

used to proxy a recovery rate.

Alternatively, economic loss may be calculated using the exposure at the time of default, loss of principal, interest, and fees, the present value of subsequent recoveries and related expenses (or the costs as calculated using an approved allocation method), and the appropriate discount rate.

Second, factors must be available to group the defaulted facilities in meaningful ways. Characteristics that are likely to be important in predicting loss rates include whether or not the facility is secured and the type and coverage of collateral if the facility is secured, seniority of the claim, general economic conditions, and obligor's industry. Although these factors have been found to be significant in existing academic and industry studies, a bank's quantification of LGD certainly need not be limited to these variables. For example, a bank might expand its loss severity research by examining many other potential drivers of severity (characteristics of an obligor that might help the bank predict the severity of a loss), including obligor size, line of business, geographic location, facility type, obligor ratings (internal or external), historical internal severity grade, or tenor of the relationship.

A bank must ensure that the reference data remains applicable to its current portfolio of facilities. It must implement established processes to ensure that reference data sets are updated when new data become available. All data sources, variables, and the overall processes concerning data collection and maintenance must be fully documented, and that documentation should be readily available for review.

S. The sample period for the reference data must be at least seven years, and must include periods of economic stress during which defaults were relatively high.

Seven years is the minimum sample period for the LGD reference data. A longer sample period is desirable, because more default observations will be available for analysis and may serve to refine severity estimates. In any case, a bank must select a sample period that includes episodes of economic stress, which are defined as periods with a relatively high number of defaults. Inclusion of stress periods increases the size and potentially the breadth of the reference data set. According to some empirical studies, the average loss rate is higher during periods of stress.

*Example.* A bank intends to rely primarily on internal data when quantifying all parameter estimates, including LGD. Its internal data cover the period 1994 through 2000. The bank will continue to extend its

data set as time progresses. Its current policy mandates that credits be resolved within two years of default, and the data set contains the most recent data available. Although the current data set satisfies the seven-year requirement, the bank is aware that it does not include stress periods. In comparing its loss estimates with rates published in external studies for similarly stratified data, the bank observes that its estimates are systematically lower. To be consistent with the standard, the bank must take steps to include stress periods in its estimates.

S. The definition of default within the reference data must be reasonably consistent with the IRB definition of default.

This standard parallels a similar standard in the section on PD. The following examples illustrate how it applies in the case of LGD.

*Example 1.* For LGD estimation, a bank includes in its default data base only defaulted facilities that actually experience a loss, and excludes credits for which no loss was recorded because liquidated collateral covered the loss (effectively applying a "loss given loss" concept). This practice is not consistent with the standard because the bank's default definition for LGD is narrower than the IRB definition.

*Example 2.* A bank relies on external data sources to estimate LGD because it lacks sufficient internal data. One source uses "bankruptcy filing" to indicate default while another uses "missed principal or interest payment," and the two sources result in significantly different loss estimates for the severity grades defined by the bank. The bank's practice is not consistent with the standard, and the bank should determine whether the definitions used in the reference data sets differ substantially from the IRB definition. If so, and the differences are difficult to quantify, the bank should seek other sources of reference data. For more minor differences, the bank may be able to make appropriate adjustments during the estimation stage.

#### Estimation

Estimation of LGD is the process by which characteristics of the reference data are related to loss severity. The relevant characteristics that help explain how severe losses tend to be upon default might include variables such as seniority, collateral, facility type, or business line.

S. The estimates of loss severity must be empirically based and must reflect the concept of "economic loss."

Loss severity is defined as economic loss, which is different from accounting measures of loss. Economic loss captures the value of recoveries and direct and indirect costs discounted to the time of default, and it should be measured for each defaulted facility. The scope of the cash flows included in recoveries and costs is meant to be broad. Workout costs that can be clearly

attributed to certain facilities or types of facilities must be reflected in the bank's LGD assignments for those exposures. When such allocation is not practical, the bank may assign those costs using factors based on broad averages.

A bank must establish a discount rate that reflects the time value of money and the opportunity cost of funds to apply to recoveries and costs. The discount rate must be no less than the contract interest rate on new originations of a type similar to the transaction in question, for the lowest-quality grade in which a bank originates such transactions.<sup>6</sup> Where possible, the rate should reflect the fixed rate on newly originated exposures with term corresponding to the average resolution period of defaulting assets.

Ideally, severity should be measured once all recoveries and costs have been realized. However, a bank may not resolve a defaulted obligation for many years following default. For practical purposes, banks may choose to close the period of observation before this final resolution occurs—that is, at a point in time when most costs have been incurred and when recoveries are substantially complete. Banks that do so should estimate the additional costs and recoveries that would likely occur beyond this period and include them in the LGD estimates. A bank must document its choice of the period of observation, and how it estimated additional costs and recoveries beyond this period.

LGD for each type of exposure must be the loss per default (expressed as a percentage of exposure at default) expected during periods when default rates are relatively high. This expected loss rate is referred to as "stress-condition LGD." For cases in which loss severities do not have a material degree of cyclical variability, use of the long-run default-weighted average is appropriate, although stress-condition LGD generally exceeds this average.

The drivers of severity can be linked to loss estimates in a number of ways. One approach is to segment the reference defaults into groups that do not overlap. For example, defaults could be grouped by business line, predominant collateral type, and loan-to-value coverage. The LGD estimate for each category is the mean loss calculated over the category's defaulted facilities. Loss must be calculated as the default-weighted average (where individual defaults receive equal weight) rather than the average of

<sup>6</sup> The appropriate discount rate for IRB purposes may differ from the contract rate required under FAS 114 for accounting purposes.