage points. In any case, the final downturn LGD estimate should be lower than or equal to 105%.

2.9 Reference value

70. Finally, it should be noted that section 8 (**paragraph 37**) describes the calculation of a reference value that acts as a non-binding challenger to downturn LGD estimation at calibration level, irrespective of the methodology used.

2.10 Remarks

71. It should be clear from the policy as well as from the rationale outlined above that there is a hierarchy of the approaches to quantification of downturn LGD estimates. This hierarchy is outlined in paragraphs 23 to 25 of the GL. Where loss data affected by a downturn period are available, the institution needs to follow the policy set out in section 5 of the final GL. Otherwise, the institution needs to follow the policy set out in section 6 and only in very exceptional cases should downturn LGD estimates be calibrated in accordance with section 7. This approach should make downturn LGD estimation more transparent and comparable than in the past. At the same time, it is aimed at providing sufficient flexibility for the institutions. The policy will make it easier to distinguish risk-based variability in applied LGD parameters from variability stemming from other sources.

72. The policy also accounts for situations in which the observed impact of an economic downturn on the relevant loss data is zero or near zero. In addition, it clarifies the terminology by distinguishing between the identified economic downturn for a type of exposure under consideration and its impact, i.e. by noting that, if the relevant loss data show no impact of an economic downturn, it does not necessarily mean that there is no economic downturn or that there will be no impact in the future. Although there might be cases in which the identified economic factors do not show a cyclical pattern, the RTS on economic downturn provide a clear definition that works independently of such patterns (which could also just reflect very long cycles). Moreover, it should be noted that the notion of the duration provided in Article 3 of the RTS on economic downturn is particularly relevant to applying the policy laid down in paragraph 27 of the final GL and the notion of severity is particularly relevant to applying the policy laid down in paragraph 31 of the GL.

73. As mentioned before, flexibility is left with regard to the calibration methodology as long as the calibration target, i.e. the downturn LGD, complies with the rules set out in these GL.

2.11 Illustrative example of a downturn LGD estimation for an obligor rating system in the retail exposure class

Example	Calibration Segment A: Mortgages	Calibration Segment B: Consumer credits and overdrafts
Downturn Period 1 (DTP_1) 1990 – 1991 Trough on house price index	LGD downturn related to downturn period 1 estimated via Haircut approach: LGD_DT(A, DTP_1) (incl. MoC)	LGD downturn related to downturn period 1 estimated via extrapolation approach (e.g. along total household debt): LGD_DT(B, DTP_1) (incl. MoC)
Downturn Period 2 (DTP_2) 2008 – 2010 Trough in GDP Growth and peak in unemployment rate and total household debt	Impact analysis conducted based on observed loss data: No impact observable, all MoC requirements fulfilled: LRAVLGD + MoC appropriate for LGD downturn estimate relating to this downturn period. LRAVLGD+MoC = LGD_DT(A, DTP_2)	Impact analysis conducted based on observed loss data resulting in LGD downturn estimates related to downturn period 2: LGD_DT(B, DTP_2) (incl. MoC)

In this example, the final downturn LGD including the MoC could be expressed as follows:

$$LGD_{DT_{Final}} = \begin{cases} LGD_{DT(A,DTP_1)}, for\ calibration\ segment\ A \\ LGD_{DT(B,DTP_2)}, for\ calibration\ segment\ B \end{cases}$$

where it is assumed that

$$Average_A\left(LGD_{DT(A,DTP_1)}\right) = max_A\left(\left(Average_A\left(LGD_{DT(A,DTP_1)}\right), Average_A(LGD_{DT(A,DTP_2)})\right)\right)$$

$$Average_B\left(LGD_{DT(B,DTP_2)}\right) = max_B\left(\left(Average_B\left(LGD_{DT(B,DTP_1)}\right), Average_B(LGD_{DT(B,DTP_2)})\right)\right)$$

3. Guidelines

EBA/GL/2019/03

6 March 2019

Guidelines on the estimation of LGD appropriate for an economic downturn ('Downturn LGD estimation')

1. Compliance and reporting obligations

Status of these guidelines

1. This document contains guidelines issued pursuant to Article 16 of Regulation (EU) No 1093/2010[10]. In accordance with Article 16(3) of Regulation (EU) No 1093/2010, competent authorities and financial institutions must make every effort to comply with the guidelines.

2. Guidelines set the EBA view of appropriate supervisory practices within the European System of Financial Supervision or of how Union law should be applied in a particular area. Competent authorities as defined in Article 4(2) of Regulation (EU) No 1093/2010 to whom guidelines apply should comply by incorporating them into their practices as appropriate (e.g. by amending their legal framework or their supervisory processes), including where guidelines are directed primarily at institutions.

Reporting requirements

3. According to Article 16(3) of Regulation (EU) No 1093/2010, competent authorities must notify the EBA as to whether they comply or intend to comply with these guidelines, or otherwise with reasons for non-compliance, by ([dd.mm.yyyy]). In the absence of any notification by this deadline, competent authorities will be considered by the EBA to be non-compliant. Notifications should be sent by submitting the form available on the EBA website to compliance@eba.europa.eu with the reference 'EBA/GL/2019/03'. Notifications should be submitted by persons with appropriate authority to report compliance on behalf of their competent authorities. Any change in the status of compliance must also be reported to EBA.

4. Notifications will be published on the EBA website, in line with Article 16(3).

[10] Regulation (EU) No 1093/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC, (OJ L 331, 15.12.2010, p.12).

2. Subject matter, scope and definitions

Subject matter

5. These guidelines specify the requirements for the estimation of loss given default (LGD) appropriate for an economic downturn in accordance with Part Three, Title II, Chapter 3, Section 6 of Regulation (EU) No 575/2013, Article 181 of that Regulation and the EBA final draft regulatory technical standards on the IRB assessment methodology EBA/RTS/2016/03 [RTS on IRB assessment methodology] of 21 July 2016 as well as EBA final draft regulatory standards on the specification of an economic downturn EBA /RTS/2018/04 [RTS on economic downturn] of 16 November 2018. These guidelines should be considered as an amendment of EBA on PD estimation, LGD estimation and the treatment of defaulted exposures EBA/GL/2017/16 [EBA GL on PD and LGD] published on 20 November 2017.

Scope of application

6. These guidelines apply in relation to the IRB Approach in accordance with Part Three, Title II, Chapter 3 of Regulation (EU) No 575/2013 for all methods based on own estimates of LGD. The use of own estimates of LGD appropriate for an economic downturn, in accordance with these guidelines, is subject to supervisory approval in accordance with Article 144 of Regulation (EU) No 575/2013. These guidelines do not apply to the calculation of own funds requirements for dilution risk in accordance with Article 157 of Regulation (EU) No 575/2013.

Addressees

7. These guidelines are addressed to competent authorities as defined in point (i) of Article 4(2) of Regulation (EU) No 1093/2010 and to financial institutions as defined in Article 4(1) of Regulation (EU) No 1093/2010.

Definitions

8. Unless otherwise specified, terms used and defined in in Regulation (EU) No 575/2013 and Directive 2013/36/EU and in [EBA GL on PD and LGD] have the same meaning in the guidelines. In addition, for the purposes of these guidelines, the following definitions apply:

Quantification of downturn LGD	Quantification of downturn LGD covers all elements of the quantification of downturn LGD including the quantification of the calibration target, the quantification of the resulting downturn LGD estimates at grade and

	pool level and the quantification of the margin of conservatism (MoC).
Calibration of downturn LGD	The term calibration of downturn LGD in the context of these guidelines refers to the quantification of the calibration target at the relevant level.
Downturn LGD estimates	These are the LGD estimates appropriate for an economic downturn at the grade or pool level after calibration but before the application of MoC.

3. Implementation

Date of application

9. These guidelines apply from 1 January 2021. Institutions should incorporate the requirements of these guidelines in their rating systems by that time, but competent authorities may accelerate the timeline of this transition at their discretion.

First application of these Guidelines

10. The internal validation function of institution should verify the changes which are applied to the rating systems as a result of the application of these guidelines, consistently with EBA final draft regulatory technical standards on the IRB assessment methodology EBA/RTS/2016/03 [RTS on IRB assessment methodology] of 21 July 2016 and the classification of the changes in accordance with Commission Delegated Regulation (EU) No 529/201411.

11. Institutions that need to obtain prior permission from competent authorities in accordance with Article 143(3) of Regulation (EU) No 575/2013 and Regulation (EU) No 529/2014 for the changes in the rating systems required to incorporate these guidelines for the first time by the deadline referred to in paragraph 9 should agree with their competent authorities the final deadline for submitting the application for such prior permission.

12. Prior to the application of these guidelines, institutions need to identify the relevant downturn periods for the type of exposure under consideration in accordance with EBA submitted [RTS on economic downturn]. The guidelines will be adapted, where relevant, when the RTS on economic downturn are published in their final version in the OJ.

