

IFRS 9 Benchmarking Report 2019

Expected Credit Loss estimates of banks vary at least by a factor 4

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ABOUT GCD

Global Credit Data (GCD) is a non-profit association owned by 50+ member banks with the simple mission to help banks better understand and measure their credit risks through data pooling and benchmarking activities.

GCD collects historical loss data through its LGD&EAD platform, to which member banks have exclusive access. This database now totals over 175,000 non-retail defaulted loan facilities from around the world. Our PD platform has now over 15 years of default rates and PDs. GCD also runs a name and cluster benchmarking database to help banks calibrate and benchmark their PD, LGD and EAD models.

The robustness of GCD's data collection infrastructure place our databases as the global standard for credit risk data pooling.

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SUMMARY

As the first IFRS 9 statements are being released, banks, investors, auditors, regulators and other financial industry participants are attempting to understand the **variability of loss projections, provision charges and Expected Credit Loss (ECL) estimates confirmed (*) by GCD's IFRS 9 benchmarking study**. The study was conducted in the summer of 2018 over 26 international banks and supported banks in finalizing their IFRS 9 implementation.

IFRS 9 requires banks to estimate a 1-year and a life-time ECL and these measurements are expected to be responsive to macroeconomic developments and to include a forward-looking perspective. A certain amount of variability is expected, as ECL should also capture banks' specificities, thus fostering diversity and enhanced resilience in the financial market. A "one size fits all" calibration shall not be the desired objective.

Each bank in the study applied their own IFRS 9 framework to the same hypothetical portfolio of obligors and exposures, using the same macro-economic forecasts and the same stress test scenarios. The effects of bank-specific scenarios on the ECL have been analysed as well. **Hence the study focuses on differences potentially driven by methodologies** and neutralizes differences due to qualitative adjustments or differences due to banks' specific risk profiles.

Key take-aways:

- **Variability of ECL estimates is noticeable for all asset classes**
 - The variability between banks' estimates is observed for all segments defined by ECL drivers such as obligor type, geography, industry, rating and PD, facility type, guarantees and collateralization
 - Bank-specific or reference macro-economic scenarios used for projections led to identical conclusions: in the current macro-economic environment, the variability between banks is mainly caused by banks' different models and not by different macro-economic forecasts
 - In order to "measure" the variability, we introduce a multiplier (=ECL 3rd quartile / ECL 1st quartile, calculated over all participating banks). We see that the multiplier is fairly stable over all asset classes and – on average – stands at least at a level of 4.
- **Projections of stress test scenarios logically increase ECL levels and also notably increase the variability between banks**

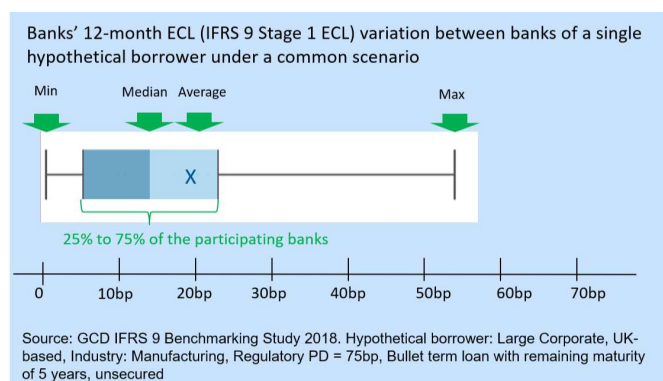
* GCD performed a similar study in 2017 and published the results in the RMA Journal. The article can be downloaded at <https://www.globalcreditdata.org/library/summary-ifs-9-benchmarking-study-2017-rma-journal-entry-may-2018>

Case study:

To illustrate the variation even under our common scenario, we zoom into one specific hypothetical borrower:

An unsecured loan with a remaining legal maturity of 5 years to a large corporate borrower located in the UK and active in the manufacturing industry would receive - in case the borrower would be rated with a PD of 75 bp - on average a provision charge* of 18.1 bp in Stage 1** (and 113 bp in Stage 2**). However, there are banks who calculate a Stage 1 provision charge of less than 1 bp or more than 50 bp for the same borrower. The majority of banks (1st and 3rd quartile) calculate a provision charge of 5.9 bp to 24.2 bp – which we consider still a significant difference, leading to the conclusion that banks’ provision charges vary by a factor 4 or more.

