

class of exposure are unlikely to be affected to an appreciable extent by cyclical factors. As with estimates of other A-IRB inputs, banking organizations would be expected to be conservative in assigning LGDs.

Although estimated LGDs should be grounded in historical recovery rates, the A-IRB approach is structured to allow banking organizations to assess the differential impact of various factors, including, for example, the presence of collateral or differences in loan terms and covenants. The Agencies expect to impose limitations on the use of guarantees and credit derivatives in a banking organization's LGD estimates. These limitations are discussed in the separate section of this ANPR on the A-IRB treatment of credit risk mitigation techniques.

#### Exposure at Default

The third principal input to the wholesale A-IRB capital formula is EAD. The Agencies are proposing that banking organizations would provide their own estimate of EAD for each exposure. The EAD for an exposure would be defined as the amount legally owed to the banking organization (net of any charge-offs) in the event that the borrower defaults on the exposure. For on-balance-sheet items, banking organizations would estimate EAD as no less than the current drawn amount. For off-balance-sheet items, except over-the-counter (OTC) derivative transactions, banking organizations would assign an EAD equal to an estimate of the long-run default-weighted average EAD for similar facilities and borrowers or, if EADs are highly cyclical, the EAD expected to prevail when default rates are high. The EAD associated with OTC derivative transactions would continue to be estimated using the "add-on" approach contained in the general risk-based capital rules.<sup>15</sup> In addition, there would be a specific EAD calculation for the recognition of collateral in the context of repo-style transactions subject to a master netting agreement, the features of which are outlined below in the section on the A-IRB treatment of credit risk mitigation techniques.<sup>16</sup>

<sup>15</sup> Under the add-on approach, an institution would determine its EAD for an OTC derivative contract by adding the current value of the contract (zero if the current value is negative) and an estimate of potential future exposure (PFE) on the contract. The estimated PFE would be equal to the notional amount of the derivative multiplied by a supervisor-provided add-on factor that takes into account the type of instrument and its maturity.

<sup>16</sup> Repo-style transactions include reverse repurchase agreements and repurchase agreements and securities lending and borrowing.

#### Definition of Default and Loss

A banking organization would estimate inputs relative to the following definition of default and loss. A default is considered to have occurred with respect to a particular borrower when either or both of the following two events has taken place: (1) The banking organization determines that the borrower is unlikely to pay its obligations to the organization in full, without recourse to actions by the organization such as the realization of collateral; or (2) the borrower is more than 90 days past due on principal or interest on *any* material obligation to the organization. The Agencies believe that the use of the concept of "unlikely to pay" is largely consistent with the practice of U.S. banking organizations in assessing whether a loan is on non-accrual status.

#### Maturity

The fourth principal input to the A-IRB capital formula is effective remaining maturity (M), measured in years. If a wholesale exposure is subject to a determinable cash flow schedule, the banking organization would calculate M as the weighted-average remaining maturity of the expected cash flows, using the amounts of the cash flows as the relevant weights. The banking organization also would be able to use the nominal remaining maturity of the exposure if the weighted-average remaining maturity of the exposure cannot be calculated. For OTC derivatives and repo-style transactions subject to master netting agreements, the institution would set M equal to the weighted-average remaining maturity of the individual transactions, using the notional amounts of the individual transactions as the relevant weights.

In all cases, M would be set no greater than five years and, with few exceptions, M would be set no lower than one year. The exceptions apply to certain transactions that are not part of a banking organization's ongoing financing of a borrower. For wholesale exposures that have an original maturity of less than three months—including repo-style transactions, money market transactions, trade finance-related transactions, and exposures arising from payment and settlement processes—M may be set as low as one day. For OTC derivatives and repo-style transactions subject to a master netting agreement, M would be set at no less than five days.

As with the assignment of PD estimates, the Agencies propose to apply supervisory standards for the estimation of LGD, EAD, and M that are consistent with the broad guidance

contained in the New Accord. More detailed discussion of these issues is provided in the draft supervisory guidance on IRB approaches for corporate exposures published elsewhere in today's **Federal Register**.

The Agencies seek comment on the proposed definition of wholesale exposures and on the proposed inputs to the wholesale A-IRB capital formulas. What are views on the proposed definitions of default, PD, LGD, EAD, and M? Are there specific issues with the standards for the quantification of PD, LGD, EAD, or M on which the Agencies should focus?

#### Wholesale Exposures: Formulas

The calculation of the A-IRB capital requirement for a particular wholesale exposure would be accomplished in three steps:

(1) Calculation of the relevant asset correlation parameter, which would be a function of PD (as well as borrower size (S) for SMEs);

(2) Calculation of a preliminary capital requirement assuming a maturity of one year, which would be a function of PD, LGD, EAD, and the asset correlation parameter calculated in the first step; and

(3) Application of a maturity adjustment for differences between the actual effective remaining maturity of the exposure and the one-year maturity assumption in the second step, where the adjustment would be a function of both PD and M.

These calculations result in the A-IRB capital requirement, expressed in dollars, for a particular wholesale exposure. As noted earlier, this amount would be converted to a risk-weighted assets equivalent by multiplying the amount by 12.5, and the risk-weighted assets equivalent would be included in the denominator of the risk-based capital ratios.

#### Asset Correlation

The first step in the calculation of the A-IRB capital requirement for a wholesale exposure is the calculation of the asset correlation parameter, which is denoted by the letter "R" in the formulas below. This asset correlation parameter is not a fixed amount; rather, the parameter varies as an inverse function of PD. For all wholesale exposures except HVCRE exposures, the asset correlation parameter approaches an upper bound value of 24 percent for very low PD values and approaches a lower bound value of 12 percent for very high PD values. This reflects the Agencies' view that borrowers with lower credit quality (that is, higher PDs) are likely to be more idiosyncratic in the factors affecting their likelihood of default than borrowers with higher credit quality (lower PDs). Therefore, the higher PD borrowers are proportionately less influenced by systematic (sector-wide or economy-wide) factors common to all borrowers.<sup>17</sup>

An important practical impact of having asset correlation decline with increases in PD

<sup>17</sup> See Jose Lopez, "The Empirical Relationship between Average Asset Correlation, Firm Probability of Default, and Asset Size," Federal Reserve Bank of San Francisco Working Paper 02-05 (June 2002).