

## Assessing Enterprise Risk Management Practices Of Financial Institutions

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In its quest to provide leadership in clarity and transparency to its investors and issuers through added discipline and analytical rigor of its risk assessment processes, Standard & Poor's Ratings Services has designed a framework and developed criteria to assess the enterprise risk management (ERM) practices of financial institutions.

This criteria builds on Standard and Poor's Policies, Infrastructure, and Methodology (PIM) framework that was constructed to assess the ERM practices of the trading operations of large financial institutions. The structure and components of the framework that has been developed to assess the ERM practices of financial institutions represents what we believe to be "sound practices," not necessarily widely applied in the industry.

As we continually strive for the highest levels of excellence in the quality of our ratings, the assessments based on the criteria described in the rest of this document form an integral part of our overall credit ratings and will be applied across all institutions as part of the ongoing surveillance process. While we have historically viewed risk management practices of financial institutions from a holistic perspective, this enhanced analytic framework reflects the evolving nature of risk management practices across the industry and provides us with a unified and consistent platform to assess the ERM practices of financial institutions globally. As ERM is a dynamic and ever-evolving discipline, our ERM criteria will be revised and updated to reflect the dialogue with companies and the evolving risk management practices within and across industries.

### Assessing Risk From An ERM Perspective

Shareholders and bondholders are becoming less forgiving in the face of mediocre results, lack of transparency, and increased competition for their capital. As a consequence, the global banking industry, among others, faces greater challenges in assessing risks in this dynamic and evolving market structure. Dramatic advances in instrument structures, valuations, risk methodologies, and the

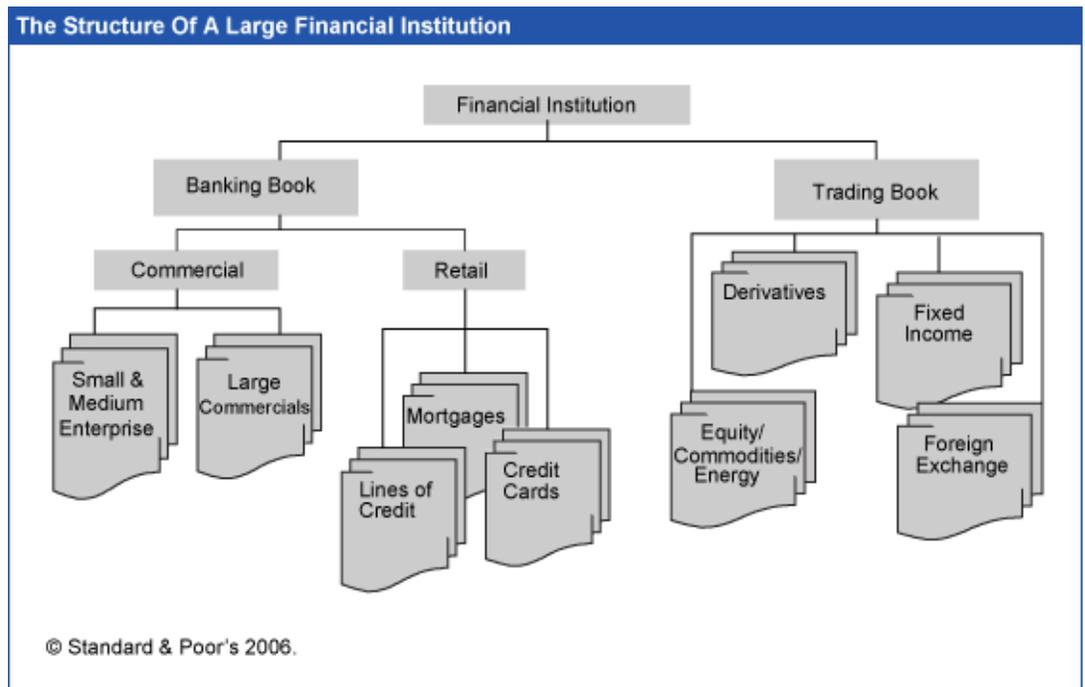
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implications of the imminent adoption of the new Basel Capital Accord (BIS or Basel II) have raised capital risk management to a new level.

The traditional risk management functions and approaches at major financial institutions continue to evolve rapidly. The mandate to coherently articulate, measure, manage, and control the risks within institutions is being embedded into a “sound practice” management philosophy. Most prominently, greater emphasis is being placed on enterprise-wide risk management. In its purest form, an ERM framework would establish risk management as an independent function with a Chief Risk Officer (CRO) at the helm who most likely reports to the CEO. Related efforts such as integrated market and credit risk measurement, wider use of quantifiable measures of aggregate risk, and credit portfolio management techniques for assessing economic capital appear in varying degrees across financial sectors. Regulatory practices have influenced and have been influenced by these trends. To some extent, Basel II, MaRisk (minimum requirements for risk management in Germany) and other legal changes (Governance Codex) represent an effort to codify ERM methodologies and pattern regulatory regimes after them. To prepare for Pillar 2 requirements under Basel II, supervisory entities are upgrading their examination tactics to be able to assess current ERM capabilities within financial institutions. As a result of this increasing sophistication around ERM capabilities, investors are naturally seeking a greater understanding and a sharper perception of what is involved.

Chart 1 depicts the structural hierarchy of a large banking institution broken down into various business units. Each line of business measures and manages different types of risks (market, credit, operational, business, reputation) in different ways.



As an example, in the trading book, credit risk and operational risk are as important as market risk. Derivative transactions such as swaps, options, and forwards have stochastic credit exposure associated with them that depends on the dynamics of the associated markets.

