Global Credit Data
by banks for banks

09 APRIL 2018

LGD Report 2018 - Large Corporate Borrowers

After default, banks recover 75% from Large Corporate borrowers

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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 started collecting historical loss data in 2004, to which member banks have exclusive access. This database now totals over 175,000 non-retail defaulted loan facilities from around the world.

In 2009 GCD introduced a PD database which now has over 10 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.

GCD operates all databases on a "give to get" basis, meaning that members must supply high quality data to receive data in return. The robustness of GCD's data collection infrastructure place our databases as the global standard for credit risk data pooling.

CONTACT GCD

Nina Brumma
Head of Analytics and Research
nina.brumma@globalcreditdata.org

Philip Winckle
Executive Director
philip.winckle@globalcreditdata.org

www.globalcreditdata.org

SUMMARY

- Recovery rate and its inverse, Loss Given Default (LGD), is a key metric in credit risk modelling, whether for regulatory capital, pricing models, stress testing or expected loss provisioning models. The data is however much more scarce than data for probability of default (PD) because the only cases which can be used come from defaulted loans, which represent around 1% of the total loan book of any bank. GCD member banks have been steadily collecting this data since 2004.
- This report is the first time GCD publishes such extensive analytics on its broad data set. The aim is to present the numerical evidence of recoveries and losses experienced by banks when providing credit facilities to large corporate counterparties. The data set in the report covers Large Corporate (>€50m turnover) borrowers who are recorded as defaulted in bank loan books, using the Basel default definition.
- The long term average LGD levels in this report can be compared to regulatory minima and standardised levels, allowing an industry wide discussion of prudent forward looking LGDs vs historical evidence. Note that the LGDs in this report are cash flow discounted observations of historical outcomes, not forward looking estimates.
- In December 2017 the BCBS made their final decision on what they call the "Finalisation of Basel III". Regulators have allowed for continued internal modelling of PD, LGD and EAD when calculating regulatory capital, albeit with floors based on standardised levels. The need for internal modelling for pricing, Economic Capital and Credit Loss Provisioning (IFRS9 and CECL) models remains strong. The trend continues with more banks pooling data to better understand their credit risk portfolios and benchmark their models.
- The results in this study offer an overall insight into the data on a global level. The main findings are:
  - Seniority and collateral are confirmed as LGD drivers (27% senior unsecured vs 40% subordinated unsecured at obligor level. The Total Secured LGD is 23%).
  - LGD varies over time, indicating that there is a relationship between the economic conditions and recoveries.
  - Because GCD data comprises privately held loans, the data set differs from most other studies. Hence the outcome can be compared to, but should not be expected to be the same as, studies which focus on publicly recorded bond defaults, single country data or liquidation only data.
- Member banks receive the detailed database and can therefore confirm these results and test them on customised sub-sets of the data.

LGD REPORT 2018 LARGE CORPORATE BORROWERS

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INTRODUCTION

Global Credit Data – established in 2004 – manages the collection of historical LGD, EAD and default observations from over 50 member banks. GCD's LGD/EAD data set is one of the world's largest sources of information on all aspects of LGD modelling for wholesale lending. The database comprises over 175,000 defaulted loans to almost 100,000 borrowers covering 11 Basel asset classes.

GCD data is detailed enough to develop or enhance internal LGD models or for validation, calibration or benchmarking. These models can be used to support the Advanced Internal Ratings-Based approach (AIRB), to fulfil the credit provisioning standards IFRS9 or CECL, for stress testing and also for economic capital and pricing.

