

Article Title: ARCHIVE | Criteria | Insurance | General: Enterprise Risk Management Data: (EDITOR'S NOTE: —This criteria article is no longer current. It has been superseded by "Insurers Rating Methodology," published July 1, 2019.) 1. S&P; Global Ratings is publishing this article to help market participants better understand its approach to assessing insurance companies' enterprise risk management (ERM). Our assessment of ERM examines whether insurers execute risk management practices in a systematic, consistent, and strategic manner across the enterprise that effectively limits future losses within the insurers' optimal risk/reward framework. 2. This paragraph has been deleted. 3. This article partially supersedes "Bond Insurance Rating Methodology And Assumptions," published Aug. 25, 2011. SCOPE OF THE CRITERIA 4. These criteria apply to all global insurance ratings, including life, health, property/casualty (P/C; known as non-life outside of the U.S.) insurers, reinsurers, bond insurers, insurance and reinsurance brokers, and mortgage and title insurers. SUMMARY OF THE CRITERIA 5. The evaluation of insurance companies' ERM is a component of our rating analysis. ERM examines whether insurers execute risk management practices in a systematic, consistent, and strategic manner across the enterprise that effectively limits future losses within an optimal risk/reward framework. ERM analysis also provides a prospective view of the insurer's risk profile and capital needs. 6. ERM analysis is tailored to each insurer's risk profile and focuses on five main areas: risk management culture, risk controls, emerging risk management, risk models, and strategic risk management. 7. These criteria bring enhanced transparency to our ratings by articulating how we score each of the abovementioned five subfactors and how we derive an insurer's ERM score based on these five subfactor scores. 8. This paragraph has been deleted. 9. This paragraph has been deleted. METHODOLOGY The Subfactors Of Enterprise Risk Management Analysis 10. ERM analysis is comprised of five subfactors: Risk management culture, Risk controls, Emerging risk management, Risk models, and Strategic risk management. 11. The criteria in this article determine how each of these five subfactors is assessed and how the assessments of these five subfactors are combined to derive the insurer's ERM score. ASSUMPTIONS Determining An Insurer's Enterprise Risk Management Score 12. An insurer's ERM is scored as (from most to least credit-supportive) (1) "very strong", (2) "strong", (3) "adequate with strong risk controls", (4) "adequate", or (5) "weak", based on the assessments of the five subfactors, which we classify as "positive", "neutral", or "negative" (see tables 1 and 2). The criteria identify key considerations in the assessment of the subfactors. Table 2 describes these considerations but it is not an exhaustive list of circumstances under which corresponding scores are assigned. 13. The analysis is evidence-based. An insurer receives a neutral score for any of the five subfactors where evidence is insufficient to assign either a positive or a negative score. However, a history of failing to disclose key enterprise risk exposures and risk management information could lead to a negative score. Table 1 ERM Assessment SCORE ASSESSMENT GUIDELINE WHAT IT MEANS IN OUR OPINION 1 Very Strong Positive score for all subfactors and economic capital model (ECM) is assessed either "good" or "superior" under our criteria. The insurer has very strong capabilities to consistently identify, measure, and manage its risk exposures and losses within its chosen risk tolerances. The insurer's risk control processes are leading edge, applied consistently, and executed effectively. The insurer continues to develop its risk control processes to integrate new technologies and adapt to the changing environment. There is consistent evidence of the insurer's practice of optimizing risk-adjusted returns, resulting in an overall stronger financial performance than peers'. Risk and risk management heavily influence the insurer's decision-making. The insurer is highly unlikely to experience unexpected losses that are outside of its risk tolerances, in our opinion. 2 Strong The risk management culture, risk controls, and strategic risk management subfactors are scored positive, one or both of the other two subfactors is scored neutral, and no subfactor is scored negative. The insurer has strong capabilities to consistently identify, measure, and manage risk exposures and losses within chosen risk tolerances. There is clear evidence of the insurer's practice of optimizing risk-adjusted returns. But such practice is not as well developed as that of a very strong ERM insurer or has a shorter track record of success. Risk and risk management are important considerations in the insurer's corporate decision-making. In our opinion, the insurer is somewhat more likely to experience unexpected losses that are outside of its risk tolerances than an insurer with a very strong ERM score. 3 Adequate with strong risk control The risk controls subfactor is scored positive, the strategic risk management subfactor is scored neutral, and no

subfactor is scored negative. The insurer has all the characteristics of an insurer with an adequate score, but has also established a variety of risk controls that we view in aggregate as positive. 4 Adequate The risk controls and risk management culture subfactors are scored at least neutral; overall doesn't satisfy the requirement for adequate with strong risk control. The insurer has capabilities to identify, measure, and manage most key risk exposures and losses, but the process has not been extended to all significant risks facing the enterprise. The insurer's loss/risk tolerance guidelines are less developed than those of insurers with a higher ERM score. The insurer demonstrates sufficient execution of its existing risk management programs, albeit less comprehensive than that of insurers with a strong ERM score. Risk and risk management are often important considerations in the insurer's decision-making. In our opinion, the insurer is more likely to incur unexpected losses than an insurer with a strong ERM score. 5 Weak One or both of the risk controls and risk management culture subfactors are scored negative. The insurer has limited capabilities to consistently identify, measure, and manage risk exposures across the enterprise and, thereby, limit losses. The insurer demonstrates sporadic execution of its risk management program; losses aren't expected to be limited in accordance with a set of predetermined risk tolerance guidelines. The insurer has yet to adopt a risk management framework and is currently satisfying regulatory minimums without regularly applying risk management to business decisions; or it has very recently adopted a risk management system that has yet to be tested. Risk and risk management are sometimes considered in the insurer's corporate decision-making process.

Table 2 Scoring The Five ERM Subfactors

SUBFACTOR	POSITIVE	NEUTRAL	NEGATIVE
Risk management culture (see paragraphs 18 to 34)	ERM is well entrenched in the organization with a formal ERM framework, an independent and well-staffed ERM department, and active Board participation. The insurer has some ERM functions at the enterprise level that cover most material risks. ERM is not practiced, or is practiced inconsistently, across the enterprise, with limited Board participation. The insurer has a clear vision of enterprise risk profile and risks are managed both at a business unit and an enterprise level within risk tolerances. There is limited or infrequent Board participation. The insurer lacks clear understanding of its enterprise risk profile. The insurer's risk appetite framework is clearly communicated and linked directly to risk limits. Risk and risk management are mainly responsibilities of business functions with limited enterprise view. The insurer manages risks predominantly in silos. The insurer has a culture of risk communication and information sharing, internally and externally. The insurer understands its enterprise risk profile around key risk exposures and manages them within chosen risk tolerances. The insurer lacks a formal risk appetite framework supported by clear rationale; risk limits do not exist or are very basic. The insurer's incentive compensation supports ERM goals. The insurer's risk appetite is less clearly defined or communicated; risk limits are fairly simple or do not align with overall risk tolerances.		
Risk controls (see paragraphs 35 to 42)	The insurer has identified all material risks from all sources and frequently monitors its risk exposures with multiple metrics. The insurer has identified and monitors its main sources of material risks. The insurer does not consistently identify and monitor its key risk exposures. The insurer has a comprehensive risk limit system and strict formal limit breach policies. The insurer has risk limits around its material risks, but the limits are relatively simply or lack linkage to risk appetite. The insurer has limited formal risk limits, or its risk limits are overly aggressive, providing no practical value in controlling exposures. The insurer uses multiple risk management strategies to effectively manage exposures within limits. The insurer has a formal limit enforcement policy in place. The insurer has no limit enforcement policy; there is evidence of prolonged breach of limits. We score risk controls of material risks predominantly as positive, and none negative. The insurer generally manages its risk exposures within the risk limits. We score one or more risk controls on material risks as negative. We score no risk controls of material risks as negative.		
Emerging risk management (see paragraphs 43 to 46)	The insurer has well-established processes for identifying and monitoring emerging risks, analyzing their significance, and preparing for and/or potentially mitigating them. The insurer has some processes in place to identify and analyze the impact of emerging risks; but these processes are more ad-hoc and don't lead to risk mitigations. The insurer doesn't have processes for identifying and evaluating emerging risks.		
Risk models (see paragraphs 47 to 52)	The insurer's risk models capture all material risks and risk interrelations in aggregating exposures. The insurer's risk models capture major risks. However, the models are less comprehensive or process used to aggregate enterprise risk exposures		