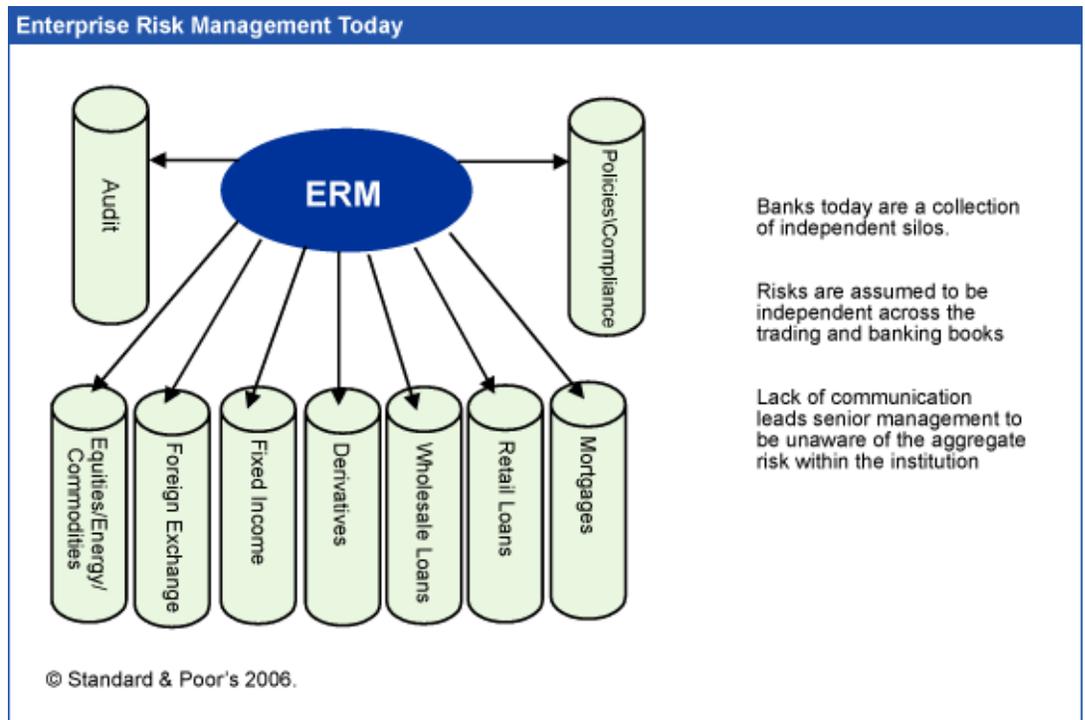
For example, to understand the credit risk exposures in the trading books of an institution, it is critical to have a clear picture of the methodologies employed to assess market risk. The modeling nuances and assumptions in terms of scenario generation and valuation methodologies used to assess market risk in the trading book need not

necessarily flow through in assessing credit risk, which is further characterized by detailed legal covenants, netting agreements, and collateral arrangements. In addition, the presence of credit derivatives, such as a credit default swaps, calls for further detailed credit risk analysis of the issuer.

Similarly, operational risk is currently widely discussed among regulators and practitioners. The Sarbanes-Oxley Act of 2002 (SarbOx) in the U.S. and the Eighth Directive in the EU are among the most sweeping legislation affecting corporate governance, disclosure, and financial accounting in more than a generation. Specifically, SarbOx Sections 302 and 404 require that CEOs, CFOs, and independent auditors certify the accuracy of financial statements and disclosures and the effectiveness of internal controls in place to ensure accurate reporting. While clarity and definition around several issues continue to evolve, operational risk managers have the responsibility to preserve shareholder value and meet regulatory requirements. This requires identifying, assessing, and measuring firm-wide operational risk while establishing transparency both internally and externally to investors and regulators. Also, effective 2007 (which may be delayed again in some continents), the new capital requirements of BIS II are expected to require financial institutions to implement a robust infrastructure for the collection and tracking of operational risk data. Clearly, a robust and consistent framework at the enterprise level is required to accomplish this.

*The silo-based approach of the risk management function today*

Most banks and large financial institutions have traditionally assessed risk in accordance with a silo-based philosophy as depicted in chart 2. This approach views business units as a collection of independent silos ignoring correlations and interdependencies. Risks are assumed to be independent across the banking and trading books, and across portfolios and products.



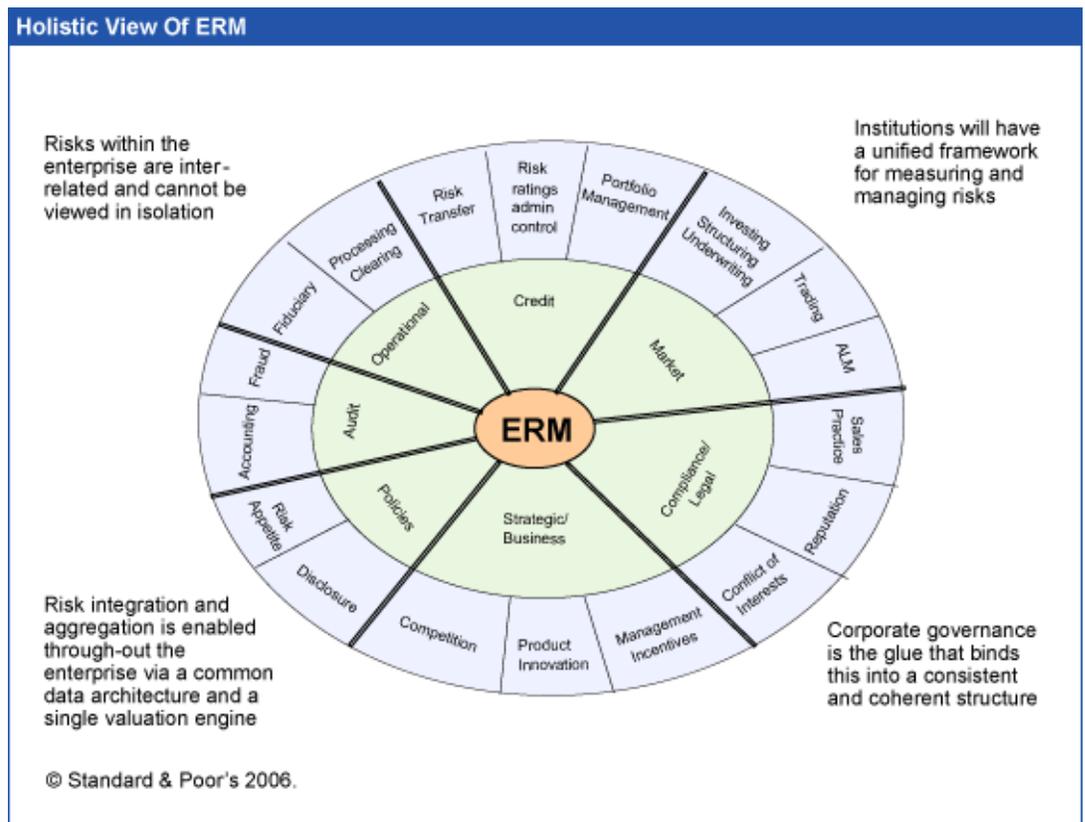
This approach leads to a potential misalignment of business strategy with the institution’s overall risk appetite, leading to a lack of awareness and accountability for the risks undertaken across the enterprise. In this structure the policies, methodologies, and infrastructure of the various groups evolve independently, not partaking of any

