In this first of two articles, the authors describe the capabilities, desired attributes, and potential accruing benefits of effective credit risk-rating systems. The practical issues arising in an overhaul, the main theme of the second article, will be shown through a case study of one regional bank’s initiative to upgrade its credit risk management process.

Credit risk ratings provide a common language for describing credit risk exposure within an organization and, increasingly, with parties outside the organization. As such, they drive a wide range of credit processes—from origination to monitoring to securitization to workout—and it is logical that better credit risk ratings can lead to better credit risk management. Yet many lenders are using ratings systems that were put in place 10 or more years ago.

The primary barrier to change, it seems, is not that the old rating models cannot be improved but that the process of implementation is challenging. Ratings are so tightly woven into the fabric of most institutions that they are part of the culture. And any significant change to the culture is difficult.

However, the pressures to change are mounting from both internal and external sources. Internally, it may be the desire to price loans more aggressively or to support a more economically attractive CLO structure. Externally, the capital markets desire more detailed, more finely differentiated measures of credit portfolios. For corporate lending, credit scoring has been an important accelerator for securitization.

Justification for Change

A decade of advancements in quantitative measures of credit risk have led to better risk management at the transaction level as well as the portfolio level. Lenders can actively manage their portfolio risks and returns relative to the institution’s risk appetite and performance targets.

At the same time, it is becoming increasingly clear that banks, in spite of their historical role, are actu-
ally disadvantaged holders of credit risk. The combination of high capital requirements and double taxation means that credit extension is typically not contributing positively to shareholder value creation. Improved risk ratings can improve the returns in this business by significantly lower- ing risk and process costs.

Some leading players are rethinking the business model as a credit conduit. The originate-and-hold strategy is being replaced with one of originate-package-distribute. Credit risk is becoming managed in much the same way as interest rate risk or equity risk. To make this strategy work, it is essential that credit risk is measured in a more standardized, accurate, and timely fashion.

Additional impetus is provided by the proposed reforms to bank regulation put forward by the Bank for International Settlements (commonly known as Basel II) that are intended to supersede the straight 8% minimum capital charge levied on banks since 1988. The expectations inherent in this reform adds to the pressures for changing internal risk rating systems. The promise is that less capital will be required for banks using more advanced ratings. Many banks will find that without a substantial overhaul, their credit risk-rating system will fail to meet Basel II guidelines.

Steps Toward Change Begin with Understanding the Goal

The fundamental goal of a credit risk rating system is to estimate the credit risk of a given transaction or portfolio of transactions/assets. The industry standard “building block” for quantifying credit risk is Expected Loss (EL), the mean loss that can be expected from holding the asset. This is calculated as the product of three components:

- **Expected Loss (EL)**
- **Probability of Default (PD)**
- **Exposure At Default (EAD)**
- **Loss Given Default (LGD)**

This article concentrates on the success of a credit rating system in terms of its ability to quantify PD and LGD. For most commercial exposures, EAD is generally treated independently from the risk ratings, and this article will treat it as such.

The important risk drivers that affect PD and LGD vary from asset class to asset class. For example, the drivers of risk vary widely between retail, commercial, and asset-backed lending. Therefore, a successful credit risk rating system that covers material exposures across a bank will necessarily be quite complex, with numerous distinct models.

This points to a second goal of a credit risk rating system: It is not enough to accurately measure risk, it also must provide the bank with a unified view of its credit risk. It needs to ensure that a rating system permits the simple aggregation of risk—by obligor, portfolio, line of business, and product type—and thus allow the institution to make decisions based on solid estimation of the credit risk being taken.

Simply put, being “right” is not enough. The system must be easily understood by a wide range of people and be useful for management decision taking.

For the user, this means that it should behave in an intuitive and predictive fashion. For example, a system that generates dramatically different risk ratings, without expla-
in institution-wide metric against which all assets will be compared.

2. **Ratings Assignment** addresses the actual ratings process.

3. **Validation** addresses confidence in the system, both internally and externally.

