

annual loss rates, and must be based on results from periods during which default rates were relatively numerous if loss rates are materially cyclical.

Banks can also draw estimates of LGD from a statistical model. For example, they can build a regression model of severity using data on loss severity and some quantitative measures of the loss drivers. Any model must meet the requirements for model validation discussed in Chapter 1. Other methods for computing LGD could also be appropriate.

*Example 1.* A bank has internal data on defaulted facilities, including information on business line, facility type, seniority, and predominant collateral type (if the facility is secured). The data allow for a reasonable calculation of economic loss. The data span eight years and include three years that can be termed high-default years. After analyzing the economic cycle using internal and external data, the bank concludes that the data show no evidence of material cyclical variability in loss severities, and that the default data span enough experience to allow estimation of a long-run average. On the basis of preliminary analysis, the bank determines that the drivers of loss severity for large corporate facilities are similar to those for middle-market loans, and that the two groups can be estimated as a pool. Again on the basis of preliminary analysis, the bank segments this pool by seniority and by six collateral groupings, including unsecured. These groupings contain enough defaults to allow reasonably precise estimates. The loss severity estimates are then calculated by averaging loss rates within each segment. This practice is consistent with the standard.

*Example 2.* A bank uses internal data in which information on security and seniority is lacking. The bank groups corporate and middle-market defaulted facilities into a single pool and calculates the LGD estimate as the mean loss rate. No adjustments for the lack of data are made in the estimation or application steps. This practice is unacceptable because there is ample external evidence that security and seniority matter in these segments. A bank with such limited internal default data must incorporate external or pooled data into the estimation.

*Example 3.* A bank determines that a business unit—for example, a unit dedicated to a particular type of asset-based lending—forms a homogeneous pool for the purposes of estimating loss severity. That is, although the facilities in this pool may differ in some respects, the bank determines that they share a similar loss experience in default. The bank must provide reasonable support for this pooling through analysis of lending practices and available internal and external data. In this example, the mean of a single segment is consistent with the standard.

S. Judgmental adjustments may play an appropriate role in LGD estimation, but must not be biased toward lower estimates.

It is difficult to make general statements about good and bad practices

in this area, because adjustments can take many different forms. The following examples illustrate how supervisors would be likely to evaluate particular adjustments observed in practice.

*Example 1.* A bank divides observed defaults into segments according to collateral type. One of the segments has too few observations to produce a reliable estimate. Relying on external data and judgment, the bank determines that the segment's estimated severity of loss falls somewhere between the estimates for two other categories. This segment's severity is set judgmentally to be the mean of the estimates for the other segments. This practice is consistent with the standard.

*Example 2.* A bank does not know when recoveries (and related costs) occurred in a portfolio segment; therefore, it cannot properly discount the segment's cash flows. However, the bank has sufficient internal data to calculate economic loss for defaulted facilities in another portfolio segment. The bank can support the assumption that the timing of cash flows for the two segments is comparable. Using the available data and informed judgment, the bank estimates that the measured loss without discounting should be grossed up to account for the time value of money and the opportunity cost of funds. This practice is consistent with the standard.

*Example 3.* A bank segments internal defaults in a business unit by some factors, including collateral. Although the available internal and external evidence indicates a higher LGD, the bank judgmentally assigns a loss estimate of 2 percent for facilities secured by cash collateral. The basis for this adjustment is that the lower estimate is justified by the expectation that the bank would do a better job of following policies for monitoring cash collateral in the future. Such an adjustment is generally not appropriate because it is based on projections of future performance rather than realized experience. This practice is not consistent with the standard.

## Mapping

LGD mapping follows the same general principles that PD mapping does. A mapping must be plausible and must be based on a comparison of severity-related data elements common to both the reference data and the current portfolio. The mapping approach is expected to be unbiased, such that the exercise of judgment does not consistently lower LGD estimates. The default definitions in the reference data and the current portfolio of obligors should be comparable. The mapping process must be updated regularly, well-documented, and independently reviewed.

S. A bank must conduct a robust comparison of available common elements in the reference data and the portfolio.

Mapping involves matching facility-specific data elements available in the

current portfolio to the factors in the reference data set used to estimate expected loss severity rates. Examples of factors that influence loss rates include collateral type and coverage, seniority, industry, and location.

At least three kinds of mapping challenges may arise. First, even if similarly named variables are available in the reference data and portfolio data, they may not be directly comparable. For example, the definition of particular collateral types, or the meaning of "secured," may vary from one application to another. Hence, a bank must ensure that linked variables are truly similar. Although adjustments to enhance comparability can be appropriate, they must be rigorously developed and documented. Second, levels of aggregation may vary. For example, the reference data may only broadly identify collateral types, such as financial and nonfinancial. The bank's information systems for its portfolio might supply more detail, with a wide variety of collateral type identifiers. To apply the estimates derived from the reference data, the internal data must be regrouped to match the coarser level of aggregation in the reference data. Third, reference data often do not include workout costs and will often use different discounting. Judgmental adjustments for such problems must be well-documented and, as much as possible, empirically based.

S. A mapping process must be established for each reference data set and for each estimation model.

Mapping is never self-evident. Even when reference data are drawn from internal default experience, a bank must still link the characteristics of the reference data with those of the current portfolio.

Different data sets and different approaches to severity estimation may be entirely appropriate, especially for different business segments or product lines. Each mapping process must be specified and documented.

## Application

At the application stage, banks apply the LGD estimation framework to their current portfolio of credit exposures. Doing so might require them to aggregate individual LGD estimates into broader averages (for example, into discrete severity grades) or to combine estimates in various ways.

The inherent variability of recovery, due in part to unanticipated circumstances, demonstrates that no facility type is wholly risk-free, regardless of structure, collateral type, or collateral coverage. The existence of