Criteria | Insurance | General:

Refined Methodology And Assumptions For Analyzing Insurer Capital Adequacy Using The Risk-Based Insurance Capital Model

June 7, 2010

*(**Editor's Note:** On Jan. 27, 2023, we republished this criteria article to make nonmaterial changes. See the "Revisions And Updates" section for details.)*

1. S&P Global Ratings' risk-based capital (RBC) adequacy model is a quantitative tool that is integral to our analysis of the capital adequacy of life, property/casualty (P/C), health insurance, and reinsurance companies worldwide. We base our overall opinion of an insurer's level of capital adequacy on insights drawn from this model, evaluated in conjunction with more qualitative factors. These include the composition of the insurer's capital structure (e.g., how much it relies on hybrid securities and debt to fund its operations); its asset quality, reserve adequacy, contingent assets and liabilities; its dependency on reinsurance; any risk concentrations; and its capital planning and financial flexibility.
2. Variations in global accounting standards and complex legal entity structures present challenges in the analysis of insurance company capitalization, but we have taken a global approach, noting regional exceptions throughout. Our opinion is typically expressed in terms of adjusted capital being either redundant or deficient across targeted levels of risk-adjusted capitalization, consistent with the rating level.
3. The capital adequacy outcome from the model is only a starting point for judging capitalization. We apply qualitative and quantitative enhancements as warranted to derive a more-complete picture of an insurer's capital position. These adjustments play a critical role in assessing risks that are unique to a company, while maintaining the ability to compare companies.
4. S&P Global Ratings is refining its methodology and assumptions for evaluating the capital adequacy of insurance companies. We are publishing this article to help market participants better understand our approach to reviewing insurance companies. This article is related to our criteria article "Principles Of Credit Ratings," which we published on Feb. 16, 2011.

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SCOPE OF THE CRITERIA

5. S&P Global Ratings is updating its criteria for its RBC adequacy model to update and refine several areas. We undertake periodic reviews of the appropriateness and level of the factor-based charges in our enhanced risk-based capital model. The updates focus on:

- Asset-related risk charges, including asset-liability management (ALM) within the International Financial Reporting Standards (IFRS)/generally accepted accounting principles (GAAP) and U.S. statutory models;
- Methodologies that were also reviewed for appropriateness and charges updated to reflect the most recent market data of the past four years; and
- The model that has been expanded to include regional variations, including the introduction of region-specific models for Asia-Pacific, Latin America, and Canada.
- Capital charges for U.S. variable annuities that have been revised.

SUMMARY OF CRITERIA UPDATE

6. This article supersedes "Analysis Of Insurer Capital Adequacy," published on Dec. 18, 2009. Notable changes include:
   - Revised risk charges for asset-related risks: equities, ALM, property, and credit (including loans, reinsurance recoverables, bank deposits, and preferred stock);
   - Addition of region-specific risk charges for Asia-Pacific, Latin America, and Canada, primarily elements of total adjusted capital (TAC) and non-life premium and reserve charges.
7. Appendix 1 lists the changes in more detail.
8. This paragraph has been deleted as it contained information that was applicable on the original date of article publication (June 7, 2010) but is no longer relevant.
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METHODOLOGY

Summary

10. The model seeks to determine the amount of capital in excess of reserves that an insurance company needs to cover losses from disparate risks over the expected life of its portfolio. The results indicate the amount of capital corresponding to varying confidence intervals that S&P Global Ratings considers commensurate with a given rating category. In the model, each risk variable is stressed using these confidence levels and our empirically observed cumulative five-year defaults across ratings, as established at the inception of this enhanced model in 2007. Although the model measures the impact of the stressed risk variables over the expected lives of the assets and liabilities, the volatility used to create the stressed scenarios is based on potential movements expected over a one-year period.
11. In other words, we are seeking to capture the present value of expected economic losses (change in shareholder equity/policyholder surplus) experienced over a year, to a degree of certainty that is commensurate with the rating. The confidence levels establishing the degree of certainty for each individual risk are: 97.2% for 'BBB', 99.4% for 'A', 99.7% for 'AA', and 99.9% for 'AAA'.
12. S&P Global Ratings gives explicit credit for diversification within the capital model, albeit at levels likely to be more-conservative than those used by many insurers in their internal models. The approach reflects our conservative view on correlations in the tail, through the application of

correlation matrices specifically designed for this model. It also partly reflects the limitations on the fungibility of diversification credits across a consolidated group.

13. Implicit diversification credit is also embedded in many of the charges (e.g., equity and mortality) where indices and industry level data are being used. The diversification credit calculated brings the sum of the capital requirement for each risk at the various rating levels to a level commensurate with the confidence level consistent with the rating.

14. Another reason why S&P Global Ratings chose to be conservative in its model's explicit diversification credit is that some diversification is implicit in the chosen confidence intervals for each risk charge. We generated these from five-year default data, which we deemed a more-appropriate measure to calibrate each charge than the more-onerous one-year horizon. We see the one-year horizon applied in some regulatory regimes and it generates a higher diversification credit.

Capital Model In Context

15. This paragraph has been deleted.

16. The model creates a consistent initial approach to measuring an insurer's capital adequacy. Still, results are primarily guideposts, not absolute benchmarks, by which to gauge capital adequacy. A vital part of the assessment of capital adequacy incorporates adjustments--both qualitative and quantitative--to the model. These quality of capital adjustments may consider:

- An insurer's ability to internally generate capital and self-fund growth through earnings. All else being equal, we usually view companies with long track records of consistently good earnings as having a stronger capacity for reliable capital development than companies with more-volatile performance. We also consider an insurer's prospective growth plans in conjunction with management's commitment to maintaining or enhancing surplus adequacy or running a leaner capital structure.
- Potential calls on capital or sources of capital support. Affiliates might look to the rated entity for future capital support, or a parent might develop an increasingly aggressive appetite for dividends. Alternatively, a parent, subsidiary, or affiliate may be able to provide future capital support. Either may alter how we view an institution's capital strength.
- Quality of asset/liability management techniques. Generally, S&P Global Ratings views companies willing to accept incremental risk less favorably than those adhering to more-prudent practices. A company's demonstrated understanding of the risks undertaken also influences the assessment.

17. Since 2005, S&P Global Ratings has been assessing the strength of ERM within insurance groups. The insight this tool offers into management techniques used to assess, quantify, and manage risk provides an important element of our analysis of capital adequacy.

18. In particular, the sophisticated risk models now employed by insurance groups as part of their ERM framework will complement the factor-based approach of S&P Global Ratings' capital model. The factor-based model benefits from simplicity and global consistency and helps to cut through the myriad assumptions that drive the result in the more-complex economic capital models. By assessing the output of both S&P Global Ratings' capital model and the insurer's own model, S&P Global Ratings expects to derive an informed opinion of capital adequacy (see "A New Level Of Enterprise Risk Management Analysis: Methodology For Assessing Insurers' Economic Capital Models," published on Jan 24, 2011).

Capital model framework

19. S&P Global Ratings' capital model is designed under a globally consistent framework. Regional factors are applied to reflect features unique to a local market. The factor-based model reflects observed volatility over periods of 15 to 30 years, depending on the risk factor, supplemented by scenario-based analysis where appropriate.

20. In our view, the model improves the analytical value of our ratings process by better linking expected capital adequacy to risk. It provides transparency to the marketplace as to the level of stress that is applied and clearly defines the risks encompassed. We believe the model parallels advances in risk management and measurement currently being made in the insurance industry, which will make it easier to apply the model in conjunction with internal (economic) capital models. The model applies a well-defined and consistent framework to measure exposure across all categories of risk (e.g., mortality risk, underwriting and reserving risk, credit risk, and financial market risk).

21. The model calculates a target level of RBC at various rating levels, based on the company's specific risk profile. The target capital captures market, credit, operational, and recoverability risks as well as insurance business-related risks of pricing, interest rate movements relative to interest-rate sensitive products, mortality/morbidity, catastrophic risks, and loss reserving.

22. An insurance company's total adjusted capital is compared with the level of target capital. At various rating levels, a redundancy or deficiency can be quantified against the target capital.

ASSUMPTIONS

Defining Capital: A Global Approach

23. S&P Global Ratings provides ratings on companies in many parts of the world. In so doing, even with the advent of International Financial Reporting Standards (IFRS), we encounter many different accounting frameworks. We have created two measures that normalize the resulting measures of owner equity on a more-consistent basis: total adjusted capital (TAC) and economic capital available (ECA).

Total adjusted capital/Economic capital available--IFRS/GAAP model

24. TAC is the measure S&P Global Ratings uses to define the capital available to meet a company's capital requirements in our capital adequacy model. S&P Global Ratings calculates TAC using a globally consistent methodology. It is a narrow capital measure reflecting a near-term view on the realization of assets.

25. For example, TAC reflects the ability to partly realize the off-balance-sheet value of in-force life insurance business through reinsurance or securitizations in a relatively short timeframe. It is also influenced more by the current regulatory views of capital than by an economic view. TAC includes nonowner capital that can absorb losses, such as hybrid capital, and forms of policyholder capital that can be used to absorb risk across an organization, such as discretionary funds backing participating life insurance policies.