are less sophisticated than those at insurers scored positive. The insurer doesn't use risk models or the risk models fail to capture major risks. The insurer's models have undergone robust validation and vetting and are under strict model governance processes. Model results are used to support the insurer's decision-making process, but are not as extensive as to pass "use test". The insurer's risk models have undergone limited validation or vetting. Model limitations are understood and compensated within the organization. There are general concerns about data quality, assumptions, and governance. These models perform both stochastic and deterministic scenario analysis. The insurer makes little use of, or overly relies on, model results in decision-making. The insurer uses model results extensively in the decision-making process (or "use test" in industry parlance). Strategic risk management (see paragraphs 53 to 56) The insurer has a track record of consistently using a risk vs. reward decision-making framework to optimize risk-adjusted returns at an enterprise level. The insurer uses some risk/reward analysis in decision-making, but the metrics and processes applied are inconsistent across the company. The insurer does not optimize risk-adjusted returns; risk and risk/reward analysis is not adequately reflected in the insurer's decision making. Risk considerations and risk adjusted return metrics, including economic capital model results, significantly influence the insurer's decisions around pricing, risk management strategies, capital allocation, strategic planning, reinsurance decisions, and strategic asset allocation. The insurer's capital allocation is risk-based, but mainly reflects the views of external constituents, e.g. regulators. The insurer's capital management process only reflects the views of external constituents, e.g. regulators. 14. All else being equal, an insurer with a stronger ERM score is less likely to experience losses outside its predetermined risk tolerances under our criteria. The aggressiveness or conservativeness of its risk tolerances, although related to ERM, is assessed in the management and governance analysis (see "Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers," published Nov. 13, 2012). 15. The importance of ERM to the rating is "high" for insurers exposed to complex risks that could cause a significant loss of capital and earnings in a short period of time or that are highly uncertain and usually long term in nature. Typically, high importance applies to companies with significant exposure to risks such as natural catastrophes, reserve volatility of their long-tail casualty business, or financial market volatility. If the insurer is not significantly exposed to these types of risk or regularly retains excess capital relative to risk, the ERM importance is "low". 16. To derive insurance groups' group credit profiles (GCPs), we generally assign a single ERM score because the scope of our analysis is the whole enterprise, encompassing all subsidiaries. The group's ERM score is assigned to group members that are either "core" or "highly strategic" (see "Group Rating Methodology," published Nov. 19, 2013). The group's ERM score could also be assigned to "strategically important" group members that are well integrated into the group ERM processes, such that their processes are virtually indistinguishable. For all other cases, the ERM score is assigned from a stand-alone perspective and may deviate from the ERM score of the group. We incorporate significant deficiencies in their ERM practices, if any, in our analysis of the group's ERM. 17. In general, start-up companies are not assigned an ERM score higher than adequate, due to insufficient historical evidence of effective processes; they nevertheless are scored on all five subfactors. A start-up insurer may receive a score higher than adequate if, for example, it was part of a larger organization with a strong ERM score, and if it can demonstrate that it has the commitment, resources, and plans in place to continue the robust ERM practices already in place within the start-up. Risk Management Culture 18. The analysis of the first ERM subfactor, risk management culture, focuses the importance accorded to risk and ERM in all key aspects of the insurer's business operation and corporate decision-making. As risk management culture encompasses all aspects of the ERM framework and all the ERM subfactors are interconnected, it is difficult to evaluate this subfactor without reference to the others. For that reason, the analysis of the risk management culture subfactor focuses on the insurer's philosophy towards risk, especially its risk appetite framework, risk governance and organizational structure, risk communications and reporting, and the embedding of risk metrics in its compensation structure. The analysis also evaluates the degree to which there is broad understanding and participation in risk management throughout the organization. 19. S&P's Global Ratings' analysis focuses on, in particular, indicators in the following key areas of the risk management culture: Risk governance and organization structure, Risk appetite framework, Risk reporting and communication, and Incentive compensation

structures. Risk governance and organization structure 20. A formal, well-defined, and independent risk governance and ERM organization structure is fundamental to an effective ERM framework. A positive risk management culture is typically characterized by a well-defined and independent ERM governance structure that supports effective risk management at an enterprise level. Such governance structure typically involves guidance and oversight from the Board of Directors, a dedicated ERM function led by a well-qualified senior executive and risk management functions at the business unit level, and a clear definition of roles, responsibilities, and reporting relationships. Additional evidence that supports a positive score can include an ERM function that has been in place for several years, enjoys high visibility, and carries significant authority within the organization. Insurers with a positive risk management culture score typically have an effective system of risk committees both at the enterprise and the business unit levels, supported by significant resources committed to day-to-day execution. The insurer also has enterprise level functions that aggregate and manage risks with an enterprise view, taking into consideration correlation and diversification. 21. An insurer with a neutral score on the risk management culture subfactor typically has some of the characteristics of those with a positive score, but with a risk governance and organizational structure that isn't equally comprehensive or is still fairly new. Insurers may also receive a neutral score if the management of key exposures is mainly a function of the insurer's business units, without enterprise-level risk view or risk supervision. 22. An insurer's risk management culture score is negative if the Board and senior management display a lack of understanding of the importance of ERM and have insufficient active involvement in the ERM process. Evidence that might lead to such a score includes the absence of dedicated resources to risk management, blurry risk ownership and reporting lines, and sporadic/ad-hoc Board level risk discussion. If an insurer has a risk management structure where key risks are managed in complete silos, the score could also be negative. Risk appetite framework 23. Strong ERM is consistent with a well-defined risk appetite framework that supports the effective selection of risks, so that the insurer takes only desired risks where sufficiently rewarded. Most insurers, independent of their size and complexity, have some capabilities to limit their risk exposure and losses within their chosen risk tolerances. The aggressiveness or conservatism of an insurer's risk appetite is a related issue, but separately considered under the financial risk tolerance criteria detailed in "Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers," published Nov. 13, 2012. The ERM score reflects our view of management's ability to operate within stated risk tolerances. In cases where we consider an insurer's risk appetite aggressive, we believe the strength of its ERM framework is critical to the management of risks within the chosen risk tolerances. 24. The meanings of terms such as risk appetite, risk preferences, and risk tolerances vary across the industry and in reference materials. Appendix 1 contains the definitions our criteria use. The criteria concentrate on the processes around the establishment and use of risk appetite, rather than the precise definitions insurers use. 25. Insurers with a positive score on risk management culture typically demonstrate a thorough understanding of the enterprise risk profile in relation to its risk appetite, a well-defined risk appetite framework, and a track record of containing risk exposures within the chosen tolerances and limits. Such risk appetite framework typically means active involvement from the Board, and strong buy-in from senior management and business units, while being well aligned with the organization's strategic goals, resources, and value proposition. There are clear rationales supporting the chosen risk tolerances and limits. The insurer typically is able to articulate the direct linkage between enterprise risk preferences, risk tolerances, and risk limits and policies. 26. A neutral subfactor score is assigned to insurers with a risk appetite that is less clearly defined or communicated or hasn't extended to all key risk exposures. An insurer with a neutral score generally has a system of risk limits in place on its key exposures, although these limits might be fairly simple or not directly linked to overall risk tolerances. 27. Insurers with a negative score have failed to demonstrate a clear understanding of their risk profile. That is, their risk appetite is either unclear or inconsistent or not supported by robust risk/reward metrics. Either the insurer has not imposed limits on some of its key exposures or its risk limits are overly aggressive to allow for outsized risk taking. Risk reporting and communication 28. A positive risk management culture score typically is consistent with an insurer's extensive and clear communications, both internally and externally, around its risk exposures and ERM practice. Such insurer has a long-standing culture of risk communicating and sharing, supported by a web of comprehensive and