**EXHIBIT 1
12-MONTH ECL (IN BP) FOR A UK LARGE CORPORATE BORROWER (PD = 75 BP, UNSECURED)**



The variability we have seen between banks in the provision charge for this specific large corporate borrower is similar to the variability in other asset classes/products/countries/risk classes.

Exhibit 2 and 3 show the provision charge (12-month and Lifetime ECL) for a hypothetical borrower in the UK with a PD of 75 bp under the common scenario assumption for various asset classes:

- **Large Corporate:** unsecured 5-year bullet term loan, industry: manufacturing
- **Bank:** unsecured 5-year bond
- **Specialized Lending Real Estate:** 5-year bullet term loan secured by Residential Real Estate (Multi-family apartment building, excellent location in the center) with LTV=70%

Note: we zoom here into the UK, but a similar variability can be seen in other countries and regions (see following chapter). **We observe – on average – for all asset classes a multiplier (=ECL 3rd quartile / 1st quartile) of at least 4.**

**EXHIBIT 2
12-MONTH ECL (IN BP) FOR A UK BORROWER IN DIFFERENT ASSET CLASSES (PD = 75 BP)**

	# Banks	Average Median	Min	1st Quartile	3rd Quartile	Max
Large Corporates	18	18.1 15.1	0.7	5.9	24.2	57.4
Banks / Non-Bank Financial Institutions	8	16.8 11.7	0.6	5.5	23.6	52.2
Specialized Lending Real Estate	7	9.8 2.2	0.6	1.0	4.8	54.0

**EXHIBIT 3
LIFETIME ECL (IN BP) FOR A UK BORROWER IN DIFFERENT ASSET CLASSES (PD = 75 BP)**

	# Banks	Average Median	Min	1st Quartile	3rd Quartile	Max
Large Corporates	18	113.0 104.2	3.7	39.2	152.3	428.6
Banks / Non-Bank Financial Institutions	8	113.6 86.4	10.5	40.2	136.0	364.0
Specialized Lending Real Estate	7	67.9 13.6	0.9	11.7	48.0	341.3

Other significant findings:

IFRS 9 requires banks to bucket their non-defaulted borrowers into two different risk categories (Stage 1 and Stage 2) dependent on whether those borrowers have experienced a “significant increase in credit risk since origination (SICR).” Banks differ very much in terms of the number of rating notches a borrower needs to be downgraded in order to trigger a movement from Stage 1 to Stage 2. The difference results from the various methodologies that banks have developed for their quantitative triggers. For example, those methodologies could be based on IFRS 9 Lifetime PD vs. purely rating-based notches. The thresholds also vary significantly. More details are presented in the following sections.

* In this report, we define the provision charge as the “12-month ECL” resp. “Lifetime ECL” in basis points which is the calculated ECL by banks divided by the outstanding to the borrower (X 10,000).

** IFRS 9 distinguishes between 3 stages. The majority of IFRS 9 banks’ portfolio is in Stage 1, where the estimation of 12-month-ECL is required. Only Stage 2 and Stage 3 require a life-time perspective. In the US regulation: CECL does not distinguish between different stages and requires for all assets a life-time perspective

INTRODUCTION

GCD has conducted this benchmarking study in 2018 to allow participating banks to compare their final IFRS 9 model parameters and functionality anonymously with peers. Participating banks are also able to identify the reason for those differences by tracking back to detailed components.

26 international banks have taken part in the IFRS 9 benchmarking study.

EXHIBIT 4 COUNTRY OF PARTICIPATING BANKS

Region	Main country	Number of participating banks
Europe	Austria	1
	France	1
	Italy	2
	Netherlands	2
	Norway	1
	Switzerland	1
	Switzerland	1
	United Kingdom	3
Asia / Oceania	Malaysia	1
	Australia	4
North America	US	3
	Canada	2
Africa	South Africa	4
		26

Part 1 of the study is based on a hypothetical portfolio and compares the Expected Credit Loss (ECL), Point-in-time PD (PiT PD), LGD and EAD for Stage 1 and Stage 2. Each borrower in the hypothetical portfolio is defined by a certain set of variables. The hypothetical portfolio has been chosen to be widely representative for a major part of our member banks' portfolios and includes:

- 2304 hypothetical borrowers in Retail banking (Mortgages)
- 480 hypothetical borrowers in Retail banking (Credit Cards)
- 144 hypothetical borrowers in Wholesale Banking (SME)
- 384 hypothetical borrowers in Wholesale Banking (Large Corporates)

- 384 hypothetical borrowers in Wholesale Banking (Banks & Non-bank Financial Companies)
- 90 hypothetical borrowers in Specialized Lending (Income-producing Real Estate)
- 21 hypothetical borrowers in Specialized Lending (Ship Finance)

Part 2 of the study benchmarks the quantitative thresholds for the "stage allocation process", i.e. the movement of borrowers from stage 1 to stage 2 based on an assessment whether the borrower has experienced a "significant increase in credit risk (SICR) since origination".

