



# EBA REPORT

RESULTS FROM THE 2019 LOW-DEFAULT AND  
HIGH-DEFAULT PORTFOLIOS EXERCISE

**EBA**

EUROPEAN  
BANKING  
AUTHORITY

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## Executive summary

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This summary report presents the key results of the 2019 supervisory benchmarking (SVB) exercise for both high-default portfolios (HDPs)<sup>1</sup> and low-default portfolios (LDPs).<sup>2</sup> The reference date for the data is 31 December 2018, and the submissions of 111 institutions at the highest level of consolidation contributed to this exercise. The main objectives of this report are to (i) provide an overview of the existing risk-weighted asset (RWA) variability and drivers of differences; (ii) summarise the latest results of the supervisory assessment of the quality of the internal approaches in use; and (iii) provide evidence to policymakers for future activities relating to RWA differences. The graphs and tables in this report are presented in a comprehensive manner in an accompanying annex, where more details on methodological choices and caveats of the analysis can be found.

The most challenging task in comparative risk weight (RW) studies is to distinguish the influence of risk-based and practice-based drivers. Furthermore, even when a substantial part of the variability is explained by a few risk-based metrics, it is not straightforward for policymakers to assess the reasons for the remaining variability. In particular, one of the key challenges is to measure and compare the variability of the internal rating-based (IRB) risk estimates, the variability of the standardised approach (SA) outcomes and the variability of the underlying empirical risk.

This report mainly builds on the methodologies already used in previous reports. In addition, institutions had to provide the hypothetical RW that would be applied using the SA for exposures in the HDP. These new data allow a new analysis based on the comparison of the variability of own funds requirements between different approaches. Three key results are relevant to further policy work:

- The observed variability of the RW under the SA (RW (SA)) over the HDP SA exposures is similar to that of the global charge (GC) under the IRB approach (GC (IRB)). Given this, the IRB approach does not lead per se to higher variability in the capital requirements than the variability already embedded in the SA.
- For both the IRB approach and the SA, a top-down analysis highlighted that the default mix (share of defaulted exposures) and the portfolio mix (the share of regulatory (sub) exposure classes) explain more than 70% of the observed variability. The higher explanatory power for this year's exercise on the IRB side is due to the difference in samples: on a common sample, the results are stable over the years with around 50% of variability explained.
- Within a single exposure class, the variability under the IRB approach follows in a conservative manner the empirical variability of risk (observed via default rates), while the variability of RWAs in the SA is less linked to the empirical risk variability.

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<sup>1</sup> Residential mortgages, SME retail, SME corporate and corporate-other portfolios.

<sup>2</sup> Large corporates, corporates – specialised lending exposures, sovereigns and institutions.

Moving to the LDP, the top-down analysis can be performed for only the IRB approach, since the data on RWs under the SA are not collected for all the institutions at this stage. However, a common counterparty analysis is possible thanks to a dedicated template, which makes it possible to quantify the non-risk-based variability both in absolute terms (percentage of deviation) and in relative terms (commonality of the ranking). The following observations affirm the general reliability of the IRB approach in the assessment of risk:

- Similarly to HDP, results are stable over the years if based on a common sample, with around 50% of variability explained by the default and portfolio mix;
- In absolute terms, the non-risk-based variability of the probability of default (PD) estimates on single counterparties has a limited impact on the variability of RW, with interquartile ranges on the common sample of obligors at 8% for large corporates and 4% for sovereigns and institutions;
- In relative terms, a statistical analysis indicates that institutions rank obligors consistently.

In addition, these analyses have been complemented by qualitative assessments by the competent authorities (CAs) of each of the institutions and by interviews with seven of the institutions for which the highest numbers of outlier observations were reported. Overall, the main results are:

- Deficiencies spotted by supervisors are spread evenly between LDP and HDP, and relate mostly to the calibration of risk parameters. The results from this exercise are expected to evolve over time due to the implementation of the IRB roadmap.<sup>3</sup>
- The number of unjustified negative (i.e. less conservative) deviations from the benchmark (comparison to peers) is decreasing over time, as is the proportion of negative deviations not identified by the CAs before the benchmarking exercise. This suggests that CAs are increasingly picking up on issues identified by the EBA SVB exercise.
- The interviews confirmed the known peculiarities of calibration for LDP, stemming from the lack of default observations. This seems to support the reduction of the scope of modelling agreed in the final Basel III framework<sup>4</sup> and also recommended by the EBA in a set of recommendations as an answer to the call for advice of the European Commission.<sup>5</sup>

Finally, these assessments were complemented by a survey on rating scales. Overall, there is significant variability in the observed practices, in particular between institutions using different type of calibration of PDs (purely continuous models, discrete direct estimate and grade-based estimation).

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<sup>3</sup> <https://eba.europa.eu/eba-publishes-report-on-progress-made-on-its-roadmap-to-repair-irb-models>

<sup>4</sup> <https://www.bis.org/bcbs/publ/d424.htm>

<sup>5</sup> <https://eba.europa.eu/eba-advises-the-european-commission-on-the-implementation-of-the-final-basel-iii-framework>

# 1. The EU benchmarking exercise

1. This summary report presents the key results of the 2019 SVB exercise for both HDPs and LDPs. The reference date for the data is 31 December 2018, and the submissions of 111 institutions at the highest level of consolidation contributed to this exercise. Table 1 shows the number of institutions, broken down by SVB exposure class and regulatory approach. The main objectives of this report are to (i) provide an overview of the existing RWA variability and drivers of differences; (ii) summarise the latest results of the supervisory assessment of the quality of the internal approaches in use; and (iii) provide evidence to policymakers for future activities relating to RWA differences.

**Table 1: Use of different regulatory approaches by SVB exposure class**

Exposure class	AIRB	FIRB	SLSC	Number of participating banks
Large corporates	55	47	-	85
Specialised lending	26	16	36	60
Central governments and central banks	25	30	-	45
Institutions	33	40	-	59
Medium corporates	54	48	-	85
Mortgages	86	-	-	86
SME - corporates	51	48	-	83
SME - retail	70	-	-	70

*SLSC, specialised lending - slotting criteria; SMEs, small and medium-sized enterprises.*

*The definitions of the supervisory benchmarking exposure classes can be found in Annex 1 of the ITS for the 2019 exercise (<https://eba.europa.eu/regulation-and-policy/supervisory-benchmarking-exercises/its-package-for-2019-benchmarking-exercise>).*

2. **The graphs and tables in this report are presented in a comprehensive manner in an accompanying annex, where all methodological choices and caveats on the analysis can be found.** The annex provides in addition to this report a visualisation of average risk estimates and portfolio compositions, with in particular their temporal evolution, a top-down analysis combining both LDPs and HDPs, the temporal evolution of the common counterparties analysis, and more detailed analyses of backtesting metrics, in particular using the newly collected RWA+ and RWA- metrics and presenting general backtesting results broken down by country.
3. In order to analyse the variability within each exposure class, it is necessary to customise analytical tools to take into account the specificities of the underlying exposures. The structure of this report follows the segmentation of this analysis:
  - a. The second section presents the result for HDPs, for which the empirical level of risk can be indirectly measured using backtesting metrics, such as the average default rates. Furthermore, the data collected for the 2019 exercise allow a

comparison of the distributions of RWs under the IRB approach, under the SA and based on the empirical level of risk.