26. ECA is a broader, more economic view of owner (shareholders, or policyholders in the case of mutuals) capital with a longer-term view on crystallizing value. It reflects, for example, the ability to partly realize the value of goodwill over the long term through asset sales or enhanced earnings.

Generally accepted accounting principles or statutory?

27. For companies or groups producing financial statements in accordance with generally accepted accounting principles (GAAP), we normally calculate TAC and ECA from information contained in those statements. However, in certain countries (e.g., the U.S.) some companies only produce financial statements in accordance with the local regulators' basis (statutory basis) of accounting. S&P Global Ratings may draw TAC and ECA from information contained in the statutory basis financial statements if there are no GAAP financial statements or if the statutory basis financial statements provide greater depth and breadth of financial information.

28. Increasingly, many companies in jurisdictions that focus on statutory solvency have subsidiaries and affiliates that operate offshore--either as local companies conducting business in international jurisdictions or as offshore captive reinsurers. In those cases, analysis based purely on statutory information might miss significant risks to the group. Therefore, S&P Global Ratings has expanded its use of GAAP capital models on a consolidated group basis. This analysis will not replace statutory analysis, which is still important to assure local statutory solvency. But the primary measure of group capital adequacy will focus on GAAP/IFRS analysis to capture group risks on a more-appropriate economic basis.

Consolidated or unconsolidated?

29. S&P Global Ratings' insurance group rating methodology outlines criteria for evaluating insurance groups. This is founded initially on an analysis of a consolidated group. We treat it as if it were a stand-alone company, and determine an opinion of its creditworthiness as if it were a single legal entity--the Group Credit Profile (GCP). Then we determine whether each insurance operating company subsidiary is core, highly strategic, strategically important, moderately strategic, or nonstrategic to the group. Finally, taking that assessment into account, we assign ratings to the group's subsidiaries. The GCP would normally determine the creditworthiness of core members of a group.

30. S&P Global Ratings prefers to base its analysis for determining the GCP on a group's consolidated financial statements and we capture the group capital on a consolidated basis. For example, this consolidated basis includes all the operations of the group, thus eliminating the effects of double leverage and intragroup transactions. Nonetheless we remain cognizant of an individual legal entity's capital in relation to local solvency requirements. The ratings on individual group subsidiaries may be influenced in part by the company's individual financial statements (which may or may not be consolidated). Where applicable, we may make adjustments for double leverage.

Components of TAC

31. TAC is reported statutory surplus or GAAP reported common shareholder equity, adjusted for certain items that affect the quality of the surplus/equity.

Table 1

Components Of Total Adjusted Capital

Reported shareholders' equity/policyholder surplus	
Plus	Equity minority interests*
Plus	Equalization/catastrophe reserves*

Table 1

Components Of Total Adjusted Capital (cont.)

Plus	Prudential margins included in reserves
Minus	Proposed shareholder dividends not accrued
Minus	Standard & Poor's impairment of goodwill
Minus	Other intangible assets
Minus	On-balance-sheet unrealized gains/(losses) on life bonds*¶ (post tax§)
Plus	Off-balance-sheet unrealized gains/(losses) on investments other than life bonds* (post tax§)
Minus	Off-balance-sheet pension deficits (post tax§)
Minus	On-balance-sheet pension surpluses (post tax§)
Plus	Up to 100% of off-balance-sheet life value of in-force (post tax§)
Plus	Property/casualty loss reserve surpluses/(deficits) (post tax§)
Plus	Property/casualty loss reserve discount
Plus	Discounted unearned premium reserve
Plus/Minus	Analyst adjustments
= ECA (economic capital available)	
Minus	Remaining goodwill after Standard & Poor's impairment
Minus	Investment in unconsolidated subsidiaries, associates, and other affiliates
Minus	Investments in own shares/treasury shares
Minus	50% deducted of off-balance-sheet value of in-force (post tax)
Minus	50% deducted of life deferred acquisition costs (post tax)
Minus	100% deducted of property/casualty deferred acquisition costs
Minus	50% deducted of property/casualty loss reserve surpluses
Minus	33% deducted of property/casualty loss reserve discount
Minus	50% deducted of discounted unearned premium reserve
Plus	Policyholder capital available to absorb losses
Plus/Minus	Analyst adjustments
= TAC before hybrid capital adjustments	
Plus	Hybrid capital (subject to tolerance limits)
Minus	Excess over hybrid tolerance
= Total Adjusted Capital	

*Where not already included in shareholders' equity. ¶Subject to fair value exception. §Where tax effect is not disclosed use effective tax rate.

32. For those jurisdictions where S&P Global Ratings continues to evaluate capital primarily based on statutory accounting, the statutory definitions of TAC are used.

Description Of TAC And ECA Adjustments

Equity minority interests

33. Often, equity minority interests already form part of shareholder equity, but if not, we will add them to TAC because they constitute capital controlled by a group's management.

Equalization/catastrophe reserves

34. Equalization and catastrophe reserves are not permitted under U.S. GAAP or IFRS because they relate to future unexpected events. However, they still remain in some national GAAPs and statutory accounting. S&P Global Ratings regards these reserves as equity.

Prudential margins included in reserves

35. In some countries, such as Australia, explicit margins are required as part of reported liabilities. We add a proportion of these margins back to equity for TAC and ECA purposes. The proportion varies depending on the margin of sufficiency included in the liabilities.

Proposed shareholder dividends not accrued

36. If the financial statements include a proposed level of shareholder dividend relating to the past financial year that is not accrued in the balance sheet, we deduct it from shareholder equity in deriving TAC.

Goodwill

37. Goodwill is subject to an S&P Global Ratings impairment charge in the calculation of ECA, and deducted in full from shareholder's equity to derive TAC.

Unrealized gains on investments

38. Treatment of unrealized gains will depend on the balance-sheet treatment of liabilities. TAC may include full credit for the market value of investments, except for bond investments matched with nonlinked (or general account) life insurance liabilities. However, bond investment market values may be included in TAC and ECA if matching balance-sheet liabilities are valued on a market-consistent basis (that is, where movements in interest rates affect both asset and liability values).

39. Accordingly, where unrealized gains/losses are on-balance-sheet, we usually remove gains/losses on bonds matching nonlinked (or general account) life insurance liabilities from TAC and ECA. However, if liabilities are valued on a market-consistent basis, we make no adjustment.

40. Conversely, where unrealized gains/losses are off-balance-sheet, we typically add gains/losses on investments other than bonds matching nonlinked (or general account) life insurance liabilities to TAC and ECA.

41. For non-life business and shareholder funds, we normally add the market value of bonds to TAC if they are off-balance-sheet.

42. The above comments provide a base position for the analysis. However, the issues arising from different accounting standards in different regulatory regimes mean further analytical judgment

may be required to better reflect the economic position.

Pensions

43. Companies increasingly deduct defined-benefit employee pension (or long-term health care) scheme deficits from their balance sheets when calculating shareholders' equity. Where such deficits are held off-balance-sheet, S&P Global Ratings usually deducts the full amount in deriving TAC. This includes deficits that remain off balance sheet where the corridor method is used.

44. All on-balance-sheet amounts related to defined-benefit employee pension (or long-term health care) scheme surpluses are also removed from TAC, given the lack of fungibility of such surpluses.

45. Where the capital adequacy models of subsidiaries are based on statutory basis financial statements, pension deficits can rarely be allocated to those subsidiaries. We generally only make pension adjustments as part of our capital analysis of the consolidated group, based on GAAP.

46. This paragraph has been deleted because it was superseded by "Insurers Rating Methodology," published July 1, 2019.

Value of in-force life insurance business and life deferred acquisition costs (GAAP model)

47. Balance sheets tend to understate the economic value of life insurance business globally, although the degree of understatement varies. Where available and audited, S&P Global Ratings uses embedded value analysis to normalize its balance-sheet analysis (and, more importantly, its earnings analysis) across the globe. Increasingly, embedded values are disclosed in supplementary financial statements, but are generally not included in balance sheets shown in the primary financial statements. S&P Global Ratings will credit up to 50% of value in force (VIF) in its calculation of TAC. Adjustments will be made to avoid any double counting of the credit given on balance sheet for VIF, deferred acquisition costs (DAC), value of business acquired (VOBA), and goodwill.

48. Where embedded value information is not available, we may include up to 50% of the value of life DAC, if we consider it reasonable to assume those costs will be recovered even under stressed scenarios. We may apply further adjustments to exclude more of the DAC if we believe the company assumptions are not sufficiently conservative. In some regions, other proxies may be available for VIF and would be considered in our analysis, if appropriate.

Property/casualty deferred acquisition costs

49. We deduct 100% of P/C DAC when calculating TAC. In jurisdictions where P/C contracts can have long-term features akin to life insurance products, partial credit may be given for DAC assets arising from those contracts.

P/C loss reserve deficits/surpluses

50. Where S&P Global Ratings determines that a company's loss reserves are either deficient or in surplus (by our own reserve analysis, external actuarial review, or other means), we will adjust TAC accordingly. For the purposes of TAC, surpluses are normally haircut by 50%. There is no double counting of credits for loss reserve surpluses and prudential margins in reserves. (For more

details, please see "Assessing Property/Casualty Insurers' Loss Reserves," Nov. 26, 2013.)

51. For the purposes of calculating expected capital needs for P/C loss reserves, and the discount calculation below, we adjust reserves to a level consistent with the TAC measurement. This avoids removing the incentive for companies to reserve conservatively.