SCENARIOS APPLIED

To isolate and analyse variances arising from differing macro-economic forecasts, participating banks were asked to run the hypothetical portfolio under various scenarios.

1. Their own bank's scenario set
2. Using a "common scenario assumption"
3. Using the baseline scenario as defined by the EBA stress test 2018 (*)
4. Using the stress scenario as defined by the EBA stress test 2018 (*)

The "common scenario assumption" requires banks to calculate the ECL with perfect hindsight. To be concrete, banks are asked to use the actual values of their macro-economic drivers from 2012 to 2016 as their forward-looking macro-economic forecast.

VARIATION OF ECL ESTIMATES SIMILAR FOR VARIOUS REGIONS

One important driver of the ECL is typically the country of the borrower (**) resulting in the fact that banks have different ECL models and macroeconomic forecasts for different countries.

The box plot diagrams in Exhibit 5 and 6 compare the 12-month ECL and the Lifetime ECL under the common scenario for a specific hypothetical borrower (Large Corporate, Manufacturing, Bullet term loan, unsecured, remaining maturity = 5 years, Regulatory PD = 75 bp) for various countries.

The majority of the banks estimate a 12-month ECL between 5 bp and 25 bp and a Lifetime ECL between 25 bp and 150 bp (1st and 3rd quartile of the boxplot charts) for that standard borrower.

* For more information, see: <https://www.eba.europa.eu/-/eba-launches-2018-eu-wide-stress-test-exercise>

** There are many different countries relevant in the context of assessing the ECL of a specific borrower (country of residence, country of business,

country of the collateral, ...). Banks usually have a methodology in place to define this country of risk.

EXHIBIT 5

VARIABILITY OF THE 12-MONTH ECL (IN BP) FOR A LARGE CORPORATE BORROWER (PD = 75BP, UNSECURED) IN VARIOUS COUNTRIES – COMMON SCENARIO

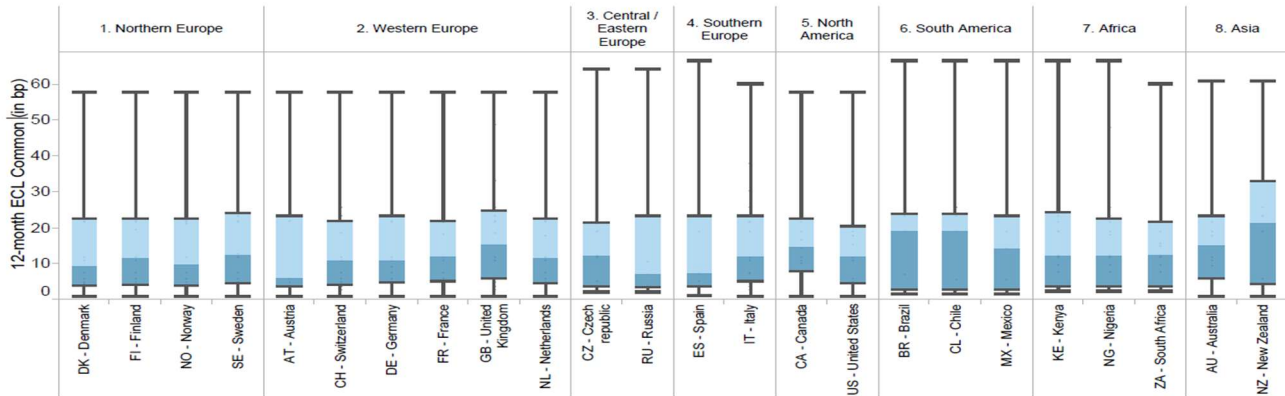
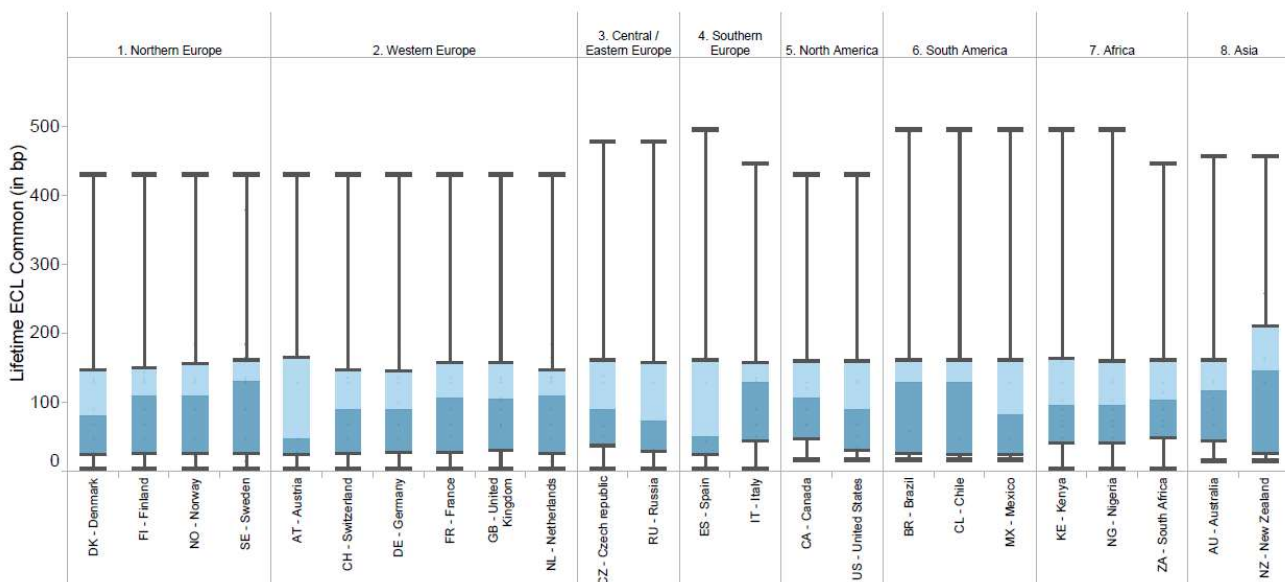