- b. LDPs generally show so few data, and in particular defaults, that historical data may not provide statistically significant differentiation between different credit risk portfolios. Instead, the third section presents a comparison of the IRB parameters and RWs for identical obligors to which the institutions have real exposures.
  - c. In addition to the quantitative analysis, understanding the source of the variability requires complementary qualitative analyses. The last part of this report summarises the results from the CA assessments, interviews with the largest outlier institutions and the results of the survey on the different uses of rating scales.
4. Given the limitations and assumptions of the different analyses, their results should be considered concurrently. In addition, some data quality issues, which are identified throughout the report, suggest that the results of the analysis should be interpreted with caution.

## 2. Analysing the variability of the HDPs

5. In the 2019 SVB exercise, the HDPs consist of four broad types of exposures: residential mortgages, SME retail, SME corporate (turnover below EUR 50 million) and corporate-other portfolios (turnover between EUR 50 million and EUR 200 million). For these exposures, the average default rates are collected in order to attempt to compare the variability of IRB estimates with the variability of empirical level of risk. Furthermore, this year institutions had to provide the hypothetical RW that would be applied using the SA for exposures in the HDPs. These new data allow a comparison of the variability of own funds requirements between different approaches. This section explores first the variability of own funds requirements between exposure classes, using the top-down analysis, before digging further into the assessment within the individual exposure class using empirical backtesting data.

### 2.1 Variability analysed between exposure classes

6. Under the IRB approach, the cost of capital of an exposure is twofold: first, the expected loss triggers deductions in capital,<sup>6</sup> and, second, the unexpected loss implies own fund requirements measured via the risk weighting of the exposures. This aggregated cost, the GC,<sup>7</sup> is especially important to consider when assessing the variability at the institution level, since the cost of capital of defaulted assets under the FIRB approach comes entirely from the expected loss (hence, only looking at the RW variability would strongly overestimate the variability of cost in capital). While a similar concept can be defined for the standardised approach, via a sum of the RWAs and the accounting provisions, the latter is not collected in the SVB exercise. Therefore:

- in this section, where the variability is assessed at the institution level, the variability of the RW under SA will be compared with the variability of the GC under the IRB; however, the two metrics are not fully comparable in absolute terms;
- in the next section, where the total costs of capital are compared between the different approaches for non-defaulted exposures only, the RW metric will be used for both approaches.

7. With respect to the calculation of the RW under the SA, it should be noted that it is calculated by dividing the RWAs calculated under the SA by the exposure value used under the IRB approach. As such, the 'RW under SA' is not exactly the RW assigned in accordance with SA requirements, as the exposure value under the IRB approach is gross of specific provisions. The 'RW under SA' is rather the 'adjusted RW under SA', i.e. the equivalent RW as if it were applied

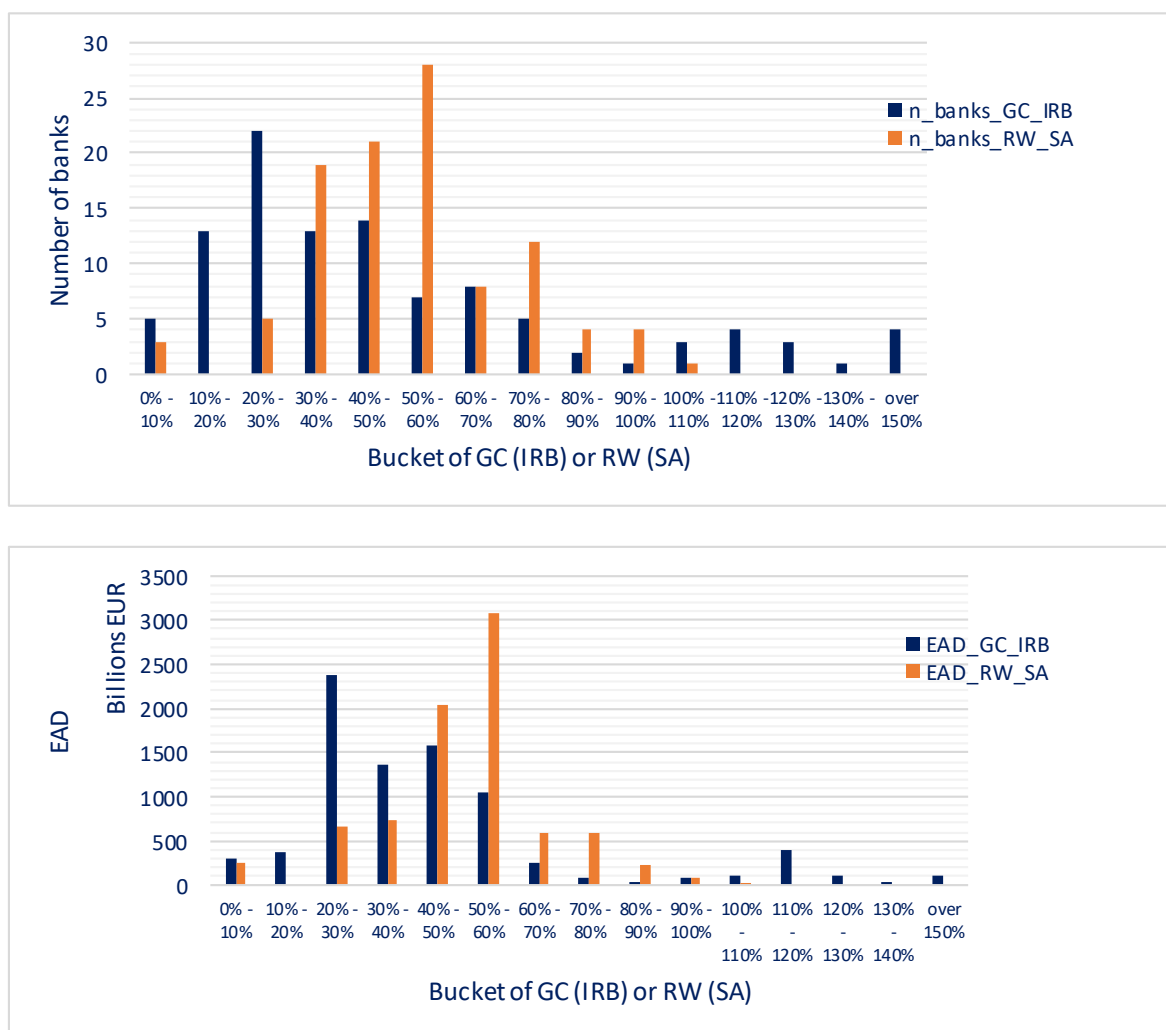
<sup>6</sup> Via the calculation of an expected loss (EL) in Article 158 of the CRR and its deduction via the shortfall of Article 159 and accounting provisions.

<sup>7</sup> The GC is calculated as  $(12.5 \times EL + RWA) \div EAD$  (exposure at default).

to the gross exposure value, in order to be able to make a comparison with the RW under the IRB.

