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Capital Allocation

Supervisory Standards for Internal Rating Systems

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In describing the emerging framework of standards that will be used as critical reference points by Federal Reserve examiners in evaluating the strength of banks' internal rating systems, this article seeks to share regulatory thinking at a point when discussion among bankers and regulators is particularly critical.

Bankers and supervisors have recently focused increasing attention and resources on the enhancement of internal credit risk rating systems. Rating systems have long been a critical “traditional” element of evaluating risk and maintaining internal credit discipline. Many banks have already made substantial investments to upgrade their systems beyond these traditional limits—to enhance the rigor and objectivity of the rating analysis, to distinguish more finely among degrees of riskiness, and to move in the direction of better measurement and quantification of risk. All of these enhancements better support the use of measurement techniques and tools in risk management; specifically, they support internal credit risk models and economic capital systems.

Examiners, too, have devoted more of their resources to evaluating internal rating systems¹. The presence of well-functioning rating systems allows examiners to gain confidence in the overall strength of credit risk management and to focus their own resources more effectively. Supervisors also have devoted increasing attention to internal economic capital systems as a tool to better understand a bank's overall capital needs.

The emerging framework of standards will be used as critical reference points by Federal Reserve examiners in evaluating the strength of bank rating systems. These standards reflect the benefit of ongoing discussions with supervisors and bankers overseas in conjunction with an internal ratings-based (IRB) approach to regulatory capital standards for credit risk.

There is great value to a healthy dialog between bankers and supervisors. Such discussions help to ensure proper vetting of the standards while they emerge, and provides lead time for banks to bring themselves into alignment with best practices as supervisors see them. Movement by banks to meet these standards more fully clearly serves the supervisor's interest in promoting further advances in risk measurement and management, whether or not there is any application to internal or regulatory assessments of capital adequacy.

A revolutionary change. An IRB approach would be a revolutionary change from the current Basel Accord. Regulatory minimum capital requirements for credit risk would be based on the bank's internal rating system and the measured risk characteristics associated with each grade and certain other aspects of the bank's exposures.

Banks would need to demonstrate the strength of their rating systems and the accuracy and consistency of their risk measurement in order to be eligible for an IRB approach. Minimum supervisory standards for internal rating systems and risk measurement will be a critical component to the substance—and the credibility—of an IRB proposal. Accordingly, the standards that emerge will be tough, and supervisors will take these standards very seriously.

These international discussions are still underway, and the IRB standards are still being finalized. Still, it would be fair to say that the standards described here are broadly indicative of the supervisory standards and prerequisites that are expected to emerge early next year from the

Basel Committee.

In the context of any set of IRB supervisory standards, there will, of course, be a few that are driven by particular decisions as to how the IRB mechanism itself will function. The IRB framework for commercial exposures will decompose the risk of loss into the probability of borrower default (PD), the economic loss given a default (LGD), and drawn exposure at default (EAD). This choice does not imply that a rating system oriented to the change in *value* of a loan or exposure as it moves up or down the rating scale would be considered inappropriate. It's expected that banks using such a system would translate the grades and loss concepts they actually use into the framework required for the IRB approach framework when calculating their regulatory capital requirements.

The overall framework of emerging supervisory standards can be broken down into six "blocks" or issue areas: the structure of the rating system, the factors on which rating decisions are based, the rating administration process and internal oversight, quantification of loss characteristics, internal use of ratings information, and disclosure. The descriptions focus on commercial exposures but would also be the starting point for standards on other portfolios, such as retail.

Structure of the Rating System

A strong rating system begins with its structure, and how well it is designed to differentiate among the degrees of risk in a bank's portfolio. The most obvious structural characteristic of a strong system is the number of grades, which, simply put, represents how hard a rating system is working to distinguish risk. The typical large bank in the U.S. uses four or five "pass" grades. The "best" of these rating systems use 20 or more grades, including "+/-" modifiers (like those used by the rating agencies).

There is no obvious single standard for assessing the right number of grades. Still, supervisors will tend to look for some minimum number of "full" pass grades, probably in the upper single digits. A full grade in this setting would likely have a complete and unique set of rating criteria and, thus, would exclude simple "+/-" modifiers. There also would be some minimum number of problem loan grades, although this is not likely to be a binding constraint in the U.S.

Coupled with the number of grades is how well the specific grades chosen serve to distinguish risk within a given bank's portfolio or, in other words, the degree of dispersion across grades. For the IRB approach, there is likely to be some maximum share of exposures within a single grade, likely to fall between 30% and 40%.