EXHIBIT 6

VARIABILITY OF THE LIFETIME ECL (IN BP) FOR A LARGE CORPORATE BORROWER (PD = 75BP, UNSECURED) IN VARIOUS COUNTRIES – COMMON SCENARIO



Our conclusion is that the variability stems from model assumptions and differences in data sources, techniques and processes between banks and that this holds for all surveyed borrower countries.

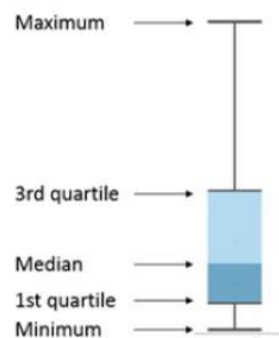
IMPACT OF MACRO-ECONOMIC SCENARIOS

Under IFRS 9, banks are required to use their own macroeconomic forecast. Participating banks could choose in this study whether they provided ECL estimates under their own macro-economic scenario set or not. In total, 10 banks submitted both estimates under the common scenario and under their own scenario set.

Exhibit 7 and 8 compare the 12-month ECL and the Lifetime ECL of our standard borrower (Large Corporate, located in the UK, unsecured, bullet term loan, 5 year remaining maturity) under the common and under banks' own scenario set. We see that the variability is practically the same under the common scenario as under the own scenario, dependent on how variability is measured. The

HOW TO READ BOXPLOTS

This report compiles a set of Benchmark Box Plots to display the variety of the ECL estimates between banks. The graph shows in which range the estimates of the participating banks lie.



difference between Minimum and Maximum is higher under the Own Scenario, the difference between the 1st and the 3rd Quartile is higher under the Common Scenario.

**EXHIBIT 7
VARIABILITY OF THE 12-MONTH ECL (IN BP) FOR A LARGE CORPORATE BORROWER (UK, PD = 7 5BP, UNSECURED) – COMMON AND OWN SCENARIO**

	# Banks	Average / Median	Min	1st Quartile	3rd Quartile	Max ECL
Common scenario	10	17.1 14.0	0.7	4.2	24.2	57.4
Own scenario	10	19.3 17.8	0.0	8.4	21.1	60.5

**EXHIBIT 8
VARIABILITY OF THE LIFETIME ECL (IN BP) FOR A LARGE CORPORATE BORROWER (UK, PD = 75 BP, UNSECURED) – COMMON AND OWN SCENARIO**

	# Banks	Average / Median	Min	1st Quartile	3rd Quartile	Max ECL
Common scenario	10	117.6 97.6	3.7	25.7	156.8	428.6
Own scenario	10	123.9 100.0	0.1	55.3	137.5	455.5

Next to a common scenario and their own scenario sets, banks were also able to provide their ECL estimates after applying the baseline and the adverse (stress) scenarios of the EBA's 2018 EU-wide stress test, which are publically available. The adverse scenario represents (according to the EBA) the most material threats to the EU financial sector at the time when the scenario was developed. This includes a cumulative fall in GDP, a steady increase in unemployment, an increase in inflation and a significant fall in residential and commercial real-estate prices. The scenarios are developed for various countries.