8. A first visualisation of the distribution of weights applied to the exposures already gives a hint of the variability under the different approaches. At the EU level, the distribution of the average total GC (IRB) and total RW (SA) at the institution level is shown in Figure 1.

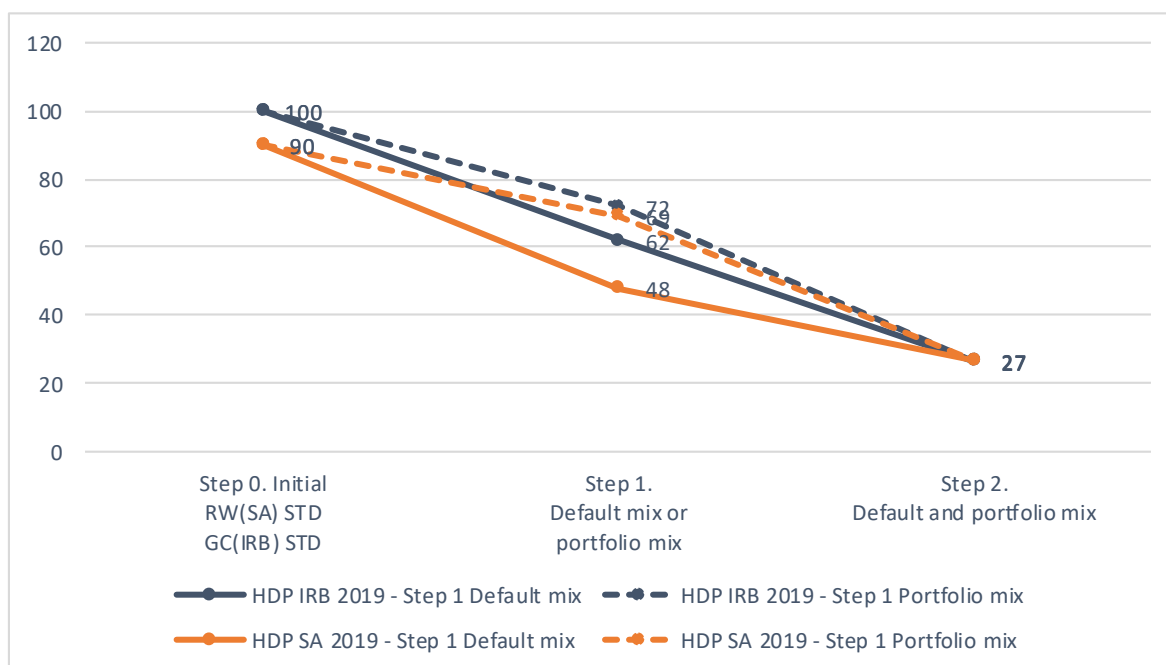
Figure 1: Distribution of GC (IRB) and RW (SA), number weighted (top) and exposure weighted (bottom)



NB: Each institution is allocated to one bucket based on its average GC (IRB) and RW (SA). The upper chart is based on the simple sum of the institutions per buckets; the lower chart adds up the exposure value of each institution per bucket.

9. Leveraging on the top-down analysis performed in the previous reports, the EBA ran the analysis on the IRB exposures, but with the two different regulatory approaches, the IRB approach and the SA. While Figure 1 shows the embedded variability without any considerations of the riskiness of the portfolio, this top down approach makes it possible to quantify the proportion of variability that can be explained by (i) the proportion of the defaulted exposures and (ii) the portfolio mix effect. .

Figure 2: Top-down analysis – SA (RW) versus IRB (GC)



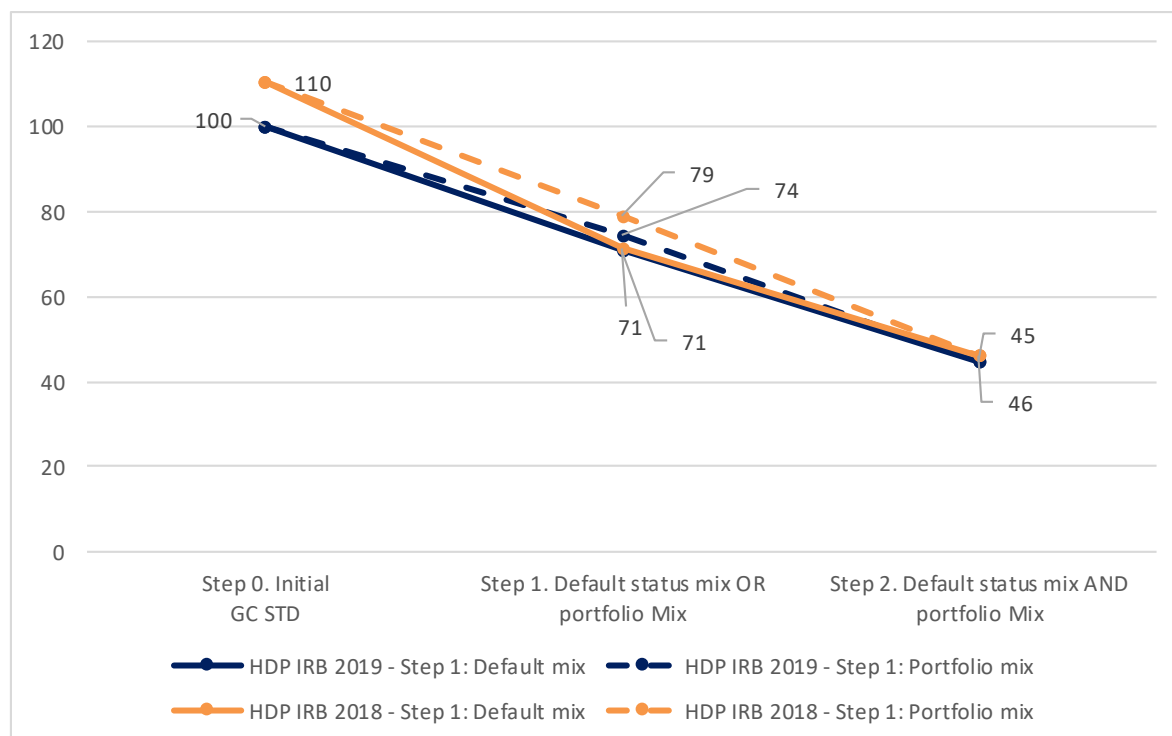
The variability is normalised with the initial IRB variability at 100

10. Based on Figure 2, it can be noted that:

- a. The observed variability of the RW under SA is similar to the observed variability of the GC under the IRB approach. This observation holds true even after controlling for the default and portfolio composition. Therefore, from this result we can conclude that the IRB approach does not lead per se to higher variability in the capital requirements than that already embedded in the SA.
- b. The explanatory power of the default and portfolio mix is similar between the SA and the IRB approach. This is an expected feature, since the SA has a dedicated treatment for defaulted exposures and a similar split of regulatory exposure classes to the IRB approach. As a matter of fact, the discriminatory power of the IRB approach is mostly higher than that of the SA within the exposure classes (due to the greater ability of IRB institutions to better differentiate and quantify the level of risk of the different exposures).

11. The higher explanatory power for this year's exercise than the previous exercise on the IRB side is due to the difference in samples. When the approach is run on a common sample, the results are stable over the years, with around 50% of variability explained.