Finally, the structure of the rating system should incorporate both a "borrower" and a "facility" (or LGD) dimension to ensure that the bank clearly evaluates and rates both the risk of the underlying borrower and the effect on risk of the transaction structure itself (for example, collateral).

Risk Factors Considered

If the structure of the rating system is what determines how well a rating system can differentiate risk, the manner in which risk factors are considered in arriving at an overall borrower or facility/LGD grade determine how informative and reliable the rating is in describing the risk of loss associated with a borrower or exposure. The issues arising in these areas are closely related to good underwriting practices more generally.

In the most general terms, "all relevant information" should be considered in assigning an internal credit rating, a principle that is consistent with sound underwriting practice. It is hard to envision borrower or facility characteristics that "never" have a material influence on the risk of an exposure.

At the same time, the factors to be considered in a rating process need to be described in some detail (generally incorporated into credit policies) to ensure consistency, comparability, and thoroughness of rating decisions. For risk factors that are readily measured (for example, leverage

or coverage), explicit quantitative target ratios or ranges should be described. If the factors are less measurable, such as management strength or market conditions for a borrower's product, verbal qualitative criteria should be clear and meaningful enough that an outsider with good credit background could understand and evaluate the assignment.

In many ways, the most difficult aspect of the rating decision is to weigh the various risk factors and arrive at an overall rating. Credit policies should describe in a meaningful way how various factors should be considered in coming to the overall rating decision.

Without such clear internal criteria and standards, it is difficult to ensure that all relevant factors are properly considered in the overall rating process. Moreover, key internal control processes (for example, loan review) may find their effectiveness lessened or impaired if the standards by which these processes should dispute or criticize a rating decision are ambiguous or highly subjective.

A particular issue in this context is the degree to which the rating decision is oriented to quantitative models of, for example, default probability. This would, among other things, address whether a rating process based entirely on a default modeling process (for example, a simple four or five-factor linear discriminant model) would be sufficient to support IRB. On the one hand, it is a clear "best practice" for a bank to incorporate such default modeling into the rating assignment and review process, contributing consistency and discipline to the rating—and, indeed, the underwriting—process. Supervisors support and encourage the effective use of such tools. On the other hand, many elements of the lending decision are difficult, if not impossible, to measure well. There is a risk that over time, the importance of more subjective elements could tend to be overlooked in an unduly model-centered rating process.

There have been new developments in the risk modeling arena that have blurred some of these lines. These developments include the use of information extracted from equity prices for publicly traded firms, development of more sophisticated modeling and model testing procedures, and use of supplemental tools (especially in retail lending) that are oriented to the observed payment or transactional behavior of the borrower.

In general, it is important that ratings be based on the most current available information. The IRB framework—like most portfolio credit risk models and economic capital systems—is oriented to the probability of default (or degree of rating migration) over a one-year horizon. The rating should thus be consistent with a one-year view of the borrower's risk of default based on currently available information. The key word here is "consistent"; it would not be appropriate, for example, to orient ratings to a specific forecast of macroeconomic conditions or the equivalent. Information that is relevant to a borrower's condition beyond one year is also appropriate, especially to the extent that this leads to a conservative view of a borrower's risk.

Rating decisions should be clearly documented, so that an outsider with good credit background could readily determine whether a grade was properly assigned. Judgment will always be important in rating decisions, as it is for underwriting decisions in general, so there will likely be exceptions to the specific rating criteria. Exceptions to rating criteria should be clearly identified, however, allowing for retrospective analysis of outcomes and patterns that may identify potential weaknesses in the rating process.

The Administrative Process for Assigning and Monitoring Ratings

Like other key bank processes, the rating process needs to be anchored with a set of strong internal controls that ensure adherence to procedures and policies and, more generally, that keep potential internal incentive conflicts in check.

One important element of these controls is an independent credit risk management function(s) that oversees relevant processes to ensure proper operation and compliance with internal and external standards, including adherence to criteria (that is, prevalence of exceptions), historical performance of loans receiving each rating (backtesting in terms of defaults and rating migration

experience), and estimation of loss characteristics (PD, LGD, and so forth).

The rating, in principle, should be assigned by individual(s) with no vested interest in the outcome of the rating itself—presumably, independent credit staff. If not assigned by independent credit staff, a rating should at least be reviewed by experienced independent credit staff (for example, through “dual signature” processes). Below some size threshold, this independence may be less important.