synergies. Thus the risk practices within the retail mortgage group may differ from those of the commercial mortgage group, as may those within the derivatives and energy groups. Furthermore, independent business unit analysis may fail to capture the cross relationships that may compound or mitigate certain institution-wide exposures. This independence of standards and practices across business units renders management’s task of assessing profitability and value-added difficult and opaque, resulting in potential failure to appropriately highlight certain risks and identify opportunities.

While there are obviously wide differentiations regarding the progress and level of risk management sophistication, banks and large financial institutions worldwide have nevertheless moved ahead and have begun implementing an ERM framework for measuring and monitoring risks. Why? The primary reason is that an ERM approach shifts the risk management focus to a strategic decision-support matrix aligned with the business objectives, from one that is primarily reactive, defensive, and viewed as a cost center.

*The holistic view of ERM*

So what will the risk function of institutions that adopt an ERM framework for managing and reporting risk look like in the future? Chart 3 provides a bird’s eye view of just that.



As institutions move along the path of risk evolution, ERM will get deeply entrenched at the core of the organization. In the process, institutions would have established a unified framework for measuring and managing risks across the enterprise. Risks would no longer be viewed and assessed in isolation. Instead, risks would be treated in a correlated fashion across multiple business lines, regions, portfolios, and products. Risk integration and aggregation would be enabled throughout the enterprise via a common data layer and a single

scenario and valuation engine. Finally, the nature and structure of the corporate governance arm would bind this together in a consistent and coherent manner.

Typically the ERM function covers all aspect of a firm's processes and activities and enables institutions to manage a wide array of risks in an integrated and holistic manner. ERM, when implemented successfully, benefits firms in a variety of ways by enhancing their ability to align their risk appetite with strategy, minimize operational surprises, decrease earnings volatility, manage cross-enterprise risks, increase capital efficiency, heighten risk awareness, and support prudent strategic decision making.

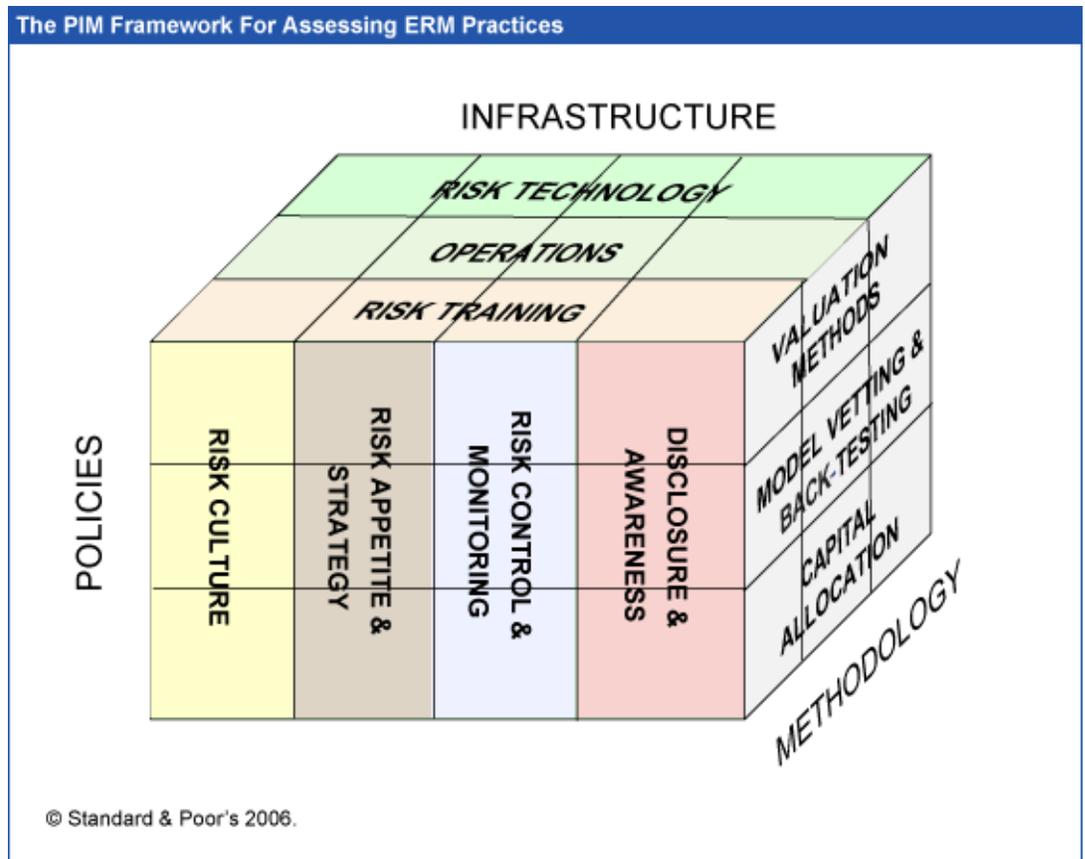
This bottom-up approach to assessing risk does not come without pain. As this approach calls for a deep understanding of each business unit's positions and interrelated risks, implementing this framework can be highly demanding on resources and time. A recent study by the Institute for Internal Auditors, "Enterprise Risk Management: Pulling It All Together," asserts that ERM is most effective when the internal audit function is allowed to play a pivotal role in its implementation. Clearly, through ERM there exists a tremendous potential to assess risk at the big-picture level, providing management and the board the prospect of achieving greater transparency and added shareholder value.

