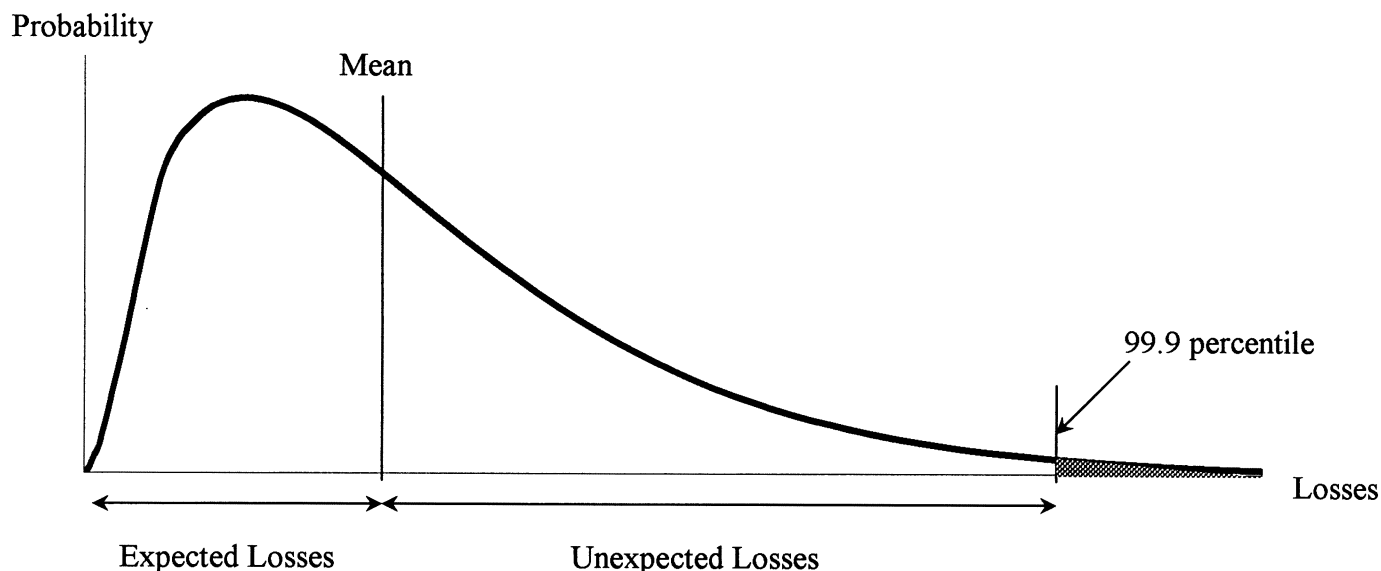


Probability Density Function of Credit Losses



The framework described in this ANPR calibrates the risk-based capital requirements to the sum of EL plus UL, which raises significant calibration issues. Those calibration issues would be treated differently if the calibration were based only on the estimate of UL. That is, decisions with respect to significant policy variables that are described below hinge crucially on the initial decision to base the calibration on EL plus UL, rather than UL only. These issues include, for example, the appropriate mechanism for incorporating any future margin income (FMI) that is associated with particular business lines, as well as the appropriate method for incorporating general and specific reserves into the risk-based capital ratios.

A final overarching assumption of the A-IRB framework is the role of asset correlations. Within the A-IRB capital formulas (as in the credit VaR models of many banking organizations), asset correlation parameters provide a measure of the extent to which changes in the economic value of separate exposures are presumed to move together. A higher asset correlation between a particular asset and other assets in the same portfolio implies a greater likelihood that the asset will decline in value at the same time as the portfolio as a whole declines in value. Because this means a greater chance that the asset will be a contributor to high loss scenarios, its capital requirement under the A-IRB framework also is higher.

Specifically, the A-IRB capital formulas described in detail below are based on the assumption that correlation in defaults across borrowers is attributable to their common dependence on one or more systematic risk factors. The basis for this assumption is the observation that a banking organization's borrowers are generally susceptible to adverse changes in the global economy. These systematic factors are distinct from the borrower-specific, or idiosyncratic, risk factors that determine the probability that a specific loan will be repaid. Like other risk-factor models, the A-IRB framework assumes that these borrower-specific factors represent idiosyncratic sources of risk, and thus (unlike the systematic risk-factors) are diversified in a large lending portfolio.

The A-IRB approach allows for much improved sensitivity to many of the loan-level determinants of economic capital (such as PD and LGD), but does not explicitly address how an exposure's economic capital might vary with the degree of concentration in the overall portfolio to specific industries or regions, or even to specific borrowers. That is, it neither rewards nor penalizes differences across banking organizations in diversification or concentration across industry, geography, and names. To introduce such rewards and penalties in an appropriate manner would necessarily entail far greater operational complexity for both regulatory and financial institutions.

In contrast, the portfolio models of credit risk employed by many banking organizations are quite sensitive to all forms of diversification. That is, the economic capital charge assigned to a loan within such a model will depend on the portfolio as a whole. In order to apply a portfolio model to the calibration of A-IRB capital charges, it would be necessary to identify the assumptions needed so that a portfolio model would yield economic capital charges that do not depend on portfolio characteristics. Recent advances in the finance literature demonstrate that economic capital charges are portfolio-invariant if (and only if) two assumptions are imposed.¹⁴ First, the portfolio must be infinitely fine-grained. Second, there must be only a single systematic risk factor.

Infinite granularity, while never literally attained, is satisfied in an approximate sense by the portfolios of large, internationally active banks. Analysis of data provided by such institutions shows that taking account of single-name concentrations in such portfolios would lead to only trivial changes in the total capital requirement. The single risk-factor assumption would appear, at first glance, more troublesome. As an empirical matter, there undoubtedly are distinct cyclical factors for different industries and different geographic regions. From a substantive perspective, however, the

¹⁴ See forthcoming paper by M. Gordy referenced in footnot number 12 above.