Figure 3: Comparison of the top-down analysis for the IRB GC, HDPs, 2018 and 2019 exercises (common sample)



Sample: 72 institutions (only common institutions between 2018 and 2019 are kept).

## 2.2 Variability analysed within the exposure classes

12. This section analyses this variability at a more granular level, i.e. the exposure class level. For the HDPs, empirical level of risk can be indirectly measured with backtesting metrics, such as the average default rates. These metrics are especially relevant when calculated at the level of rating grades. Hence, it is necessary to first assess the level of consistency of the two regulatory approaches (the IRB and the SA) at the level of the rating grade.

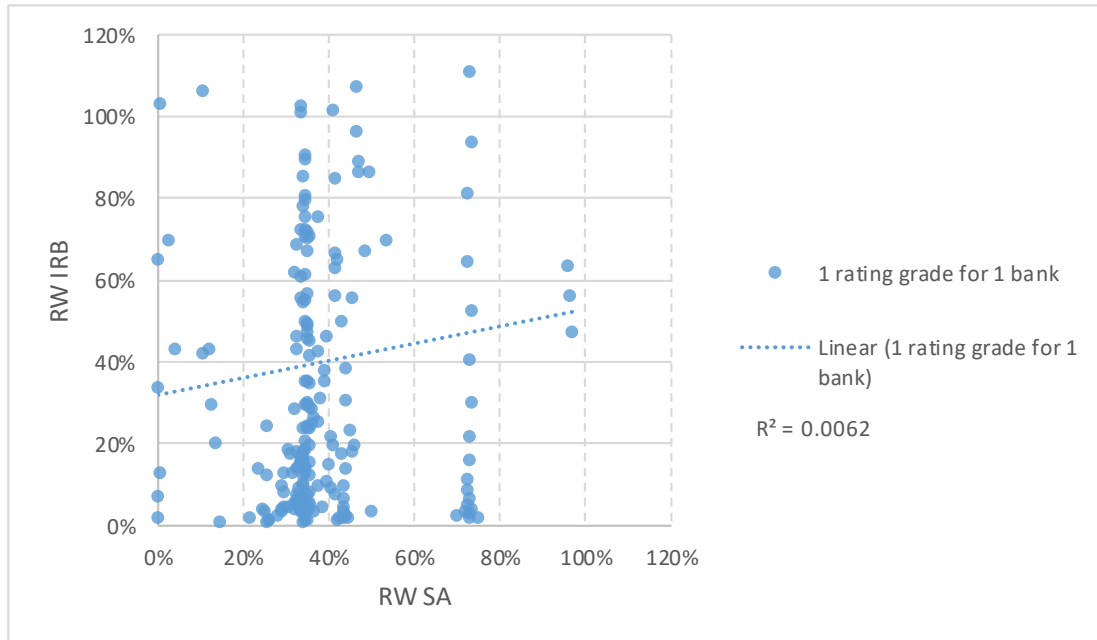
13. This section goes into more details on the variability of the residential mortgages portfolio<sup>8</sup>. It illustrates the difference in the outcomes between the IRB approach and the SA, and allows a risk-based comparison.

14. Figure 4 shows that the RWs of the two approaches are not assigned in a consistent manner (low  $R^2$ ).<sup>9</sup> The fact that the two regulatory approaches do not assess the risk in a consistent manner at the rating grade level is not surprising. While the SA uses average RW with a very low number of risk drivers, the IRB approach targets a higher degree of risk differentiation.

<sup>8</sup> However, the charts in the report focus on the mortgages SVB exposure class, where the highest number of data points is observed. The same conclusions can be drawn for the other exposure classes. The graphs for the other exposure classes are presented in the annex of this report.

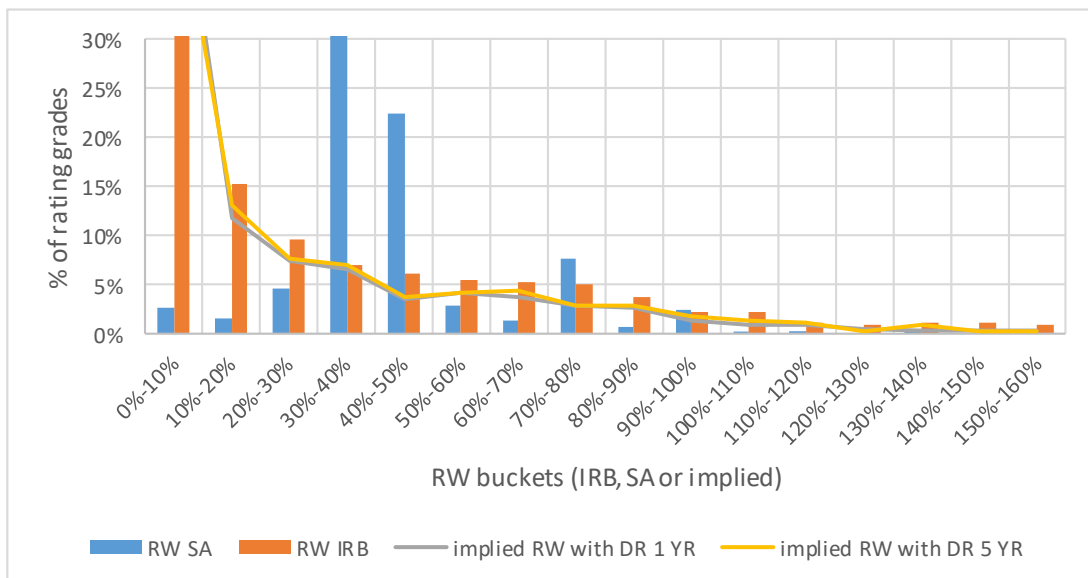
<sup>9</sup> This is potentially explained by the lack of risk drivers in the SA, which uses only the LTV to differentiate the risk.

Figure 4: RW (IRB) versus RW (SA) at the grade level, mortgages portfolio



15. In order to assess the appropriateness of the approaches, it is therefore relevant to add to this analysis a proxy for the level of risk. One simple and convenient way to visualise how the RW under the IRB approach and the RW under the SA relate to the underlying level of risk is to compare their related distributions with the distributions of 'implied RW', defined as the average RW recalculated using the observed default rates<sup>10</sup> at the grade level (Figure 5).