4. General requirements on downturn LGD estimation

13. For the purpose of quantifying LGDs that are appropriate for an economic downturn, institutions should apply all definitions and all requirements set out in Section 4, Section 6, Section 7, Section 8 and Section 9 of the EBA Guidelines on PD estimation, LGD estimation and the treatment of defaulted exposures (EBA/GL/2017/16) of 20/11/2017 (EBA GL on PD and LGD estimation) that are relevant for this purpose.
14. In addition to paragraph 13, for the purpose of quantifying downturn LGD institutions should apply the following requirements specific to downturn LGD estimates by facility grade or pool:
    (a) calibrate downturn LGD at least at the same level at which institutions calculate the corresponding long-run average LGD for the purpose of calibrating LGD in accordance with paragraph 161 of the [EBA GL on PD and LGD estimation].
    (b) split the set of facilities covered by the same LGD model into as many different calibration segments as needed where each calibration segment carries a significantly different loss profile and might thus be affected differently by different downturn periods; for this purpose, institutions should at least consider the appropriateness of introducing calibration segments that cover material shares of exposure in different geographical areas, in different industry sectors and, for retail exposures, of different product types;
15. Where institutions identify multiple downturn periods in accordance with the final draft RTS on economic downturn submitted by EBA [RTS on economic downturn],
    (a) they should perform each of the steps in the following sequence:
        (i) calibrate downturn LGD for each identified downturn period in accordance with Section 4.3 for each calibration segment;
        (ii) for each of those downturn periods, apply the resulting downturn LGD estimates to their current non-defaulted exposures of the type of exposures under consideration and at the time of calibration;
        (iii) choose the period as finally relevant downturn period that results in the highest average downturn LGD, including final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation], on a considered calibration segment of their current non-defaulted exposures as referred to in (ii). Institutions should then use the resulting downturn LGDs based on the finally relevant downturn period for each calibration segment to comply with paragraph 181 (b) CRR.
        (iv) in case that institutions can calibrate downturn LGD in accordance with Section 5 or Section 6 for at least one downturn period but they are unable to quantify downturn LGD in accordance with Section 5 or Section 6 for one or several other downturn periods, consider only the estimates based on Section 5 or Section 6, and add appropriate Category A MoC in accordance with paragraph 37(a) of

[EBA GL on PD and LGD estimation] to the final downturn LGD estimates to cover for the downturn periods where sufficient and relevant loss data to assess or estimate the impact is not available;

(b) In derogation to paragraph 15(a)(i), institutions do not need to provide a calibration of downturn LGD for a considered calibration segment for downturn periods identified in accordance with the [RTS on economic downturn] where institutions can provide evidence that the according economic factors are not relevant for the considered calibration segment.

4.1 Requirements that apply to the final downturn LGD estimates

16. For the purpose of ensuring that the resulting downturn LGDs are used if they are more conservative than the according long-run average LGDs in line with Article 181(1)(b) of Regulation (EU) No 575/2013, institutions should apply the following:
    (a) where institutions use separate estimation methodologies for long-run average LGD and downturn LGD, compare their final downturn LGDs used for calibration plus the according final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation], to their long-run average LGDs plus the according final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation] at the level where the long-run average LGD is calculated for the purpose of calibrating LGD in accordance with paragraph 161 of the [EBA GL on PD and LGD estimation];
    (b) where institutions set a single LGD estimate, which involves a long-run average LGD estimation and a downturn adjustment added to the long-run average LGD estimation, they should ensure that the final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation] on the downturn LGD estimates encompasses the uncertainties stemming from both the long-run average LGD estimation and the calculation of the downturn adjustment.

17. For models with risk drivers sensitive to the economic cycle, institutions should ensure that the resulting downturn LGD estimates are not unduly sensitive to changes in economic cycle. For this purpose, institutions should do all of the following:
    (a) analyse the difference between the distribution of exposures over facility grades or pools, or over appropriate intervals in case of continuous facility scales, of the current portfolio and the likely distribution of the current portfolio impacted by the relevant downturn period selected in accordance with paragraph 15,
    (b) if there is a substantial difference as a result of the analysis in (a), institutions should apply an adjustment to their downturn LGD estimates to limit the capital impact of an economic downturn in accordance with Article 181(1)(b) of Regulation (EU) No 575/2013.

18. Institutions should compare the final downturn LGD with the reference value calculated in accordance with Section 8 on the according RDS and calculated at least at the level of calibration segments. Institutions should justify any material difference between the final downturn LGD and the reference value.

19. When comparing the final downturn LGD with the reference value in line with paragraph 18, institutions should take into account all of the following:
    (a) A material difference between the final downturn LGD plus final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation](s) and the reference value can be justified if the period of losses identified by the reference value does not stem from a - potentially unidentified - downturn period or if the difference is due to the minimum MoC requirement in paragraph 36(b) where the downturn LGD is based on the methodology in Section 7. In case that the underlying downturn LGD is based on the methodology in Section 5, institutions may use the evidence gathered from the impact assessment in paragraph 27.
    (b) If the material difference between the final downturn LGD and the reference value cannot be justified, institutions should re-assess their quantification of downturn LGD ensuring in particular that the downturn periods have been identified comprehensively and that, where intermediate parameters are used, the impact of the relevant downturn period observed (based on Section 5) or estimated (based on Section 6) on intermediate parameters has been aggregated adequately. After the institution has re-assessed its quantification of downturn LGD, and the methodology is assessed to be adequate, a material difference from the reference value can be explained.

4.2 Downturn LGD estimation for defaulted exposures

20. For downturn LGD estimation for defaulted exposures, institutions should use the same downturn period as identified for the corresponding non-defaulted exposures.
21. For downturn LGD estimation for defaulted exposures for the downturn period referred to in paragraph 20, institutions should comply with all of the following:
    (a) The downturn component of LGD estimation for defaulted exposures as referred to in paragraph 193(b)(i) of the [EBA GL on PD and LGD estimation] should be quantified by either:
        (i) calibrating downturn LGD for the defaulted exposures under consideration for each reference date in accordance with Section 4.3 by inferring the downturn component of the LGD in default for each reference date based on the difference between the downturn LGD estimates and ELBE; or
        (ii) first calibrating downturn LGD in accordance with Section 4.3 for the defaulted exposures under consideration for the moment of default and subsequently inferring the downturn component of the LGD in default at other reference dates

based on the difference between the downturn LGD estimates at the moment of default and ELBE at the moment of default.

(b) In order to comply with paragraph 21(a)(ii), institutions may use the downturn component of the LGD estimates for non-defaulted exposures instead of the downturn component for defaulted exposures at the moment of default where the institution can provide evidence that this results in more conservative estimates.

(c) In order to comply with paragraph 21(b) and where institutions use separate estimation methodologies for long-run average and downturn LGD in accordance with paragraph 16(a), the downturn component of the LGD estimates for non-defaulted exposures may be inferred by considering the difference between the resulting downturn LGD estimates and the corresponding long-run average LGDs taking into account paragraph 193 of the [EBA GL on PD and LGD estimation].

4.3 Downturn LGD estimation for a considered downturn period

22. For the purpose of calibrating downturn LGD for each considered downturn period identified in accordance with Regulation (EU) xx/xx [RTS on economic downturn], institutions should use one of the three types of approaches set out in Section 5, Section 6 and Section 7 of these guidelines in accordance with the hierarchy set out in paragraphs 23 to 25 below.
23. Where institutions have sufficient and relevant loss data to conduct the impact analysis set out in paragraph 27, they should calibrate downturn LGD for the considered downturn period in accordance with Section 5 of these guidelines. For this purpose, institutions should ensure that the relevant loss data is available during the considered downturn period as well as during an appropriate period before and after the considered downturn period.
24. Where sufficient and relevant loss data to assess the impact of the considered downturn period is not available but it is possible to calibrate downturn LGD for the considered downturn period by applying the approach set out in Section 6, institutions should calibrate downturn LGD for the considered downturn period in accordance with Section 6 of these guidelines.
25. Where sufficient and relevant loss data to assess the impact of the considered downturn period is not available, and it is not possible to quantify downturn LGD for the considered downturn period by applying the approach set out in Section 6, institutions should calibrate downturn LGD for the considered downturn period in accordance with Section 7 of these guidelines.
26. Regardless of the approach used for calibrating downturn LGD institutions should adhere to the following principles

    (a) where the approach used involves the estimation or analysis of different intermediate parameters, the aggregation of these intermediate parameters for the purpose of calibrating downturn LGD should start with the parameter where the highest impact is observed in accordance with paragraph 27 or estimated in

accordance with paragraph 30 and any additional impact observed or estimated on other parameters should be added where necessary.

(b) The downturn LGD estimates should not be biased by observed or estimated cash flows that are received with a significantly longer time lag than the period referred to in paragraph 156 of [EBA GL on PD and LGD estimation] and which might rather reflect an upturn or improved economic conditions following the considered downturn period.

5. Downturn LGD estimation based on observed impact

27. In order to calibrate downturn LGD based on the observed impact of a considered downturn period, institutions should carry out an analysis of the impact of this downturn period on the loss data related to the considered calibration segment.
    (a) The analysis shall comprise at a minimum all of the following:
        (i) evidence of elevated levels of realised LGDs, driven by the considered downturn period taking into account all of the following:
            (1) the realised LGDs should be calculated as averages related to all defaults that occurred in a considered year and that have either reached their maximum time of recovery in accordance with paragraph 156 [EBA GL on PD and LGD estimation] or have been closed before;
            (2) for all incomplete recovery processes of defaulted exposures that have not reached their maximum time of recovery in accordance with paragraph 156 [EBA GL on PD and LGD estimation], the marginal recoveries reached in each year after default should be computed. The resulting recovery patterns should be compared to the recovery patterns of the defaults considered in letter (1) for each year in which the defaults occurred.
        (ii) evidence of decreased annual recoveries by sources of recoveries that are relevant for the considered calibration segment. These annual recoveries should be analysed with and without repossessions where applicable and irrespective of the date of default;
        (iii) evidence of decreased numbers of exposures that defaulted and returned back to the non-defaulted status within a predefined fixed horizons for all defaults that happened in a considered year in accordance with Article 178(5) of Regulation (EU) No 575/2013; The predefined fixed horizon should be appropriate for the type of exposure under consideration.
        (iv) evidence of increased time in default per year related to all defaults in a considered year.