COMPOSITION OF THE DATABASE AND REFERENCE DATA SET CREATION

Two reference data sets (RDS) are used in this study:

- Large Corporates (LC) aggregated on obligor level where loans for each borrower are aggregated
- Large Corporates aggregated on obligation level where each loan or facility is treated separately

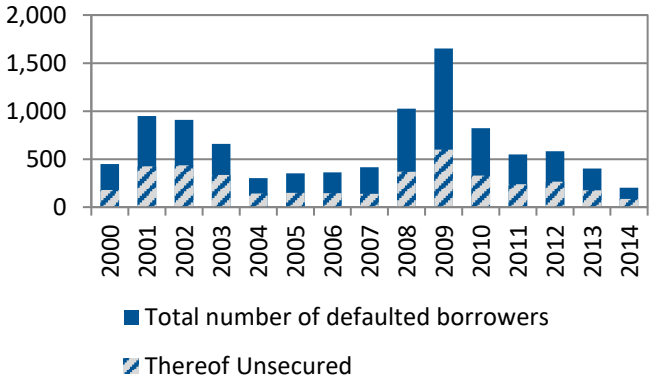
GCD recognises that there are different aggregation levels used by its members and therefore the results are shown on both levels in the tables. Note that the graphs are on obligor level. Obligation level results are so similar that they are not repeated in the graphs. Most of the facilities in the GCD datasets are loans of some type, e.g. term loans or overdrafts, however the data also includes significant numbers of contingent facilities, e.g. letters of credit or derivatives as well as some bonds and equity.

The RDS uses only resolved defaults, i.e. cases for which the workout is completed, submitted until April 2017. Cases with year of default from 2000 to 2014 were chosen due to completeness. Pre-2000 defaults can be biased towards long, difficult workouts while post 2014 defaults contain too high a mix of quick workout (cure) cases. For a detailed description of the RDS creation see the Appendix. The RDS contains 9,631 defaulted borrowers and 16,665 facilities (see Table 1). These defaults are from over 50 lenders worldwide. A significant portion of the data comes from completely unsecured situations (see definition in Appendix) which allows for a more detailed analysis.

TABLE 1
REFERENCE DATA SET

	Number of Borrowers	Number of Facilities
Reference Data Set (RDS)	9,631	16,665
RDS Unsecured	4,010	6,818
EAD	170 bn EUR	
Number of Lenders	55	

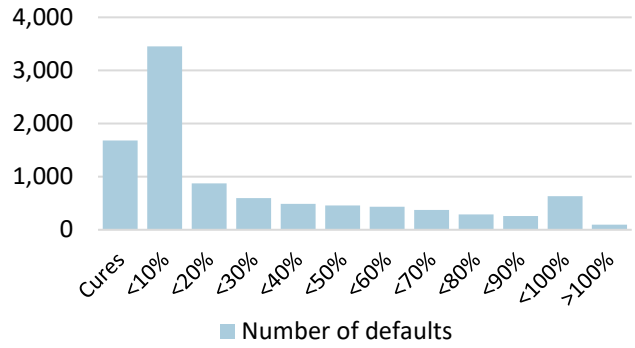
EXHIBIT 1
BORROWERS BY YEAR OF DEFAULT



The LGD calculation is made using a cap of 150% and floor of 0% using GCD's LGD2 method (see Appendix) where the EAD is increased by the amount of any post default advances. The LGD is calculated by discounting the cash flows at a risk-free rate of 3 months EURIBOR. The LGD levels are calculated on raw data and do not reflect any bank specific portfolio alignment or addition of any statistical uncertainty add-ons. Variations could include using a different discount rate based on a combination of the risk free rate and a risk premium for systematic risk at the time of default (see LGD Discount Rate Study for a comprehensive analysis).

A well-known characteristic of LGD is the bimodal left-skewed distribution (see Exhibit 2) which generates large variations when calculating average LGD. Note in the graph that the cures, which by definition have a nominal LGD of zero, are displayed separately from the LGD bucket <10%.