**Ratings scale.** A risk rating system uses an objective scale to rank credits according to risk. In defining the scale, we answer three questions:

- What does a given rating mean?
- How many ratings are there?
- Which credits does the scale apply to?

The ultimate goal is to provide a measure of the loss expected for booking a credit and the capital required to support it. By examining the ratings of any two credits in a portfolio, we would like to know which credit is riskier and the expected loss associated with each. Obviously, if we can answer the second question, we know the answer to the first part. As mentioned, many credit rating systems perform well in defining credit risk on a relative basis but poorly in gauging an absolute level of expected loss of each.

Most rating systems use a two-dimensional scale to solve this problem, with the probability of default (PD) and the loss given default (LGD) being quantified separately (consistent with the proposed Basel II guidelines). The first dimension (PD) is primarily determined by the obligor characteristics. The second dimension estimates how the facility structure affects the LGD.

A key element in the definition of a ratings scale is the determination of the appropriate level of granularity. Each grade should have markedly (and measurably) different risk characteristics. If the level of granularity is too small (that is, there are too few grades), the system will not be a useful decision support tool for management. Conversely, too much granularity may lead to a false sense of accuracy (with models assumed better than they, in fact, are) or too much detail as a basis for management’s strategic decisions.

Finally, an effective ratings scale must be applicable across the bank’s entire credit portfolio. Banks should strive to rate all exposures, but often this is not the case with specific credit exposures being overlooked, such as letters of credit or the counterparty credit risk arising from trading positions. To get an accurate profile of an institution’s credit risk exposure, every credit exposure needs a comparable risk rating. The key is to use a “master scale”—a single scale to which all counterparties are mapped. It should be noted that having such a universal ratings scale does not imply that all asset classes use the entire scale. For example, you would expect corporate loans to be concentrated at the top end of the scale (with low probability of default) and retail loans to be concentrated towards the lower-middle part of the scale.

**Ratings assignment.** After the ratings scale is defined, it is necessary to choose an approach for assigning ratings to counterparties, and this raises several issues:

- How are ratings assigned for each business unit?
- Who assigns the ratings?
- What tools are used in the assignment process?

The answers to these questions typically differ by business unit. Figure 2 classifies alternative ratings approaches—in practice; banks use a mixture of these, depending on customer type. The choice between methods should depend on their cost/benefit charac-

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**Figure 1**

**The Three Parts of a Credit Risk Rating System**

<table>
<thead>
<tr>
<th>Ratings Scale</th>
<th>Ratings Assignment</th>
<th>Validation/Refinement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What does a rating mean?</td>
<td>• How are ratings assigned for each business unit?</td>
<td>• How are ratings validated?</td>
</tr>
<tr>
<td>• How many ratings are there?</td>
<td>• Who assigns the rating?</td>
<td>• What data is needed for validation and model refinement?</td>
</tr>
<tr>
<td>• Which credits does the scale apply to?</td>
<td>• What tools are used in the assignment process?</td>
<td>• Who is responsible for the analyses?</td>
</tr>
</tbody>
</table>
characteristics. For example, the use of extensive financial and nonfinancial (subjective) data may result in increased accuracy but can slow the process, thereby adding cost. Such analyses should be used only when the benefits from the marginal increase in accuracy are great. This applies to corporate lending, where many banks use a combination of financial and subjective information to drive a scoresheet approach to assign ratings. In some cases, the scoresheets may also be supplemented by a model-based approach, such as Moody’s RiskCalc.

Conversely, where the marginal benefit of increased accuracy at an individual asset level is not as great—for example, in small business lending—banks are making aggressive use of pure model approaches, similar to those used to manage retail credit card portfolios.

There should be a clear articulation of responsibility for ratings assignment. The best mechanism for achieving this will differ not only from business line to business line but also from bank to bank. At some banks, ratings assignments for corporate and/or commercial credits will be undertaken by the line, by the credit function, or jointly. For retail portfolios, it’s common for centralized underwriting to assign ratings. The key is to ensure that it is clear who is responsible for assigning the relevant ratings, be it line, credit, or centralized underwriting, and that whoever assigns the rating thoroughly understands the ratings approach.