(b) The analysis required in paragraph 27(a) shall take into account as many points in time as possible where sufficient relevant loss data is available. Otherwise, if only scarce relevant loss data is available on an annual basis, institutions should merge consecutive years of observations as long as deemed of added value for the analysis.

(c) The analysis required in paragraph 27(a) and (b), shall take into account any lag between a downturn period and the time when its potential impact is observed on the relevant loss data.

28. Based on the evidence obtained from the impact analysis referred to in paragraph 27, institutions should calibrate downturn LGD by applying an estimation methodology which is coherent with the evidence obtained from the impact analysis.

29. Where the impact analysis conducted in accordance with paragraph 27 shows no impact of a downturn period on an institution's relevant loss data, such that the average observed realised losses in this downturn period are not different from those under other economic conditions, the institution may use the long-run average LGD as downturn LGD, where all of the following applies:

(a) the institution ensures and documents that the deficiencies identified and MoC applied in accordance with Section 4.4 of the [EBA GL on PD and LGD estimation] incorporate all additional elements of uncertainty related to the identified downturn periods;

(b) for the purpose of letter (a), the institution should in particular verify that, for the considered downturn period, none of the deficiencies identified under the Category A, MoC in accordance with paragraph 37(a) of [EBA GL on PD and LGD estimation] are of higher severity and that no additional deficiencies or adjustments under the Category B MoC in accordance with paragraph 37(b) of [EBA GL on PD and LGD estimation] are applicable.

6. Downturn LGD estimation based on estimated impact

30. Where paragraph 24 applies, institutions should calibrate downturn LGD using one of the methodologies specified in paragraph 31 ('haircut approach') and paragraph 32 ('extrapolation approach') or a combination of those. Prior to quantifying its downturn LGD estimates, institutions should choose the most relevant methodology based on:

(a) the appropriateness of the methodology to estimate the impact of the downturn period under consideration on a realised LGDs, intermediate parameters or risk drivers;

(b) where relevant, the need to use a combination of the methodologies to ensure that the resulting downturn LGDs for the downturn period under consideration adequately reflect a potential downturn impact on all material components of

economic loss in accordance with Section 6.3.1 of the [EBA GL on PD and LGD estimation] and in accordance with the principles set out in paragraph 26;

In particular the haircut approach should be considered most appropriate for the above purposes where the market value or an according index related to a relevant type of collateral serves as a direct or transformed input into an institution's model for LGD estimation and has been identified as a relevant economic factor in accordance with Article 2 of Regulation (EU) No xx/xxx [RTS on economic downturn].

31. ('Haircut approach') For the purpose of these guidelines, a 'haircut approach' refers to an approach for the estimation of the impact of the downturn period on realised LGDs, intermediate parameters or risk drivers in which one or several economic factors as referred to in Regulation (EU) xx/xx [RTS on economic downturn] are direct or transformed input(s) in the LGD model and where for the purpose of this estimation these input(s) are adjusted to reflect the impact of the downturn period under consideration. In particular, where the considered economic factor relates to the downturn period under consideration, the haircut should be based on the most severe observation of this economic factor in accordance with the specification of the severity of an economic downturn laid down in Article 3 of Regulation (EU) xx/xx [RTS on economic downturn].
32. ('Extrapolation Approach') For the purposes of these guidelines, an 'extrapolation approach' refers to the estimation of the impact of the downturn period under consideration on LGDs, intermediate parameters or risk drivers if all of the following conditions are met:
    (a) where a statistically significant dependency between the realised LGDs, intermediate parameters or risk drivers, averaged over appropriate periods in time, and the economic factors selected in accordance with Article 2 of Regulation xx/xxx [RTS on economic downturn] which are relevant for the downturn period under consideration, can be established the resulting estimates are based on the extrapolated values of the average realised LGDs, intermediate parameters or risk drivers to the period reflecting the impact of the downturn period;
    (b) where no statistically significant dependency as described in paragraph 32(a) can be established for an intermediate parameter or risk driver, institutions may estimate the impact of the downturn period under consideration on an intermediate parameter or risk driver based on observed data from a different period, where all of following three conditions are met:
        (i) at least those components of economic loss that explain the major share of the total economic loss should be estimated by either a haircut approach in accordance with paragraph 31 or an extrapolation approach in accordance with paragraph 32(a);
        (ii) the institution has observed data for the intermediate parameter or risk driver for a sufficient period of time which is at least as long as the period referred to in Article 181(1)(j) or Article 181(2), last subparagraph of Regulation (EU) No 575/2013; this period of time should include a period

where the economic factor(s) underlying the considered downturn period show values representing adverse economic conditions.

(iii) the intermediate parameter or risk driver under consideration shows low volatility in the periods referred to in sub point (ii).

33. Where institutions have observed data covering the downturn period and reflecting the impact of the respective downturn conditions under consideration on an intermediate parameter or risk driver they should use the observed data in combination with the Haircut or Extrapolation Approach to calibrate downturn LGD for the considered downturn period in accordance with paragraph 30.
34. Where institutions apply any of the approaches outlined in paragraphs 31 to 33 for the purpose of estimating intermediate parameters or risk drivers, they should ensure that the dependency structure between intermediate parameters or risk drivers is reflected appropriately in the aggregation of these intermediate parameters or risk drivers in accordance with paragraph 30.
35. To reflect the lack of sufficient loss data, institutions should quantify a strictly positive Category A MoC in accordance with paragraph 37(a)(xi) of the [EBA GL on PD and LGD estimation] for all approaches in this section. In particular, institutions applying an extrapolation approach:
    (a) as referred to in paragraph 32(a), should quantify the Category A MoC by using an appropriate confidence interval to reflect the uncertainty related to the statistical model used to describe the dependency between the realised LGDs, intermediate parameters or risk drivers and the relevant economic factors;
    (b) for an intermediate parameter or risk driver as referred to in paragraph 32(b), should quantify the Category A MoC taking into account the ratio of the value(s) of the economic factor(s) underlying the considered downturn period identified in accordance with Article 3 of Regulation xx/xxx [RTS on economic downturn] and value(s) of the relevant economic factor(s) observed in the periods referred to in paragraph 32(b)(ii);

7. Downturn LGD estimation where observed or estimated impact is not available

36. Where the relevant loss data to assess the impact of the downturn period under consideration is not available and it is also not possible to calibrate downturn LGD for the considered downturn period in accordance with Section 6 of these guidelines, institutions

should quantify downturn LGD through any other approach subject to the following conditions:

(a) they should ensure that the appropriate MoC required to be applied in accordance with Section 4.4.3 of the [EBA GL on PD and LGD estimation] includes a Category A MoC that is strictly positive to account for the missing data;

(b) they should ensure that the resulting downturn LGD estimates including the final MoC as set out in paragraph 45 of the [EBA GL on PD and LGD estimation], for the considered downturn period are higher or equal to the minimum between

- the according long-run average LGDs plus an add-on of 15 percentage points and
- 105%;

Moreover, they should provide justification to the satisfaction of the competent authority that they cannot calibrate downturn LGD appropriate for the considered downturn period by applying any of the approaches set out in Section 5 and Section 6 of these guidelines.

8. Reference Value

37. Institutions should calculate a reference value in accordance with the following sequence of steps:

(a) Using all available loss data, institutions should select the two individual years with the highest observed economic loss by:

(i) grouping all defaults according to the year in which the defaults occurred;

(ii) for each year as identified in (i) calculating for the defaults that occurred in the considered year the ratio of total economic loss as specified in Section 6.3.1 of the [EBA GL on PD and LGD estimation] to the total outstanding amount of the according credit obligations at the moment of default;

(iii) selecting the two individual years with the highest annual ratio of total economic loss to total outstanding amount resulting from (ii) as the two individual years with the highest observed economic losses.

(b) Institutions should calculate the reference value(s) at least for each calibration segment as the simple average of the average realised LGDs from the two individual years with the highest observed economic losses, as identified in paragraph 37(a)(iii).

4. Accompanying documents

4.1 Draft cost-benefit analysis/impact assessment

The impact assessment (IA) analyses the potential related costs and benefits of the policy provided in the draft guidelines. This analysis shall provide the reader with an overview of the findings as regards the problem identification, the options identified to remove the problem and their potential impacts.

A. Problem identification

While the proposed RTS aim to harmonise the definition of an economic downturn, these guidelines focus on the estimation of downturn LGD per se. Indeed, both the definition of an economic downturn and the downturn LGD estimation have been identified in different reports (from the EBA [11] as well as from the industry) as key drivers of non-risk-based variability of capital requirements. All issues that have been considered while developing the RTS and these guidelines relate to the identification and/or limitation of drivers of unjustified RWA variability in the context of downturn LGD.

The RTS and these GL are expected to provide a more harmonised framework for the identification of economic downturn conditions and downturn LGD estimations, leading to more comparable RWA outcomes across institutions.

B. Policy objectives

The objective of these guidelines is to establish convergence between institutions' methodological choices in estimating downturn LGD estimates. These methodological choices are considered to be drivers of unjustified RWA variability; hence the harmonisation of the current practices is expected to increase the comparability of own funds requirements.

The guidelines introduce three different type of approaches to estimate the downturn LGD, taking into account the data availability of the institution. The most appropriate approach should be used.

- The first and optimal approach should be relied on when loss data reflecting the impact of an economic downturn (identified in accordance with the draft RTS on the specification of the nature, severity and duration of an economic downturn) are available. In this case, the institution can model the downturn directly.
- The second approach comes into play if insufficient data are available, in which case the institution has the choice of quantifying the downturn adjustment using a limited set of methodologies.