Figure 5: Distribution of RW (IRB), RW (SA) and implied RW, mortgage portfolio

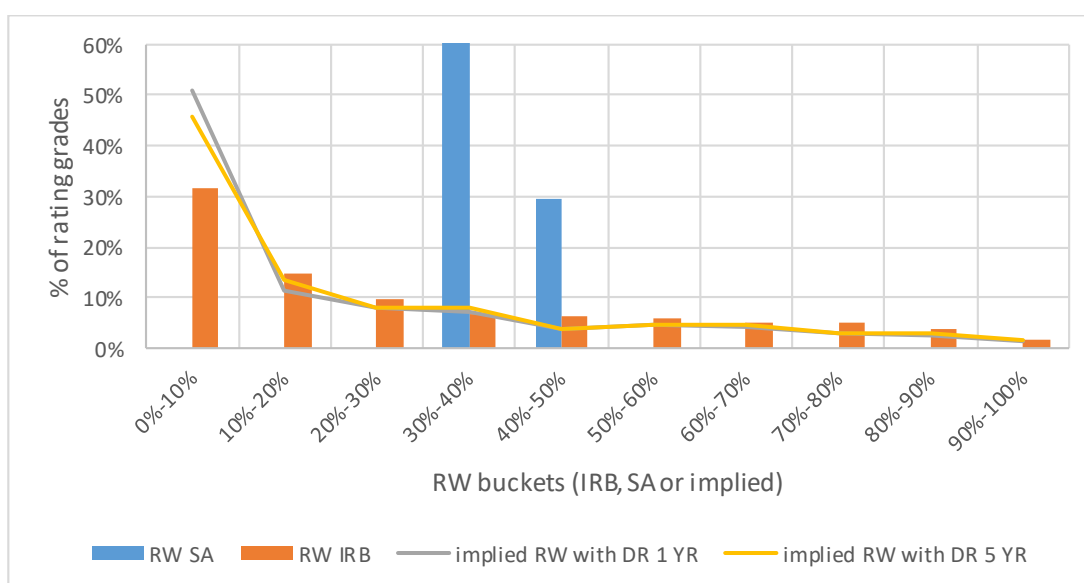


Missing values due to y-axis capped at 30%: (i) RW (IRB) between 0% and 10%, 47%; (ii) RW (SA) between 30% and 40%, 31%; (iii) RW (DR1Y) between 0% and 10%, 52%; RW (DR1Y) between 0% and 10%, 47%.

<sup>10</sup> The data collected allows the use of both a 1-year and a 5-year exposure value-weighted average default rates. These data points are complemented by the average LGD and maturity at the grade level to calculate the implied RW.

16. Figure 5 shows that, while the RWs calculated under the SA are restricted to only a few buckets, the RWs calculated under the IRB take better into account the wide diversity of risk (represented by the implied RW) within the mortgage portfolios. In addition, a considerable dispersion of the RWs calculated under the IRB for a given SA RW band can also be observed. This can be illustrated for selected RW bands, for instance the 30%-50% SA bucket (highest proportion of SA exposures). Figure 6 replicates Figure 5, but only keeping the rating grades with RW (SA) between 30% and 50%.

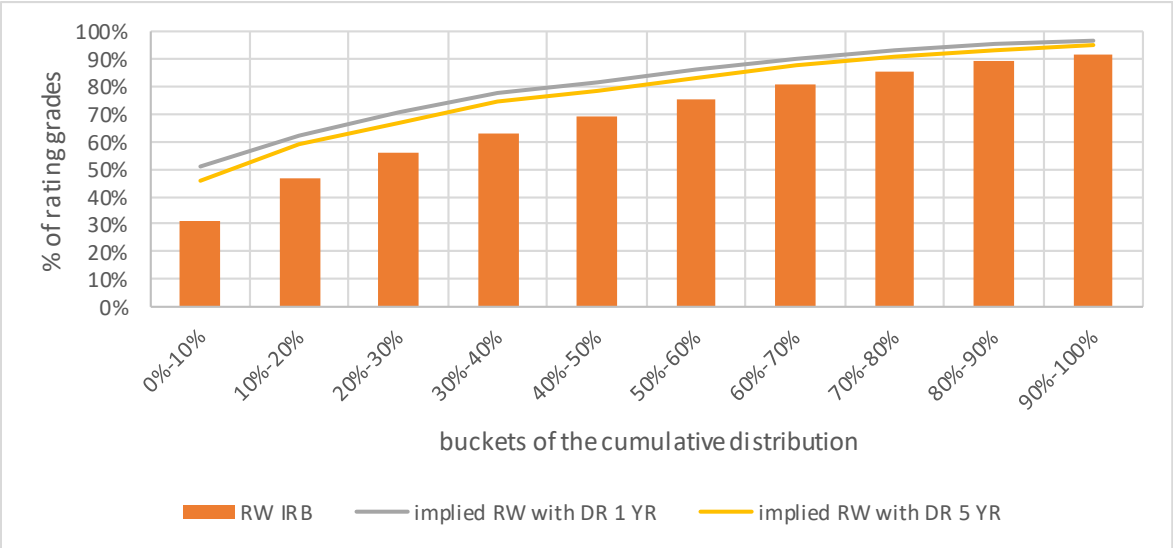
**Figure 6: Distribution of RW (IRB) for exposures with RW (SA) between 30% and 50%**



17. This distribution analysis can be complemented by the cumulative distribution. Figure 7 shows not only that the RWs calculated under the IRB are closer to the level of risk of the exposures, but also that there is still a conservatism embedded in the estimates at this point in time. This is illustrated by the fact that the cumulative distribution of the RWs calculated under the IRB is constantly lower than the cumulative distribution of implied RWs. This comes in particular from the observation that, for many rating grades, the observed default rates are equal to 0, while the PD incorporates a margin of conservatism that leads to a RW higher than 10%.<sup>11</sup>

<sup>11</sup> The cumulative distribution does not reach 100% because the x-axis is capped at 100%.

Figure 7: Cumulative distribution of RW (IRB) for exposures with RW (SA) between 30% and 50%



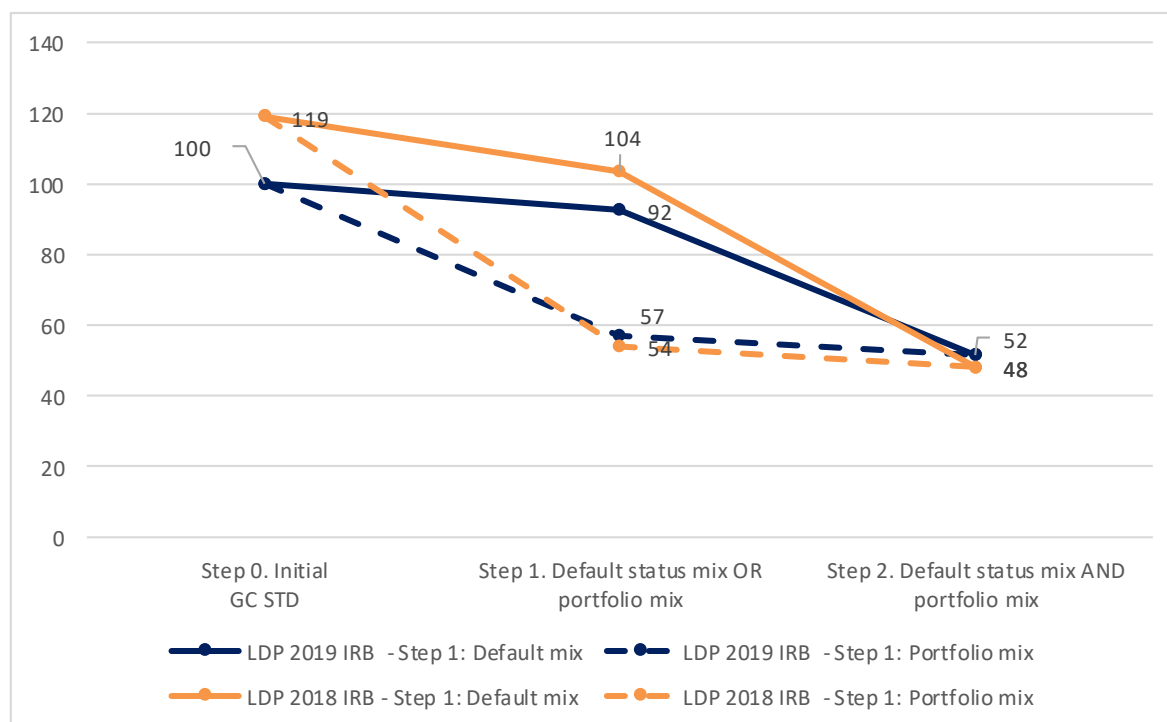
### 3. Analysing the variability of the LDPs