Discount on P/C loss reserves

52. TAC is adjusted to eliminate any explicit or implicit discount of P/C loss reserves. S&P Global Ratings then calculates its own estimate of the time value of money, based on the non-life reserve duration and the relevant 10-year government bond yield. We use a weighted-average for companies with reserves denominated in more than one currency.

We calculate the loss reserve discount as:

Non-life loss reserves (net of reinsurance) x (1-(1/(1+r)^n)) where:

r = applicable long-term government bond yield.
n = mean term of claim liabilities in years.

53. As a matter of prudence, S&P Global Ratings has chosen to haircut the loss reserve discount by 33%. The discount calculation is applied to loss reserves after any adjustments for deficits/surpluses.

Discounted unearned premium reserve

54. S&P Global Ratings deducts 100% of non-life deferred acquisition costs when it calculates TAC. However, we recognize that value will normally be embedded in the unearned premium reserve (UPR). We recognize this value by giving partial credit for the time value of the unearned premium reserve. TAC is adjusted to reflect the discounted value of the UPR, based on the company's reserve duration (subject to a two-year maximum) and the relevant 10-year government bond yield (or a weighted-average for companies with reserves denominated in more than one currency).

We calculate the unearned premium reserve discount as:
Unearned premium reserve x (1-(1/(1+r)^n)) where:

r = applicable long-term government bond yield.
n = estimated duration of reserves, subject to a two-year maximum.

55. We apply a 50% haircut to capture an allowance for expenses, taxes, and general conservatism over the timing of future claims. We will continue to reflect pricing risk elsewhere in the model through our premium charges.

Policyholder capital available to absorb losses

56. Certain forms of policyholder capital may be included in TAC if they are available to absorb losses (notably investment losses) across the organization. This could include the unallocated divisible surplus in the U.K. and free Rückstellung für Beitragsrückerstattung (RfB) in Germany. Policyholder capital is generally excluded from the hybrid equity ratio, with the notable exception of mutuals.

Deferred tax

57. Usually, no routine adjustments are made for on-balance-sheet deferred tax assets and liabilities, although we may make adjustments where asset recoverability is questionable or distant. All adjustments to TAC that would result in a tax charge or credit are adjusted for the tax impact. This typically applies to the value of off-balance-sheet life insurance in force, off-balance-sheet pension adjustments, unrealized investment gains, and deferred acquisition costs. In the absence of disclosed tax effects, adjustments are made using the effective tax rate determined from the income statement.

Subsidiaries, associates, and other affiliates

58. Unconsolidated investments in subsidiaries are subject to a 100% capital charge. This recognizes that the asset and liability risks associated with such subsidiaries are not consolidated in the reported financials and, therefore, the capital model. The 100% capital charge assumes that the subsidiary has sufficient capital to meet its requirements. If the subsidiary is material, the company should either be consolidated into the group capital model or a stand-alone analysis should be performed. The 100% capital charge is then adjusted up or down for any redundancy or deficiency of capital resources relative to requirements, with appropriate consideration of any capital fungibility constraints.

59. S&P Global Ratings may give partial credit where the book value of listed affiliates is understated relative to their market value. We apply haircuts to the excess of market over book value of core or strategically important affiliates because, in our view, these holdings are unlikely to be fully realized and also to recognize the potential liquidity risks. We will recognize full value for the excess of market over book value of listed nonstrategic affiliates, subject to a standard 27% equity volatility charge. We will adjust upward the base charge of 27% if these investments are material or domiciled in higher-risk equity markets.

Leverage Analysis

Quality of capital

Paragraphs 60–64 have been deleted.

Hybrid capital

65. A detailed description of hybrid capital is given in "Hybrid Capital: Methodology And Assumptions," published on July 1, 2019.

66. S&P Global Ratings employs a simple methodology for analyzing hybrid securities that parallels the regulatory approach, classifying hybrids into three categories to reflect their relative degree of equity strength. The limits for inclusion by category broadly parallel the regulatory policy of capping the inclusion of hybrids in regulatory capital, and allow for global comparisons of capital measures.

[Table 2 has been deleted.]

Hybrid Capital/Double Leverage Tolerance

67. To better reflect the often-significant regional variations in the nature of insurance regulation, as well as the many local differences in the regulatory eligibility of diverse forms of capital, S&P Global Ratings uses differentiated criteria in respect of its hybrid capital and double leverage tolerances.

68. Our focus is on two analytic variables that are used to establish appropriate tolerances for hybrid capital and for the proceeds of ordinary debt-funded double leverage. The two analytic variables depend on the extent to which structural subordination is likely, in our view, to be enforced by regulators on a company-by-company basis, and also on the local regulatory tolerance of debt capital in eligible solvency.

69. The use of debt and hybrid capital to fund operating company capital is evaluated in the context of local regulation. Double leverage calculations are based on S&P Global Ratings' view of the local regulatory enforcement of structural subordination. In light of a growing trend by regulators to limit the use of debt and hybrid capital to fund insurance operating company capital, double leverage calculations are expressed as a percentage of group consolidated capital, which better captures these regulations.

70. Where the level of structural subordination is high and regulators allow holding-company debt to fund operating company capital, S&P Global Ratings' tolerances for double leverage will generally rise. Where the level of structural subordination is low and regulators exclude holding-company senior debt from group solvency capital, S&P Global Ratings' tolerances for double leverage will generally fall.

71. For capital models that are based on operating company statutory balance sheets, the excess over the double leverage tolerances are deducted from TAC. For capital models that are based on consolidated GAAP balance sheets, qualifying hybrid capital is added to TAC, subject to the tolerances referred to in table 3.

Table 3

Maximum Tolerances For Double Leverage And/Or Hybrid Equity Usage

Cases where enforcement of structural subordination is high and regulators allow holding-company debt to fund operating-company capital (e.g., currently U.S., Bermuda, and Canadian general insurers)		Cases where enforcement of structural subordination is low and regulators exclude holding company senior debt from group solvency capital (e.g., currently Europe, Asia-Pacific, Latin American, and Canadian life insurers)	
Category	**Maximum tolerance**	**Category**	**Maximum tolerance**
Total double leverage tolerance	Up to 45% of capital	Total double leverage tolerance	Up to 35% of capital
Debt-funded double leverage	Up to 20% of capital	Debt-funded double leverage	0%
High Equity Content	Up to 25% of capital	High Equity Content	Up to 35% of capital
Intermediate Equity Content	Up to 15% of capital	Intermediate Equity Content	Up to 25% of capital
No Equity Content	0% credit	No Equity Content	0% credit

72. In Europe, S&P Global Ratings' qualifying hybrid capital for hybrid ratios and double leverage may include hybrid issued or guaranteed by an operating subsidiary in addition to parent company hybrid.

73. When determining if a hybrid capital instrument qualifies as S&P Global Ratings qualifying hybrid, we first consider whether the instrument would be eligible regulatory capital and included in full in the regulatory solvency calculation. We exclude any excess above regulatory upper limits from both S&P Global Ratings' qualifying hybrid and regulatory qualifying hybrid.

Diversification

74. There is limited data to credibly model and project tail correlations. Study of company- and industry-level correlation matrices has highlighted numerous methodologies and factors being employed, and these have led to significant variation in the amount of diversification credit being assumed by companies in their models.

75. S&P Global Ratings has taken a more conservative view on how to project correlations in the tail than that generally observed in insurers' models. The matrices have been specifically designed for this model. This credit is in addition to the implicit diversification credit embedded in many of the charges (e.g., equity and mortality) where we are using indices and industry-level data. The

diversification credit calculated brings the sum of the capital requirements for each risk at the various rating levels back to a level commensurate with the rating category. No explicit quantitative credit is currently given in the capital model for the geographic spread of business.

76. Our conservatism with respect to the explicit diversification credit also reflects some implicit diversification in the chosen confidence intervals for each risk charge. These were generated from five-year default data that we considered to be a more-appropriate measure to calibrate each charge than the more-onerous one-year horizon that we see applied in some regulatory regimes, where higher diversification credit is permitted.

77. There are four simple matrices applied in the model:

- P/C captures correlation between different lines of business. These have been clustered into six main product groupings.
- Life matrix looks through product types and captures the underlying risks, e.g., mortality, morbidity. These have been categorized into four risk types.
- The third matrix looks to provide credit for the high level diversification derived from writing life and P/C risks.
- Asset risk correlation matrix focuses on the three core investment classes.

78. Given the uncertainties around tail correlations, a 50% haircut is applied to the resulting diversification credit.

79. S&P Global Ratings will continue to study the effects of diversification as part of its evolving analysis of economic capital models and ERM (see appendix 8).

Asset-Related Risks

Credit risk charges

80. Losses relating to credit largely result from credit defaults and changes in value resulting from ratings transitions, and systemic credit spread movements. The sources of these credit risks at insurance companies can include fixed-income assets, credit derivatives, commercial mortgages, and counterparty credit exposure relating to reinsurance contracts, deposits, and over-the-counter (OTC) derivative contracts.