[11] https://eba.europa.eu/-/eba-publishes-reports-on-comparability-of-risk-weighted-assets-rwas-and-pro-cyclicality

- Finally, if no such data are available and the limited set of methodologies cannot be applied either, the institution still has to provide downturn LGD estimates (as this is a CRR requirement) but needs to include a margin of conservatism, covering for the lack of data and methodological deficiencies. Under this third and final approach, it is required that the final downturn LGD estimates include an appropriate margin of conservatism and be higher than the corresponding long-run-average LGD estimates plus 15% (capped at a final downturn LGD estimate of 105%).

C. Baseline scenario

The baseline scenario can be defined in terms of supervisory rules and practices, institutions' current practices and regulatory environment.

The baseline scenario in terms of the supervisory expectations is specified on the basis of data collected from competent authorities for the purpose of the reports on comparability and procyclicality of capital requirements published by the EBA in December 2013. These data were updated as regards downturn LGD and CF supervisory rules and practices in December 2016 and were summarised in the last consultation paper (CP).

Findings from Report on the comparability of supervisory rules and practices

Downturn LGD: around half of the CAs (45%, nine CAs) define a rule concerning the methodology of downturn LGD. Among those CAs, in four cases the rule is public and binding and, moreover, seven CAs confirm that banks should base their downturn LGD estimates on historical scenarios; three of them specify further that their methodology also builds on hypothetical stressed scenarios, in particular for those cases where the downturn period is not reflected in the historical series of the institutions. Moreover, three CAs mentioned the use of either a margin of conservatism to address data issues or a conservative add-on for those cases where the estimation made at institution level is not considered conservative enough.

Downturn CF: only 30% (six) of the CAs define a rule concerning the methodology of downturn CF. Among those CAs, only in one is the rule public and binding and, moreover, only two CAs confirm that banks should base their downturn CF estimates basing on historical scenarios; one of them specifies further that its methodology also builds on hypothetical stressed scenarios for those cases in which the downturn period is not reflected in the historical series of the institutions.

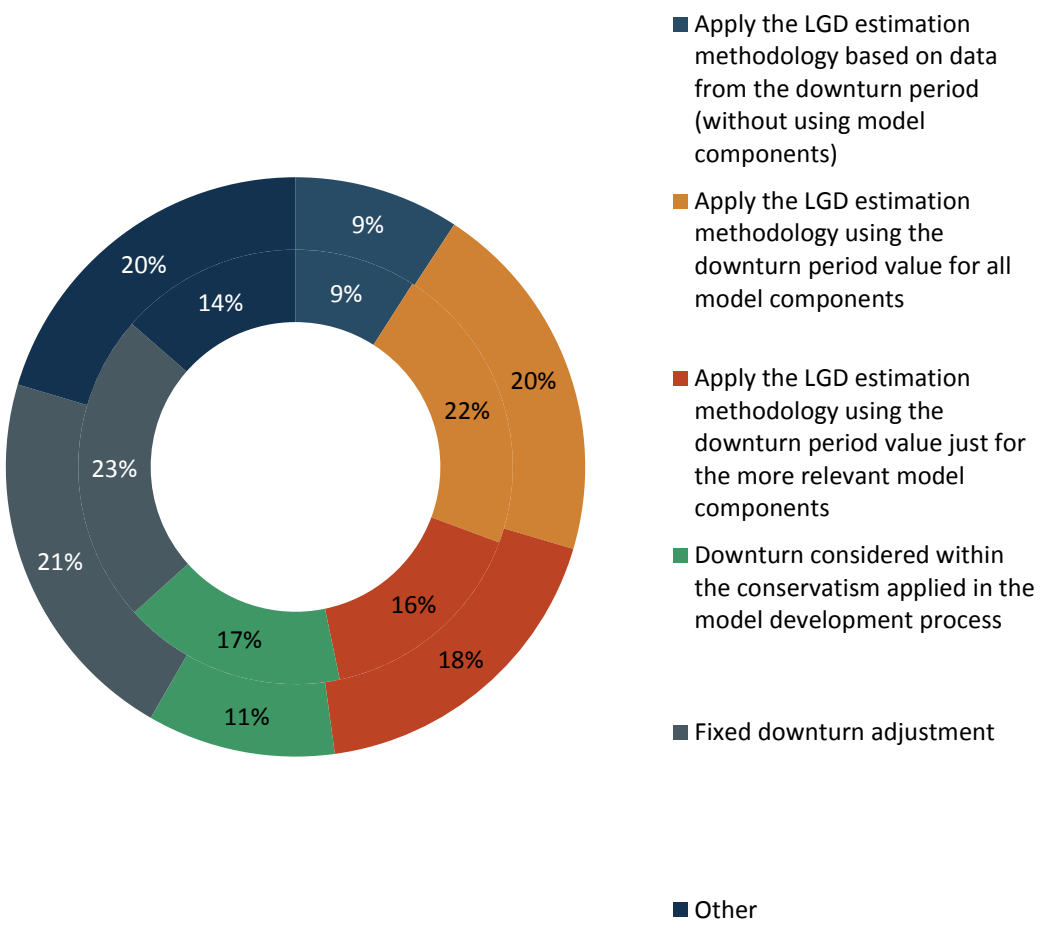
Furthermore, the work on the harmonisation of the estimation of the risk parameters was completed in 2017 through guidelines[12] which were based on a survey on the main practices of modelling. In this context, the report on the IRB practices[13] published in 2017 also highlights the wide variety of practices for the estimation of downturn LGD.

[12] https://www.eba.europa.eu/regulation-and-policy/model-validation/guidelines-on-pd-lgd-estimation-and-treatment-of-defaulted-assets

[13] https://www.eba.europa.eu/documents/10180/1720738/EBA+Report+on+IRB+modelling+practices.pdf/0212ecde-426d-4e18-84f8-04b036dcce00

Findings from the IRB survey on the variety of methodologies[14]

Figure 53: What is the main methodology used to determine LGD estimates that are appropriate for an economic downturn?



Note: the inner circle shows the share of each option where all LGD models are weighted equally, whereas the outer circle shows the share of each option where LGD models are weighted by their corresponding exposure value.

244. When it comes to the methodologies that institutions use to determine downturn LGD estimates, a wide variety of practices can be observed (see Figure 53). However, in 38% of LGD models, the downturn period value is used for all model components (22%), or for the most relevant components (16%). In 23% of LGD models, a fixed downturn adjustment is applied, and in 9% of models the LGD estimation is based on data from the downturn period without using model components.

245. Around 17% of respondents indicate that they use conservatism in the model development process to reflect downturn LGD estimates.

In terms of the regulatory environment, the baseline scenario for downturn LGD estimates is set out by the currently applicable Guidelines on the implementation, validation and assessment of

Advanced Measurement (AMA) and Internal Ratings Based (IRB) Approaches (GL 10) published by the Committee of European Banking Supervisors in April 2006. Those previous guidelines define appropriate downturn conditions as those in which relevant drivers of default rates are consistent with conditions in which credit losses for the supervisory exposure class are expected to be substantially higher than average. This framework put an emphasis on the correlation between default rates and recovery rates; in fact, if no material dependencies between default rates and recovery rates are identified, the downturn LGD estimates may be based on the long-run average LGD.

D. Options considered

This section presents the assessment of the technical options considered in the guidelines. Under each option, the potential advantages and disadvantages of the options are discussed together with potential costs and benefits. Since most of the alternatives are presented in explanatory text for the consultation, this section refers to these explanations.

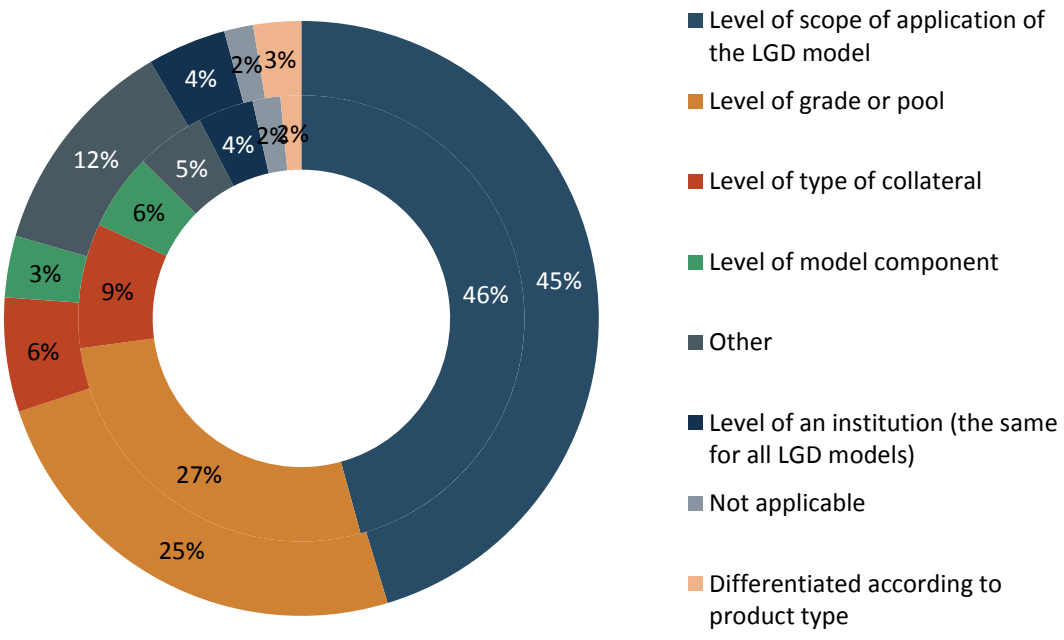
Specification of the level of application of the downturn

Paragraph 14 requires institutions to provide a downturn LGD estimate at least at the same level as the one considered for long-run average LGD in LGD calibration. The report on IRB modelling highlights a significant variability of practices

Findings from the IRB survey on the variety of methodologies

Figure 52: At which level is the downturn adjustment specified?