### The PIM Framework For Assessing ERM

Chart 4 is a graphic view of the PIM framework that underlies our structure for assessing financial institutions' ERM practices.

Along the policy dimension, we look at four key variables: stature of risk management, risk appetite, risk control process, and risk disclosure. In assessing the stature of the risk function we evaluate the role and structure of risk management (RM) and the overall quality of the risk function. For the risk appetite, we assess the process by which the *risk* tolerance is established qualitatively and quantitatively, and the robustness of the new product approval process. The risk control process opines on the established policies, the limit-setting process, and the limit-monitoring policies. For risk disclosure, we assess the quality of both internal disclosure and external risk disclosure.

Along the infrastructure component, we assess the quality of two primary attributes: risk architecture and back-office operations. With respect to risk architecture, we evaluate some potential risk factors such as the degree to which the risk systems are integrated, the data recovery process, and the quality of the institutions' business continuity planning strategy. In the case of back-office operations we evaluate the structure of the operations, the quality of the personnel employed, and the integrity of the data sources.



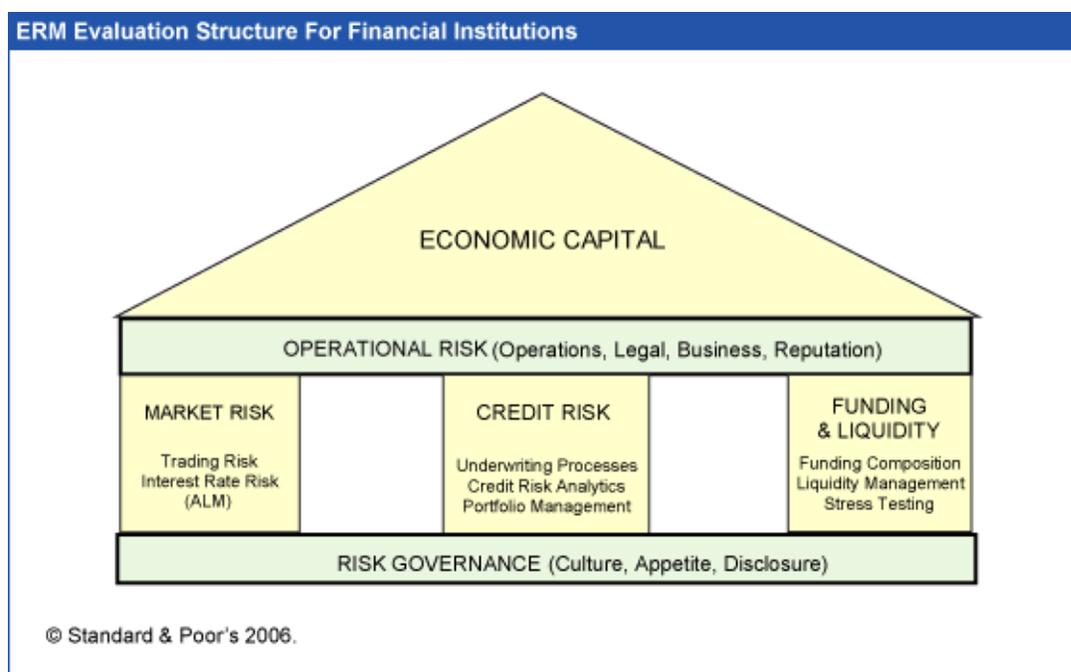
The methodology component assesses the quality of the valuation techniques employed by the institution in assessing market, credit, and operational risks, and the robustness of their model vetting processes. The valuation techniques evaluate the process employed by the institution around determining the relevant pricing methodologies for all transactions including those on the banking and trading book. We also assess the various risk metrics, including stress tests, sensitivity analysis, and other risk measures employed by the institution to assess and measure risk to the enterprise.

### ERM Evaluation Structure

In evaluating the ERM practices of financial institutions, we assess the practices and processes around five key areas; risk governance, operational risk, market risk, credit risk, and liquidity and funding. We are also starting to look in greater detail at economic capital assessments that some banks have developed to quantify these different risk types more consistently.

As illustrated in chart 5, we view risk governance as the foundation of the evaluation structure where we assess the quality of the risk culture, the risk appetite of the institution, the ability and robustness of how the firm aggregates risk at the enterprise level, and the quality of its risk disclosure.

Operational risk is inherent in all exposures that an institution faces and runs through all its activities. In addition to the robustness of the processes around a firm's operations, we evaluate the practices that an institution employs to insure against business, legal, and reputation risk.



Three key pillars of the evaluation structure are market risk, credit risk, and the risk to liquidity and funding. Market risk assesses the risk management practices for both trading risk and ALM or interest rate risk. In looking at credit risk, we evaluate underwriting processes, credit risk analytics, and portfolio management practices, while for funding and liquidity risk, we assess funding composition, liquidity management, and stress testing practices. Economic capital evaluation is outside the scope of the current document.

### ERM Evaluation Methodology

For each of the five key components that are evaluated, we describe factors that are considered favorable and less favorable in our assessment of the quality of an institution's ERM practices. By no means are these an exhaustive set of factors. They are subject to change as a result of the evolving nature of ERM. A qualitative score (excellent, strong, adequate, or weak) is used to describe an institution's overall ERM practices.