frequent risk reporting around all key areas of risk exposures. Enterprise risk profile and risk management practices are typically clearly communicated internally (to the Board, senior management, and to business level) and externally (notably to regulators, investors, and analysts). Also supporting a positive score is an insurer's commitment to a high level of transparency during its discussions with S&P; Global Ratings. For example, the management is open to discussing with external constituents lessons learned from past mistakes or current areas of improvement. 29. A negative score is assigned to insurers with only very limited internal risk communications to the Board or external disclosure about its risk management practices; or if the insurer uses risk reports that are not frequently updated or not granular enough to reflect its risk exposures; or if the insurer has a track record of failing to disclose key enterprise risk exposures and risk management information. 30. An insurer will get a neutral score if it fits into neither the positive or negative category. Incentive compensation structures 31. The alignment of a compensation structure with metrics that encourage long-term goals, rather than those incentivizing excessive risk taking is an important element of a positive risk management culture subfactor. Evidence that the insurer's incentive compensation structure rewards managers based on an analysis of risk/return tradeoffs, and that it is consistent with the insurer's strategic goals and objectives, generally supports a positive risk management culture score. 32. Incentive compensation structures not supported by robust risk reward metrics that reward managers predominately using medium- to long-term profitability targets, but that do not promote short-term risk taking, are consistent with a neutral subfactor score. 33. A negative score is generally assigned where short-term profitability or business-volume is the key influence of an insurer's compensation design. 34. The analysis of an insurer's risk management culture subfactor involves assessing the above-mentioned components, as well as considering the reflection of risk management culture in the other ERM subfactors. Risk Controls 35. The second subfactor, risk controls, analyzes the processes and procedures insurers employ to manage their key risk exposures within the general areas of credit and counterparty risk, equity risk, interest risk, insurance risk (including underwriting and reserving risk), and operational risk. The specific risks on which the analysis focuses are a function of the insurer's business and risk profiles. For example, market risk is a focus for an insurer with a large U.S. variable annuity business or a large U.K. life with-profits business, but not so much for a property and casualty insurer with only short-term liabilities and limited equities and real estate in its investment portfolio. The analysis may also extend beyond these broad risk categories, for example, to merger and acquisition (M&A;) risks if the insurer has an acquisitive business strategy. 36. To score the risk controls subfactor for an insurer, the criteria first require scoring of the risk controls of each of the insurer's material risks as positive, neutral, or negative. The combination of these individual risk controls scores determine the overall risk controls score using the same scale of positive, neutral, or negative. Each risk's relative importance to the insurer's overall risk profile determines its weight in the score combination. Table 3 describes the general guidelines used to derive an insurer's risk controls subfactor score from the individual assessments of risk controls on the insurer's key risks. Table 3 Risk Controls Subfactor Assessment SCORE GUIDELINE Positive Risk controls of materials risks are predominantly scored positive; no risk controls of an individual risk is scored negative Neutral All other combinations Negative One or more risk controls of material risks is scored negative 37. To arrive at one individual risk control score for each of the insurer's major risks, various aspects of the risk control process, including risk identification, risk measurement and monitoring, risk limits and standards, the procedures to manage risks to stay within limits, and the execution and the results or effectiveness of such risk control programs, are analyzed. The criteria also consider risk limit enforcement processes and the insurer's practice of learning from its own, or the industry's, experiences. The combined quality, comprehensiveness, and effectiveness of these aspects of an insurer's risk controls lead to the assessment of risk controls for each of the insurer's major risks. 38. A positive individual risk control score is assigned if the insurer has an effective risk control program in place to consistently identify, measure, monitor, and manage the risk exposures and is able to demonstrate a track record of effectively managing risk exposures within pre-determined risk tolerances, even during stressful periods. Such program generally involves an established risk-specific risk management structure, comprehensively identifies risk exposures from all sources, employs frequent risk monitoring and risk reporting using multiple appropriate risk metrics, has a formal and clearly-communicated risk limit system, and uses multiple risk mitigation strategies to

proactively contain exposures to be within risk limits. The insurer follows clearly defined risk limit enforcement policies and promptly addresses breach of risk limits. A risk control program that receives a positive score is also characterized by the insurer's continuous efforts to review the program's effectiveness and to improve the program based on new developments as well as lessons learned from the past. 39. A neutral assessment typically indicates that the insurer has generally effective risk control programs in place to identify, measure, monitor, and manage the risk. However, the risk control program is less comprehensive or effective than one in the positive category. Fairly new risk control programs are typically scored as neutral until there is a track record of consistent effectiveness. An insurer with limited exposure to a risk and consequently a relatively simple control program that is commensurate with the exposure would receive a neutral score. 40. Generally, a negative assessment occurs only if that particular risk is a material exposure to the insurer and there are major deficiencies in the insurer's risk control processes. Examples of such deficiencies include, but are not limited to, the insurer's history of incurring losses outside its risk tolerance, lack of a consistent process to identify risk exposures from all sources, informal and infrequent risk monitoring and reporting using overly simplistic risk measures, lack of formal and well-communicated risk limits, and observed prolonged breach of risk limits without justification or timely action. A negative score is also assigned if the insurer deliberately takes on outsized risk positions in an attempt to speculate on future market movements. 41. The main risk categories in the analysis of an insurer's risk controls are: Credit risk, Interest rate risk, Market risk, Insurance risk, and Operational risk. 42. Appendix 2 provides examples of how we assess risk controls of each of the insurer's major risks, taking into consideration the various aspects of risk control processes (as described in paragraph 37), including risk identification, risk measurement and monitoring, risk standards and limits and limit enforcement, risk management, and risk learning. Appendix 2 also provides examples to illustrate how we analyze risk controls of each one of the main risk categories, including credit, interest rate, market, insurance, and operational risks. These examples are for illustrative purpose only and should not be interpreted as either a constraining or exhaustive list based on which we form our assessments. While some of these risks and the related risk control practices are common to all insurance companies, others are more relevant to individual insurers in specific sectors. As such, the scope of our analysis is adjusted to reflect an individual insurer's risk profile. Emerging Risk Management 43. The emerging risk management subfactor analyzes how the insurer addresses risks that are not a current threat to creditworthiness, but could become a threat in the future. In addition, it assesses the insurer's level of preparedness if those emerging risks materialize. Such risks could derive from areas such as regulation, the physical environment, the macroeconomic environment, and medical developments. Effective emerging risk management serves as an early-warning system so that such risks do not catch the insurer by surprise. 44. The subfactor is scored positive if evidence shows that the insurer has well-established processes to consistently identify, assess, monitor, and potentially mitigate the threat of each identified emerging risk if necessary. Typically, insurers that receive a positive score perform scenario analysis to estimate the impact of possible adverse events on the insurer's reputation, liquidity, and overall financials, taking into consideration existing and new risk mitigation and contingency plans. 45. The score is neutral if the insurer has some processes in place for anticipating emerging risks and envisioning their significance, but these processes are limited to the identification of the emerging risks with limited or no measurement and mitigation. 46. If an insurer doesn't have any emerging risk management process, either formal or informal, or has experienced outsized losses due to past failures to identify emerging risks and hasn't shown sufficient evidence of having learned from such experiences, it would receive a negative score. Risk Models 47. Risk models are an integral part of a robust ERM framework. They are used extensively to measure risk exposures, test risk correlation and diversification, validate risk mitigation strategies, and quantify capital requirements for a given risk profile. The subfactor covers not only the risk models related to distinct risks (for example, credit, market, insurance, and operational) and enterprise risk aggregation across risks, but also other models used in the insurer's day-to-day operations, including pricing, valuation, and projections. If available, the analysis factors in the insurer's economic capital model where the insurer measures its overall risk exposure considering correlation and diversification. 48. The analysis of risk models focuses on assessing the robustness, consistency, and completeness of the insurer's risk models, including, where relevant, its development and use of an

economic capital model, and the processes for model governance and validation. The subfactor score reflects the comprehensiveness and quality of the risk models used, the risk measures adopted, the methodology, data and assumptions used, the incorporation of risk-mitigation activities in those models, the infrastructure to support the risk models, how the model results are used, and whether model limitations are communicated and understood by the risk managers and senior management. 49. The score is positive if the insurer's risk model system captures the insurer's material risk exposures and the interrelation between risks. The models have undergone extensive validation and are under a rigorous model governance process. Such risk models typically employ comprehensive metrics to measure risk. They generally have the capability to perform both comprehensive stochastic analysis and deterministic stress scenario analyses. Model risks are fully understood by the insurer and have been compensated with thoughtful judgment whenever possible. Also, characteristics of a positive subfactor score include evidence that the insurer uses model results extensively in making ERM decisions. For example, risk models are used to ensure risk exposures are within the predetermined risk tolerances to compare and validate risk mitigation strategies. 50. While an economic capital model is a substantive enhancement to any risk model system in that it provides a valuable enterprise-wide and economic-based view of the insurer's risk profile, the existence and the use of the economic capital model is not a pre-requisite for a positive risk models subfactor score. 51. The score is neutral if the insurer has effective models in place for its materials risks, but the risk models are less comprehensive or robust compared to those in the positive category; or if the results of these models are not used extensively in guiding risk management decisions. 52. The score is generally negative if: The risk models are not complete or granular enough to accurately reflect the insurer's major risk exposures and enterprise risk profile; The reasonableness of the methodologies and assumptions used, or the robustness of the model validation and the process to obtain data used in the models, is questionable; The insurer's use of risk models is limited to satisfying the regulatory requirements; or The insurer performs limited sensitivity or stress testing, or has shown no or limited use of model results in decision-making.