[14] https://eba.europa.eu/documents/10180/1720738/EBA+Report+on+IRB+modelling+practices.pdf



Note: the inner circle shows the share of each option where all LGD models are weighted equally, whereas the outer circle shows the share of each option where LGD models are weighted by their corresponding exposure value.

242. In nearly half of the LGD models, the downturn adjustment is specified at the level of the LGD model, whereas in smaller shares of models, the downturn adjustment is specified at a lower level: at the level of the grade or pool (in 27% of models), differentiated according to the type of collateral (9%) or differentiated by product type (2%) (see Figure 52). In around 4% of models, the downturn adjustment is specified uniformly in the institution. Some respondents (around 6%) mentioned that the downturn adjustment is applied at model component level, in which case it is not entirely clear whether this leads to a different adjustment by grade or pool, collateral, or product type, or whether this leads to a uniform adjustment for all exposures under the scope of application of the LGD model.

The following options were considered:

Options	Advantages	Disadvantages
1. Flexibility-based approach: no requirements		No reduction in undue variability
2. Consistency approach: level at which the long-run average is considered for LGD calibration	In line with the CRR, where the requirement to reflect downturn conditions in the LGD is part of risk quantification (and not risk differentiation) Ensures consistency with the long-run average LGD (in particular for the comparison)	This approach may increase the burden of the estimation for some banks
3. Prescriptive approach: level of the type of exposure	Easy to implement	Differences between the potential impacts of an economic downturn on, for example, secured and unsecured parts or different grades and pools might not be appropriately reflected

The second option was retained, since it strikes a good balance between harmonisation and the necessary flexibility that has to be kept in modelling choices.

Possibility of dismissing a downturn period in the assessment of downturn LGD (presented in explanatory texts)

Paragraph 15 requires institutions to provide a downturn LGD estimate for all downturn periods identified. The following options were considered:

Options	Advantages	Disadvantages
1. Flexibility based approach: possibility of dismissing a downturn period	Less burdensome for institutions	Opens up the possibility of regulatory arbitrage: it is not easy to set objective criteria to dismiss a downturn period Possible lack of prudence, all the more so in cases where no severe downturn is reflected in the internal loss data
2. Prescriptive approach: no possibility of dismissing a downturn period	Ensures maximum harmonisation Most prudent approach	Downturn LGD also has to be estimated where no data are available for a particular downturn period, which might lead to less reliable estimations

Finally the first option was chosen, subject to the requirement that a downturn period can be dismissed only if it is based on economic factors that are not relevant to the calibration segment under consideration.

Adjustment of the calibration to take into account potential migrations (not presented in explanatory texts)

Article 181(1)(b) of the CRR states that, 'to the extent a rating system is expected to deliver realised LGDs at a constant level by grade or pool over time, institutions shall make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn'.

The following interpretations were considered:

- The capital impact of an economic downturn should be limited at the portfolio level through a calibration methodology that reflects the facility-grade distribution of exposures at the point in time at which the downturn impact was observed. The rationale for this is that capital requirements stemming from the downturn LGD estimation should not increase in the event of an economic downturn but rather be appropriate for an economic downturn as required in Article 181 (1)(b) regardless of the current state of the economy.

- The capital impact of an economic downturn should be limited by requiring institutions to make adjustment to their estimates by grade and pool by using a calibration

methodology that takes into account the fluctuation arising from the economic cycle of the loss rates.

Options	Advantages	Disadvantages
1. Additional requirements (paragraph 17)	Ensures that capital requirements (stemming from downturn LGD estimation) do not increase in the event of an economic downturn	Taking into account the potential migrations in the calibration may be complicated and increase RWA variability Not consistent with the introduction of grades and pools in the Basel framework
2. No additional requirements	Ensures that the realised LGDs are stable at the grade level	Capital requirements (stemming from downturn LGD estimation) increase if the economy enters an economic downturn

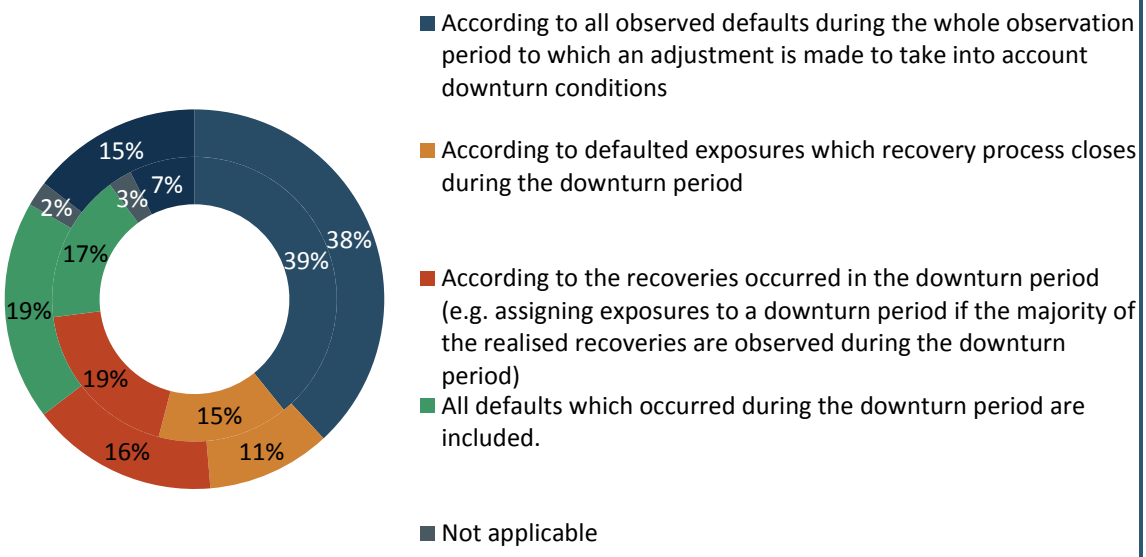
The first option was selected for the consultation, in order to assess the materiality of the issue from the industry.

Alternative approach under type 1 methodology: vintage of defaults and vintage of recoveries

Paragraph 27 requires institutions to conduct an impact assessment related to the calibration segment under consideration. For this, the construction of several yearly time series is required. Several grouping options have been considered: use of the date of default, the date of the main recovery or the date of return to non-defaulted status or close work out process.

Findings from the IRB survey on the variety of methodologies

Figure 51: How are data selected used in downturn estimation?



Note: the inner circle shows the share of each option where all LGD models are weighted equally, whereas the outer circle shows the share of each option where LGD models are weighted by their corresponding exposure value.

237. The IRB survey then enquired how institutions select data once the downturn period is established to compute the long-run average LGD. Based on the responses, however, it appears that this question was not properly understood, since nearly 50% of original responses were for the category 'other' and provided a wide range of explanations not answering the question. As a result, many of the responses have been discarded because the explanations given responded to a different question. This was the case when it was mentioned, for instance, that the data used in downturn estimation are selected based on expert judgement, or based on historical time series, etc. The results shown in Figure 51 are therefore based on a much smaller sample of LGD models than those represented in Table 57 (148 instead of 202).

238. In nearly 40% of LGD models, the data used in downturn estimation are selected based on all observed defaults during the whole observation period to which an adjustment is made, to take into account downturn conditions, whereas in 17% of models all defaults that occurred during the downturn period are included.

239. In 19% of models, those exposures for which the recoveries occurred in the downturn period are selected (e.g. assigning exposures to a downturn period if the majority of the realised recoveries are observed during the downturn period). In two institutions, the data are selected according to defaulted exposures for which the recovery process starts during the downturn period. However, in around 15% of models defaulted exposures are selected for which the recovery process closes during the downturn period.

240. Among the responses in the category 'other', one institution mentioned that it selects the data used in downturn estimation according to exposures that default during the downturn period. One institution mentioned a three-step approach: (1) downturn periods are identified if the house price index has decreased; (2) the average house price decline during the downturn period is calculated; and (3) the recovery rate under downturn periods is computed by subtracting the average house price decline from the usual recovery rate. Other institutions mentioned a combination of selecting all exposures that defaulted during the downturn period for the unsecured part of the exposure, and selecting all exposures for which the recovery process ends during the downturn period for the secured part of the exposure.

241. In some cases, the respondent mentioned that the question is not applicable. This was the case for a sovereign portfolio and an aviation portfolio, and in one case it was mentioned that no downturn period could be identified.

The following approaches have been considered:

Options	Advantages	Disadvantages
1. Vintage of default	Consistent with PD series	Unclear consequences on models using loss components
2. Year of recoveries	May be easier to find a relationship with the economic cycle	Year of recoveries is not currently defined in the regulatory framework Potential inconsistency with the PD series
3. Different analysis covering both views	Allows consistent estimation with respect to impact observed considering various dimensions Catch-up effects (i.e. sales after a downturn) can be identified	It may be challenging to build a model which reflects all aspects

The proposed text is a compromise between the different options:

- The impact assessment considers different groupings, depending on the aspect component considered.

- Flexibility is left with regard to the estimation of the downturn LGD as long as it is coherent with the results obtained in the impact assessment. However, the final GL contain some principles in paragraph 26 which will support an appropriate aggregation of the results of the impact assessment.