#### *Risk governance*

Culture.

In assessing the risk culture of an institution, we evaluate the stature of the risk function within the organization and its role and relationship with the business units.

The following factors are viewed as favorable to the assessments:

- The Risk Management function is independent of the business. Nevertheless, there would be a daily close partnership with the business through constant dialog.
- Risk Management has the authority to advise the business to cut positions or halt the execution of specific transactions if the need arises.
- Risk Management is involved at the outset, in the budgeting and planning process for the firm. This would involve active participation by the CRO at strategic planning sessions with senior management and/or the board.
- The institution seeks to appoint as senior risk managers individuals with significant business/trading experience and who may also have advanced degrees.

▪ The institution goes the extra mile to ensure that the stated culture of risk percolates through the organization. The following factors are viewed as less favorable to the assessments:

- The RM function, even though administratively independent of the business, plays a strong police role with minimal dialog with the business on a daily basis.
- RM would have no authority to advise the business to cut positions or halt the execution of specific transactions if the need arises.
- RM would not be involved with budgeting and planning.
- The RM function would be viewed as a cost center within the organization with little or no value added.

Risk appetite.

We assess how the risk appetite at the aggregate level is established for the firm, and the role Risk Management plays. Is this consistent with the business strategy, and how does the firm translate that appetite into a tangible quantitative metric?

The following factors are viewed as favorable to the assessments:

- An institution establishes risk appetite through dialog between RM and the businesses, strategically considering risk-reward trade-offs.
- An institution has established a clear tie between the aggregate level of risk tolerance and market, credit, and operational risk tolerances. The market, credit, and operational risk tolerances would be an allocation of the aggregate tolerance reflecting diversification effects and risk-reward trade-offs for the various risk opportunities and requirements.
- An institution expresses aggregate level risk tolerances holistically in terms of impact on earnings, volatility of revenues, capital, work force retention, and reputation.
- Market risk, credit risk, and operational risk tolerances are quantitatively expressed in terms of various metrics including, stress limits, stop-loss limits, and key risk indicator thresholds.
- An institution has established a clear definition of the nonperforming asset (NPA) process. There would be an NPA Committee consisting of all support functions, with any one having veto powers. The process would be clearly documented and electronically tracked.

The following factors are viewed as less favorable to the assessments:

- Institutions have the business establish the risk appetite with minimal or no dialog with RM and limited strategic risk-reward analysis.
- Institutions express aggregate level risk tolerances primarily quantitatively with almost no holistic view.
- Institutions have a limited set of metrics to monitor risk tolerances.
- Institutions have no clear structure and definition for the NPA process. The NPA committee would have all support functions, with no one representation having veto powers. The process would have little or no documentation and would most likely have a “paper” tracking process.

Risk aggregation and quantification.

We assess if and how an institution employs firm-wide metrics to understand the aggregate exposure to the firm. Do these metrics capture nonfinancial risks as well? How do these firm-wide risk measures get established and what is the level and quality of the interactions among RM, the board, and the business in establishing these metrics?

Is the firm in a position to monitor and aggregate risks across the organization? Can RM coherently describe how this process works and whose responsibility it is to aggregate risks across the various business lines? Is risk adequately controlled in smaller/remote offices?

The following factors are viewed as favorable to the assessments:

- In consultation with the business, the institution has established risk policies that would be approved by the board's risk committee.
- In association with business units, managers decide on appropriate global risk metrics that would effectively and accurately assess the firm's risk exposures.
- The institution ensures that periodic dialogue takes place among the board, business heads, and group RM on the appropriateness and relevance of the various key financial and nonfinancial risk metrics.
- The institution periodically provides senior management with a coherent picture of the aggregate risks that the firm is exposed to at any given point in time. This is accomplished with state-of-the-art risk technology that is developed either in-house or through an external vendor. Visits to remote offices by senior members of group RM would also be conducted regularly.

The following factors are viewed as less favorable to the assessments:

- RM plays second fiddle to the business in establishing the relevant global risk metrics to assess the firm's risk exposure.
- There is a limited view of the aggregate risks with no clear articulation of appropriate key financial and nonfinancial risk metrics.
- Senior management is provided with a myopic picture of the aggregate risks that are significantly more quantitative than qualitative in flavor, with minimal insight into the nonfinancial risks. There would be limited investment in risk technology and senior members of group RM would rarely visit remote offices.

Risk disclosure.

We assess how well informed senior management and the board are of the financial and nonfinancial risks. How often does the risk committee of the board meet to discuss the risks? Who participates in these meetings and how involved is the board in understanding the ERM initiatives within the organization? How frequently are internal audits of the RM function conducted, and what is the process for resolution? Administratively, what is the reporting structure for the audit function?

The following factors are viewed as favorable to the assessments:

- Have weekly, monthly and quarterly meetings with RM, the business, and senior management to discuss financial and nonfinancial risks.
- Articulate to senior management all risks through clear, high-quality internal reporting. Reports would contain qualitative and quantitative descriptions of the risks in terms of key risk indicators (KRIs), exposures versus limits, concentrations and exceptions, and where appropriate an assessment of the impact on earnings and capital.
- Ensure that the board is well engaged with ERM initiatives within the organization and is to some degree setting the tone.
- Proactively ensure that external disclosure to shareholders goes beyond the minimum requirements.
- Encourage periodic assessments of RM by independent internal audit.

The following factors are viewed as less favorable to the assessments:

- Infrequent meetings with RM, the business, and senior management. There would be minimal to no discussions of the nonfinancial risks.
- Risk reports that contain inadequate qualitative and quantitative descriptions of the risks, with no clear vision of the appropriate impact on earnings and capital.
- The board is almost never engaged with ERM initiatives.
- Minimal external disclosure.
- Little heed paid to the RM assessments conducted by internal audit.