Strategic Risk Management 53. Strategic risk management is the process through which insurers facilitate the optimization of risk-adjusted returns, starting with a view of the required risk capital and a well-defined process for allocating capital among different products, lines of business, and risk factors. The strategic risk management subfactor assesses the insurer's program to optimize risk-adjusted returns and to evaluate and prioritize strategic options on a level playing field. The analysis is based on evidence of situations where the insurer has made strategic decisions using economic risk/reward metrics that are consistent with its risk appetite; and on how an insurer balances other concerns, including regulatory and accounting considerations. The analysis focuses not only on the choice and outcome of the strategic decisions, but, more importantly, on the risk/reward rationale underlying the insurer's chosen strategy. 54. The score is positive if the insurer executes consistent and effective risk-reward analysis in the majority of the key areas of analysis, including the company's strategic planning, product pricing and re-pricing, strategic asset allocation, reinsurance strategy and net retained risk profile, new risk-bearing initiatives (including M&A; entry into new markets), capital and/or economic capital budgeting, and optimization of risk-adjusted returns. The score is positive only if the insurer demonstrates a history of successful execution of its strategic risk management program, including for example better-than-peer risk-adjusted returns and a track record of successful M&A; that is consistently accretive on a risk-adjusted basis. 55. The score is neutral if the insurer does execute some risk-reward analysis in some of the key areas and plans to add the rest eventually. However, the insurer uses an approach to optimize risk-adjusted returns that is based on relatively simplistic capital metrics compared to that used by insurers with positive scores. The score could also be neutral if an insurer has developed an economic capital model and uses model results in the strategic risk management process, but the economic capital model has limited history or credibility. 56. If the insurer doesn't use a risk-reward optimization approach in any of the aforementioned key areas, so that capital management is very basic with no consideration of enterprise level risk reward optimization; or if the insurer's capital management program is solely premised on the view of external constituents (e.g. regulatory capital requirements) with no adjustments, a negative score is assigned.

APPENDIX I: Definitions 57. The criteria use the following definitions: Risk appetite as the framework that establishes the risks that the insurer wishes to acquire, avoid, retain, and/or reduce. Risk preferences as qualitative

risk appetite statements that guide the insurer in the selection of risks. These qualitative risk appetite statements (risk preferences) may or may not be risk specific, but nevertheless, establish the underlying principles for the selection of risks. For example, "The Group has no appetite for unrewarded risk", or "The Group has an appetite for insurance risks as these are expected to be value additive". Risk tolerances as quantitative risk appetite statements that guide the insurer in the selection of risks. These statements typically specify maximum acceptable losses. They help the insurer to translate the qualitative risk preferences into action by constraining the insurer's exposures to risks, as defined by its risk limits (see below). Risk tolerances are often probabilistic in nature with reference to, for example, the insurer's solvency or earnings over a specified period at a chosen confidence level. Examples of risk tolerances include "Maintaining capital adequacy consistent with target rating following a 30% equity market decline" or "Constraining losses to within one-quarter's planned earnings following a 1 in 250 year event over the following year". Risk limits as quantitative boundaries that serve to constrain specific risk-taking activities at the operational level within the business. The risk appetite statements are usually implemented within the business through the use of risk limits. For example, an insurer may express risk limits as maximum percentage of total investments in equities, maximum duration mismatch, or maximum exposure by geography.

APPENDIX II: Risk Controls Of Major Risks

58. This appendix provides examples of how we analyze the risk controls subfactor. For each of the insurer's major risks, we assign one individual risk control score by assessing the overall effectiveness of the risk control processes, including the quality of risk identification, risk measurement and monitoring, the comprehensiveness and robustness of risk limits and standards, the rigor of the procedures to manage risks to stay within limits, and the execution and the results or effectiveness of such risk control programs. We also consider risk limit enforcement processes and the insurer's practice of learning from its own, or the industry's, experiences.

59. Table 4 below provides some detailed examples of how we analyze these various aspects of the risk control process in assigning an individual risk control score. Examples that are more favorable support a positive risk control score while the less favorable ones may lead to a negative score. We do not assign scores to each of these risk control aspects, such as risk identification or risk limit. But rather, the combined quality, comprehensiveness, and effectiveness of all these aspects lead to the assessment of risk controls for each of the insurer's major risks. The granularity of our analysis is tailored based on the materiality of a particular risk in the insurer's overall risk profile.

60. The rest of Appendix 2 translates the general examples outlined in Table 4 into examples that are risk specific. These examples are for illustrative purpose only and should not be interpreted as an exhaustive list based on which we form our rating opinions. The risks discussed in this appendix include: Credit risk, Interest rate risk, Market risk, Insurance risk, and Operational risk.

Table 4 Examples Of Individual Risk Control Assessments

	MORE FAVORABLE	NEUTRAL	LESS FAVORABLE
Risk identification	The insurer has a comprehensive process of identifying all risk exposures. The insurer has identified all material risk exposures. Not all significant risk exposures have been identified.		
Risk measurement and monitoring	The insurer monitors all significant risks on a regular basis, using multiple measures. The insurer monitors all significant risks, although the process is not as comprehensive or frequent as the leading peers'. The insurer's risk monitoring is informal, irregular, and of questionable accuracy. The insurer uses a combination of stochastic analysis and deterministic sensitivity and stress tests to ensure containment of exposure, considering diversification and risk correlation. Stress testing is performed sometimes, but the scenarios might not be stressful enough or the results of the testing aren't used in decision making. Stress testing is rarely or never performed. The insurer has comprehensive risk reports that are updated frequently to reflect risk profile by risk, business line, and at the enterprise level. Risk reports are updated regularly. Risk reports are sporadic and inconsistent, making it difficult to have a clear understanding of enterprise risk profile. Risk exposures are clearly communicated to all levels of the organization. Risk exposures are communicated across the organization, but the communication is less formal or not as extensive as that of insurers with a positive risk controls score. Risk standards and limits		
The insurer has clearly documented comprehensive risk limits, risk standards, and early warning systems for risk taking and risk management. The insurer has limits for all material risk exposures, but some of them might not be as equally comprehensive as those of leading peers or not clearly documented or communicated. Risk limits don't exist for some material risk exposures, or are not			

documented, or are overly aggressive to constrain risk taking. Risk limits are directly linked to risk tolerances and are clearly communicated and widely understood within the company. Risk limits are conservative in general, although lacking strong rationale. Risk limits and policies are not well communicated or understood internally. Risk limits are expressed in multiple measures. Corporate risk policies are not completely documented or well communicated. Corporate risk policies don't exist for some material risks; product development policies don't exist or don't include any risk metrics. The insurer clearly documents and communicates its risk policies and has formal corporate product development policies to ensure new products comply with clearly defined risk standards. Risk management The insurer has formal programs in place and uses multiple strategies to proactively manage the risks within tolerances. The insurer has risk management programs in place, but the execution might not be consistent all the time. The insurer's risk management activities are situational, ad hoc, and driven by individual judgment. The insurer has a formal risk-specific risk management structure starting with risk committee and dedicated resources, supported by coordination with and effective feedback between all related business functions. Risk is managed mainly at business unit level with some coordination and feedback between related functions. There is no or very limited coordination and feedback between risk managers and other business functions. There are clear rationales supporting the chosen risk management strategies and well-defined measurements of effectiveness. Risk is an important consideration in product pricing and development, but the insurer lacks a consistent way to assess risks in new products across product lines. Risk is not a major consideration in product pricing and development. Risk and risk management are key considerations in product pricing and development. The insurer has, in general, not incurred losses outside its chosen tolerances, maybe with only a few exceptions. The insurer deliberately takes outsized risk positions in an attempt to speculate future market movements. The insurer has a good track record of not incurring losses outside its risk tolerances, even in stressful periods. The insurer has a history of incurring losses outside its risk tolerances. Risk limit enforcement The insurer has clear processes to correct a breach of risk limits and to respond to early warning limits within a prescribed time limit. Breaches of limits are usually corrected, but there is no formal procedure or time requirement to address breach of limits. The insurer's review of compliance of limits is irregular, and often there are no consequences or actions for exceeding limits. There is frequent monitoring of compliance against all established risk limits and policies. The insurer monitors compliance of risk limits and policies, but less frequently or rigorously than the leading peers. Observed evidence of prolonged breach of limits without justification or action. Special situations falling outside the limits are constantly monitored until resolved. Key risk exposures are generally managed within limits. All risk exposures are managed within chosen risk limits. Risk learning The insurer has a defined process to analyze and learn from past losses, near-misses, as well as successes; enhancements to ERM framework occur as a result of such process. The insurer reviews loss events, but such reviews are more ad-hoc in nature and do not necessarily lead to actions. The insurer quickly puts loss situations behind without review or with a review of limited scope. The insurer might also perform back-testing to ensure the effectiveness of the changes and enhancements. The insurer might also institute drastic changes to the ERM program as a result of recent losses but without sound reasons. Credit risk controls 61. Credit risks are the exposures an insurer faces from incurring economic losses caused by the default of another company on that company's obligations, or losses from the perceived or actual deterioration of another company's creditworthiness. Credit risk exposure could also come from counterparty risk, which is the risk of counterparties failing to fulfill their obligations in full and in a timely manner. Typical counterparties for an insurer are reinsurers, derivative counterparties, and other business partners, including banks, brokers, and dealers and third party administrators. Credit deterioration of these entities can also create credit risk. In addition, some insurance liabilities have a very high correlation to credit risk, such as director's and officer's coverage. In evaluating credit risk controls at insurance companies, it is important to acknowledge that there may be a high degree of correlation between these sources of exposures. 62. To assess an insurer's credit risk controls, we evaluate the processes and practices around risk identification, risk measurement and monitoring, risk limits and standards, enforcement of risk limits, risk management, and risk learning. The assessment of strength and effectiveness of all these aspects supports our view of the overall robustness of the insurer's risk control program on credit risk controls. 63. Table 5 provides some