This approach was retained because of the lack of consensus in the responses to the previous consultation paper as well as the diversity of practices highlighted in the IRB survey. It is, however, acknowledged that this option leaves some RWA variability in the estimates.

Conditions for using the long-run average as a downturn LGD parameter

Article 181(1)(b) of the CRR states that 'institutions shall use LGD estimates that are appropriate for an economic downturn if those are more conservative than the long-run average.'

The following options were considered:

Options	Advantages	Disadvantages
1. Flexibility-based approach: no requirements		No harmonisation of practices
2. Prescriptive approach: give conditions for using the long-run average	Brings harmonisation to practices	The specifications may not be sufficiently clear

The final proposal builds on the second option: the conditions for using the long-run average are prescribed (e.g. certain data requirements where the assumption of no impact on long-run average LGD is justified) and cases where the long-run average cannot be used are explicitly mentioned; in particular, if the downturn LGD is estimated using an add-on to the long-run average, this add-on can be estimated as being null but an appropriate MoC should be added to cover for the uncertainty of this estimation.

The alternatives and the costs and benefits analysis are presented in the explanatory boxes.

E. Cost-benefit analysis

The guidance given in these guidelines and the corresponding draft RTS on economic downturn affect LGD and CFs modelling. Therefore, it is expected that these regulatory products will lead to additional steps in the model, involving the identification and inclusion of economic downturn conditions, and in general to changes in the model.

However, detailed assessment of the costs for institutions of these model changes and their impact on capital requirements is not possible, as the current flexibility of the IRB approach does not allow the definition of a common baseline scenario regarding current modelling choices from an

institution perspective. It is expected that the impact of these guidelines and RTS on individual institutions will vary depending on the currently implemented solutions. In this sense, the qualitative assessment performed in the last CP remains valid.

However, compared with the first CP, the complexity has been reduced, in particular with respect to the concept of model components, as has the permitted flexibility with respect to which economic factors have to be considered.

F. Preferred option

This part presents a direct comparison between the final downturn package and the first consultation on the RTS (and more particularly) based on the example that was presented in the Explanatory Box related to Article 6 of the draft RTS[15] (assessment of the joint impact):

<table>
<tr><th rowspan="2">CP</th><th rowspan="2">New ordering</th><th colspan="3">New proposal</th></tr>
<tr><th>Type 1 estimation (section 5)</th><th>Type 2 estimation (section 6)</th><th>Type 3 estimation (section 7)</th></tr>
<tr><td>Step 1: identifying model components</td><td>4</td><td colspan="3">There is no requirement to identify model components</td></tr>
<tr><td></td><td></td><td>Prescriptive impact analysis covers main loss components (paragraph 22)</td><td>No prescription, but material components of economic loss should be identified (paragraph 24(b))</td><td>No prescription</td></tr>
<tr><td>Step 2: identifying relevant economic factors</td><td>1</td><td colspan="3">In the RTS, now independent of the model components, and more prescriptive, with a list in Article 2 of economic factors that have to be considered relevant, instead of general principles (Article 3 of the draft RTS)</td></tr>
<tr><td>Step 3: identifying downturn period for each economic factor</td><td>2</td><td colspan="3">In the CP, the notion of a downturn period was linked to an individual economic factor. In the revised concept, a downturn period relates to various economic factors</td></tr>
<tr><td>Step 4: identification of the downturn scenarios</td><td>3</td><td colspan="3">In the revised draft RTS, the concept of the downturn period is similar to the previous concept of the downturn scenario, i.e. it is characterised by a set of economic factors that reach severe levels simultaneously or shortly after each other and are the effect of one overall economic condition</td></tr>
</table>

[15] https://eba.europa.eu/-/eba-consults-on-specification-of-an-economic-downturn

Step 5: computation of downturn LGD for each downturn scenario	**5**	Downturn LGD estimation in accordance with one of the three types depends on data availability and the ability to use the methods prescribed in section 6
Step 6: identification of the final downturn scenario	**6**	In the guidelines, the highest downturn LGD per calibration segment (and not type of exposure, as specified in Article 6 of the CP) is selected

4.2 Summary of responses to the consultation and the EBA's analysis

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
General comments			
General support	In summary, the respondents welcomed the general approach and in particular the EBA's effort to simplify LGD estimation by making the identification of an economic downturn independent from the LGD estimation methodology.		
Implementation	As they did for the RTS on economic downturn, respondents pointed out that the final Basel III framework will influence the scope of application of these GL as well as of the GL on PD and LGD estimation published in November 2017. Therefore, alignment of the dates of application of these GL and of the GL on PD and LGD to the envisaged date of application of the revised Basel III standard was requested.	A potential need for a review of the date of application will be assessed at a later point in time when more information is available regarding the implementation of the Basel III finalisation in the EU and with respect to all products covered by the EBA's regulatory review of the IRB approach.	
Non-applicability to CF	Several respondents asked for confirmation that the concepts set out in these GL do not apply to the estimation of conversion factors appropriate for economic downturn conditions.	Indeed, these GL do not apply to the estimation of conversion factors appropriate for economic downturn conditions.	
Interaction with FIRB LGDs, IFRS9 and stress test	Some respondents asked for the interlinkage of these GL and the regulations for FIRB LGDs, IFRS9 or stress testing.	These GL set out rules for the estimation of downturn LGD. The EBA considers FIRB-LGDs, IFRS9 and stress-testing regulations to be independent and based on	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		different assumptions from the rules set out in these GL.	
Multiple downturn periods	Several respondents (on the RTS as well as on the GL) claimed that it remains difficult to understand the choice of the most severe downturn period where several downturn periods are identified.	It should be noted that, in accordance with the RTS, multiple downturn periods can be identified. The finally relevant downturn periods are chosen for each calibration segment. The process for choosing the finally relevant downturn period for a calibration segment under consideration is clarified in paragraph 15 of these GL.	Paragraph 15 has been clarified.
Relevant loss data	Some respondents expressed concerns that data availability issues could increase the unjustified variability, in relation to the requirement to look at a time series of 20 years for economic factors.	The GL specifically allow for type 2 approaches to overcome this issue.	
Type 1 approaches	Respondents asked how to reach a conclusion on the effect that a downturn period has on LGD where one (or more) of the components assessed in the impact assessment (i.e. elevate levels of realised LGDs, etc.) has positive outcomes during the downturn period, and they offset any negative outcomes from one (or more) of the other components.	Paragraph 26 clarifies that such compensation effects cannot be taken into account. Moreover, it clarifies that it is not expected that downturn impacts observed on different components (which may reflect different stages of the NPL life cycle) are simply added. Example 4 in the Background and rationale illustrates how different results from the impact analysis in paragraph 27 could be aggregated. As, however, an aggregation of impact on different components may also be necessary under type 2 or even type 3 approaches, the principles set out in that paragraph 26 are not limited to type 1 approaches. Moreover, paragraph 29 clarifies that the long-run average LGD can be considered appropriate for economic downturn only if no impact has been observed in all dimensions analysed in the impact	The principles in paragraph 26 have been added to the GL text.

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		assessment and if all other requirements set out in paragraph 29 are met.	
Type 1 approaches	Respondents pointed out that cyclical dependency may be better assessed by year of major cash flow.	The EBA considers that the standardised impact assessment in paragraph 27 provides for a level playing field with respect to a minimum scope of the analysis of an impact of an identified downturn period where observed loss data are available. It should, however, be noted that an analysis of the year of major cash flow may be an appropriate element of the downturn LGD estimation methodology to ensure it is coherent with the evidence obtained from the impact analysis as required in paragraph 28.	
Type 1 approaches	Several respondents asked for clarification on the treatment of incomplete cases in the impact assessment. It was considered that only closed cases should be taken into account for the analysis on realised LGD.	Paragraph 27(a)(i) has been split into two analyses: one covers the subset containing all closed cases, where for this purpose facilities which have reached their maximum time to recovery as defined in paragraph 156 of the GL on PD and LGD estimation should be considered closed; and the other set should contain all incomplete recovery processes that have not reached their maximum time to recovery. The latter may reveal, in particular, impact on downturn LGD for defaulted exposure.	Paragraph 27(a)(i) has been split into (1) and (2).
Type 1 approaches	Some respondents requested guidance on the time period for the time lag to be considered in the impact assessment.	The EBA agrees that optimally such guidance would be provided. However, such time lags should follow the time lags which are observed in practice, into which the EBA considered that the industry has more insight.	

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Type 1 approaches	Some respondents asked for clarification of how the annual recoveries in the impact assessment should be calculated.	The purpose of this analysis is to reveal the impact of the downturn period under consideration on the loss data. As a minimum, institutions should consider annual recoveries by sources of recoveries that are relevant to the calibration segment under consideration and irrespective of the date of default (and with and without repossessions where relevant). Analysing the impact on annual recoveries as ratios of the outstanding amounts may, however, be an appropriate additional element to consider.	
Type 1 approaches	Several respondents asked for confirmation that the haircut approach may be appropriate even if sufficient downturn data have been observed, rather than 6.	Indeed, and as pointed out in the Background and rationale, a haircut approach can also be used within a type 1 approach. However, in this case the haircuts would need to reflect the results obtained from this impact assessment in order to comply with paragraph 28.	
Responses to questions in Consultation Paper EBA/CP/2018/08 **Question 1: Do you think that additional guidance around the estimation of LGD in default, which reflects downturn conditions, is needed? If yes, could you provide examples of sound methodologies for transposing downturn LGD estimates from performing to non-performing exposures?**			
Question 1	A majority of respondents welcomed the proposal laid down in the explanatory box of the consultation paper. However, several respondents proposed simplified approaches, e.g. whereby the downturn component estimated for performing exposure would be applied to defaulted exposure as well or an add-on could be derived from the calibration of the model for performing	The feedback has been taken into account and subsection 4.2 on downturn LGD estimation for defaulted exposures sets out the requirements for downturn LGD estimation for each reference date as well as the requirements for using a simpler approach which builds on the calibration of downturn LGD for non-defaulted exposure.	Section 4.2 has been added to the GL.