EXHIBIT 2
DEFAULTS BY LGD BUCKETS AND CURES



The two modes reflect the observed reality that banks recover from defaulted loans either most of the outstanding loan amount or almost zero. Receiving a partial repayment of the outstanding amount is less likely to be observed than observing either of these extremes, although it does occur. Indeed, when an average LGD is derived from an RDS the calculated average LGD value

TABLE 2
SENIORITY AND COLLATERAL

	Obligor level				Obligation level			
	Number of defaults	LGD	Time to Resolution [years]	Time to Recovery [years]	Number of facilities	LGD	Time to Resolution [years]	Time to Recovery [years]
Total Secured	5,621	23%	1.9	1.3	8,907	23%	2.0	1.2
Total Unsecured	4,010	28%	2.1	1.3	7,758	26%	2.2	1.2
thereof Senior	3,641	27%	2.1	1.3	7,247	26%	2.2	1.2
thereof Subordinated	112	40%	2.3	1.4	223	37%	2.5	1.3
thereof Other/Unknown*	257	34%	2.2	1.5	288	34%	2.2	1.5
Total	9,631	25%	2.0	1.3	16,665	24%	2.1	1.2

* Borrowers are not always borrowing uniquely senior or subordinated. Occasionally a bank will provide facilities of differing seniority to the same borrower. We also include the small number of bond and equity defaults as well as unknowns here.

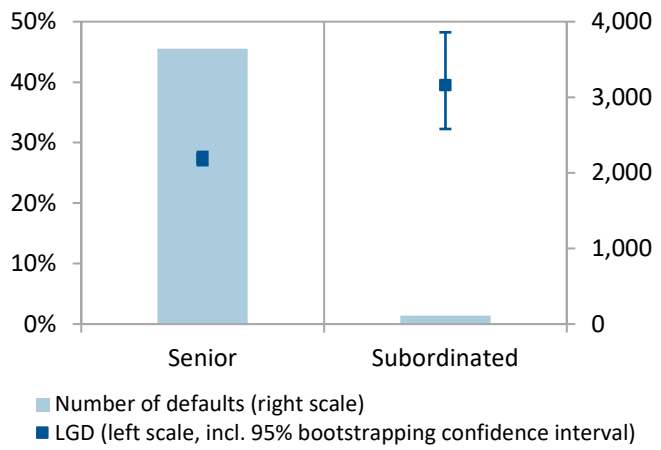
usually falls into an LGD bucket which exhibits a lower frequency of loans such as: 20% to 30% or 30% to 40%. The bimodal distribution has implications for measures of spread such as standard deviation.

A simple standard deviation calculation will produce extreme values and larger amounts of data are required to stabilise the central tendency. The variation of the mean is shown here by bootstrap confidence intervals: a simple non-parametric method for constructing confidence intervals.

SENIOR UNSECURED LGD SIGNIFICANTLY LOWER THAN SUBORDINATED UNSECURED

LGD is often seen to depend on seniority and collateral. Typically, an LGD outcome is lower for collateralised defaults. This is confirmed by the GCD data where secured LGDs are lower than unsecured (i.e. 23% vs. 28% on obligor level). Unsecured defaults are a relatively homogeneous data set that should isolate the impact of seniority. The data endorses the strong impact of the rank. Senior unsecured defaults have a significantly lower LGD than subordinated unsecured defaults (see Exhibit 3).

EXHIBIT 3:
SENIOR AND SUBORDINATED UNSECURED LGD

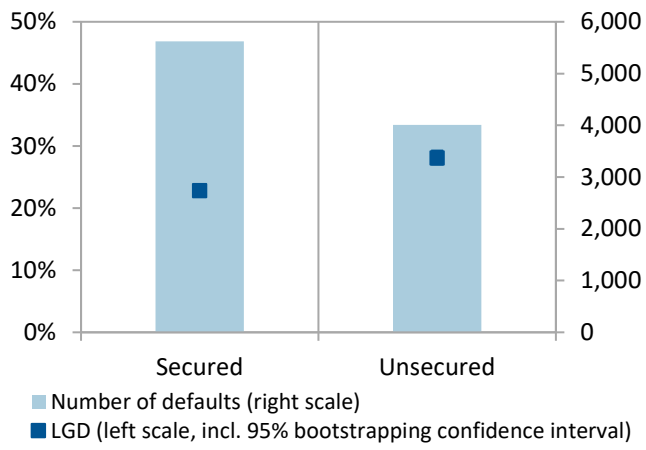


When analysing secured defaults, the characteristics of the collateral are expected to strongly influence the LGD outcome. Examples include type of the collateral, the collateral value and the Loan to Value ratio. Therefore, any analysis on secured LGDs needs a deeper view including the above-mentioned items. GCD members can choose from a large selection of extra fields of collateral detail, for further analysis.