Under the EBA baseline scenario, banks' ECL estimates show a similar variability as under GCD's common scenario or banks' own scenario. This is confirmed by Exhibit 9, which shows the variability of the 12-month ECL for our standard borrower (Large Corporate, located in the UK, unsecured, bullet term loan, 5-year remaining maturity) and only those banks are selected that have submitted estimates under the common scenario, the own scenario set and the EBA scenarios (7 banks). A similar situation can be seen for other countries, asset classes and facility types. Overall, we conclude that the effect of the non-stress scenarios on the variability of the

ECL between banks is less significant in the current benign macro-economic environment. More relevant are different modelling choices, assumptions and data sources.

**EXHIBIT 9
VARIABILITY OF THE 12-MONTH ECL (IN BP) FOR A LARGE CORPORATE BORROWER (UK, PD = 75 BP, UNSECURED) – COMMON, OWN AND EBA SCENARIO'S**

	# Banks	Average / Median	Min	1st Quartile	3rd Quartile	Max ECL
Common Scenario	7	23.5 23.2	5.8	14.0	25.1	57.4
Own scenario	7	22.7 20.3	6.4	15.0	20.8	60.6
EBA Base Scenario	7	21.2 19.4	5.5	10.8	20.7	60.6
EBA Stress scenario	7	37.6 28.4	10.0	26.3	53.1	65.7

IMPACT OF A STRESS SCENARIO

When applying the EBA stress scenario, banks' average ECL increases, as expected under a stress scenario, but with it also the variability between banks (defined as the difference between the first and the third quartile of the ECL). Exhibit 9 shows this clearly for our standard borrower but a similar view can be seen for other hypothetical borrowers of the study.

The reason behind this is that banks' models can react more or less sensitively to extreme macro-economic threats. This can be measured by a "stress factor", i.e. ECL (Stress scenario) / ECL (Base scenario).

Exhibit 10 displays the "stress factor" for the 12-month ECL and the Lifetime ECL of our standard borrower. The table can be read as such, e.g. for the Large Corporates asset class: on average, the 12-month ECL increases by 2.3 times and the Lifetime ECL by 2.5 times through the application of the stress scenario (in comparison to the EBA base scenario).

We see that the Real Estate portfolio of banks reacts the most severely to the stress scenario, which assumes a sharp fall in commercial real-estate prices.

EXHIBIT 10

"STRESS FACTOR" FOR VARIOUS ASSET CLASSES (UK, PD = 75 BP)

	# Banks	Stressfactor 12-month ECL	Stressfactor Lifetime ECL
Large Corporates	7	2.3	2.5
Banks / Non-Bank Financial Institutions	5	1.9	2.4
Specialized Lending Real Estate	5	4.3	4.1

VARIABILITY OF PD AND LGD

Under IFRS 9, institutions are required to estimate a forward-looking Point-in-time (PiT) PD. As most banks are using the regulatory through-the-cycle (TTC) PD as the starting point for their modeling of a PiT PD (*), GCD has chosen to provide banks with the TTC PD as the starting point in this benchmarking survey.

Exhibit 11 shows the average PiT PD, LGD and the 12-month ECL over all participating banks for a 5-year bullet term loan to a hypothetical borrower in the UK under the common scenario assumption and for different TTC PDs (0.2%, 0.75%, 1.5%):

- Large Corporate: unsecured, industry: Manufacturing
- Bank: unsecured
- Specialized Lending Real Estate: secured by Residential Real Estate (Multi-family apartment building, excellent location in the center) with LTV=70%

The data endorses that:

- many banks assign a lower PiT PD than the regulatory TTC PD
- for many banks, the LGD is calibrated independently from the PD
- secured lending such as "Specialized Lending Real Estate" receives on average a lower LGD than unsecured lending to Large Corporates / Banks