18. In the 2019 SVB exercise, the LDPs consist of three broad type of exposures: large corporates (with turnover above EUR 200 million), institutions, and central governments and central banks (sovereigns). The analysis needs to be adapted to the specificities of LDPs. Whereas a top-down methodology can be performed across exposure classes,<sup>12</sup> the analysis within the exposure classes cannot be based on backtesting results, due to the scarcity of defaults. Instead, it is possible to compare the IRB parameters and RWs for identical obligors to which the institutions have real exposures (common counterparty analysis) to control for underlying risk.

#### 3.1 Variability analysed across exposure classes

19. In the same fashion as what has been presented for the HDP portfolio, the top-down analysis can be performed for the GC computed under the IRB approach. A similar share of the variability as in the HDP is explained by relatively simple risk drivers (see annex of this report), and the results are stable over the years when the approach is run on a common sample of institutions. Figure 8 shows that the proportion of explained variability is around 50% on the common sample.

Figure 8: Comparison of the top-down analysis, LDPs, 2018 and 2019 exercises (common sample)



Sample: 72 institutions (only common institutions between 2018 and 2019 are kept).

<sup>12</sup> Only on IRB risk metrics, since the SA risk metrics were not reported by all institutions.

### 3.2 Absolute level of variability (on same counterparties)

20. For each institution, it is possible to calculate RW deviations on a set of common counterparties based on the distance between the internal estimates and the median estimates of the sample of institutions. These deviations are aggregated at institution level (based on the median of the deviations at counterparty level), hence giving an estimate of the position of the institutions in terms of estimate of risk compared with their peers. Table 2 shows the interquartile ranges of the RW deviations resulting from the use of benchmarks. A complete description of the methodology and caveats for this analysis can be found in the annex of this report.

**Table 2: Summary statistics on the RW deviations (first and third quartiles, median and interquartile range) by SVB exposure class and regulatory approach (%)**

		AIRB			FIRB	
		Dev 1 (ALL)	Dev2 (PD)	Dev5 (LGD <sub>unsec</sub> )	Dev 1 (ALL)	Dev2 (PD)
Large corporates	Q1	-8	-4	-4	-2	-2
	Q3	5	4	1	6	5
	Median	0	0	0	0	0
	Q3-Q1	13	8	5	8	7
Sovereigns	Q1	-4	-2	-3	-4	-3
	Q3	3	3	1	2	2
	Median	-1	0	0	0	0
	Q3-Q1	7	4	4	6	5
Institutions	Q1	-9	0	-5	-7	-2
	Q3	-2	4	1	0	3
	Median	-6	0	0	-3	0
	Q3-Q1	8	4	7	7	5

Example of reading: “-4” for row “Q1” of “Large corporates”, column “Dev2 (PD)” of “AIRB”:

- the use of the PD benchmarks instead of the actual PD estimates for each large corporate with an own estimate of LGD (i.e. use of AIRB) would, all things being equal (i.e. same exposure value, LGD and Maturity) decrease the RWA 4%.
- This decrease of 4% is measured on the median of the counterparties for each institution, i.e. the use of the PD benchmarks decrease the RWA by more than 4% and by less than 4% for half of the counterparties.
- This decrease is for the first quartile of institutions, i.e. 25% of institutions have a decrease higher than 4% (in absolute value) and 75% a lower one.

21. The results in Table 2 show that most of the interquartile ranges of the RW deviations resulting from the use of benchmarks are below 10 percentage points. These interquartile differences are greater under the AIRB than under the FIRB approach for the large corporates due to the LGD and the maturity effects, but the PD deviations are comparable between the regulatory approaches. These PD deviations are the most relevant ones, since the nature of the exercise,

based on a common set of obligors, is tailored to control the default risk (linked to the PD estimation) rather than transaction risk (which would explain the LGD deviation).

22. The variation in PD is not risk based, as the risk assessment of the same counterparties by different institutions should not be expected to significantly differ. This variability is limited, and is not necessarily unexplained or undue. For instance, in some specific cases, such as the ones described in Article 172(1)(e) of the CRR (e.g. country transfer risk, associated guarantee), the PD of the same obligor may be different for different facilities. Furthermore, a difference in the estimates may also be explained by different default experiences or different chosen scopes of the applicable rating model.

### 3.3 Relative level of variability (Kendall tau metric)

23. As highlighted by its name, one key component of the internal rating-based approach is its capacity to rate and rank the obligors according to their relative level of risk. Thus, the variability can be analysed in two dimensions: first as the variability of the risk parameters in absolute terms,<sup>13</sup> and second as the variability of the ranking of the counterparties (i.e. variability of the risk parameters relatively to each other).<sup>14</sup> This distinction of the variability coming from the risk differentiation and the risk quantification is very relevant to policymakers, as it triggers different corrective measures.<sup>15</sup> One possibility for assessing the efficiency of the risk differentiation is to measure the commonality of the ranking among institutions over the common sample of obligors. The Kendall tau coefficient is a simple metric to assess this commonality, and can be seen as a correlation coefficient: a Kendall tau equal to 1 means that two institutions rank their common counterparties in the same manner, while a Kendall tau equal to -1 means they rank their common counterparties in opposite manners. More explanation of this metric can be found in the annex of this report.

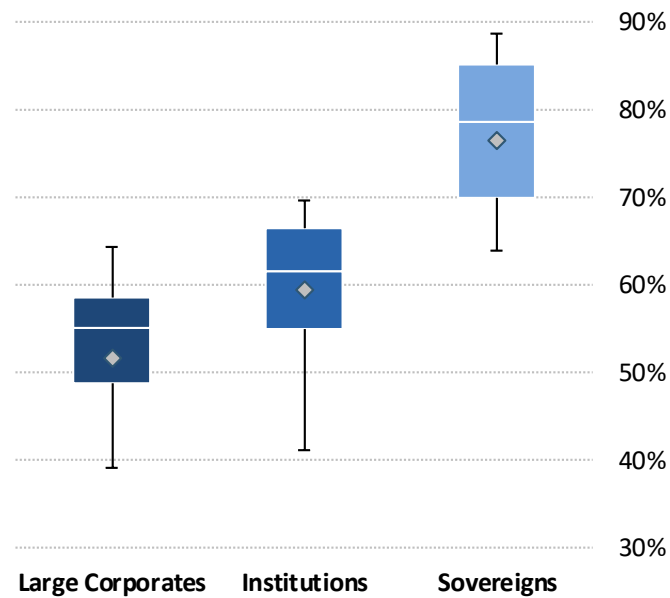
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<sup>13</sup> For example, for counterparties X and Y, institution A estimates PD(X) and PD(Y) differently from institution B.