Validation. A key, but often overlooked, part of a ratings system is a well-defined process to ensure that it is working well. Three questions must be answered:

1. How are ratings validated?
2. What data is needed for validation and model refinement?
3. Who is responsible for the analysis?

The first two questions are answered jointly, since validation requires data. In fact, Basel II is explicit about the need to validate internal ratings with historical data. Validation—the process of ensuring that the ratings are accurately conveying the bank’s credit risk—includes:

- Checking accuracy of ratings—for example, are the model’s predicted results consistent with the default history of the bank? If not, are the models inappropriate, being misused, or miscalibrated (both for PD and LGD)?
- Checking raters’ performance—for example, if there is a subjective component in the ratings process, does the rater’s judgment improve the ratings or not?
- Checking applicability of models and tools—for example, has enough data been collected for further refinements? Are there...
newly available vended models that outperform the current one?

Without an effective process of validation, ratings will never provide confidence, either internally or externally (and will not be accepted by regulators for the purpose of capital allocation). At a minimum, the required data for these analyses should be explicitly specified and data-capture systems should be implemented to collect the data. It should be noted that all the data in the world is worthless, unless someone within the bank reviews and analyses it. Banks vary in their approaches, but the responsibility for data analysis must be clearly specified. In some banks, this function is delegated back to the businesses, while in others it is centralized.

What makes a risk rating system effective? Nearly all banks have risk rating systems, but not all systems perform well. A sound rating system should improve a bank’s downstream tactical and strategic applications. Perversely, this is often an area of unexpected gain—ratings are improved for regulatory reasons but are subsequently found to pay off in other areas. Banks miss substantial opportunities if they view the development of credit ratings primarily as a regulatory compliance issue. Robust credit rating systems have the potential for significant bottom-line impact and improved shareholder value creation. Some examples of value-adding applications are given in Figure 3.

An effective risk rating system should bolster these applications and processes. Those that do so exhibit certain features:

Consistency within a portfolio. Two individual raters independently evaluating a credit package should assign the same rating (or very close), assuming that both have the same information. Intra-portfolio ratings inconsistency negatively affects the efficiency of approvals and pricing and may generate disagreements between the line and credit functions.

Consistency across portfolios. Credit risk should be discussed across the entire organization in common terms, facilitated by the use of the central master scale, described earlier. Inconsistency in the measurement of risk across portfolios undermines most portfolio-level decisions and processes and severely impairs the credibility and usefulness of bank-wide RAROC / SVA systems.

Granularity. To effectively distinguish between risk levels, ratings systems need a fairly high level of granularity, with increased granularity in the portfolio subsegments having a high concentration of credit. Many first-generation rating tools with between five and 10 pass grades are unsuitable for value-adding applications, such as risk-adjusted pricing, portfolio management, and securitization initiatives.

Independent of regulatory pressure, most banks have already been increasing the granularity of their risk-rating systems to meet competitive needs.

**Table: Applications That Rely on Risk Ratings**

<table>
<thead>
<tr>
<th>Process/Decision</th>
<th>Credit Risk Rating System Role</th>
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<tbody>
<tr>
<td>Approval (new applications)</td>
<td>Measure risk</td>
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<tr>
<td></td>
<td>Test pricing adequacy</td>
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<tr>
<td>Syndications</td>
<td>Pricing deal</td>
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<tr>
<td></td>
<td>Increase market share in relation to risk appetite</td>
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<tr>
<td>Limit Setting</td>
<td>Assist in determining capital cost of increased concentration</td>
</tr>
<tr>
<td>Capital Management</td>
<td>Loss forecasting and provisioning</td>
</tr>
<tr>
<td></td>
<td>Capital requirements</td>
</tr>
<tr>
<td>Risk Transfer</td>
<td>Benefits of risk transfer depends on estimate of risk</td>
</tr>
<tr>
<td>RAROC</td>
<td>Determine risk-adjusted profits</td>
</tr>
<tr>
<td></td>
<td>Economic capital estimates a function of risk</td>
</tr>
<tr>
<td>Customer Profitability Measurement</td>
<td>Estimate of customer-level risk-adjusted profit</td>
</tr>
</tbody>
</table>