In the same vein, ratings for commercial borrowers should be reviewed at least annually by those responsible for initially assigning the rating, and more frequently for problem or workout loans. The firmness of this requirement for “pass” loans could be influenced by the use of default-probability models or other “surveillance” or “early warning” tools.

Periodic human-based review by an internal loan review/credit audit function also is important to review adherence to rating criteria and overall adherence to rating policies. As a characteristic of best practices currently observed, this human element is important in evaluating how well judgment is being applied. Such reviews need to be conducted by individuals with experience and credit skills at least comparable to those making the rating assignment. The internal coverage requirement would probably be relatively high, subject perhaps to the degree to which default-probability models or other tools are being used as surveillance or early warning tools. Periodic review by internal/external audit of comparable scope would also be important to ensuring the integrity of the rating process.

To support all of these internal controls and monitoring processes, the institution’s board of directors and senior management need to review and approve key policies and processes.

Quantification of Loss Characteristics

This is a new and substantial area of interest for supervisors, even without the prospect of an IRB regulatory capital framework. Even disciplined, well-structured, and well-administered rating processes become potentially much more powerful when linked to measurable outcomes. This puts a sharp focus on the goal of the rating process (detailed risk assessment), provides for linkage of credit evaluation to other risk measurement and risk control processes (including incentive compensation), and allows for retrospective evaluation of the performance of the rating systems (for example, back-testing).

Data adequacy is an issue. The availability and quality of loss data has emerged as a significant issue in measuring credit risk. Most U.S. banks rely on indirect risk measures (for example, mapping from rating agency grades and loss experience to internal borrower grades). There is a clear consensus among supervisors globally that banks need to enhance their data-collection efforts on their historical loss experience by internal rating grade and other loss characteristics (for example, LGD). In particular, banks seeking eligibility for the IRB approach should move to develop and warehouse their own historical loss experience data by borrower/facility grade, collateral type, and other key characteristics.

There are very important definitional issues in the measurement area that can seriously affect the value of historical loss and default information, whether internal to the bank or from external sources. In particular, banks need to demonstrate that PD and LGD data are calibrated as closely as possible to the same definition of what comprises a default event. The prevailing practice in the U.S. is to define a defaulted exposure as one on nonaccrual status, especially in the context of internal LGD measurement. Use of rating agency results to quantify the probability of default implicitly means that the bank is applying the agencies’ definition of a default event. Similar issues arise in the context of the definition of loss.

Reflecting current practice, the data concept to be measured is the long-term average default rate for each grade evaluated over a one-year horizon (for example, a 30-year average of annual default rates).

Supervisors in general will prefer banks to use their own internal default experience by borrower grade over a robust historical observation period, both for internal purposes and for the IRB approach. Mapping to rating agency default experience by grade or the use of default model output by grade would nonetheless be acceptable, at least for the relevant borrower types. For the latter two approaches to PD quantification, supervisors will expect banks to be able to provide convincing supporting analysis that demonstrates the applicability of that technique and data to the bank's portfolio. Similarly, even for a bank's own data, the bank would be expected to provide analysis showing that the type of lending and underwriting decisions being made are comparable with those made during the historical observation period.

LGD information should be measured as economic loss and not necessarily accounting loss, taking explicit account of discounting, cost of carry, and other administrative costs. The data concept is long-term average of present value of economic loss as a percentage of exposure level at default.

Surveys and other information suggest that even sophisticated banks in the G-10 countries often do not have reliable, empirically based LGD or EAD data. Recognizing the shortcomings in available LGD information, the IRB framework being developed in Basel will include supervisory LGD assumptions that can be used by banks in lieu of internal or external empirically based data. Supervisory LGD treatment is likely to be conservative and quite limited—maybe only a few different categories of LGD (for example, unsecured versus exposures secured by one or two collateral types) and/or EAD. This will be termed the “foundation IRB” approach, while the use of internal estimates of LGD and EAD will be termed the “advanced IRB” approach. Recognition of collateral types under the advanced approach for regulatory purposes will not be restricted by the choices made for the specific collateral types or other LGD categories.