### *Operational risk*

This is one area of risk management that is nascent and evolving. The approach that we have taken to assess this critical risk type is based on GE's six-sigma approach to quality control, namely the DMAIC process.

The process has the following five key components:

- Define (What is operational risk [OR]?);
- Measure (establish the risk indicators and relevant metrics);
- Analyze (assess the results; does it facilitate decision making?);
- Improve (iteratively improve the process through robust enhancements);
- Control (manage the process).

In short, the process is key. A robust process sets the foundation for strong risk management.

Definition and categorization of OR.

We assess how the OR management (ORM) function of the institution defines OR. Is this definition consistent across business lines? What educational programs are in place to ensure this consistency of understanding? Does the ORM function of the institution have a well-defined process for prioritizing the components of OR? Is there a cost benefit analysis in prioritizing both external and internal events?

What process does the institution employ to understand and analyze its OR? How does it differentiate among cause, event, and impact (or effect) of the loss event? What are the different components of operational risk that the institution has categorized as material to the ORM process? How does this map in with the cause, event, and impact process that is employed by the institution, and is there a clear mapping of legal/compliance and reputational risks?

The following factors are viewed as favorable to the assessments:

- A clear definition of what gets categorized as OR. (Outside the influence of pure market and credit factors are a set of variables that fall under the purview of operational risk. legal, compliance/regulatory, fraud, technology, people, information, strategic, and reputation are some components of OR). The categorization of OR would be consistent across business lines within the organization. There would also be a specific statement on OR that identifies roles, responsibilities, and functional scope that would be part of the broader ERM vision for the firm.
- Adequate education across the organization to ensure that there is a disciplined process toward establishing a consistent OR framework across the organization.
- Granular mapping of loss events, to the cause and their impact. (Understanding the cause of the loss event for each of the business lines is critical to the appropriate management of those risks.) The institution would also be in a position to clearly articulate the cause and effect of legal/compliance liabilities and reputational liabilities across business lines. (Assessing the impact of an event is of critical importance to the ORM process. Some of the key events are internal fraud, external fraud, product approval processes and business practices, BCP and IT process failures, and HR practices. There are several causes that lead to these events. Some of the more critical causes could include compliance/legal/regulatory causes, resources, fraud, technological, inadequate supervision, or key man causes.)
- Clear definition of the key causes of an OR risk impact, and understanding that any event could have a reputational impact (i.e., lead to foregone future income).
- Identification of the interrelation among cause, event, and impact of each risk for each business line. The institution would prioritize each risk within that business line on a cost benefit analysis (CBA) basis. (The use of a CBA approach to prioritize risks within a business line provides for a consistent platform across the organization and ties in with the broader business strategy for the firm.)

The following factors are viewed as less favorable to the assessments:

- A fuzzy definition of what gets categorized as OR. The categorizations would not necessarily be consistent across business lines and would not be part of the broader ERM vision within the organization.
- Inadequate support from senior management with very limited opportunity to educate personnel across the organization on what a consistent ORM framework would entail.
- A limited understanding about assessing the impact of an event with spotty mapping of loss events, to their cause and impact.
- No coherent prioritization of OR.

Measurement and reporting of OR.

In assessing how institutions measure and report on OR, we look at how the institution collects OR loss data. Is this process consistent across business lines and does the institution use external/internal data or a combination of the two to measure and monitor its operational risks?

Does the firm coordinate its efforts across business lines to capture and track event and risk indicator information? How does the institution classify its key risk indicator information?

What is the quality of the institution's OR reporting? Is there a heat-map process that exposes the risk profile of each of the business units, and how is this used by senior management to manage the institution's OR exposure and to improve the OR control processes?

The following factors are viewed as favorable to the assessments:

- Operational loss data is tracked by business lines using parameters that are consistent across the organization. If institutions use external data in their analysis, measurement, and control of operational losses, it should be done with appropriate adjustments (i.e., external data sources may not be relevant to the institution in question and hence may need to be scaled or adjusted).
- Efforts are coordinated across the organization in identifying and tracking predictive indicators and drivers of operational risk. There would be an effort to capture both qualitative and quantitative data on risk drivers. The institution would attempt to classify its KRIs by type (such as a control indicator, a composite indicator, or an inherent indicator), by risk class (such as people or technology), and by whether the KRI is specific to the business unit or is firm wide. Backtesting these indicators is critical to ensuring the quality and usefulness of the ORM process.
- Sound practices would have established a heat map or OR dash board that highlights the operational risk exposure of each of the business units in a way that would provide for effective decision making by senior management.

The following factors are viewed as less favorable to the assessments:

- Operational loss data for a limited number of business lines is not necessarily consistently across the organization. There may be a substantial dependence on external data sources with minimal or no adjustments to reflect the institution's characteristics.
- Minimal resources and effort is allocated to capture both qualitative and quantitative data on risk drivers. The institution would not be in a position to identify its KRIs by type (such as a control indicator, a composite indicator, or an inherent indicator), or by risk class (such as people or technology).
- No established heat map or OR dash board that highlights the operational risk exposure of each business unit in a way that would provide for effective decision making by senior management.

### ***Market risk***

Trading risk .

In assessing the quality of market risk management, we look at trading risk and the process for managing interest rate exposure. For trading risk, we assess how the market risk tolerance for the firm is established. Is it consistent with the business strategy and is there a well-defined process for the approval of new products?

How do risk limits get assigned? Who assigns them? At what levels are the limits set (e.g., region, desk, book, portfolio, trader) and what types of limits are used? Who has the authority to grant exceptions?

Do pricing models exist for all transactions? How are complex transactions valued? How frequently are models reviewed? How is counterparty credit exposure as it relates to the trading book calculated? Are credit derivatives integrated into the exposure measurements? How are stress tests constructed? How frequently is stress testing conducted and revised? Can ad-hoc or “what-if” scenarios be run through the daily process if required?