* based on a GCD survey among its member banks and discussions in GCD's working group IFRS 9

EXHIBIT 11

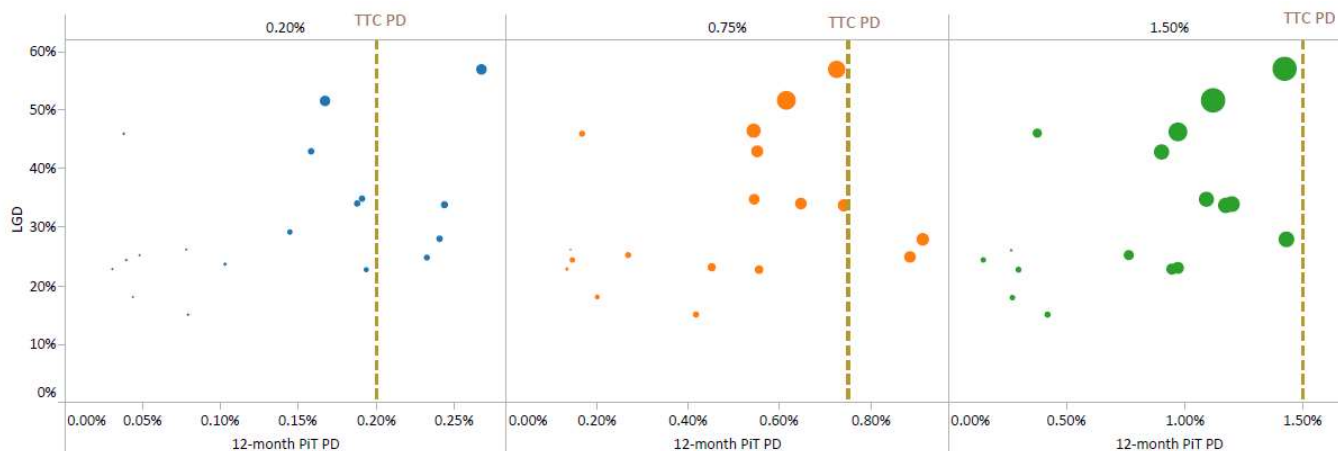
PiT PD, LGD AND 12-MONTH ECL FOR A 5-YEAR BULLET TERM LOAN TO A HYPOTHETICAL BORROWER IN THE UK UNDER THE COMMON SCENARIO ASSUMPTION AND FOR DIFFERENT TTC PDs (0.2%, 0.75%, 1.5%)

	TTC PD	Avg. 12-month PiT PD	Avg. LGD	Average 12-month ECL (in bp)
Large Corporates	0.20%	0.12%	39%	6.46
	0.75%	0.41%	39%	18.34
	1.50%	0.76%	39%	33.19
Banks / Non-Bank Financial Institutions	0.20%	0.14%	31%	5.2
	0.75%	0.48%	32%	18.14
	1.50%	0.86%	32%	31.38
Specialized Lending Real Estate	0.20%	0.21%	12%	2.72
	0.75%	0.66%	12%	8.09
	1.50%	1.01%	12%	11.56

Exhibit 12 shows the variation of the PiT PD and the LGD between banks for our standard UK borrower (unsecured, Industry: Manufacturing, bullet term loan, remaining legal maturity of 5 years) under the common scenario assumption and for different TTC PDs (0.2%, 0.75%, 1.5%).

The other hypothetical borrowers show a similar variability. This variability does not result from a different economic outlook, but rather from each bank's default history in a specific country, the techniques they used to create their PiT PD models, or the different assumptions they used in their modelling and data preparation. Under the common scenario assumption, most banks assume a lower PiT PD than the regulatory TTC PD provided for each hypothetical borrower (0.2%, 0.75%, 1.5%). A reason for that could be that banks include a certain level of conservatism ("margin of conservatism") in their regulatory TTC PDs, which they remove for provisioning purposes. It's also possible that banks may consider the current economic circumstances as more positive than the long-term average.

EXHIBIT 12: PIT PD VS LGD FOR THREE DIFFERENT REGULATORY TTC PDS (*)



(*) the size of the dots is related to the 12-months ECL: The higher the 12-month ECL, the bigger the dot

The other hypothetical borrowers show a similar variability. Next to the report, participating banks have also received a detailed data return based on a “give-to-get principle”.