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	exposures, which would be transferred to the default portfolio.		
Question 2: Do you share the concern that the proposed policy in paragraph 15 could create an undue burden if applied to every downturn period identified? If yes, in order to better balance the accuracy of the estimations and its operational complexity what evidence should be provided by institutions in order to justify the exemption of identified downturn periods from the proposed policy in paragraph 15?			
Question 2	A majority of respondents shared the concern about excessive burden if applied to every downturn period identified.		
Question 2	A couple of respondents proposed the exemption of downturn periods for which downturn LGD can be estimated only in accordance with section 7 (i.e. type 3 methodology).	The draft GL in the consultation paper already provided a waiver for the analysis of downturn periods, where the bank can provide downturn LGD estimates based only on type 3 approaches for the downturn period under consideration (but on type 1 or type 2 approaches for a different downturn period). The final GL still contain this waiver in paragraph 15(a)(iv). As pointed out in the Background and rationale, downturn LGD estimation subject to the minimum add-on is disregarded where downturn LGD estimation is possible based on observed or estimated impact for any other downturn period subject to an additional appropriate MoC. However, under no circumstance should this principle be abused to circumvent the obligatory use of type 2 approaches where their application is possible. Indeed, it is expected that type 3 approaches will be considered only in exceptional cases. Therefore, the waiver for downturn periods which require a type 3	

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		approach as set out in paragraph 15(a)(iv) will be revised by the EBA, should there be indications of excessive or misuse of this waiver.	
Question 2	Another respondent pointed out its doubts about the compliance of the 20-years approach with Articles 145 and 176 of the CRR, and considered that, at least, the approach of penalising institutions that cannot collect 20 years' data was unfair.	The EBA considers that the uncertainty of the impact of a downturn period is higher where such a downturn has not been observed. An additional MoC for a lack of such observed impact on loss data is therefore covered by Article 179 of the CRR, requiring a margin of conservatism to be added to an institution's estimates where methods and data are considered less satisfactory.	
Question 2	Several respondents proposed exempting downturn periods for which the relationship between LGD and economic factors is not supported by statistical model or economic reasoning.	Paragraph 15(b) has been added, allowing institutions not to calibrate downturn LGD for a calibration segment under consideration for downturn periods identified in accordance with the RTS on economic downturn, where institutions can provide evidence that the economic factors in question are not relevant to the calibration segment under consideration. An example is provided in the Background and rationale, paragraph 22.	Paragraph 15(b) has been introduced
Question 2	Other respondents proposed exempting downturn periods which are not representative of the current portfolio.	The EBA considered that issues of representativeness should be dealt with by complying with section 4.2.4 of the GL on PD and LGD estimation, on 'Representativeness of data for calibration of risk parameters'. Moreover, paragraph 15, on multiple downturns, implicitly covers any issues of representativeness, as the resulting downturn LGD estimates for each identified downturn period are applied to the current portfolio, and the one	

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		downturn period that leads to the highest average downturn LGD is chosen for a calibration segment. Thus the most appropriate period is chosen for the current composition of the portfolio.	
Question 2	Several respondents proposed exempting downturn periods that are identified by the existence of potential structural breaks. As an example, one respondent pointed out that the 2003 peak in the unemployment rate in Germany relates to the social reforms and redefinition of unemployment rate rather than to a change in economic conditions.	The EBA considers that in such a situation adequate time series corrected for redefinitions should be assessed. However, if this is not possible then no impact should be visible in the impact assessment anyway.	
Question 2	Some respondents considered the analysis of multiple downturn periods not relevant where a major macroeconomic crisis is already considered in the observed or estimated impact.	The EBA discussed this view but finally concluded that excluding such situations would, apart from the problem of defining a major macroeconomic crisis, lead to an uneven playing field. Analysis of the recent crisis showed that, for example, in some jurisdictions the housing market was hit, whereas in others no impact on house prices was observed. Just relying on the last major macroeconomic crisis would thus lead to an non-level playing field for mortgage portfolios in the EU.	
Question 2	Several respondents suggested considering an average of the different downturn periods instead of the worst, in cases of several downturn periods.	As the different downturn periods by construction refer to different economic factors and thus represent downturn conditions of different natures, the EBA considered that an average downturn LGD arising from these different periods would not be meaningful.	

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Question 3: Do you agree with the proposed level of LGD downturn estimation set out in paragraph 14? In particular, do you support the concept that the LGD downturn estimates of different calibration segments could be based on different downturn periods? Is the policy on the level of LGD downturn estimation as well as the relation between the level of LGD downturn estimation and the relevant downturn periods sufficiently clear?			
Question 3	A majority of respondents requested more clarity on the concept of calibration segment. The respondents also requested an example of the interaction between the CRR exposure classes and the calibration segments.	Paragraph 14 of these GL clarifies the notion of calibration segments and provides some guidance on the use of calibration segments in downturn LGD estimation.	Paragraph 14 has been added to the GL.
Question 3	Many respondents welcomed the policy that the LGD downturn estimation should be performed at the level at which the long-run average LGD is calculated for the purpose of calibration (e.g. grade/pool, calibration segment).		
Question 3	One respondent also pointed out that the policy in the consultation paper might incentivise institutions to have fewer calibration segments/pools/grades in order to reduce operational burdens.	The EBA is aware of that issue, which is mitigated by the guidance that has been introduced in paragraph 14 of the GL.	Paragraph 14 has been added to the GL.
Question 3	Several respondents asked that the standardised impact analyses should be performed at the level of the type of exposure, while the modelling could be done at a more granular level.	The EBA considers that an impact assessment at the level of the type of exposure would lead to a non-level playing field, as, for example, internationally active institutions could then benefit from compensation effects where local institutions (active in only one jurisdiction) could not.	
Question 4: Do you consider the description of the approaches to be sufficiently clear?			

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Question 4	A majority of respondents confirmed that they have no problem in understanding the haircut and extrapolation approaches.		
Question 4	Regarding the haircut approach, one respondent claimed that it is not clear if this economic indicator needs to be drawn from the mandatory list of indicators used to identify downturn. If it is not, and the downturn period can be identified using a different set of macroeconomic indicators from those that drive internal loss experience, there is no guarantee that the values of the economic indicators used to model loss will be conservative during the previously identified downturn period.	The GL start from the assumption that there is already an LGD model to assign facilities to grades or pools. If this model contains economic factors, then these should also be identified as additional relevant economic factors under Article 2 of the RTS. For the downturn periods constituted by economic factors that are used as inputs to the LGD models, the GL prescribe that the haircuts should be based on the most severe observations of these economic factors in accordance with the specification of the severity of an economic downturn laid down in Article 3 of Regulation (EU) xx/xx [RTS on economic downturn]. However, there could be other downturn periods constituted by economic factors that are not inputs of the LGD model. In that case, the GL still allow the use of the haircut approach to estimate the impact of the downturn period under consideration, but no rules as regards the setting of the haircut are set out.	
Question 4	One respondent asked how to handle downturn periods with a duration longer than 12 months. He claimed there is no clear definition of which corresponding values should then be used for the economic factors in the haircut or extrapolation approach.	The most severe value of an economic factor is clearly described in the specification of the severity of an economic downturn laid down in Article 3 of Regulation (EU) xx/xx [RTS on economic downturn]. This most severe value does not depend on the duration of the corresponding downturn period. In addition, it should be noted that, for the extrapolation approach, the resulting estimates	

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		should be based on the extrapolated values of the average realised LGDs, intermediate parameters or risk drivers to the period reflecting the **impact of the downturn period.**	
Question 4	The general assumption of the approach is that a dependency between observed realised LGDs and macroeconomic variables exists. This is probably true given a long observation period with different macroeconomic circumstances, but may not apply to any observation period. Nevertheless, in particular given a retail portfolio with a large number of observations, a statistical model may derive a dependency between the observed realised LGDs and a macroeconomic factor although the underlying observation period covers a stable economic environment. In fact, the derived dependency is just a pseudo-correlation, and the LGDs obtained by backward extrapolation are unsuited for calculating the downturn add-on.	Paragraph 32 has been amended to allow backwards extrapolation based on observed data as well if no statistical dependency to the economic factors underlying the downturn period under consideration can be established. However, this approach is subject to a number of requirements ensuring a clear distinction from cases when type 3 methodologies need to be considered.	Paragraph 32 has been amended.
Question 5: Do you agree to the limitation of approaches for quantification of downturn LGD estimates? If not, which other approaches should be considered? Would you prefer the alternative policy considered – if yes how should a minimum MoC be established in this case?			
Question 5	Several respondents agreed to the limitation, but asked for some amendments and flexibility in the haircut or extrapolation approach. Several other respondents disagreed with this limitation but unfortunately did not present any other methodology.	The EBA considers that both the haircut and extrapolation approaches as described in the GL allow a sufficient level of flexibility. Additional flexibility would weaken the normative character of the text.	
Question 5	Several respondents interpreted the requirement set out in paragraph 29 of the GL text in the consultation paper as	Several changes have been made in order to ensure that no double counting of the downturn impact is	Paragraph 26 has been added and

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	forcing the use of the extrapolation approach in many cases.	required in the final estimation and that no use of the extrapolation approach is forced where not necessary: (1) Paragraph 30(b) of the final text clarifies that a combination of the methodologies needs to be considered only where necessary to adequately reflect a potential downturn impact on all material components of economic loss. (2) Even if then the impact needs to be reflected in several components, using potentially both the haircut and extrapolation approaches, the principles set out in paragraph 26 clarify how the impact estimated on the different components should be aggregated. (3) Paragraph 32 has been amended to allow backwards extrapolation based on observed data as well if no statistical dependency to the economic factors underlying the downturn period under consideration can be established. However, this approach is subject to a number of requirements ensuring a clear distinction from cases when type 3 methodologies need to be considered.	paragraphs 30 and 32 have been changed.