The following factors are viewed as favorable to the assessments:

- Risk tolerances in terms of VaR limits, stress limits, stop-loss limits, and intraday limits during times of excess volatility established through dialog with Market RM and the business. Illiquid products or positions would have additional limits.
- A clear definition of the types of transactions that are required to go through the NPA process.
- RM-assigned limits to the business units and all the way down to the desk heads after dialogue with the business heads and other senior management through the risk management committees. Desk heads would also assign limits to individual traders after adequate dialogue with RM.
- RM has authority to grant limit exceptions, as does the business, where appropriate. There would be clear limitations on the tenor of temporary limit exceptions.
- RM reviews all pricing models periodically with a gap of no longer than six to nine months for structured and complex products. All pricing models that are current would be clearly documented, stating the type of model, underlying assumptions, the pricing algorithms, accuracy level, permissible range of parameter values, model limitations, and date of last review. The methodology for calculating counterparty credit exposure would go beyond add-on methods to account for the stochastic nature of the underlying risk factors. There would be a clear articulation of capturing double defaults in exposure measurements for CDs.
- RM vets all pricing models independently of the business, clearly specifying the mathematical logic and assumptions underlying the models. Data sources for the inputs to the models and the appropriate procedures for estimating model parameters would be well established and documented.
- Stress tests are created in conjunction with macroeconomic analysis, historical scenarios, hypothetical scenarios, and a hybrid of the two. Scenarios would be revised every six to nine months, and more frequently during periods of prolonged uncertainty. Stress tests would be run at varying levels of granularity depending on the concentrations and vulnerability of the portfolio.
- Carefully analysis of correlations across risk factors to assess implied effects.
- The capability to run “what-if” or “one-off” scenarios for a specific book or transaction.

The following factors are viewed as less favorable to the assessments:

- The business primarily establishes, assigns, and monitors market risk tolerances.
- Market risk tolerances are expressed with a limited number of quantitative metrics.
- A fuzzy definition of transactions that go through the NPA process.
- Limited stress tests and scenario analysis.
- Lack of ability to conduct “what-if” analysis.

ALM/IR Risk.

In assessing asset-liability management (ALM; or interest rate risk [IR]), we evaluate an institution's assumptions about the maturity structure of the balance sheet and how the firm models the duration and price sensitivity of the various classes of liabilities with indeterminate maturities and/or administered pricing.

The process by which spread risk and prepayment risk is measured is also assessed. What hedging strategies does the firm employ? In measuring interest rate risk, is there a reliance on gap analysis, duration matching, or other dynamic metrics and (third party) models?

We also assess how scenarios are developed and tested by the institution. How frequently are the scenarios run and what is the methodology for yield curve forecasting (or simulation)? How does this tie in with the scenarios that are developed?

The following factors are viewed as favorable to the assessments:

- Clear articulation of the assumptions used both from a theoretical and business perspective, in modeling the maturity of the balance sheet. The institutions would have performed the necessary analysis and research based on internal and external data.
- Prepayment risk is modeled rigorously, using in-house data and relevant modeling assumptions. (The key issue here is the modeling of interest rate dynamics. Institutions with sound practices would use factor models for the interest rate evolution process, but the rationale for doing so would be explicitly articulated and supported by strong analytical evidence.)
- Use of stochastic techniques instead of static measures for measuring IR risk. If using a third-party valuation system (such as QRM), the institution would avoid a "black-box" syndrome by establishing the ability to change and "tweak" the models to meet its needs and to conduct "what-if" analysis.
- Clear and robust methods used in scenario analysis. Future IR scenarios would be evolved using either a one- or two-factor IR model. In creating scenarios, the firm should then stress earnings based on these IR evolution processes. If the forward curve is used as the "best predictor" of future interest rates, then in addition to the standard parallel shifts, the institution would include steepening, inverted, or twisted scenarios in its analysis.
- Stress tests constructed in conjunction with macroeconomic analysis, historical scenarios, hypothetical scenarios and a hybrid of the two. Scenarios would be revised periodically and more frequently during periods of prolonged uncertainty.
- Clear capability to run "what-if" or "one-off" scenarios to assess the sensitivity of earnings, net income, and equity.

The following factors are viewed as less favorable to the assessments:

- Use of limited assumptions in modeling the maturity of the balance sheet. The institutions would have performed minimal to no analysis and research in arriving at these assumptions.
- Simplistic prepayment modeling assumptions that do not consider option-adjusted spread techniques.
- Reliance on static gap and duration measures for assessing IR sensitivities.
- Inadequate scenario construction methods and little ability to conduct "what-if" analysis.

### ***Credit risk***

Underwriting process and portfolio management.

In assessing the underwriting process, we evaluate the clarity of an institution's underwriting policies and the process for establishing the relative risk appetite. Is there an adequate degree of segregation between origination and underwriting staff/processes? What are the criteria and internal approval structures that the institution has adopted in the delegation of its underwriting processes?

What is the structure of on- and off-balance-sheet exposures? What is the process for monitoring outstanding exposures for early warning signals of potential problems? What is the level of diversity in the portfolios (by geography, collateral, maturity, borrower type, etc.)? What is the tolerance for large exposures to individual names and/or sectors and the process for collections and recoveries?

The following factors are viewed as favorable to the assessments:

- Well-articulated policies governing the types of exposures the institution is willing to accept, with effective procedures to ensure that underwriting criteria/processes are consistent with that policy. Underwriting policies and processes would be reviewed periodically to ensure that during times of low yield, standards are not compromised. Underwriting standards would be recalibrated to historical experiences.
- Clearly documented criteria that establish the delegation of the underwriting processes throughout the organization. They would allow for sufficient detail by product type and customer groups.
- A low tolerance to concentrations in the portfolio, including large exposures to single names and sectors.