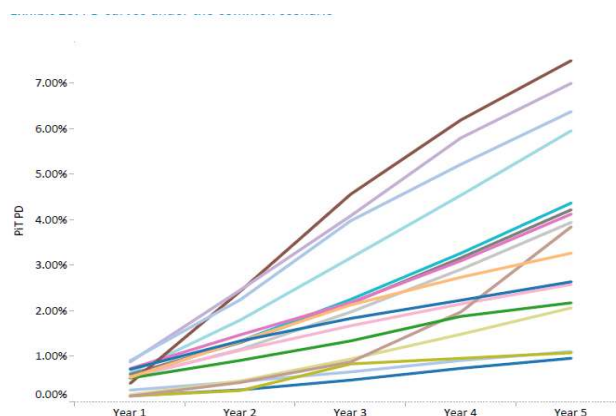
The data return allows banks to reproduce the results presented in this report as well as to conduct their own in-depth analysis. It includes all (anonymized) estimates submitted by the participants, i.e. the PD (curves), LGD (curves), EaD profiles and the Expected Life of the underlying hypothetical borrowers under the 4 different types of scenario sets (own scenario sets, common scenario assumption, EBA base case scenario, EBA Stress test scenario).

One other important driver for the difference between banks is the difference in multi-year PD curves.

Exhibit 13 shows the difference in PiT PD curves for one specific hypothetical borrower with a regulator PD of 0.75% (unsecured, country = UK, Industry = Manufacturing, bullet term loan with remaining maturity of 5 years) under the common scenario assumption. Each line in the graph represents the PD curve of a different bank for this hypothetical borrower.

Similar differences can be found for the other hypothetical borrowers with different facility types and regulatory PDs and under the banks’ own scenario set, the EBA baseline or the EBA stress scenario. Banks that have participated in the Benchmarking study have the anonymized data and can zoom into the details. Banks vary in the 1-year PiT (starting point) as well as in the “steepness” of the curve.

EXHIBIT 13 MULTI-YEAR PD CURVES



DIFFERENCES IN THE STAGE ALLOCATION PROCESS

IFRS 9 requires banks to bucket their non-defaulted borrowers into two different risk categories (Stage 1 and Stage 2) dependent on whether those borrowers have experienced a “significant increase in credit risk since origination (SICR).” Banks differ in terms of the number of downgrade notches required to trigger a movement from Stage 1 to Stage 2. The difference results from the various methodologies that banks have developed for their quantitative triggers. For example, those methodologies could be based on IFRS 9 Lifetime PD vs. purely rating-based notches.

EXHIBIT 14

MINIMUM NOTCHES OF DOWNGRADES NEEDED BETWEEN ORIGINATION AND REPORTING DATE IN ORDER TO TRIGGER STAGE ALLOCATION (BASED ON THE QUANTITATIVE TRIGGERS BANKS DEVELOPED). ASSET CLASS: LARGE CORPORATE - UNSECURED

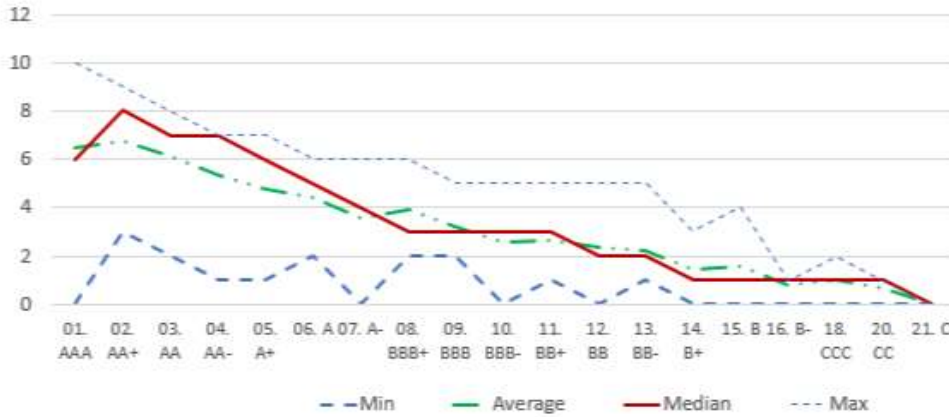


Exhibit 14 shows the variability between banks for a "Large Corporate unsecured" loan with a remaining maturity of 5 years, which was originated 5 years ago (total maturity = 10 years).

The graph should be read as such: e.g. Rating class = AA+: One bank requires a downgrade of 3 notches (minimum value), while another bank requires a downgrade of 9 notches (maximum value) in order to move the borrower from Stage 1 to Stage 2. On average, banks require a downgrade of 7-8 notches, which corresponds with a movement from investment grade to subinvestment grade.