SECURED LGD LOWER THAN UNSECURED LGD

On a single driver analysis, GCD data shows that, consistently over time, collateralised loans and obligors produce significantly lower LGD than unsecured loans and obligors. This outcome supports common bank lending policies which assume that the taking of collateral will improve the bank's position versus unsecured creditors.

EXHIBIT 4:
SECURED AND UNSECURED LGD



One of the reasons why this effect is limited to a 5% difference may be these same policies, which often require that less capitalised companies, with more volatile assets are more likely to be required to give collateral to the lending bank. Thus, the lending bank

TABLE 3
LGD BY REGION

	Obligor level				Obligation level			
	Number of defaults	LGD	Time to Resolution [years]	Time to Recovery [years]	Number of facilities	LGD	Time to Resolution [years]	Time to Recovery [years]
Africa & Middle East	275	21%	2.0	1.5	394	19%	2.0	1.4
Asia & Oceania	1,019	31%	1.8	1.2	1,787	28%	1.9	1.1
Europe	3,072	23%	2.1	1.3	6,124	22%	2.1	1.2
North America	4,187	24%	2.0	1.3	6,562	24%	2.0	1.2
Latin America	1,033	28%	2.1	1.3	1,712	28%	2.2	1.3
Unknown	45	34%	3.7	1.7	86	35%	4.0	1.6
Total	9,631	25%	2.0	1.3	16,665	24%	2.1	1.2

compensates for expected weak recoveries and higher LGDs by taking collateral to improve this.

TIME TO RECOVERY AND RESOLUTION

Time to resolution is on average around 2 years. Generally, a default can resolve because of three reasons. First, the borrower pays back all the debt. Second, the borrower returns to a non-defaulted status. Third, the bank decides to stop the recovery efforts and writes off the outstanding debt (or sells it). Only the first option depends entirely on the borrower while the other two are influenced by choices made by the bank involved. Continued forbearance is also under the control of the lending bank.

We therefore apply a different measure of the time in default that is more objective as it only depends on the timing of the cash flow. The Time to Recovery (TTRec) is the average period between default and cash flow payment weighted by the amount of the payment. TTRec is by definition shorter than or equal to the time to resolution. The outcome is remarkably similar for TTRec across differing collateral and seniority states.

As the TTRec represents the middle point of the cash flows, it is a good measure for understanding the effect of discount rates on the LGD. The cash flows are discounted on average for approximately 1.3 years and not the full 2 years of the average Time to Resolution.

REGIONAL VARIATIONS

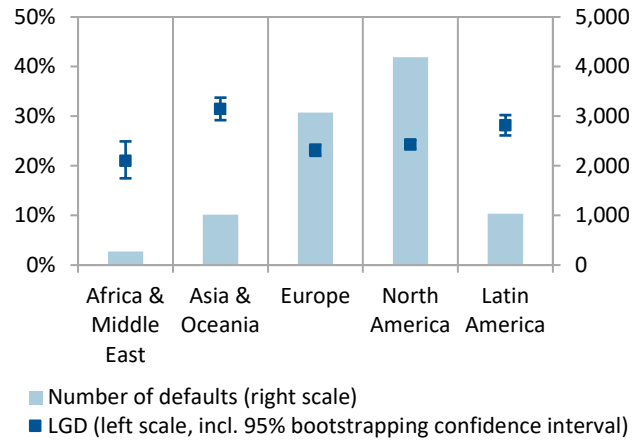
The country or region of the borrower is expected to be a driver of LGD, as lending practices, insolvency laws and regional economic differences should affect recoveries. The GCD data set offers country information on several levels: country of residence; country of jurisdiction; collateral country of jurisdiction. The impact is best analysed on country level but granularity must be weighed against availability of a significant amount of data points. Reflecting the global membership base of GCD, there are almost 140 countries reported in the data. This study shows the LGD by region based on the country of residence of the defaulted borrower.