The following factors are viewed as less favorable to the assessments:

- Inadequate policies governing the types of exposures the institution is willing to accept.
- Compromise on underwriting policies during times of low yield, with minimal to no recalibration of underwriting standards to historical experiences.
- Lack of clear criteria for the delegation of the underwriting processes within the organization.
- Lack of strict guidelines regarding exposure concentrations.

Credit risk analytics.

We assess the quality of an institution's ability to quantify its credit exposures on a stand alone basis as well as on a portfolio basis. Is there a strategic view to credit risk management? Does the institution have a global credit exposure management system?

To what extent does the institution use internal credit rating and scoring applications, and/or behavioral systems in its credit decisions? Does the institution use internal probability of default (PDs), loss given default (LGDs), and exposure at default (EADs) for its expected loss (EL) modeling? To what extent has the institution stress tested these parameters?

The following factors are viewed as favorable to the assessments:

- Technical infrastructure to quantify credit exposure on a single-name basis as well as on a portfolio basis. There would be strong support from senior management to manage exposures based on advanced portfolio analytics and quantitative methods.
- Robust exposure management systems that are updated continuously so that exposure can be monitored in near real time.
- Sound internal credit rating models built on well-tested behavioral assumptions. Robust and granular internal data warehousing and systems infrastructure would extract customer-related information and market rates on demand. The institution would possess highly robust historical data on PDs, LGDs, EADs, covenants, and commitments.
- Ability to calculate several risk measures such as EL, UL, and marginal risk contributions. Significant research would establish default correlations and credit exposures would be actively managed on a portfolio basis.
- Extended analysis using advanced quantitative techniques such as Extreme Value Theory and Monte Carlo simulations to arrive at a loss distribution for the portfolio that would address economic capital allocation issues and risk-adjusted performance measures.

The following factors are viewed as less favorable to the assessments:

Limited to no support from senior management that would encourage the use of advanced portfolio analytics and quantitative methods to manage exposures.

- Lack of technical support and systems infrastructure to update and monitor exposures on a continuous basis.
- Spotty to no internal data relating to PDs, LGDs, EADs, and other customer-related information.
- Rudimentary or crude risk measures used to manage the credit exposure in the portfolios.
- Lack of a risk-based approach to capital allocation with no performance measurement metrics.

### ***Liquidity and funding***

In assessing the quality of an institution's liquidity and funding practices, we evaluate how well established and documented the funding policies are, and the extent to which the institution places a premium on maintaining diverse funding sources (by product, investor type, geography, etc).

We assess how this process is managed and monitored, the day-to-day practices of managing its funding position, and the degree to which the institution has conducted behavioral analysis of its assets and liabilities.

How does the institution model the expected impact of a liquidity crunch? How severe/realistic are the liquidity stress scenarios and the net outflows that would result from such scenarios? Does the institution maintain sufficient liquidity capacity (unencumbered liquid assets, bank facilities, etc.) to raise emergency liquidity?

The following factors are viewed as favorable to the assessments:

- A diverse funding profile without overreliance on any single product/source.
- ALCO reports that include gap analysis and similar techniques to analyze the expected maturity profile of its assets and liabilities over future periods.
- Extensive stress testing and/or contingency planning to demonstrate the ability to source sufficient liquidity to survive a reasonably modeled worst-case scenario.
- Ability to survive a reasonably modeled worst-case liquidity stress scenario without damaging the franchise.
- At least one year's coverage of short-term debt.

The following factors are viewed as less favorable to the assessments:

- Significant reliance on a couple of sources/products for funding needs and inadequate documentation on funding policies.
- Limited stress testing and/or contingency planning to demonstrate the ability to source sufficient liquidity to survive a reasonable worst-case scenario.
- Inability to survive a reasonable worst-case liquidity stress scenario without damaging the franchise.

### **ERM Assessment Classification**

Institutions with Weak ERM practices cannot consistently control all of the major risks. Control processes are incomplete and these institutions have limited ability to fully identify, measure, or manage major risk exposures. Weak ERM practices may have an adverse effect on the ratings on the institution.

Adequate ERM practices would describe institutions that have fully functioning risk control systems in place for all major risks. The risk management process is solid, classical, and established governance structures, although primarily silo-based. Nevertheless, these institutions often lack a clear and holistic vision of their overall risk appetite. Risk limits for various risks have usually been set independently, and systems for each risk element usually function completely separately, without significant coordination across silos of its risks. Institutions with Adequate ERM practices also lack a robust process for identifying and preparing for emerging risks. Since neither cross-risk views nor overall risk tolerance exists, no process to optimize risk-adjusted return is present either. We

do not expect these companies to experience any unusual losses outside of their separate risk tolerances unless a rapid, major change occurs in the environment related to one or more of their major risks. Institutions can also have Adequate ERM practices if they have developed a cross-risk view, and an overall risk tolerance that uses risk-return considerations for its business decisions, and have a process for envisioning the next important emerging risk, but do not have fully developed controls. We do not view Adequate ERM practices as a negative factor in the ratings process.

Institutions with Strong ERM practices would have exceeded the Adequate criteria for risk control and have a vision of their overall risk appetite and risk tolerances. There would be a sound risk governance process with a well-established operational risk structure that is tied to the risk-adjusted returns for the various alternatives, and a goal for optimizing risk-adjusted returns. In addition, Strong programs would have robust processes to identify and prepare for emerging risks. We expect that the ERM practices of such institutions would be a strategic and competitive advantage over time. The process of selecting choices that have the best risk-adjusted returns should result in lower losses per unit of income over time, allowing such institutions to choose among offering lower prices, retaining higher capital, and obtaining funding at a lower net cost than those of competitors without such a strategic ERM practice.

Institutions with Excellent ERM practices share all the criteria for structures considered Strong, but are more advanced in their development, implementation, and execution effectiveness. An Excellent ERM practice will have developed its processes more fully over time, may have implemented it throughout a higher percentage of its group, and/or may be executing the process more effectively. Excellent ERM practices are more likely to have a positive impact on an institution's ratings.

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