U.S. supervisors, in particular, are inclined to prefer strongly that banks develop and make use of their own LGD data rather than standardized supervisory values. Best practice U.S. banks have already conducted detailed analysis of their LGD experience, in some cases covering decades of loss experience, and have such data available already. Pooled or mapped data may be acceptable with supporting analysis demonstrating applicability to the bank's portfolio and lending standards. This view recognizes the possible adverse incentives associated with the use of standardized supervisory values for LGD. It would be undesirable, for example, for banks to use these standardized values in their internal analysis. The right outcome from the supervisor's view is development of meaningful internal LGD estimates.

As noted above, the commitment to estimate PD and LGD has provided best practice banks with a number of new management capabilities, including the ability to retrospectively analyze whether the estimated PDs and LGDs used internally were borne out by actual outcomes. This kind of analysis closely resembles the backtesting that is conventionally performed for Value-at-Risk models of market risk for trading portfolios.

In the market risk setting, the results of such testing provide statistically reliable evaluation of whether modeling has been adequate. Unfortunately, due to the relative infrequency of default events, no such statistically reliable backtesting is feasible in the credit risk context, especially in the commercial loan portfolio. Even so, banks should develop such internal quantitative evaluations as one tool among many in their ongoing evaluation of the adequacy of their risk measurement. These tools can highlight potential issues in an institution's attribution of PDs and LGDs to its exposures. Supervisors could also review the results of such internal testing as part of their assessment of risk measurement.

Internal Reliance on Ratings and Estimated Loss Characteristics

Supervisors expect banks to rely upon internal ratings information and associated risk measures for internal management purposes. Especially in the IRB setting, such “use” standards will be critical in gaining supervisory comfort that banks believe in the strength and integrity of these tools

and systems. Rating systems and information should be well integrated with internal risk management systems, including relevant internal administrative thresholds and credit approval authority levels. Rating information should also be well integrated with internal reporting of the institution's credit risk position and profile, to inform directors and management of the significance of—and possible shifts in—the institution's credit risk profile. Directors and senior management also should review results of retrospective reviews of rating performance, the estimates of key loss characteristics, and other key elements of the rating-based information being generated internally and/or being used in the IRB framework.

Such quantitative information should also be meaningfully considered in internal reserving and provisioning analysis, in the broader context of proper assessment of the possible range of losses embedded in a credit portfolio.

Rating information should also be well-integrated into the analysis—although not necessarily the mechanical determination—of (credit) pricing decisions. This is typically done through comparison of a loan's interest rate with an internal hurdle rate that is sensitive to the risk of the loan.

In the IRB setting, a further and related standard would be that ratings information and estimates of loss characteristics be used as part of a meaningful internal economic capital or profitability analysis system. In this context, such a system would be one that is important in strategic decision-making and incentive compensation. Significantly, this use standard would be the only one that would encompass both the ratings process and the PD, LGD, and EAD estimates. Such a standard would help to reduce the incentive for banks to “manage” their PD and other loss estimates primarily to minimize regulatory capital requirements.

Disclosure of Key Internal Ratings and Loss Estimate Information

As a final area of supervisory standards, supervisors will seek to promote meaningful market discipline to supplement supervisory review of internal ratings systems and associated risk management practices. Especially in the IRB context, key disclosures would include the distribution of exposures across borrower and/or facility grades, key loss characteristics (for example, PD by borrower grade, LGD by collateral type or business line), and internal economic capital allocated to each borrower grade, major line of business, and/or product line. Disclosures should describe the sources of information and analysis used to arrive at these loss characteristics and report the results of internal retrospective analysis of the reliability of these loss estimates over time. Such disclosures should be accompanied by some description of the rating process itself along with the risk quantification process used at the bank.

Specifically in the context of the IRB capital framework, disclosures would need to include reporting of the institution's overall regulatory capital requirements and a comparison of these requirements to its capital positions.

Next Steps

These standards will continue to develop, particularly as dialog with the industry advances on the IRB approach. To improve their assessment of rating systems, supervisors themselves may develop various quantitative tools—not to substitute for bank internal analysis but, rather, as reference points and surveillance tools. We can all look forward to a constructive and lively dialog on internal rating systems over the coming months and years.

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NOTES

¹ See, for example, the Federal Reserve's examination guidance in internal ratings systems at large commercial banks, contained in SR letter 98-25 issued in September 1998 (available at www.federalreserve.gov).

² The general outline of an IRB approach can be found in a January 2000 paper from the Models

Task Force of the Basel Committee entitled “Range of Practice in Bank Rating Systems” (available at www.bis.org, under Press Releases).

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