81. We apply factors to all the major sources of credit default risk, including credit default swaps and OTC counterparty credit exposure, where significant. Because losses on risk relating to systemic credit spread movements are largely related to asset-liability risks, exposure to this risk is likely to be captured in the factors for risk relating to asset-liability mismatches (see "Asset/Liability Management"). Based on our research on the potential economic impact of ratings transitions on insurance company portfolios, S&P Global Ratings believes the magnitude of this risk does not warrant separate specific risk factors.

82. In calculating the expected capital adequacy for credit default risk, S&P Global Ratings applies a default charge relevant to the tenor of and rating on the security.

83. **Methodology for computing default factors.** S&P Global Ratings has tracked and studied default rates on each annual pool of ratings since 1981. We publish cumulative default statistics annually, based on data taken from S&P Global Market Intelligence's CreditPro. These cumulative default studies were used to compute the annual marginal default rate for each rating and tenor.

84.

S&P Global Ratings discounted the marginal default rates using a spot curve based on term structure of U.S. dollar interest rate swaps plus 200 basis points (bps). We then aggregated the discounted marginal default rates occurring on or before each tenor for each rating for each separate pool to derive the discounted cumulative default rates. We computed the average and standard deviation of the discounted cumulative default rates across each pool. To create the credit risk factors, we selected the mean of the discounted cumulative defaults experienced across the pools and added a standard deviation movement based on an established confidence level commensurate with the targeted capital level. Recoveries were applied to the stressed discounted cumulative default rates, which varied based on credit quality of the exposure.

Fixed-income securities

85. Credit risk factors for fixed-income securities were formulated for each rating level and for five tenor groupings: (one year and less, one–five years, five–10 years, 10–20 years, more than 20 years). In the U.S., filing conventions require assets to be grouped according to NAIC (National Association of Insurance Commissioners) classifications. To determine which rating(s) to assume for the stressed cumulative default factors applied to each NAIC bucket, S&P Global Ratings researched the corporate bond holdings across a spectrum of U.S. insurance companies and analyzed the breakdown of ratings in each NAIC category. From this review, we weighted the ratings within the NAIC classification band. S&P Global Ratings assumes NAIC 6 assets are impaired and the company has experienced a commensurate reduction in capital. Therefore, the charges on assets categorized as NAIC 6 across all tenors largely reflect further potential impairment on the residual value. This was done by analyzing the empirical data on the prices of senior bonds at the time of default (proxy for the impaired value), and the emergence price after bankruptcy (proxy for the actual recovery value). The final NAIC 6 factors reflect the volatility of the difference between these two sets of data, stressed to confidence levels we view to be commensurate with the rating.

Unaffiliated preferred shares

86. We used the same methodology to derive the credit default factors for preferred shares as we used for fixed-income securities (see "Fixed-income securities"), except that a lower recovery rate (10%) was used across all rating classes.

87. Based on available reporting, S&P Global Ratings bases the factor it applies to holdings of preferred shares of U.S. life insurance companies on NAIC classification and an assumed tenor of 10 years. It bases the factor it applies to holdings of preferred shares of U.S. non-life insurance companies (where the reporting convention does not require preferred holdings to be broken out by NAIC classification) on an assumed ratings spectrum and a tenor of 25 years.

88. Factors for impaired preferred securities classified into the NAIC 6 category were based on the same methodology as the fixed-income securities, with the exception of the underlying data, which was based on subordinated bond prices.

89. Outside the U.S., the IFRS/GAAP capital model charges for preferred stock assume a 20-year tenor, 10% recovery, and an average 'BB' rating.

Sovereign debt and government agencies and government-sponsored enterprises

90. S&P Global Ratings does not apply credit default risk factors to direct sovereign debt that we have

rated 'AAA'. For all other direct sovereign debt, we apply the same default factors that we apply to corporate obligations (default probabilities and recoveries will be assumed equivalent to the pools of corporate debt).

91. S&P Global Ratings treats federal agencies of sovereigns that we rate 'AAA', and direct obligations of the national governments) in a manner consistent with the sovereign debt of the country. We treat government-sponsored enterprises (GSEs) of national agencies, which have an implied, but not direct guarantee from a government, like corporate debt when modeling capital adequacy for credit risk.

OTC derivative counterparties

92. In situations where S&P Global Ratings determines that the counterparty credit exposure relating to OTC derivative contracts for an insurance company is material, we will calculate expected capital adequacy relating to such exposure. To determine the expected capital adequacy relating to such exposure, S&P Global Ratings will apply the stressed discounted cumulative default factors (see Credit risk charges), based on the average tenor of the exposure and the rating on the counterparty to the related unrealized gains of the insurance company. We may give credit for counterparty netting and risk mitigation techniques, such as collateralization provisions, where applicable.

Credit default swaps

93. In situations where S&P Global Ratings determines that credit exposures relating to credit default swaps held by an insurance company are material, we will calculate expected capital adequacy relating to such exposure. To determine the level of exposure when the company has "long" credit exposure, S&P Global Ratings will apply the stressed discounted cumulative default factors based on the tenor of the swap and the rating on the referenced party to the notional amount of the swap. Exposure to counterparties resulting from "short" positions (purchased protection) will be analyzed in the same fashion as for OTC counterparties. In cases where companies purchase credit default swaps to mitigate other credit exposures, we may factor this into the capital modeling.

Commercial mortgage loans (U.S.)

94. Paragraphs 94 to 100 have been superseded by "Methodology For Assessing Capital Charges For Commercial Mortgage Loans Held By U.S. Insurance Companies," published on May 31, 2012.

101. **Residential mortgage-backed securities (RMBS) and CMBS.** This paragraph and table 4, which followed it, have been deleted because they have been superseded by "Methodology For Assessing Capital Charges for U.S. RMBS and CMBS Securities held by Insurance Companies," published on Aug. 29, 2014.

Mortgages (Europe)

102. S&P Global Ratings recognizes that the capital risk to an insurer holding a mortgage asset largely depends on the degree to which that mortgage is backed by collateral. Since 2003, S&P Global Ratings has differentiated its charges on German, Swiss, and Austrian mortgages, based on their loan to value (LTV) ratio. Since 2007, we have applied this approach to all non-U.S. markets. The charges will still be distinguished between performing and nonperforming loans, however, our

model does not currently draw a distinction between commercial and residential mortgages. We may adjust the base factors to reflect other security features of the assets, valuation practices, etc.

Other Asset Credit Risk Charges

Reinsurance receivables plus reinsurance recoveries, less reinsurance deposits and letters of credit

103. The risk inherent in reinsurance recoverables is often the largest asset-based risk for P/C companies; particularly those writing longer-tailed lines of business. In that case, the primary company will estimate and record a reserve for notified outstanding claims and incurred but not reported claims, and will offset any reinsurance arrangement that it believes will bear a portion of those claims. However, the reinsurer will not settle these potential obligations until the insurers have settled the gross claim, which may take a long time. S&P Global Ratings therefore selected a single tenor of 10 years for non-life insurance companies in computing the credit default factor. In the U.S. life insurance sector, this lag is substantially reduced so a single tenor of one year is applied for life insurance companies.

104. In the GAAP/IFRS model used outside the U.S., all reinsurance recoverables are charged based on a single tenor of 10 years, and we may make adjustments depending upon the split and nature of those recoverables, if we view it as material.

105. **Methodology for computing default factors.** These single tenors of 10 years and one year, respectively, are applied to the recoverables from reinsurers and subject to the specific reinsurer rating. If letters of credit from a financially secure financial institution or suitable trust assets are available to offset the recoverability risk, credit for up to 100% of the collateral could be used to offset the reinsurance recoverable credit risk charge.

106. We may apply a surcharge of 20% on reinsurance recoverable balances related to asbestos and environmental pollution losses to reflect the prospective impact on capital due to disputed coverage. This surcharge does not apply to intragroup reinsurance recoverables where the reinsurer is highly rated.

Capital charge for fixed assets, including owner-occupied property

107. The charge applied against the market value of owner-occupied property reflects a 5% liquidity premium at 'BBB' over the real estate charge for the specific market in which the property is held (and is then scaled up at higher ratings).

108. We do not assign a capital charge to investment income due and accrued interest because past experience has shown us that the risk associated with this is not material.

Deposits with credit institutions

109. S&P Global Ratings applies a charge to cash and bank deposits to reflect the counterparty risk associated with these assets. In most developed markets, a standard flat-rate charge will be applied. S&P Global Ratings derived this charge from its corporate default studies using a methodology consistent with that used for deriving credit risk charges on corporate bonds. As bank deposits are short-term assets, S&P Global Ratings has assumed a duration of less than one

year for these assets. Recovery assumptions, however, are higher than for corporate bonds. This reflects the potential support of the sovereign we expect for depositors with financial institutions we consider systemically important, owing to the importance of confidence in the banking system for financial stability.

110. In less-developed markets, where the local currency sovereign rating is lower than 'A-', the charge applied to bank deposits is usually higher, to reflect the additional credit risk. The sovereign rating is used as a proxy for the credit risk associated with bank deposits.

111. This paragraph has been deleted.

Loans

112. For unsecured loans, S&P Global Ratings has again looked to its default statistics. We assume that half the loans are 'B' range and the other half 'BB' range and that the outstanding duration is five years. If loans represent a material asset on the balance sheet, we may conduct additional analysis to refine the charge.

113. Policy loans are usually secured against an underlying policy liability, so no charge is applied to these assets. Provisions for bad debts or recoveries should be offset against the loan balance.