<sup>14</sup> For example, institution A assesses that PD(X) < PD(Y) while institution B assesses that PD(X) > PD(Y).

<sup>15</sup> For instance, the EBA believed the risk quantification part of the IRB framework was insufficiently detailed, and therefore focused its comprehensive review on this part of the framework.

Figure 9: Interquartile range, median and average of Kendall tau metrics



24. Generally speaking, Figure 9 shows that the ranking of the counterparties is very consistent among institutions, with Kendall tau metrics being positive for all asset classes, and generally above 50%. It is, however, likely that the higher values for sovereigns and Institutions are to be explained by the more common use of shadow ratings models (external ratings), with therefore a higher concordance expected.

## 4. Qualitative assessment of the variability

### 4.1 Main findings from CAs' assessments based on supervisory benchmarks

25. Article 78(4) of the CRD requires CAs to make an assessment where institutions diverge significantly from the majority of their peers or where there is little commonality in approaches, leading to a wide variance in results. In these cases, the CA should investigate the reasons and take corrective action if the institution's approach leads to an underestimation of own funds requirements that is not attributable to differences in the underlying risks. In order to facilitate the transfer of the information gathered in these assessments from the CAs to the EBA, the EBA issued a questionnaire to the CAs, which had to be completed for each institution participating in the SVB exercise. The EBA received the responses for 100 institutions. Figure 10, Figure 11 and Figure 12 provide the key information derived from these assessments. More comprehensive feedback is presented in the annex of this report.

Figure 10: CAs' overall assessment of the level of institutions' own funds requirements, using benchmark deviations

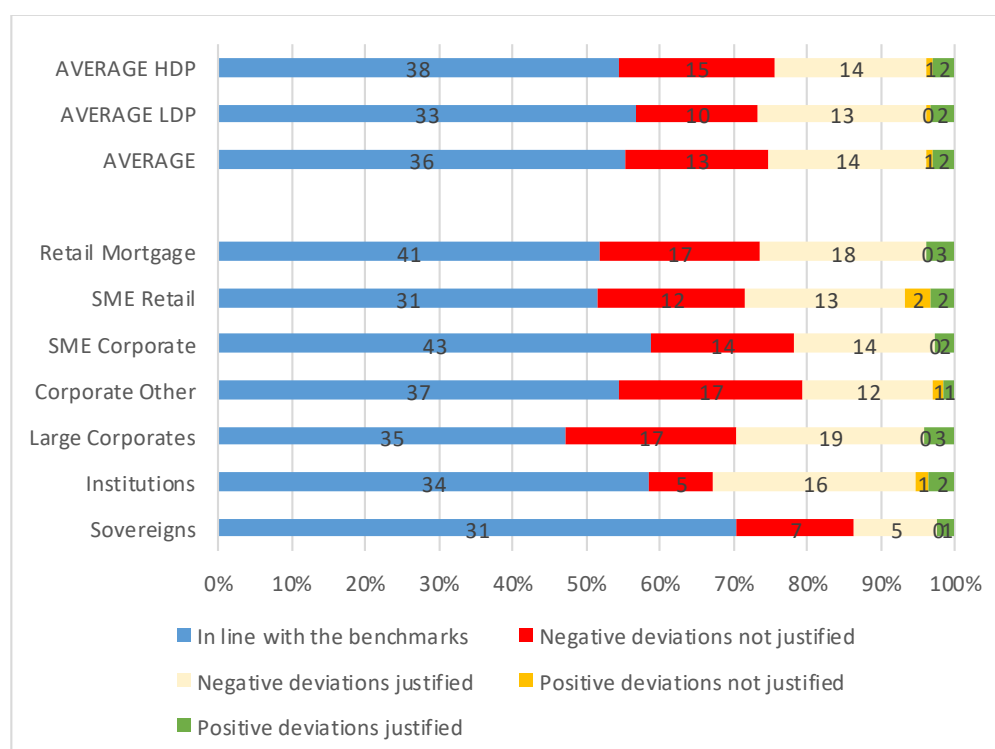


Figure 11: Common reasons for negative deviations not justified (at least one parameter)

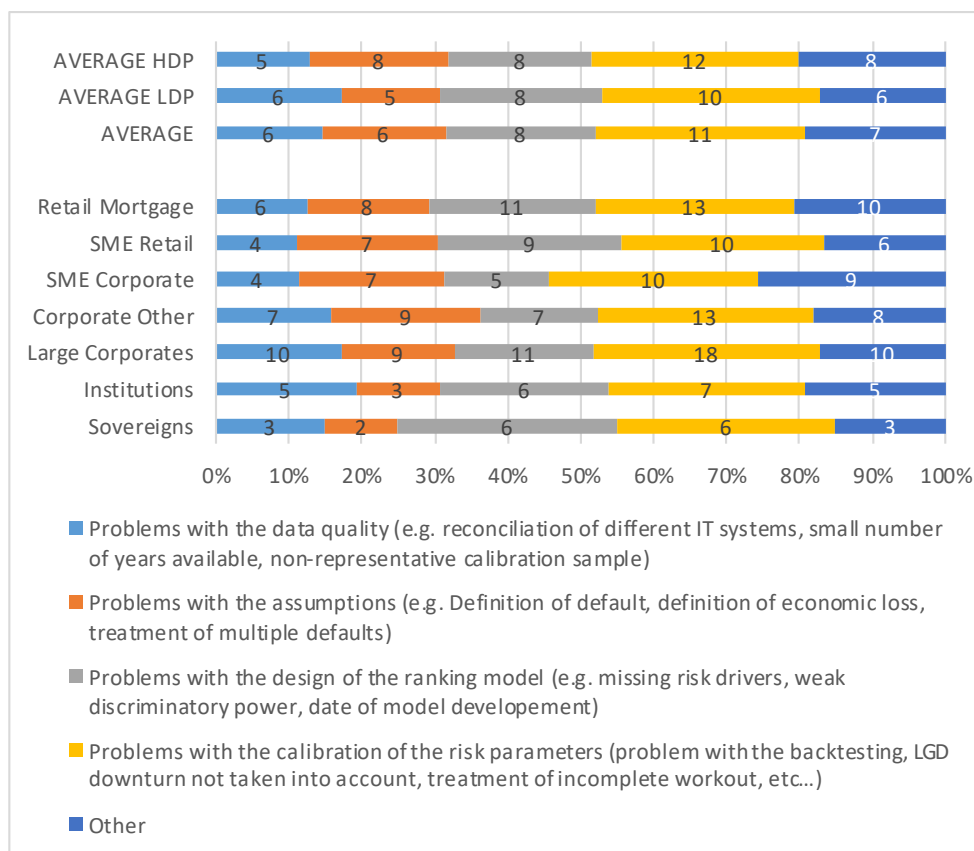
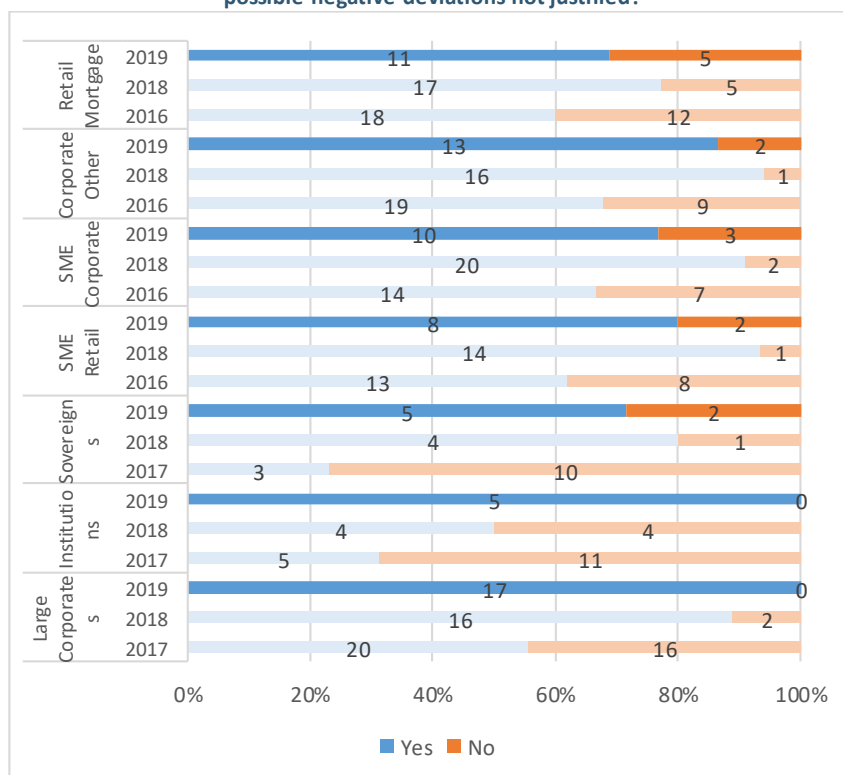