examples of the credit risk-specific evidence that informs our analysis. These examples are consistent with the examples in Table 4. Table 5 Credit Risk Controls Assessment POSITIVE NEUTRAL NEGATIVE The insurer has identified and captured all potential credit risk sources (for example, investment portfolios, derivative counterparties, credit default swaps [CDS], brokers, reinsurers, policyholders), and exposures are aggregated across all sources. The insurer has identified and captured all major credit risk exposures, including the investment portfolio and key counterparties, and aggregates all major credit exposure. Insurer does not, as a practice, identify credit risk other than within the investment portfolio while it is exposed to other sources. The insurer uses multiple metrics to measure credit exposure, incorporating both internal and external credit assessments. It may also use other parameters such as movements in equity prices, including advanced frameworks such as value at risk (VaR) or the Merton model. Credit exposures are measured using only a few relatively simple metrics. Credit risk is mainly managed at portfolio or business unit level. The insurer doesn't aggregate exposures across the enterprise and all sources. The insurer's risk control framework takes into consideration codependences between sources of credit risks. The insurer's modeled credit loss doesn't incorporate the actual concentrations of credit risks or codependences among various credit risk sources. Credit risk exposure information is not made readily available to those making credit decisions. The insurer performs frequent stress testing, including both systemic and single obligor/sector credit events. The insurer uses a system of credit limits, but there is no clear linkage to the insurer's risk appetite. The insurer uses a simple metric to monitor credit risk. The insurer has comprehensive credit risk limits (for example, single obligor, credit quality, concentration by geography and sector). The insurer relies mainly on external credit assessment to monitor creditworthiness. Risk limits do not exist, are not documented, or are overly broad to provide any constraining effect on credit risk-taking. Risk limits are expressed in multiple measurements, e.g., limits around notional amount (e.g. market value as a percentage of total invested assets) as well as around exposures (e.g. value-at-risk, max dollar value change due to spread widening). The insurer performs stress testing, but the testing is not as frequent or as sophisticated as that of the leading peers. The insurer uses simplistic credit risk measures and management techniques; however, decisions are frequently made based on the judgment of the portfolio manager. Counterparty risk exposures are strictly managed through a centralized counterparty approval process and the use of a combination of minimum rating requirement, frequent monitoring of obligor creditworthiness, and collateral requirement. 64. An insurer's interest risk controls are the (i) processes of identifying and measuring the exposures through its portfolios of assets and liabilities to losses resulting from movements in interest rate risk components and (ii) managing and mitigating such risks to be consistent with the insurer's business goals and risk appetite. Our analysis therefore considers the factors that can cause assets and liabilities, including hedge instruments, to expose insurers to potential downside financial risks. 65. Interest rate risk can arise from a variety of sources and is typically most significant in cases where the assets and/or liabilities are long term in nature, or product profitability is sensitive to asset performance, or assets and/or liabilities contain implicit or explicit options that cause the cash flows to change dynamically based on interest rate movements. Examples exclude options in the investment portfolios (e.g. call options and prepayment) as well as options granted to policyholders in the liability portfolios (for example, flexible premiums, lapse, and withdrawal). Interest rate risk may arise from exposures to absolute changes in interest rate rates, relative changes in interest rates (spread relationship), and interest rate volatilities. For each of these, an insurer's exposures could be to one or more points along the term structure and, in some cases, to interest rate movements in multiple financial markets. 66. Table 6 provides some examples of the interest rate risk-specific evidence that informs our analysis. Table 6 Interest Risk Controls Assessment POSITIVE NEUTRAL NEGATIVE The insurer has identified and captured all exposures from assets, liabilities, and hedge instruments to all sources of interest rate risks (e.g. change in yield curve level and shape, volatility, spread, and spread volatility). Insurer has identified and captured all major interest rate exposures from assets liabilities and hedge instruments. Insurer has only identified some of the interest rate risks of its assets or liabilities. All relevant component exposures are measured and monitored using multiple metrics (e.g. duration, key rate duration, spread duration convexity, value at risk [VaR], dollar duration, capital at risk) at both the sub-portfolio and the enterprise level. The insurer segments asset and liability portfolio into

homogeneous sub-portfolios with clear interest rate risk limits. The insurer doesn't have a formal framework to control interest rate risks; interest rate risk monitoring is infrequent and primarily takes place to meet regulatory requirements. Asset and liabilities are segmented into sub-portfolios; interest rate risk limits, e.g. cash flow/key rate duration/convexity mismatch limits, are employed for each sub-portfolio as well as at enterprise level. The insurer monitors multiple metrics, but the key focus of risk monitoring and risk limits is duration only; or captures only the impact of absolute rate changes at one or multiple points along the term structure. The insurer doesn't segment its portfolio, even when underlying asset and liabilities have varying interest rate risk characteristics. Stress testing analyzes the impact on the insurer's financials, liquidity, and underlying economics of scenarios such as low interest rates, rate spikes, systemic and idiosyncratic spread movements, taking into consideration the interaction between asset and liability cash flows. Performs sensitivity and stress tests to analyze the impact of interest rate movements; however, such analysis might not capture the dynamic interaction between asset and liability cash flow (e.g. uses static lapse assumption for interest sensitivity products regardless of rate movements). The insurer performs very limited stress testing and lacks thorough understanding of the impact of adverse interest rate scenarios. The insurer uses multiple interest rate risk management strategies, including active management of "inforce" business, strategic asset allocation, and hedging. The insurer uses appropriate interest rate management strategies, including inforce management and product pricing. There is evidence of substantial breach of interest rate risk limits without remediation. The insurer's product development team works closely with interest rate risk management team to develop investment and/or hedging strategies and to ensure new products have desirable asset liability management (ALM) characteristics. Although risk is an important consideration, risk management is not an integral part of the product development process as it is in the case of insurers with a positive assessment. Management deliberately takes interest rate positions to speculate on future rate movements. There is no or very limited coordination between risk management, product pricing, and inforce management. Market risk controls 67. Our analysis of an insurer's market risk controls mainly focus on its process of capturing the exposure to equity, real estate, and foreign exchange risk and its ability to manage and mitigate such risks to within the insurer's pre-determined risk tolerances. Since foreign exchange risks are generally managed fairly tightly at insurance companies, we typically place more emphasis on equity risks (where applicable). 68. The major sources of an insurer's exposures to equity and property risks are its investments in equities, equity linked securities, and insurance liabilities that contain embedded options or guarantees that are linked to equity and real estate investment performance, which include variable annuities, equity indexed annuities, and with profit funds. Equity risk also manifests itself through the volatility of account-value-based fee revenues that fluctuate as a result of equity market movements. 69. Given the potential volatility of equity and real estate risks relative to other risk drivers, we view the analysis of an insurer's market risk controls as a critical part of ERM analysis in instances where the insurer provides certain of the products listed above, or where equities and real estate related investment form a substantial portion of the insurer's investment portfolio. During periods of economic stress, a sharp decline in equity markets or drastic increase in equity market volatility could put significant strain on these insurers' financial condition. We also analyze risk controls related to foreign exchange risks, especially for insurers with a substantial international business or international investments outside their home country currency. 70. While all insurers are exposed to market risks to certain degrees, some insurers' exposures are fairly limited. Such a limited exposure lowers the importance we place on this portion of our ERM analysis. In such cases, we focus on the insurer's risk controls that are commensurate with the limited exposure and would not always view the use of a sophisticated equity hedge program necessary for a neutral risk control score here. In other instances where equity risk is a key risk exposure of an insurer, our assessment involves an in-depth analysis of the insurer's ability to manage the risk, including the complexity of risk metrics used, the frequency and robustness of risk reporting, the risk mitigation strategies in place, the instruments used to hedge exposures, the choice of hedge targets, and hedge effectiveness and characteristics of embedded options in the liability portfolio. We also assess the product pricing and development and inforce management process in the context of equity risk controls. 71. Table 7 provides some examples of the market risk-specific evidence that informs our analysis. Table 7 Market Risk Controls Assessment POSITIVE NEUTRAL NEGATIVE