Unit-linked assets

114. S&P Global Ratings does not apply an explicit charge to unit-linked assets. Expense risk, lapse risk, operational risk, and risks associated with embedded options in the contract (e.g., guarantees) are captured through liability-based reserve charges.

Other assets

115. Other assets not explicitly mentioned, or captured in the calculation of TAC, are subject to a 5% other-asset charge for 'BBB', which is scaled using the same confidence levels previously described.

Volatility Risk

Unaffiliated common stock: Methodology for computing volatility risk factors

116. Equity charges in the capital model have been derived for each market using a log-normal regime-switching approach. We based the base model on work carried out at the University of Toronto and the Society of Actuaries in the U.S. We then took monthly price data from the local Morgan Stanley Capital International (MSCI) indices for each country for the past 30 years (or the longest possible period, if less). The model was then parameterized to these data and the tail returns were estimated over 10,000 simulations to each of our defined confidence levels.

117. Historically, equity price models commonly included the assumptions that equity prices followed a geometric Brownian motion and that volatility was a constant. This is equivalent to assuming that price changes follow the log-normal distribution and continuously compounded returns follow the normal distribution.

118. These days, the limitations of this simple model, particularly in the tail, are more widely appreciated. The regime-switching model is one way to incorporate the observed fat tails and

negative skew implied by the historical data, and also allows for nonconstant volatility to be assumed, providing a closer fit to observed returns.

119. The regime-switching model chosen by S&P Global Ratings assumes two distinct periods (regimes), generally a stable period, characterized by a relatively higher mean return and relatively lower volatility, and a less-stable period, characterized by a relatively lower mean return and relatively higher volatility. Within each regime, returns are assumed to follow a log-normal distribution with regime-specific parameters. Given that the process is in either regime at any one time, there exists an associated probability of transitioning between regimes. The transition process is assumed to be Markovian; the probability of transition depends only on the current state, and not on previous states. The process randomly switches between the two log-normal processes, with the probabilities of switching regimes given by the estimated transition probabilities. This process not only produces the desired fatter tails, but we also believe it captures stochastic volatility in a simple, yet effective, manner.

120. For each country under consideration, the model was parameterized to 30 years of monthly returns data (where possible) from the respective MSCI index for the country. The parameters estimated were the mean return for each regime, the volatility for each regime, and the two transition probabilities of switching between regimes. We estimated the parameters using maximum likelihood estimation. We then simulated 10,000 monthly equity returns paths, making use of the estimated parameters and a high-quality random number generator. For each target rating, the associated confidence levels were mapped to percentiles of the one-year returns distribution of the 10,000 simulated paths to produce the capital charges.

121. The simulation technique involved generating monthly returns paths. For each path, the initial regime was selected using the unconditional probabilities pi1 and pi2. Once the initial regime was chosen, the algorithm simulated monthly returns by randomly drawing from the regime-specific estimated distribution. After the return value for the month was drawn, the algorithm compared a random draw from the uniform distribution with the appropriate transition probability to select the regime assumed for the following month. Analytical adjustments were applied to the final charges to group countries displaying similar characteristics into seven distinct charging buckets.

122. Diversification within cross-border equity portfolios has been recognized by applying this method to regional equity indices. Again, monthly data were taken from the MSCI, and insurers that can demonstrate that they maintain a broadly based portfolio will be able to apply the index charge to that portfolio, rather than the individual country-specific charges. Some judgment will be required in deciding whether a portfolio is sufficiently well balanced to justify the regional charge. As an example, the MSCI Europe index has about 50% of its weight over two countries (U.K. and France) and about 75% of its weight over five countries (U.K., France, Germany, Switzerland, and Spain). An equity portfolio would need to broadly mirror the proportions and geographic split to warrant the regional index charge.

Real estate

123. S&P Global Ratings has assumed that property prices follow a log-normal distribution (that is, that compound returns follow the normal distribution) and that the volatility of prices is constant over time.

124. For selected countries, the model was parameterized with reference to quarterly or annual capital value data over periods of 10, 20, and 30 years. The primary data sources were publicly available data published by Investment Property Databank and various local indices. Given the lack of reliable data available for most countries, S&P Global Ratings decided that it would apply three categories of property investment charge for bands of countries, based on its multiperiod analysis

of several selected countries.

125. The final charge for each rating level was then determined using the appropriate confidence levels for the parameterized model.

Schedule BA invested assets, including bond, mortgages, real estate, and common stock--U.S.

126. For companies filing U.S. statutory financial statements and reporting invested assets in Schedule BA, S&P Global Ratings may apply a higher capital charge. Because these assets are usually higher risk or have a less-liquid secondary market, the range of the charge will likely be 20%–50%. For companies that employ a hedge fund-of-fund investment strategy, S&P Global Ratings acknowledges that the base capital charge (20%-50%) might not reflect the reduced volatility of a fund-of-fund investment strategy. As an alternative to the general capital charge, S&P Global Ratings has developed a tailored analytical approach for forecasting the likely volatility for any hedge fund-of-fund investment strategy. For the fund-of-fund investment strategies that are analyzed under this enhanced analytical approach, S&P Global Ratings will apply capital charges using confidence intervals that are consistent with our insurance risk-based capital adequacy model.

127. Paragraphs 127-132 and table 5, titled "Invested Asset Concentration Charge," have been deleted.

Liability-Related Risks P/C (Non-Life) Charges

Evaluation of U.S. P/C (non-life) underwriting and reserve risks

133. In our analysis, the fundamental risk associated with underwriting and reserving is that in setting both the premium and reserve levels, the emergence of a claim and its actual cost will vary from the expected cost by line of business. The risk exists not only on all present and future business, but also on past business not already settled. Although internal frequency and severity estimations account for a large part of the variability, changes in economic, legal, and social conditions can increase the variability of claim costs.

134. The underwriting risk is that the company's business will be unprofitable and that underwriting losses will need to be covered by capital.

135. **Methodology for computing risk charge factors.** S&P Global Ratings' methodology is adapted from the NAIC methodology that was first applied by U.S. regulators in the early 1990s for their RBC model. The charges reflect 20 years of experience, covering at least two full underwriting cycles.

Premium risk

136. To gauge premium risk for primary and proportional reinsurance, S&P Global Ratings first analyzed Schedule P data from 1994-2003 (10 years). This information is filed with the U.S. regulators and offers line-of-business accident- and calendar-year loss data. The risk associated with business written but not yet earned was not charged in the model, as we judged the equity in the unearned premium reserve to be sufficient to cover the risk.

137. Investment income resulting from the time lag between premium collection and loss payment is an important consideration in insurer profitability. Accident-year loss data was captured from

individual companies that constituted 90% or more of the U.S. market share for each line of business. We selected the second-highest observed accident-year loss ratio from 1994-2003 and an average expense ratio for all years by business line. We then calculated a combined ratio (CR) by adding the two ratios and calculated the underwriting risk factor (representing observed volatility from 1994-2003) by subtracting 100% from the CR.

138. We calculated the final premium factor (reflecting volatility over a 20-year period--both hard and soft underwriting cycles) by taking a simple average of the factors for each line of business for each 10-year period. We apply this factor to the net written premium for each line of business and scale it to ratings higher than 'BBB' according to the confidence levels established in the default work on fixed-income securities.

139. The charges for proportional reinsurance continue to reflect the underlying primary insurance charges. The data on nonproportional reinsurance is less meaningful because the information is aggregated into just three groupings: short-tailed lines of business (property); long-tailed lines of business (casualty); and financial lines. In U.S. statutory filings, these are referred to as Reinsurance A, B, and C, respectively.

140. To provide some granularity, S&P Global Ratings has chosen to base its charges on the primary charges, with a surcharge for the nonproportional, longer-tailed lines. We deemed the incremental charge to be prudent as experience has shown us that reinsurers in excess-of-loss positions sufficiently above the working layer covers of proportional and primary business are not as aware of unexpected emerging volatility and have less time to change pricing and terms and conditions. No surcharge is applied to property lines as the period of uncertainty is greatly reduced and a separate property-catastrophe charge is applied.

141. We also conducted analysis on a net of reinsurance basis. Because reinsurance can reduce underwriting volatility and risk, we compared net and gross worst accident-year results for all lines of business, but did not find a meaningful distinction.

142. With respect to the workers' compensation line, we wished to mitigate a potential downward bias in our data which could result from the fact that some workers' compensation funds might not be part of the data set. We performed a separate analysis and increased our calculated factors modestly.

Reserve risk

143. Reserve risk is the risk that balance sheet loss reserves will become deficient due to unexpected variability in estimating frequency and severity trends, as well as changes in economic, legal, and social conditions that can add further variability to claim costs. The reserve risk charge does not attempt to measure the adequacy of current loss reserves. This is done elsewhere in the financial strength analysis and any adjustment to set the reserves at an adequate level is done in TAC.

144. The reserve risk charge measures only the variability a company would expect to encounter in its reserve levels given its lines of business and ensures that capital is sufficient to cover this expected variability at different levels of confidence.