**Figure 3**

**Granularity.** To effectively distinguish between risk levels, ratings systems need a fairly high level of granularity, with increased granularity in the portfolio subsegments having a high concentration of credit. Many first-generation rating tools with between five and 10 pass grades are unsuitable for value-adding applications, such as risk-adjusted pricing, portfolio management, and securitization initiatives.
costs of origination, approval, and monitoring. Faster processes are favorable, since they reduce these costs and improve the customer’s experience with banks. The key is to optimize the potential tradeoff between speed and accuracy.

**Benefits of a Leading-edge Ratings System**

Implementation of leading edge risk-rating systems can have substantial costs. Costs include development staff (internal and external); software/modeling costs; IT and infrastructure costs; and training costs. Given these not inconsiderable costs, banks should expect significant benefits from ratings systems implementation in addition to regulatory compliance. Substantial benefits can be achieved as applications leverage a leading-edge ratings system, including a reduction in risk cost, increased risk-adjusted profitability, and cost reduction through credit process redesign.

**Reduction in risk cost.** Banks face two costs of credit risk: expected losses and the cost of the capital required to protect the bank against the volatility of losses. The direct benefit from the introduction of an improved rating system is the reduction in credit losses due to improved asset selection and the avoidance of “winner’s curse,” whereby a bank that systematically misprices loans suffers from negative selection. An indirect benefit from improved rating systems is the more efficient use of economic capital through improved portfolio composition. Active management of the credit portfolio, underpinned by robust risk and valuation metrics, can dramatically improve risk/return characteristics. In many instances, it also can lead to a reduction of loss volatility—and consequently economic capital consumption—by 20-30%. The proposed Basel II guidelines provide an additional regulatory carrot, whereby banks with more advanced credit rating systems will also enjoy reduced regulatory capital requirements as applied to their lending activities.

**Increased risk-adjusted profitability.** Generally, we expect enhanced credit risk measurement to boost risk-adjusted profitability by supporting improvements in pricing discipline. Risk-adjusted pricing facilitates the cherry picking of higher quality credits from banks with less robust risk measurement capabilities and also ensures adequate compensation from riskier credits. It is possible to realize risk-adjusted improvements in profitability of 10-15 bps of assets per year through these mechanisms. The net present value of this benefit, assuming a 15% discount rate, is 80-90 bps of assets minus the fixed costs associated with the project.

**Cost reduction through credit process redesign.** Leading-edge risk rating systems allow banks to reduce costs in many credit-related processes. The key benefit of ratings tools is that they allow the streamlining of the entire credit process along risk-adjusted lines. Simply cutting costs across the board may, in the long term, actually increase losses as appropriate controls are compromised. Instead, efforts are recommissioned on the areas where additional, costly assessments have the greatest payback.

The approvals process, in relation to low-risk transactions, can be semi-automated while efforts are recommissioned on those deals for which the bank expects greater losses or there is most uncertainty. The same approach can be taken throughout the value chain—from approvals, through monitoring, to recoveries—but only if the risk inherent in each credit is well measured. Banks that have been aggressive in credit process redesign have seen large cost reductions in credit-related processes. In many instances, banks have reduced credit-related expenses by 25-30%.

**Conclusion**

Upon reviewing the Basel II guidelines relating to internal credit risk models, many credit risk managers at banks globally are faced with the reality that their internal risk-rating systems fall short of what is necessary for compliance. What options are available? What is the cost-benefit of each? The answers to these questions are constrained by available time, data, IT systems, and organizational needs. In the perfect situation, highly customized ratings systems with internally calibrated, quantitative models can be designed and rolled out. This may be desirable for the many banks that are partway there already. For others, this may be impractical. Regardless of the approach, all models need to follow the same basic outline. The benefits generated from putting in such a system can far outweigh the costs, even without considering the regulatory advantages, and the value of such a system can only increase.