The insurer has identified and captured equity, real estate, and foreign exchange exposures from all sources. The insurer has identified and captured equity, real estate, and foreign exchange exposures from major sources. The insurer has only identified and captured equity, real estate, and foreign exchange exposures from its investments and lacks a clear understanding of its exposures through its liabilities, if applicable. Frequency of risk measurement and monitoring is consistent with tolerance and hedging strategy (e.g. dynamic strategy vs. static strategy using over the counter derivatives). The insurer frequently monitors multiple risk metrics and has risk limits in place, but the metrics used and stress tests performed are not as comprehensive as those for an insurer with a positive score. The insurer uses only a few simple metrics to monitor equity exposures through the liability and/or hedge portfolio (if material), e.g. account value only. The applied metrics capture all relevant component equity risks (e.g. Delta, Gamma, Vega, and Rho), on both gross and net of hedges. The insurer performs supplemental stress tests and supplemental historical VaR. The insurer has a hedge program or other risk mitigation strategies in place if equity and/or foreign currency exposures are material. The insurer applies overly simply risk limits, mainly on its investments, or very broad risk limits that provide no constraining value. The insurer uses comprehensive risk limits expressed in multiple metrics (e.g. equity as a percentage of invested assets, single name/industry limits, the Greeks, VaR). Hedge program is generally effective, but hedging targets are not backed by a clear rationale. Hedging coverage is low relative to the risk tolerances. The insurer performs very limited or no stress tests beyond regulatory requirements. The insurer effectively measures foreign exchange exposure in all currencies it has exposure to and has stated risk limits to movements in foreign exchange exposure because of each relevant currency. Hedge performance is monitored, but limited hedge performance or attribution analysis is performed. The insurer doesn't have a hedge program at all (if it has material exposures) or such program does exist, but exposures are outside of its tolerances and such program provides no practical value. The insurer applies hedging strategies and risk mitigation techniques to ensure retained risk exposures are within defined risk limits. The hedge portfolio is rebalanced frequently enough to reflect the market developments, but is less responsive on risk mitigating product strategies. Other risk mitigation strategies (such as bonus policies and use of surplus capital buffers policies) are not well defined or ineffective in times of stress. The insurer does not perform adequate studies about profit distribution and capital sustainability. The insurer has clearly defined hedge targets (e.g. protection of capital, reduction of earnings volatility, economics) and has been very effective in achieving the chosen targets; unhedged residual exposure is fairly small and within risk tolerances. The insurer may have risk mitigation strategies in place similar to insurers with a positive assessment, but there is evidence that these strategies were not fully implemented or effective during financial crises. These strategies are regularly reviewed based on profit distribution and capital sustainability under a range of market scenarios but mainly based on scenario testing. The insurer deliberately takes outsized risk positions to speculate on future market movements. The insurer closely monitors hedge performance and frequently rebalances, if hedge strategy necessitates, to reflect trends and developments, including deviation of policyholder behavior from expected and higher-than-expected market volatility. The insurer relies mainly on third party software with some vetting, but has a limited view of potential model limitation and model risk. Thorough hedge performance, basis risk, and attribution analysis and results are used to support hedge program enhancements or changes, model improvements, product development, and inforce management. Equity risks and risk controls are an important consideration in product development and inforce management. The insurer has well-defined and embedded risk mitigation strategies (such as adjusting policyholder's profit distribution, use of surplus capital buffers, re-pricing of guarantees, and change in equity and real estate exposures to reflect capital buffer). There is a track record of these strategies being implemented in times of stress. These strategies are also regularly reviewed based on extensive studies about profit distribution and capital sustainability under a wide range of market scenarios utilizing stochastic modeling and scenario testing. Risk managers work closely with product managers to embed risk mitigation strategies in product development and inforce management. Life and health insurance risk controls--mortality, longevity, morbidity, and policyholder behavior risks 72. Most life insurers are exposed to mortality risk, longevity risk, morbidity risk, and policyholder behavior risks, while health insurers are typically exposed to morbidity risk. These risks arise from the deviations of actual experiences from those

expected in pricing and reserving and could potentially hurt product profitability if adverse deviations exceed the margins built into the product by the insurer. An insurer's exposure to these insurance risks depends on its product offerings and benefit structures. Therefore, our assessment of insurance risk controls focuses on an insurer's key exposures given its liability profile. 73. Table 8 provides some examples of the life and health insurance risk-specific indicators that inform our analysis. Table 8 Life And Health Insurance Risk Controls Assessment--Mortality, Longevity, Morbidity, And Policyholder Behavior Risks

POSITIVE	NEUTRAL	NEGATIVE
The insurer has identified and captured exposures from all sources (e.g. underwriting, mortality volatility, concentration, pandemic) and has a clear understanding of all potential policyholder behavior risks (e.g. lapse, flexible premium, annuitization, withdrawal), especially the "in-the-moneyness" of policyholder options. The insurer has identified and captured exposures from all major sources and has some understanding of potential policyholder behavior risks. The insurer has not clearly identified major exposures. The insurer performs frequent and comprehensive experience studies to compare actual experience vs. expected (including mortality rates, morbidity claim incidence and severity, policyholder demographic distribution, concentrations); experiences in recent years have generally been favorable. The insurer performs some experience studies, but not frequently enough compared to the trends and development. Experience studies are either not performed, or are too infrequent or simple to provide real value. There is very limited monitoring of new business and inforce experiences. The insurer has formal limits that are directly linked to its risk appetite (e.g. retained risk, concentration). The insurer has clear underwriting standards that are well documented and communicated. Retention limits and the use of reinsurance are ad-hoc. The insurer has clear underwriting standards and authorities that are well documented and communicated; compliances are closely monitored and rigorously audited. Retention limits are in place, but not necessary linked to risk tolerances. Underwriting standards do exist, but the enforcement lacks rigor. Limits and standards are breached without remediation. The insurer has a disciplined product development process and close monitoring of new business sales and inforce business experiences on all key profitability drivers. Some feedback from experience monitoring and study to other areas (claim management, underwriting, product development and risk management), but generally lag behind experience developments. The insurer has a history of overly optimistic/aggressive assumption setting that isn't supported by any experiences studies or research. The insurer has an effective feedback loop from experience monitoring and studies to claim management, underwriting, product development, and risk management areas. Pricing and valuation assumptions are generally set conservatively based on relevant experience; however, limited sensitivity and stress testing is performed to test the robustness of these assumptions. The insurer has had continued unfavorable experiences in recent years compared to pricing or reserving and no action was taken. Pricing and valuation assumptions are set prudently and are refreshed frequently to reflect recent experiences; product benefits are structured to discourage excessive policyholder anti-selection. The insurer performs extensive sensitivity and stress testing in pricing and valuation on key insurance assumptions, especially those with less credible experiences. Property and casualty risk controls--reserve and claim management risks		

74. This section, as well as the next two sections, provide examples of how S&P; Global Ratings assesses risk controls related to property and casualty insurance risks. 75. Loss reserves tend to be the largest source of uncertainty in the balance sheets of many property and casualty insurers. Loss reserve is the estimate of funds required in order to fulfill all claims arising from prior policies. The ultimate amount of these future payments can be highly uncertain, both in terms of the amount and the timing. Reserving risk relates to the uncertainty surrounding (1) the level of reserves that will ultimately be needed to meet all liabilities and (2) the timing of those liabilities. Claims risk arises when claims paid deviate significantly from the insurer's expectation due to irregularities in the claim management processes, insufficient rigor to the claims process, or unexpected legislative, regulatory, or court intervention in the claims process. The processes, controls, and reviews used to manage the uncertainties around loss reserves and claim management form the foundation of our analysis of an insurer's reserve risk controls. 76. Table 9 provides examples of an insurer's loss reserve and claim management risk control indicators that inform our analysis. Table 9 Property And Casualty Risk Controls Assessment--Reserve And Claim Management Risks