145. **Methodology for computing risk charge factors.** S&P Global Ratings used a loss development metric (LDM) methodology, where the LDM measures changes in ultimate incurred loss from one calendar year date to the next by line and accident year. The LDM measures the magnitude of adverse or favorable loss reserve development over time. An LDM greater than one indicates adverse reserve development from one period to the next and an LDM less than one indicates favorable reserve development. The LDM was developed from S&P Global Ratings' database, which contains 20 years of loss data (1984-2003). Volatility in LDM ratios by lag is an indicator of

reserve volatility.

146. We created "data triangles" of LDM ratios (current accident-year ultimate net loss divided by ultimate accident-year net loss in the prior annual time periods) for each company group using Schedule P lines of business. These LDM ratios, for all lines of business, were discounted using one of three interest benchmark discount factors, chosen to suit the expected duration of the line of business. The interest benchmark here refers to a relevant interest rate reference benchmark upon which interest payment is being calculated.

147. The discounted LDM ratios were calculated by line of business, company, and accident year and a percentile distribution was established to measure adverse scenario loss development. Higher percentiles indicate more-adverse scenarios. We produced the risk charge by taking a company's indicated adverse scenario ultimate incurred loss, minus the carried ultimate incurred loss.

148. The LDM factors at the 75th percentile were selected for all lines except workers' compensation, medical malpractice claims made, passenger auto liability, and homeowners'/farm owners'. Although the individual lines could be more volatile relative to other lines of business, all were stable in their volatility at the 75th percentile. The noted volatility rose more quickly and/or more steeply for some lines of business. To capture this risk, a higher percentile (ranging from 80th to 90th percentile) was used on a selected basis.

149. The factor was scaled to the rating levels higher than 'BBB' according to the confidence levels established in the default work on fixed-income securities. The factors are the same for all primary, proportional, and nonproportional covers. S&P Global Ratings continues to seek to break down the Reinsurance A-C further into lines of business comparable to those reported on proportional reinsurance.

Premium and reserve charges outside the U.S.

150. Premium and reserve charges outside the U.S. are adapted for relevant regional markets and conditions. However, in view of the varying levels of public information available outside the U.S., the U.S. charges, suitably mapped to regional definitions of lines of business, provide significant input to setting regional charges. Other influencing factors are:

- Our perceptions of volatility relative to the U.S. (particularly for liability lines of business, where non-U.S. experience has been significantly better);
- Public-domain regulatory charges;
- The charges embedded in insurers' own capital models; and
- The observations derived from rating insurance securitizations.

151. For reinsurers, U.S. exposed business is captured using U.S. statutory lines of business and associated charges. Non-U.S. business is captured using local accounting classes and associated charges.

Exposure-driven property catastrophe charge

152. S&P Global Ratings incorporates a tax-adjusted aggregate one-in-250-year property-line-only probable maximum loss catastrophe capital charge, calculated net of reinsurance and other forms of mitigation such as catastrophe bonds. This probable maximum loss must include demand surge, fire following (attached to earthquake and fire policies), sprinkler leakage, storm surge, and secondary uncertainty losses. The capital charge covers global catastrophe exposures:

hurricanes (wind), flood, earthquake, tornadoes, and hail. The charge should capture the impact of investments in catastrophe bonds, as well as those issued by the insurer.

153. There are two premium adjustments. S&P Global Ratings removes the catastrophe load premium embedded in the premium risk charge so as not to double-count required capital. In the absence of catastrophe loading computed by the insurer, a 5% premium adjustment is made. The second adjustment is to reduce the net aggregate one-in-250-year modeled loss by 70% of the associated net written premiums, given the short-tail nature of property catastrophe risk.

154. This charge is also net of any applicable tax relief. S&P Global Ratings believes that the charge represents an extreme event risk and if it occurs, those that are taxpayers would receive this benefit and it would absorb some of the surplus impact. The charge is material enough that we do not scale it up for higher rating levels; we apply the one-in-250-year standard to all insurers and reinsurers.

Liability Related Risks Life Charges

155. A fundamental risk in pricing life insurance products is that the mortality/longevity, expense, and persistency assumptions built into the products may not be sufficiently conservative.

Methodology for mortality risk charge

156. S&P Global Ratings measured the volatility of actual to expected ratios for the top 100 U.S. life companies. In this review, some adjustments were made to remove outliers, typically related to merger and acquisition activity. We calculated a standard deviation of actual to expected ratios and translated it into a percentage of the net amount of insurance at risk. We then computed relative factors by using the confidence levels.

157. The factors are applied to several net-amount-at-risk groupings: less than $1 billion, $1 billion-$5 billion, $5 billion-$10 billion, $10 billion–$50 billion, $50 billion–$100 billion, and more than $100 billion. The in-force bands were created to provide credit for higher levels of diversification. Credit for catastrophic reinsurance, assuming no significant risks are excluded (nuclear, biological, and chemical) is permitted up to 20% of the base charge. These factors are applied for products sold in the highly developed life insurance markets (which, for the purposes of these criteria, are defined as Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Malta, The Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Swiss Confederation, Taiwan [Republic of China], the U.K., and the U.S.).

158. The mortality factors applied in highly developed markets are increased by 25% for those in medium-developed life insurance markets (defined for the purposes of these criteria as the remainder of the EU, Argentina, Brazil, Chile, Israel, Malaysia, Mexico, and South Africa). The mortality factors are increased by 50% for all other nations, where we anticipate that the life insurance market would be less developed.

159. Critical illness coverage is a relatively new product offering in many markets. Because actual loss experience is still too much in its infancy to be meaningful, S&P Global Ratings used a multiple of 3x the mortality risk charges across the same band of in-force groupings denoted previously. As the data develops, it is our intention to re-evaluate the risk and assign a capital risk charge that we believe is more reflective of the underlying volatility. In many cases, critical illness cover is offered as a rider to a base life insurance policy. In these cases, we apply only the critical illness charge, as it is the dominant risk, and should incorporate the mortality-related volatility.

Methodology for longevity risk charge

160. S&P Global Ratings derived the longevity charge by measuring the actual life expectancy data and its development for each major European market in the past 10, 15, and 20 years. The volatility of change in life expectancy around the mean trend was then calculated and assumed to be normally distributed around that trend. The implied charge at each rating level was then calculated using the defined confidence intervals.

161. Some additional assumptions underlie the setting of this charge. First, we assume that an insurer will maintain comparable levels of prudence in its longevity assumptions as underlying life expectancy changes. The same charge is applied to an insurer that has large margins in its assumptions as to one that uses small margins, the differences in prudence of reserving will be captured elsewhere in the rating analysis. Second, we assume that reserves for longevity are not, in practice, adjusted every year, as it typically takes several years for a trend to be distinguished from random fluctuations. S&P Global Ratings observes such reserve additions occurring at approximately five-year intervals. Consequently, the longevity charge in the capital model reflects our opinion of the likely reserve strengthening that would be carried out in the coming year, rather than the actual incremental cost of one year's improvement in mortality.

Life reserve risks--other

162. S&P Global Ratings also applies a life reserve charge to pick up residual risks within product types. Expense risk, lapse risk, operational risk, and risks associated with embedded options in a contract (e.g., guarantees) are captured through liability-based reserve charges.

Asset-Liability Management

Evaluating asset/liability mismatch ALM risk--U.S.

163. S&P Global Ratings has developed factors that address the increasing complexity of life products. These ALM factors will be applied to insurance products, where spread income is generated between the cost of funding and the yield on assets including traditional participating business, fixed annuities, indexed annuities, funding agreements, guaranteed investment contracts (GICs), medium-term notes (MTNs), and structured settlements.

164. Each of the ALM factors consists of an aggregation of various subfactors that capture the different types of risks embedded in each type of liability.

165. All of the ALM factors consider mismatch risk, systemic spread volatility risk, and guarantees and options. We apply the factors for ALM risk to the statement value of liabilities. Although foreign exchange risk is not directly addressed in the model, we may make adjustments to the ALM factors to account for such risk, if applicable.

Methodology for computing asset/liability mismatch factors in the U.S.

166. The ALM factors consider expected capital requirement for durational mismatch risk, which is calculated comprising two components: an assumed durational mismatch and an applied interest rate movement (interest rate volatility).

167. S&P Global Ratings assumes that the simple durational mismatch provides a proxy for the net

percentage change in market value, between the combined assets, liabilities and hedge instruments, given a 100 bps change in rates (sometimes known as modified duration). S&P Global Ratings also makes an assumption regarding the applied interest rate movements (volatility), which are stressed according to a confidence level that is commensurate with the rating's spectrum.

168. S&P Global Ratings designates a financial instrument in each international locality to act as a proxy benchmark to use when investigating volatility based on empirical data. We choose the proxies based on tenor and other characteristics that we feel best link the interest rate volatility to our assessment of company data and practices.

169. Once the proxy benchmark asset is chosen, we determine the annualized standard deviation of monthly percentage movements (change in yield divided by previous yield) in rates observed over a representative time period, which would typically be at least five years. The standard deviation is then multiplied by the year-end yield on the proxy benchmark asset to equate the standard deviation to an applied basis point shift.

170. S&P Global Ratings' rationale for deriving standard deviations based on percentage movements, rather than actual basis point movements, and then converting back to basis points, is to allow us to take observed volatility under different rate scenarios and calibrate it to current rate levels.

171. The ALM factors also consider capital required to support systemic spread volatility risk, which is also calculated comprising two components: an assumed spread duration mismatch and an applied proxy for spread movement (spread volatility).