Note: Next to the quantitative triggers, banks usually apply qualitative triggers or backstop triggers, including criteria such as whether a client is on the watchlist, whether a client falls under the forbearance regime, whether their debt is past due, etc. The qualitative triggers are applied next to the quantitative triggers.

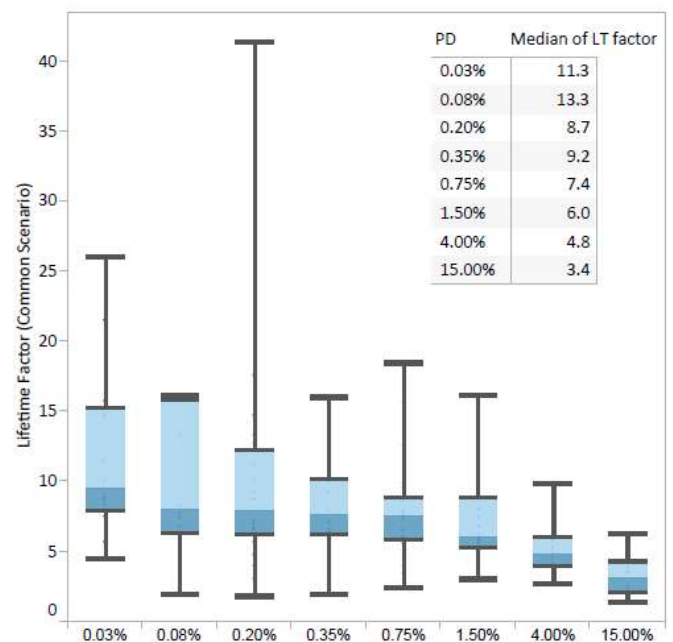
IMPACT OF MOVING FROM STAGE 1 TO STAGE 2: DIFFERENCE BETWEEN 12-MONTH ECL AND LIFETIME ECL

IFRS 9 requires banks to estimate a 12-month ECL for all exposures in Stage 1 and a Lifetime ECL for all exposures in Stage 2. Therefore, moving a borrower from Stage 1 to Stage 2 significantly increases the provision charge under IFRS 9 for that specific borrower. How much the provision charge will increase can be calculated by the factor "Lifetime ECL / 12-month ECL", called "lifetime factor" in this report.

The lifetime factor usually depends on the PD: the higher the PD, the higher the 12-month ECL, the lower the factor.

Lifetime factors vary significantly between banks as the boxplot diagram in Exhibit 15 confirms. The table in Exhibit 15 displays the average lifetime factor per regulatory PD over all participating banks. Note: All graphs show the averages over all countries as banks typically have similar lifetime factors for all countries provided in this study.

**EXHIBIT 15
VARIABILITY OF THE LIFETIME FACTOR FOR DIFFERENT PDS (LARGE CORP, UNSECURED, 5-YEAR BULLET LOAN) – COMMON SCENARIO**



CONCLUSION

CECL and IFRS 9 represent groundbreaking changes for the financial services industry. As institutions develop more precise methods to improve future credit loss estimates, we can expect that regulators and auditors will focus on the differences and push for greater consistency. Institutions are also required to regularly validate their credit loss estimates, and benchmarking is an integral part of that validation process.

When banks are benchmarking and refining their models, it is further recommended to:

- Benchmark all levels of your models (data, assumptions and methodologies). The GCD study shows that the variability between banks is there and provides a starting point for your benchmarking efforts.
- Perform a sensitivity analysis to determine what drives the final ECL value.
- Engage in peer discussions. Your benchmarking should be based on facts, not on rumors about what other banks may be doing.
- Follow the review of your IFRS 9 calculations with an internal discussion on the appropriateness of the bank's assumptions and other variables that contributed to your result.

OUTLOOK

GCD will run the study again in 2019. Participating banks will receive a detailed data return and a peer comparison report based on a "give to get" principle. The data return allows banks to reproduce the results presented in this report as well as to conduct their own in-depth analysis. It includes all (anonymized) estimates submitted by the participants, i.e. the PD (curves), LGD (curves), EAD profiles and the Expected Life of the underlying hypothetical borrowers under the 4 different types of scenario sets (own scenario sets, common scenario assumption, EBA base case scenario, EBA Stress test scenario).

Banks who are interested in joining are invited to contact daniela.thakkar@globalcreditdata.org or richard.crecel@globalcreditdata.org