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Question 6: Do you expect that the total exposure amount or share which is treated with the policy proposed in section 7 is material? Question 7: Do you have specific examples of types of exposures which will fall under the policy proposed in section 7?			
	Many respondents stated that they do not expect the application of type 3 methodology to cover material portfolios.		
	Several respondents highlighted that they are concerned that low default portfolios might be perfect candidates for the application of the type 3 methodology in the light of the limited number of defaulted exposures modelled.	It should be noted that paragraph 23 requires that institutions ensure that the relevant loss data are available during the downturn period under consideration as well as during an appropriate period before and after the downturn period under consideration. Moreover, it should be noted that paragraph 27(b) explicitly tackles the problem of scarce loss data by requiring that, if only sparse relevant loss data are available on an annual basis, institutions should merge consecutive years of observations if they are deemed to add value to the analysis. In this context, it should also be noted that the CRR sets out (in Article 179(2)) explicit requirements for the use of pooled data for the purpose of risk parameter quantification.	
	One respondent also highlighted that corporate exposures not secured by real estate might be subject to the application of section 7.	See answer above.	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	One respondent, however, enquired whether type 3 methodology is explicitly intended by the EBA to cover newly established portfolios or portfolios that have not yet experienced a downturn.	The EBA considers that type 2 approaches should be used if a portfolio under consideration has not yet experienced a downturn. Regarding newly established portfolios, these may indeed be candidates for type 3 approaches. However, if for example pooled data are available for such a portfolio, a type 2 approach may be possible and should be used if possible in accordance with paragraph 24 of the GL.	
	In addition, one respondent would like the EBA to clarify that section 7 should never be applied to portfolios with long time series which already capture a downturn period.	It should be noted that there could be multiple downturn periods. The downturn period which is already captured may not be the most relevant one to the portfolio under consideration. An example of this situation is provided in the Background and rationale (Example 1).	
Question 8: Do you agree to require a minimum MoC quantified via a fixed add-on to the long-run average LGD? If not, which of the alternatives should be considered? Do you see reasons for differentiating the fixed add-on according to exposure classes? **Question 9: Do you agree to the minimum MoC as the max(0,min(20%, 105% - LRAVLGD)?**			
	Five respondents raised the issue of the excessive conservativeness of the MoC calibrated as an additional add-on of 20% and said that it lacked a rationale.	It should be recalled that type 3 approaches are applied if the impact of a downturn period can neither be assessed based on observed loss data nor be estimated using a type 2 approach. Thus it is also challenging to calibrate an appropriate add-on, which has therefore been chosen to be sufficiently conservative.	The minimum MoC requirement in paragraph 36 has been lowered to a 15% add-on to the long-run average LGD.

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	Moreover, three respondents suggested differentiating the 20% add-on on the basis of the type of exposure (portfolios) (e.g. 20% add-on for non-retail exposures, X% for retail ones).	As pointed out above, the calibration of an appropriate add-on is challenging in the light of the nature of type 3 approaches. Therefore, a further differentiation of the add-on has not been considered.	The minimum MoC requirement in paragraph 36 has been lowered to a 15% add-on to the long-run average LGD.
	Two respondents perceived the 105% cap as being unjustified, and highlighted that the definition of a cap higher than 100% lacks a rationale.	The EBA considers that a downturn could indeed cause LGDs higher than 100% in the light of prolonged workout times.	
	Another respondent suggested that the EBA perform a quantitative impact study in order to assess the impact of the measure.	As pointed out in paragraph 19 of the Background and rationale, it is expected that type 3 approaches will be considered only in exceptional cases. Moreover, to ensure that the waiver for downturn periods which require a type 3 approach as set out in paragraph 15(a)(iv) will not be used excessively or inappropriately, the EBA will monitor the use of type 3 approaches.	
Question 10: Is the policy regarding the reference value sufficiently clear? Alongside the potentially limited applicability of the reference value to the downturn LGD estimation according to paragraphs 18-19-20, for what reasons could the reference value feasibly be omitted? Do you agree to the proposed clarification of the role of the reference value?			
	A majority of respondents questioned the use of the reference value, referring to its inappropriateness and lack of comparability in the light of the lack of linkage of its results to the actual downturn conditions	The EBA has clarified the role of the reference value as a non-binding challenger. In particular, paragraph 19 points out that a material difference between the final downturn LGD plus final MoC and the reference value can be justified if the period of losses identified by the reference value does not stem	Paragraphs 18 and 19 have been amended.

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		from a — potentially unidentified — downturn period.	
	One respondent claimed that using the reference value as a challenger would work for type 3 models only, while for sounder type 1 models the reference value might be inappropriate, as it might represent a floor difficult to compare with the results from the models.	It is clarified in paragraph 19 that the reference value does not represent a floor. It is explicitly stated that 'After the institution has re-assessed its quantification of downturn LGD, and the methodology is assessed to be adequate, a material difference from the reference value can be explained.'	Paragraphs 18 and 19 have been amended.
	Several respondents pointed out that it might disincentivise banks from investing in more efficient recovery processes.	The EBA considers it should be in the institution's own interest to invest in efficient recovery processes.	
	Some respondents pointed out that comparison in the case of type 1 and 2 methods is difficult and imposes an additional burden of proof on the institutions. In the light of that, some of the respondents proposed disregarding the reference value in the new framework or, instead, using it as a replacement for the type 3 approach currently proposed.	As pointed out in the Background and rationale, the EBA considers that the non-binding character of the reference value should be noted. As stated in the Background and rationale, the reference value will generally not comply with the rules set out in these GL and should therefore not be used as a calibration target for downturn LGD estimation. The EBA considers the reference value nevertheless to be a meaningful supervisory tool, which supports the supervisory assessment of the resulting downturn LGD estimates and can support institutions in understanding the dynamics of their realised LGDs over time.	Paragraphs 18 and 19 have been amended.
	Three respondents raised concerns about the robustness of the reference value concept and the excessive volatility of its results based on the consideration of loss rates and	The EBA discussed these concerns and amended section 8 and paragraphs 18 and 19, requiring the comparison with the reference value at least at the	Section 8 and paragraphs 18 and

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	not on economic factors. More particularly, the results might be heavily influenced by events not linked to downturn conditions such as the presence of individually significant exposures entering default or the occurrence of extraordinary events.	level of calibration segments, which should limit the concern about robustness. Moreover, as stated above, paragraph 19 clarifies that a material difference between the final downturn LGD plus final MoC and the reference value can be justified if the period of losses identified by the reference value does not stem from a — potentially unidentified — downturn period.	19 have been amended.
	Some respondents claimed that the reference value layer of computation should be reconsidered whenever the two years with the highest losses are based on a low number of observations.	The EBA considers that, in particular in those situations, the use of the reference value as an indicator for increased losses due to economic downturn conditions is not straightforward.	
	A couple of respondents pointed out that the highest realised ratio to the exposure value does not necessarily have to be accompanied by the highest economic loss in the numerator in the case of greater portfolio exposure fluctuations. The comparison of the LGD weighted by the occurrences of default with an LGD weighted by the exposure makes no sense.	The EBA is aware of the inconsistency between the reference value as an exposure-weighted quantity and the downturn LGD as a case-weighted quantity. As pointed out above, the EBA nevertheless considers the reference value to be a meaningful supervisory tool, which supports the supervisory assessment of the resulting downturn LGD estimates and can support institutions in understanding the dynamics of their realised LGDs over time.	
	Three respondents highlighted a lack of explanation of how to treat the correlation among different intermediate parameters of the calculation. In particular, the respondents asked for clarity on (i) the way the reference value should be calculated, e.g. aggregating the reference values for each model component together (i.e. [avg. worst two cure rates + avg. worst two LGD secured]?) and (ii) whether the two worst years over 20 years should be	The EBA discussed these concerns and amended paragraphs 18 and 19, requiring the comparison with the reference value at least at the level of calibration segments.	Section 8 and paragraphs 18 and 19 have been amended.

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	computed according to each axis of analysis (i.e. cured losses, not-cured losses, probability of cure) or should be determined once for all by the analysis of not-cured losses.		
	One respondent pointed out that the reference value concept might not work at all for regression-type models producing a range of LGD estimates for each calibration segment (not a unique single downturn LGD for each calibration segment).	Paragraph 18 sets out the requirement to compare the resulting downturn LGD with the reference value calculated in accordance with section 8 on the corresponding RDS and calculated at least at the level of calibration segments. In practice, for regression-type models this might require calculating the downturn LGDs for each facility in the RDS and averaging it at the level of calibration segments.	
	Three commentators highlighted that using two years for the calculation of the reference value could be insufficient, and proposed aligning its length with the longer duration of a downturn.	The EBA considers the average of two years to be appropriate to provide a simple non-binding challenger value for downturn LGD calibration.	