Figure 12 Have the CA monitoring activities (ongoing or on-site) of the internal models identified the most relevant possible negative deviations not justified?



26. Overall, the EBA notes the following results:

- a. Supervisors generally deem the institutions' level of RWAs adequate (Figure 10), although the adequacy of RWA levels cannot be assessed from the SVB results only.
- b. Deficiencies spotted by supervisors are spread evenly between LDPs and HDPs, and rather relate to the calibration of risk parameters (although other reasons are observed as well; Figure 11). The latter is expected, since considerable regulatory effort has been put in place to clarify the rules related to the risk quantification.
- c. The number of unjustified negative deviations from the benchmarks (i.e. underestimation of own funds requirements) is decreasing over time, as is the proportion of previously unidentified negative deviations (Figure 12). This shows that CAs are more and more picking up on more and more issues and gaining in efficiency.

## 4.2 Main findings from the interviews

27. The EBA conducted interviews with the seven institutions where significant numbers of negative deviations were spotted. As a general remark, the findings are generally consistent with those of previous years, and several general data quality issues and problems in the reporting also explain the deviations. Some of the deficiencies are already known but are still reported in the SVB exercise due to a pending validation of the model changes. An extended list of the takeaways of the interviews is presented in the annex of the report.

28. **For the LDPs**, the main challenge is to overcome the scarcity of data, and many issues directly stem from the attempt to overcome this lack of data.

29. **For the HDPs**, some reasons for negative deviation are linked to deficiencies in the models that should be resolved once the guidelines on PD and LGD estimations are in place. These include the check of the homogeneity at the grade level and a well-defined MoC framework. Other deviations in the backtesting of risk parameters come from the definitions used for the SVB exercise (e.g. parameters in SVB are exposure weighted and not obligor weighted, and SVB portfolio definitions deviate from model scope), as well as cycle effects (in particular for the backtesting results with the 5-year default rates, where an increase in the credit quality of some portfolios makes the old default rates not representative at the portfolio level).

30. In general, the interviews with the institutions were helpful for the EBA, the CAs and the institutions, to clarify the practices within each institution and gain a better understanding of its risk assessment compared with its peers.

## 4.3 Main findings from the survey on rating scales

31. Since the 2018 exercise, the EBA has conducted an annual survey on a selected topic, in order to gain a better understanding of the variability of the results reported. Whereas the treatments

of guarantees and derivatives were analysed in the previous report, the survey of the 2019 SVB exercise was focused on the different practices in terms of rating scales, and the impact of using a supervisory master scale.

32. Institutions were asked to provide information for two models, selected as being the most representative for the large corporates exposures and the mortgage portfolio. In addition to various questions on the type of calibration and rating scale they were using, institutions had to populate several backtesting data fields,<sup>16</sup> using first their internal rating scale and then a harmonised benchmarking rating scale. Participation in the survey was voluntary and a total of 81 institutions submitted answers.

33. This survey tried to differentiate the variability of practices by type of calibration approach:

- a. **Continuous direct estimates of PD:** the PD estimates used for capital requirements calculation result from a continuous modelling approach leading to a direct PD estimate, by converting the score into a direct PD estimate. An additional calibration step in order to achieve a calibration target (which potentially leads to adjustments of PDs) may or may not be applied.
- b. **Discrete direct estimates of PD:** this category uses a continuous modelling approach; however, in this case the continuous PDs are not used directly for capital requirements calculation, but instead mapped to a discrete rating scale (either a master scale used across different portfolios or a grade scale specific to the portfolio). The PD estimates of each grade are derived not from the long-run average default rate by grade but from the average of obligor/facility PDs assigned to each grade or a fixed PD per grade (e.g. the average of the upper and lower bounds of each grade), as set out in Article 180(1)(g) of the CRR.
- c. **Grade-based estimation of PD:** the PDs used for capital requirements calculation result from the long-run average default rate calculated at pool or grade level.

34. Overall, there is significant variability in the observed practices:

- a. While the number of purely continuous models is low, the discrete direct estimate and the grade-based estimation of PDs are evenly split for LCOR whereas the latter is preferred for MORT. The number of grades is (as expected) lower for grade-based estimation than for other methodologies of calibration.
- b. The PD values associated with the grades are rather constant over time for discrete models (although a significant minority of institutions regularly change their PD estimates, in particular for grade-based models under LCOR). However, the

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<sup>16</sup> Four data points were collected: 1-year and 5-year default rates, using both obligor- and EAD-weighted average schemes.

definition of the buckets stays constant over time for most of the institutions, while a yearly recalibration of the model is the dominant trend.

- c. If a master scale is used, the methodology of construction differs depending on the type of calibration and the exposure class. For LCOR, continuous models fix the boundaries of the scale, grade-based models fix the PD values and discrete direct estimate models fix both. Similar practices are observed for MORT, with the exception of grade-based models, which are constructed most of the time by fixing the boundaries of the buckets. These master scales are used most of the time across all PD models, for reporting, disclosure and setting risk appetite in particular, but not necessarily for calibration.

35. All the results and tables are presented in the annex of this report. In particular, the data collected at the internal rating grade level and using a supervisory master scale also make it possible to assess the impact of using EAD-weighted average metrics (PD or DR) versus an obligor-weighted average, as well as the impact of using a supervisory master scale.



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