172. S&P Global Ratings assumes each of the nonindexed funding type liabilities in a given international jurisdiction will be exposed to the same amount of systemic spread volatility risk for a given targeted rating category. Our factor for determining systemic spread volatility risk is designed to capture the amount of capital adequacy that we believe is required to cover the impact of:

- Asset spreads widening relative to that of the liability or hedge instrument in cases where assets are longer than the liabilities or market value (MV) sensitivity of assets is greater than MV sensitivity of liabilities; and
- Asset spreads tightening in cases where assets are shorter than the liabilities or MV sensitivity of assets is less than MV sensitivity of liabilities.

173. In both cases, we seek to determine capital required to cover for such losses only over the period of time where a mismatch exists and make the determination that the mismatch can be due to either case. S&P Global Ratings uses the same assumed durational mismatch as developed for mismatch risk.

174. To develop an applied proxy for spread movement, S&P Global Ratings compared the empirically observed monthly spread differential between a U.S. dollar 'A' rated bond index created with a constant 10-year maturity and the 10-year constant maturity U.S. dollar swap index, over a representative time period. The spread differentials were separated by observation month to create 12 different sets of data (e.g., spread differential observed in January of each year over the entire observed period).

175. For each set of data, S&P Global Ratings calculated the change in spread observed over each of the annual periods and divided it by initial spread at the start of each year to derive the annual percentage change in spread relative to the asset yield. The standard deviation of the percentage change in spread was calculated for each of the 12 sets of data (a one-year period coincides with our targeted period for expected capital sufficiency). To calibrate the percentage change to current markets and convert to basis points, the product of the percentage change in spread and

the current rate on the bond index was used as the applied standard deviation.

176. Although S&P Global Ratings is aware that various sectors (e.g., asset-backed and mortgage-backed securities), ratings, and tenors will produce varying statistical spread relationships, we believe that this methodology provides reasonable estimates of expected spread volatility given the targeted confidence levels.

177. S&P Global Ratings recognizes that spreads and underlying interest rates do not move wholly in step. In determining the volatility risk charge, allowance for historic levels of correlation is incorporated. The analysis is repeated, as above, using the U.S. dollar 'A' rated bond index created with a constant 10-year maturity separated by observation month to create 12 different sets of data. For each set of data, we calculated the change in yield observed over each of the annual periods and divided it by initial yield at the start of each year to derive the annual percentage change in yield relative to the asset yield. We then calculated the standard deviation of the percentage change in yield for each of the 12 sets of data. To calibrate the percentage change to current markets and convert to basis points, the product of the percentage change in spread and the current rate on the bond index was used as the applied standard deviation.

178. The last risk the ALM factors consider is that associated with the structural features embedded in insurance company investment products, such as payout schedules based on mortality, book value surrenders upon death, minimum guarantees, and benefit responsive withdrawals. When present, S&P Global Ratings will view these risks as additive, and we have developed incremental risk factors for each of the major types of structural features that have the potential to create adverse economic losses. The appropriate incremental risk factors will be aggregated with the mismatch and spread volatility risk factors to compute a single risk factor for each product.

179. In most cases, S&P Global Ratings has made industrywide assumptions we consider reasonable based on the extensive data available, but we realize that each company varies in its practices, and additional analytic services can be provided to refine company-specific assumptions.

Variable annuity guarantees

180. S&P Global Ratings has revised its capital charges for variable annuities where some fixed or indexed guaranteed living or death benefit exists on underlying equity funds. The criteria responds to product developments that increase the risk of these benefits in varying market conditions over a long period of time and the regulatory requirements that assess these long-term risks to insurers through sophisticated stochastic modeling.

181. The C-3 Phase II regulatory requirement was implemented in the U.S. for year-end 2005 statutory reporting. It provides a stochastic approach to modeling the risk in variable annuity guarantees. S&P Global Ratings reviews the results provided by companies and applies the stochastically generated capital charges where the results are considered reasonable. The capital required is based on the difference between the total assets required (TAR) at various conditional tail expectation (CTE) levels minus the reserves held, and it allows 50% credit for the value of hedging. The CTE-based data should be based on the American Academy of Actuaries prepackaged scenarios to ensure reasonably comparable results. As a result, CTE (90), CTE (95), CTE (98), and CTE (99.5) correlate with 'BBB', 'A', 'AA', and 'AAA' capital requirements, respectively. For companies with demonstrated robust hedging programs, S&P Global Ratings may eventually give a higher level of credit for hedging.

182. This formulation of capital required is not affected by any change in reserves held, such as occurred with the adoption of Actuarial Guideline XLIII (AG 43), which became effective on Dec. 31, 2009. This is because every dollar change in reserves is offset by an equal but opposite change in both reported statutory capital and the capital requirement we calculate.

183. Under the C-3 Phase II regulatory requirement, insurers have the option to occasionally switch between smoothed and unsmoothed TAR values, provided their regulator consents. At year-end 2009, some insurers switched to unsmoothed TAR values. Rationales vary, but S&P Global Ratings has observed that unsmoothed TAR values require less capital from insurers in a rising equity market and smoothed values require less capital in a declining market.

184. Therefore, to enhance consistency and comparability, S&P Global Ratings uses unsmoothed TAR values to calculate the capital required metric. In addition, when forming an opinion of insurer capitalization, S&P Global Ratings considers the sensitivity of capital required to various factors because point-in-time capital metrics, even stochastic ones, cannot adequately reflect the potential fluctuations in capital required resulting from significant changes in the financial markets. Because the capital required for variable annuity risks can increase dramatically when equity markets decline, S&P Global Ratings' opinion of the quality of capitalization for these risks will reflect our sensitivity analysis of the impact on capital required from assuming a range of immediate material declines in the equity markets, for example, declines of 30%, 50%, and 70%.

185. In cases where we believe a company's stochastic modeling is not as robust, capital charges will be assessed through static charges applied to the related account balances associated with variable annuities with death or living benefit riders. These charges were developed using a series of more than 150 stress tests applied to a typical portfolio for each benefit type at the same confidence levels. Charges on this basis at the 'AA' level range from 0.56% for a simple return-of-premium death benefit to 3.46% for a guaranteed withdrawal benefit.

186. Outside the U.S., variable annuities are most prevalent in Canada (segregated funds) and Japan. Charges have been developed for these markets, taking into consideration the treatment in the U.S. and the product and regulatory features of the local markets.

ALM: GAAP/IFRS Model

Life

187. The ALM charge in S&P Global Ratings' capital model consists of two elements.

188. The first is an estimate of the percentage divergence between asset and liability values, assuming that they are mismatched by one year, for interest rate and spread movements associated with each confidence level ('BBB', 'A', 'AA', and 'AAA'). This is based on the analysis of U.S. bond yields, as described above, taking into consideration the availability and credibility of data in other regions. The final volatility charge, in both the statutory and GAAP models, is equalized and applied globally, with the exception of Japan.

189. The second element is an assumed durational mismatch between assets and liabilities. For life insurance, this ranges between one and 10 years, depending on the market and the structural features within it. For traditional life insurance business, where bonuses are paid on top of guaranteed benefits, credit has been given to the flexibility inherent in these discretionary benefits.

190. Example: Germany. The modified durations of assets and guaranteed benefits typically differ by about seven years (market average). However, the current yield on those assets is greater than the current average guarantee on the matching liabilities, and therefore bonuses are being paid. If interest rates were to fall by a small amount, then the value of the guaranteed benefits would increase by more than the value of the assets, but the impact of this would be borne almost exclusively by the policyholders, in the form of lower bonuses. Only if an interest rate shock greater than the current margin of asset yield over average guarantee occurs would the insurer's

capital suffer.

191. S&P Global Ratings has made assumptions about the typical spread between yields on assets and average guarantees and compared them with the assumed interest rate shocks at different rating levels. For simplicity in the model, the impact of this loss-absorbing cushion is translated into an effective reduction in the assumed mismatch for the market. In the case of Germany, the effect has been to turn the seven-year observed mismatch into an implied three-year mismatch.

Asset-liability management adjustment

192. For life insurers, the application of country-specific duration settings within the model captures what we consider to be a reasonable proxy for each market and are intentionally conservative to account for risks not captured in the simple duration mismatch measure. Although we believe these charges are appropriate in most cases, they may not be appropriate for companies that use more-sophisticated tools and methods for ALM. Therefore, an adjustment to the model is possible in instances where the company can demonstrate tighter ALM.

193. We determine the amount of credit to give through our assessment of the insurer's ALM risk controls (see Appendix 9). For companies with Positive ALM risk controls, as demonstrated through a review of the tools and reports that they use and some current portfolio and historical measures, we could lower the charge below the standard for their market. To do this, we will apply a factor of the average of the standard factor, and a factor based on the company's actual maximum target mismatch. The average will be subject to a floor of one year.

194. We will continue to apply the standard model charges for companies with Neutral or Negative ALM risk controls.

195. Example: Company XYZ, based in Germany, operates an ALM policy that has an upper fixed-income investment policy limit equivalent to a one-year duration mismatch. The capital model applies a three-year duration setting for Germany

196. Under the three scenarios for ALM risk control assessments, we would adjust the duration setting as follows:

- Positive: lower to two years.
- Neutral: remain at three years, with no offset.
- Negative: remain at three years, with no offset.