The data set in this report comes from Large Corporate borrowers, defined by their sales or assets being above €50m. Many of these companies have multi country operations and participate in cross border trade, which could act to reduce the regional variation.

EUROPEAN AND NORTH AMERICAN DATA SHOW SIMILAR RESULTS

GCD data has its strongest database in Europe and North America, regions which on this summarised level show very similar LGD and TTR as well as TTRec periods. Asia & Oceania show relatively high LGDs, which is driven by some of the Asian countries in the dataset. On the other hand, African & Middle East data shows lower LGDs, but the difference is not significant due to the lower number of defaults (see Exhibit 5).

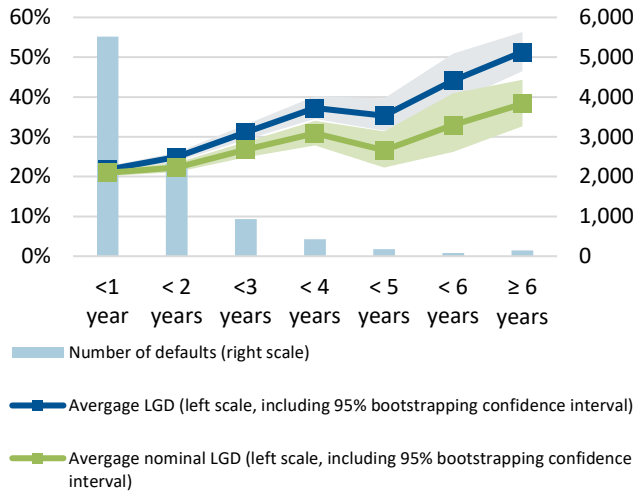
EXHIBIT 5:
LGD BY REGION



Another interesting question is how the workout period correlates with the LGD outcome. Exhibit 6 shows a clear

trend. Average LGD levels based on TTRec buckets are displayed. The longer the TTRec the higher the LGD. Because this effect can be related to higher discounting effects in addition to the usual LGD which is discounted, nominal LGDs were added in the picture (green line). The nominal LGD is lower than the discounted numbers but still rises steadily. It may be that workouts which take more time due to their complexity, legal disputes or other factors just happen to have lower recoveries and higher LGD. Alternatively, banks may proceed more quickly in recovering cases where the prospects are strongest.

EXHIBIT 6
LGD BY TIME TO RECOVERY

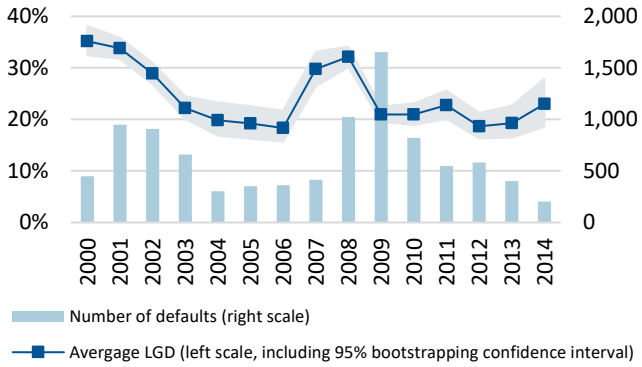


TTRec is shown as it best relates to the cash flow timing. The distribution of the time to recovery buckets complements the information on the averages displayed in Table 3 and 4. For most cases the main cash flows occur in the first year after default. The number of defaults per bucket decrease steadily. Nevertheless, there are a number of data points with an over 6-year average recovery period which are grouped into one bucket.

MACROECONOMIC EFFECTS IN HISTORICAL LARGE CORPORATE DATA

The observation of downturn effects in historical LGD data is typically complicated by short time series, few data points and the multitude of input parameters for LGD estimates. Requirements like IFRS9/CECL or stress testing/CCAR create the need for more detailed default and loss modelling, especially in respect of term structure and macroeconomic dependency. The long timespan of the GCD database and the detailed cash flow data allow for dedicated LGD time series analysis. To assess the variance over time the LGDs are plotted by year of default in Exhibit 7, with the corresponding numbers displayed in Table 4. The shape of the curve shows variance over time with higher LGDs in the early 2000s as well as in 2007/2008.