POSITIVE	NEUTRAL	NEGATIVE
The insurer has a track record of reserve release consistent with target reserve levels and has an effective feedback loop from actuarial		

to underwriting to claim management. The insurer has no major adverse reserve development for recent underwriting years. The insurer has experienced chronic adverse development. The insurer uses a centralized reserving function independent from the risk-taking business function, with coordination and support from all business functions and units. The insurer shares information among actuarial, underwriting, and claim management, but the feedback loop may not always be very effective. The insurer exhibits lack of adequate understanding and modeling of the risk of adverse loss development. Assumptions (e.g. claim-cost-trend and loss-development) are robustly set and justified, and allow for emerging changes in the development of premium, losses, and claims. Reserving is predominately a province of business units, but there may be some coordination through the headquarters office. Reserving is disconnected from claims and might be pressured from underwriting. The insurer uses appropriate and extensive data in setting assumptions; performs thorough reconciliation to ensure completeness and reliability; may supplement internal data with external one. Reserves are based on traditional actuarial ultimate-loss projections calculated and reviewed by qualified actuaries. Reserving is fragmented in business units without centralized coordination or supervision. The insurer uses stochastic reserve models to help evaluate the risk of adverse reserve development and may also feed that information into economic capital models. The insurer performs sensitivity analyses (e.g. to high claim-cost inflation) to help assess reserve adequacy. The insurer uses overly optimistic assumptions. The insurer has deep in-house expertise, supplemented by the use of external expertise. The insurer has well-defined claims management authority levels. The review process is unsatisfactory and has failed to reveal chronic issues. The insurer employs a robust review process, including both internal and third party actuarial reviews (beyond audit). There are no claims management authority levels or they're not applied in practice. The insurer has a well-defined and extensive claims management framework with clear authority levels, which are consistently applied. Property and casualty risk controls--underwriting, pricing, and cycle management risks 77. P/C insurers typically establish multiple controls to address the risk that the premiums charged for unearned business, together with the premiums to be charged for prospective business, may be insufficient to cover losses experienced and expenses incurred from these exposures. Specifically, underwriting risk is the risk that the insurance coverage offered has a different risk profile and therefore different loss distribution than is needed to achieve the targeted profitability. Pricing risk may arise even when the coverage offered has the exact risk characteristics that were expected in pricing, but the loss distribution differs from expectation. The differences emerge because the process that formed the expected loss distribution was flawed in some way. For example, the process flaw could be due to bad data, bad process, or an unanticipated change in trend. Cycle management risk is the risk that the insurer writes business during a soft market that is later found to have claim costs significantly higher than premiums because of higher claim frequency/severity and/or softer policy terms and conditions.

78. An insurer uses controls associated with underwriting, pricing, and cycle management to ensure that risks are adequately priced. To achieve so, pricing needs to proactively take into account the industry cycle, and to prevent adverse risk selection, especially in a soft cycle. In assessing the strength of these controls, we seek evidence such as the examples in Table 10. Table 10 Property And Casualty Risk Controls Assessment--Underwriting, Pricing, And Cycle Management Risks

POSITIVE	NEUTRAL	NEGATIVE
The insurer has a track record of higher-than-peer underwriting returns with low volatility. There may be some pockets of strength, but the overall results (underwriting returns and volatility) are average among its peers. The insurer has experienced chronic underperformance relative to industry and peers. The insurer uses a comprehensive system of underwriting authorities (experience- and risk-based), limits, peer reviews, and audits. The insurer has formal underwriting authorities and limits and performs multiple reviews and audits, including departmental self-audits and peer reviews. There are concerns about the insurer's ability to thoroughly understand and capture the complexities of risks and their interdependencies. The insurer performs rigorous audits (including underwriting audits and counterparty/client audits) following a pre-defined risk-based cycle. The insurer performs underwriting audits following a pre-defined cycle for all material exposures. The insurer has underwriting authorities and limits in place. However, the execution lacks rigor, and there is observed evidence of breaches of underwriting authority and limits without remediation. Underwriting platforms have pre-built quality controls and facilitate information sharing and reporting. The insurer performs		

some analyses of pricing trends, and provides quantitative support to pricing, although such analysis isn't as advanced or comprehensive as leading peers'. There is evidence of top-line based incentives for underwriters that provide incentive for risk taking. The insurer uses a portfolio (enterprise-wide, ECM-informed) approach to setting risk-adjusted underwriting targets. Instances of underpricing are rare, and corrective actions are prescribed and taken, although the insurer might not have a formal remediation plan in place. There is evidence of insurer's excessive exposure concentrations and lack of intent to better diversify the portfolio. The insurer has in place robust cycle-management plans and has demonstrated a record of disciplined and stable pricing and terms over the course of a cycle. The insurer's compensation system provides no incentive to chase top-line results. The insurer uses advanced analyses of pricing and exposure trends using a comprehensive basket of tools (e.g. expert opinion, trade journals, broker survey, premium rate indices); such analysis provides robust quantitative support to pricing. The insurer uses cost/benefit analyses in reinsurance purchase decisions. The insurer uses multiple risk management strategies with a goal to optimize the balance between risk retention and risk transfer (e.g. reinsurance, catastrophe bonds) for maximum cost-efficiency and capital utilization. Close coordination across different business lines, geographies, as well as with areas such as actuarial, claims, and legal. Property and casualty insurance risk controls--catastrophe risks

79. Catastrophe risk is the risk that a single event, or series of events of major magnitude, usually over a short period, leads to a significant deviation in actual claims from the expected claims. Such events can occur naturally, such as tornadoes, floods, or earthquakes, or they can be man-made, such as an accidental explosion or an act of terrorism. These events are typically infrequent but significant in loss potential. Writers of commercial lines, personal lines, and reinsurance lines may all face catastrophe risks within their insurance portfolio. 80. Given the potential devastating effect of catastrophic events on an insurer's financial health and the substantial challenges in quantifying exposures and losses related to catastrophic events, an insurer's risk controls of catastrophe risks is of crucial importance to its sustained financial health, even survival in some instances. Our analysis focuses on the insurer's risk management program around catastrophe risk if it is deemed a material exposure of the insurer. Key areas of our assessment include: The insurer's risk tolerance for catastrophe risk and the analysis behind chosen tolerances; Risk correlations: although many insurance risks often have inherent correlations, these correlations tend to be even more pronounced during extreme events, exacerbating the adverse impact; and Modeling risk: quantifying exposures and potential losses related to catastrophic events is a challenging task and even the best modeling efforts are susceptible to errors and misuse. 81. Table 11 provides some examples of the catastrophe risk-specific evidence that informs our analysis. Table 11 Property And Casualty Risk Controls Assessment--Catastrophe Risks

POSITIVE	NEUTRAL	NEGATIVE
The insurer has a granular and up-to-date view of catastrophe risk exposure. The insurer has a granular view of exposure in areas of high concentration. Catastrophe risk (if major) is not adequately measured or monitored; the insurer doesn't have a clear vision of its catastrophe risk profile. Catastrophe risk tolerance is well defined and supported by a clear rationale and thorough analysis. Catastrophe risk tolerance is defined and translated into risk-taking limits; however, the tolerance may not be supported by a clear rationale. There are no retained probable maximum loss (PML) or concentration limits. The insurer has a comprehensive system of risk limits that are linked to the chosen risk tolerances; risk-taking is strictly constrained by limits (e.g. zonal limits). Concentrations are monitored across the main lines of business relative to the limits in the most exposed zones. The insurer has some high zonal accumulation of exposures that raises concerns. The insurer performs frequent and thorough analysis of concentration, relative to limits; such analysis spans across all lines of business, exposed risk classes, and geographic zone. The insurer has some in-house expertise, with reliance on external (brokers, vendors, consultants) resources. There is insufficient data reconciliation and checking; the quality of data is questionable. The insurer has deep in-house expertise, which is supplemented by use of external resources. The insurer has a formalized process for vetting the service providers, including periodic re-evaluations. The insurer has scarce in-house skills and over-reliance on external expertise (e.g. brokers); external advice may be used without sufficient validation. The insurer performs regular rigorous reviews of proprietary models, e.g. those used to capture "non-modeled" (such as severe weather) risks, and makes continued improvements to these models; model risks and limitations are well understood and compensated. The		