EXHIBIT 7
LGD BY YEAR OF DEFAULT



GCD has extensively analysed downturn effects on LGD especially including the distribution of cash flows over time. The recovery cash flows are dispersed over varying periods of time. On average the workout period lasts 2 years but recoveries can be collected over a much longer period (see Exhibit 6) which is even longer if excluding cures. Looking at the timing of the underlying cash flows, the evolution of loss given default values over time can be analysed with respect to their co-movement with macroeconomic indicators. The results are published in GCD's Downturn LGD Study 2017.

TABLE 4
LGD BY YEAR OF DEFAULT

	Obligor level		Obligation level	
Year of Default	Number of defaults	LGD	Number of facilities	LGD
2000	449	35%	749	35%
2001	949	34%	1,638	32%
2002	908	29%	1,477	27%
2003	660	22%	1,099	21%
2004	301	20%	517	18%
2005	353	19%	580	19%
2006	361	18%	556	19%
2007	414	30%	736	31%
2008	1,024	32%	1,768	31%
2009	1,653	21%	2,992	20%
2010	822	21%	1,446	20%
2011	549	23%	1,021	22%
2012	583	19%	1,075	21%
2013	403	19%	662	20%
2014	202	23%	349	25%
Total	9,631	25%	16,665	24%

Table 4 displays the volumes and LGD averages by year of default, aggregated at both obligor and obligation levels. Not surprisingly, the difference between levels is small.

CONCLUSIONS

In summary, conclusions can be drawn from the analyses presented here regarding the following questions:

- **Does LGD differ if it is calculated for each facility or at overall borrower level?** The average LGD level over time differs by only 1% for this factor. Individual facility (loan) outcomes do vary greatly for each borrower, which may depend on contract conditions, collateral differences, laws or even bank policies. However, across many borrowers the outcome becomes even, both per year and over time.

- **What is the impact of seniority?** After taking collateral out of the picture by reviewing only unsecured LGD, seniority is confirmed as a driver at obligor level (27% senior vs 40% subordinated). The effect is slightly less on obligation level (26% vs 37%).

- **What is the effect of collateral on LGD?** Secured LGD is lower than unsecured LGD (23% vs 28% on obligor level, 23% vs 26% on obligation level).

- **Are regional variations significant for LGD?** After aggregating country level data to regions, North America and Europe appear to have similar levels of LGD, Time to Resolution and Time to Recovery.

The insights gained by the high-level results presented here confirm the benefit of a detailed and granular collection of post default cash flow data. It is crucial for banks using a data-driven credit risk estimation method to understand and quantify loss given default.

NOTE ON TERMS USED

LGD refers to Loss Given Default rate which is calculated as (1 – recovery rate). The recovery rate is the net of all cash flows including external costs (using the discounted cash flows where the discount rate is equal to the risk-free rate as at the default date) divided by the amount outstanding at default. This calculation is capped between [0%,150%]

Nominal LGD is calculated in the same way but using nominal cash flows, i.e. not discounted.

Time to Resolution (TTR) is calculated as the period between the date of default and the date of resolution (i.e. repayment, write-off, return to performing, etc).

Time to Recovery (TTRec) is defined as the cashflow weighted average period between default and cashflow.

A more detailed definition is given in the Appendix.

NOTE ON METHODOLOGY

This report is based on a certain LGD methodology. Definitions used, calculations made and data filters applied are laid out in detail in the **Appendix** to this report. Evidence for the consistency and veracity of the GCD data is presented. GCD members have access to the raw but anonymised data which enables them to produce customised representative data sets and calculate averages suitable for their own portfolio comparisons.

OUTLOOK

For this study, large corporate data was used. The same analytics can be performed on the other asset classes in the GCD data.

A dimension not explored here is comparing one bank's default data to that of other banks. These comparative analyses answer the question of where does each bank stand compared to its peers and will be made available to GCD member banks in the near future.