insurer performs sufficient validation of in-house models and data. The insurer does not conduct stress analyses to test its ability to absorb losses. The insurer performs thorough validation of vendor-provided models and data. Stress scenarios are used to evaluate the impact of extreme events. The insurer uses scenario/impact analyses (Realistic Disaster Scenarios) to supplement stochastic models, and to help test the effectiveness of controls (e.g. zonal limits, reinsurance, catastrophe bonds) and ensure risk containment. The insurer uses portfolio-based pricing, taking into account (cross-class) exposure accumulations/concentrations. There is a comprehensive process for ensuring accuracy of exposure data. Health insurance risk controls--underwriting, pricing, claims management, and provider renewal risks 82. Health insurers face certain risk exposures that differ in scope from those faced by other insurers. Some of the more significant risks are rising medical costs, changing regulations and legislation, and less-than-perfect data in the underwriting and pricing processes. Moreover, controls to counter these risks might be effective or permissible in one region or country, but not in another. Some health insurance risk exposures are unique in nature and require different risk control practices. This section provides examples of how we analyze the risk controls related to these unique health insurance risks. Examples of our analysis of health insurer's risk controls of morbidity risks are provided in table 8. 83. Health insurance companies use underwriting to assess the health insurance risk, either on an individual or an employer group basis, and estimate the cost of coverage. Underwriting risk arises when the health insurance coverage offered has a different risk profile and therefore different loss distribution than is expected and assumed in pricing. Another factor that further complicates the underwriting risks is that not all health coverage is underwritten. For example, large group accounts typically do not include medical underwriting of the participants, or when "community rating" is used. Pricing risk refers to the risk that the health insurance premium is not sufficient and can't be adjusted quickly to cover the cost of providing the health insurance coverage. This risk is particularly prominent when medical costs continue to rise at an accelerated pace. Claim management risk includes all exposures that arise from an insurer's practices around claim processing, reserving, and payment. Claim management risk may manifest itself as failures to identify claims filings abuse, miss-assessment of treatment necessity, and claim-cost development. 84. Provider renewal risk arises when the health insurer experiences a drastic rise or sudden changes in health service cost of providers, but isn't able to promptly adjust provider contracts in response to the rise or the change. Particularly susceptible to provider renewal risks are insurers with heavy provider concentration, more provider renewals around a particular date (for many, January 1), or limited negotiation power with providers. 85. Table 12 provides some examples of health insurance risk-specific evidence that informs our analysis. Table 12 Health Insurance Risk Controls Assessment--Underwriting, Pricing, And Claim Management Risks

	POSITIVE	NEUTRAL	NEGATIVE
The insurer uses a discipline underwriting process with clearly defined limits (e.g. concentration limits and minimum enrollment requirements) and authorities. The insurer has a system of underwriting limits and authorities, but not as comprehensive as leading peers'.			

Underwriting limits and authorities are blurry. The insurer performs active monitoring and analysis of claim experience (incidence rates and severity), which provide feedback into the pricing and projection process. Claim experiences are monitored and shared with other areas, although the feedback loop might not be very effective. The insurer readily assumes a large concentration, in a certain group, sector, or regions, even when limits are breached. The insurer judiciously performs reviews and audits of underwriting and claim management. Pricing updates are mainly reactive, and the techniques used to reflect medical cost and health care trends are not very sophisticated. There is a recurrence of longer-than-expected claims process. The insurer performs an ongoing review of health care trends, medical advances, and medical costs and assesses their impact as well as mitigation strategies. In addition, the insurer uses multiple medical care cost forecasting techniques. There is some cost-benefit analysis of reinsurance usage, but not very robust. The pricing assumptions are updated infrequently, and there is no system or process to identify medical cost trends or incorporate health care developments. When possible, the insurer staggers rates renewals throughout the year to facilitate prompt pricing adjustments. The compensation system provides no incentive to chase top-line results. The reviews and audits of underwriting and claim management are infrequent and fail to identify past issues. The insurer maintains effective communication with regulators and health care providers to address existing and future issues to avoid surprises. The insurer uses standard policy provisions, although some exceptions

are granted. The insurer routinely accepts inconsistent policy terms and has very little pricing power. The insurer carefully selects reinsurance coverage, balancing risk retention and risk transfer. The insurer uses more than a few providers, but its provider network is not as diversified as the leading peers'. The insurer is highly concentrated in a few providers. Incentive structure is tied to the portfolio-based performance targets that balance risk and rewards. The insurer has some negotiation power, but doesn't have the ability to consistently negotiate more-favorable-than-peer terms with providers. Products and service offerings are extremely limited in scope. The insurer uses standard policy provisions that are applied to all providers and consistently maintains pricing power and has the ability to negotiate favorable terms with sponsors and networks. The insurer maintains multiple providers in the portfolio; when possible, provider contract renewals are staggered throughout the year.

Operational risk controls 86. Operational risk for insurers is the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events. Specifically, operational risks include information technology and business continuity processes, environmental issues, regulation, compliance, fraud, terrorism as well as human resources, change management, distribution, and outsourcing. Also included is reputation risk, which usually arises with or after some other significant loss. 87. While insurers might be exposed to vastly different operational risks, some of the key elements are essential to all insurers' operational risk controls. These include, firstly, procedures in places to systematically identify operational risks and to monitor, assess, and mitigate those identified risks. Secondly, a sound business continuity plan (BCP) that has undergone multiple drills. A business continuity plan comprises processes and procedures the insurer would follow to limit the adverse impact of an event. Such event could be a natural disaster or terrorist attack that causes a major interruption to the normal course of business operations. Our analysis also focuses on the risk controls around operational risks that are of particular importance to the individual insurer. For examples, a health insurer's risk controls around compliance risks. 88. Table 13 provides some examples of the operational risk-specific evidence that informs our analysis. Table 13 Operational Risk Controls Assessment

POSITIVE	NEUTRAL	NEGATIVE
The insurer has thoroughly identified all major operational risks using industry's and insurer's own experience, with a focus on high priority risks. The insurer focuses on compliance and uses a bottom-up process for risk identification. The process is mostly informed by internal audits. The insurer has frequent incidences of noncompliance, fraud, and system failures. For each key operational risk, risk owners are assigned, close monitoring is in place, mitigation actions are initiated, and progresses are monitored	The insurer's identified operational risks are prioritized (using more of an intuitive assessment) according to their likelihood and impact.	Operational risks are not systematically identified, nor are they clearly prioritized. The insurer has comprehensive compliance standards that are clearly documented, well communicated, and subject to rigorous compliance reviews and audits. The insurer has some mitigation actions in place, but they're not as proactive or comprehensive as those of leading peers. Remediation is sporadic and poorly enforced (with no or limited accountability). The insurer has effective internal audit and compliance functions that work in close coordination with the ERM function, and help assess and monitor operational risks. There is a focus on disaster recovery rather than business continuity. There is no disaster-recovery testing. Business-continuity and disaster-recovery programs are in place and regularly tested. The insurer hasn't suffered major losses from operational risk events in recent years; or has had only minor losses and the insurer quickly revised and enhanced the program as a result. The insurer hasn't translated past operational risk losses into enhancements to the program; losses are quickly put behind. Loss events and "near misses" are meticulously recorded and (along with industry data) inform the quantification of operational risk. The insurer hasn't suffered major losses from operational risk events in recent years.

REVISIONS AND UPDATES This article was originally published on May 7, 2013. The criteria became effective as of the publishing date. To the extent that elements of these criteria applied to Lloyd's Syndicate Assessments, the effective date was Nov. 1, 2013. Changes introduced after original publication: Following our periodic review completed on Feb. 26, 2016, we updated the contact information. Following our periodic review completed on Feb. 26, 2017, we updated the contact information, updated criteria references, and deleted paragraphs 2, 8, and 9, which were related to the initial publication of our criteria and no longer relevant. Following our periodic review completed on Feb. 20, 2018, we updated the contact information, criteria references,

and text in paragraphs 7, 23, and 35 to enhance the transparency of the article. We also deleted text related to the initial publication of our criteria, which had previously been moved to the revision history section and was no longer relevant. On April 10, 2019, we republished this criteria article to make nonmaterial changes to update the contact information. RELATED CRITERIA AND RESEARCH
Related Criteria Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017 Group Rating Methodology, Nov. 19, 2013 Insurers: Rating Methodology, May 7, 2013 Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012 A New Level Of Enterprise Risk Management Analysis: Methodology For Assessing Insurers' Economic Capital Models, Jan. 24, 2011 These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.