197. If Company XYZ were in the U.S., the U.K., Spain, Australia, New Zealand, or Canada, where we already assume a one-year mismatch, no adjustment to the base factors would be necessary.

198. The ALM methodology (linked to the ALM risk control assessment) extends to the non-life ALM charges.

199. This approach is the starting point for the capital model. We believe the fungibility of capital to cover ALM risks that may arise in different legal entities, regions, or simply between the policyholder and shareholder fund forms a key part of any analytical adjustment. The resulting capital charges are the baseline for any credibility adjustment for an economic capital model assessment, in our view.

Non-life

200. For non-life insurance, we also apply the ALM charge, to reflect the risk to capital from movements in yields and spreads on the market value of bonds and the potential reinvestment

risk associated with a mismatch between asset and liability durations. Although S&P Global Ratings gives partial credit for discounting of loss reserves in its definition of capital, changes in the market value of bonds are unlikely to be offset by an equivalent change in the value of liabilities.

201. S&P Global Ratings uses the same underlying methodology to derive capital requirements for shareholder and non-life bond volatility risk as that used to derive equivalent charges on bonds backing life insurance business. That said, there is no possibility of credit for discretionary benefits.

202. Although the underlying methodology to determine interest rate and spread volatility is the same, our approach to the assumed mismatch is different. Investments in long-term bonds are subject to additional risk for non-life insurers, because of the greater uncertainty around liability cash flows, particularly for long-tail lines of business. To simplify the analysis and information requirements, S&P Global Ratings has decided to use the same duration buckets for bonds backing non-life insurance liabilities as those used to assess credit risk. S&P Global Ratings recognizes that the weighted-average duration of fixed-income securities in each bucket is likely to be less than the midpoint of the range. To take into account the challenges associated with matching non-life liabilities, we have assumed the duration mismatch is 50% of the midpoint of each bond duration bucket.

203. For example, the assumed duration mismatch on bonds with one-five years until maturity is 50% of the midpoint of the range (three years), or 1.5 years. In other words, the cash flow from the asset (maturity proceeds) are assumed to emerge in three years, whereas the liability cash flows are assumed to emerge between 1.5 and 4.5 years, reflecting uncertainty around the timing of claims settlement. The longer the liability duration (and, therefore, the longer the duration of the assumed matching asset), the greater the potential mismatch and exposure to changing yields and spreads. Consequently, capital requirements are set at a higher level for longer-duration assets.

Shareholder

204. The assumed duration mismatch for bonds backing shareholders' equity is the outstanding duration of the fixed-income security, as changes in yields and spreads directly affect net assets.

205. Like all charges in the capital model, analytical adjustments are made if S&P Global Ratings determines that the capital requirements for non-life and shareholder bond volatility are inappropriate for a particular business line or country. For example, in certain jurisdictions, accident and health and motor third-party liability reserves can have very long tails. This often reflects the structure of claims settlements which are more akin to a payout annuity than an uncertain future lump sum. Where the reserves relate to annuity-type liabilities and S&P Global Ratings determines that the risks are similar to equivalent life reserves, the charges will be adjusted accordingly.

206. However, the capital model recognizes that the impact of an interest rate shock on a portfolio where assets are shorter than liabilities has the opposite effect to the same interest rate shock on a portfolio where the assets are longer than the liabilities. Consequently, the model tests the aggregate impact of a downward shock on life, non-life, and shareholder bonds and also the aggregate effect of an upward interest rate shock. The capital charge for ALM is then the greater of these two tests.

Capital charges for participating business

207. For life insurers, the mismatch between assets and liabilities is a key risk factor. It is also a risk that can be difficult to accurately measure using public information. For participating business, the mismatch can be even more challenging to assess owing to the structure of liabilities and impact of management actions. Moreover, in some jurisdictions, participating business is written in separate funds, restricting the movement of surplus assets around companies and groups. Consequently, S&P Global Ratings' approach to assessing capital adequacy for groups writing participating business varies by market and corporate structure, to reflect the different regulatory, product, and legal issues at play.

208. In general, public disclosure of information to accurately quantify the risks on participating business is limited. One exception to this is the U.K., which has introduced the concept of realistic balance sheets to more-accurately value the complexity of risks (that is, cost of options and guarantees) faced by insurers. In this case, S&P Global Ratings adjusts the information provided under the realistic reporting framework, to derive an appropriate capital charge within the model.

209. In those markets where a robust assessment of the risks associated with participating business is not publicly available, S&P Global Ratings applies its standard charges. We may adjust these capital requirements, however, to recognize any additional flexibility a company may have to adjust its liabilities in a stress scenario.

U.S. Accident And Health Charges

Evaluation of accident and health insurance risks

210. Several structural changes have taken place in the health insurance sector. Negotiated payment for services rendered became more widespread by the late 1990s, leading to greater predictability for the unit cost side of claim cost volatility. As a result, the amount and intensity of services utilized has increasingly served as the key driver of claim cost volatility. Many companies engage in active utilization management and disease management for many chronic conditions. S&P Global Ratings has observed that the 80/20 rule (80% of cost generated by 20% of pool members) generally applies to high utilizers, a small group who dominate the claim experience and significantly affect costs.

211. The migration to contracted fees has had the effect of changing practice patterns, regardless of insurance product. That said, capitated arrangements, a form of contracted fees that sets limits by medical group, have seldom been global in nature. As a result, claims were paid more quickly and accurately, giving insurers the opportunity to adjust pricing to reflect changing trends. S&P Global Ratings reviewed historical loss ratios and concluded that volatility has been effectively reduced.

212. Those companies with concentrations in the Medicare and Medicaid programs, both administered by the U.S. government, will require more capital to reflect their concentration in one payor/sponsor, uncertainty of future changes in contracted rate levels, lock-in periods to premium/benefit bids, and political ramifications of dropping out of selected geographic areas.

213. **Methodology for computing factors.** S&P Global Ratings undertook a study of historical loss ratio volatility (1992-2004) as a proxy for actual to expected results. Actual to expected data is not available on an aggregated industry basis. The data was aggregated by legal enterprise or rated group and a standard deviation of loss ratios for each group over the 13-year period was

calculated. A natural split in volatility between large and small consolidated organizations was not found, therefore the midpoint in terms of size was selected. The median of standard deviation for consolidated companies with more than $2.5 billion medical premium was 2.8%, while the median standard deviation of small companies was 3.6%. These serve as the basis for our current factors.

214. S&P Global Ratings assumed a normal distribution and applied Z-scores developed from the 2005 default statistics to develop volatility factors by various rating classes.

215. All medical factors were increased by 20%, reflecting additional catastrophic volatility not experienced in the 13 years of the study. Dental products have benefit limits, such that S&P Global Ratings will use the medical factor before loading for catastrophic margin.

216. S&P Global Ratings does not expect volatility to vary materially by reimbursement methodology because a significant majority of reported comprehensive major medical premiums (excluding administrative services only [ASO] and federal employee health benefits) are paid by contracted fees.

217. S&P Global Ratings expects experience under Medicare and Medicaid risk contracts to be more volatile--not only based on recent actual experience--but also by virtue of concentration in one payor, legislated contracted rate levels, lag between bidding deadlines and effective periods of up to 18 months, and the political difficulty of exiting from a market when payment received for service rendered is no longer adequate. These Medicare and Medicaid premiums are reported on health statutory filings and S&P Global Ratings' model includes an additional charge on them of 15%. If a company has been given multiyear rate guarantees on underwritten business, we may increase the charge by 200 bps-600 bps, depending on the duration of the guarantees.

218. Administrative services business, by which insurers administrate access to health care on behalf of large companies, carry reduced risks, in our view, compared with insured/underwritten business. Where the arrangement brings in more than $5 billion in premium and equivalents, we add a third factor to accommodate the benefits of volume. These factors apply to disability as well as medical ASO business. Volatility in federal employee health benefit business is proportionately lower, such that the factor (currently based on premium) is reduced to 3% from 4%.

219. Factors for stop-loss, hospital indemnity, other limited benefits, and medical supplement coverage have not changed and are based on premium. These products are generally not influenced by contracted rates, utilization management, and other managed care factors that have contributed to increased rate stability in the sector. They also tend to issue more opportunistically and therefore are more subject to swings in underwriting cycles.

220. The risk factors specific to long-term care (LTC) insurance were developed to capture the pricing risk and an ALM risk. S&P Global Ratings believes that the insurance risk begins when a potentially mispriced LTC product is brought to market (e.g., a severely underpriced policy that is heavily marketed and sold) and not only when claims begin to emerge. Consequently, our premium factor exceeds the NAIC RBC formula for longer-term care insurance factor by 20%. This should result in a smoother build-up of required capital. More importantly, the incurred loss ratio for a typical LTC block of business is not expected to reach 50% until about 10 years after the business was sold.

221. S&P Global Ratings applies an additional charge for LTC and individual disability to recognize the difficulty in matching assets and liabilities, given the products' long liability duration. Our risk charges for Standard Medicare Part D prescription drug benefit (which has been offered since Jan. 1, 2006) include a 20% surcharge to the base factor, reflecting the higher threshold expected at the 'BBB' level from the RBC company action level. Factors for the target capital levels at 'A' through 'AAA' were then scaled to the confidence levels determined for fixed-income securities.

APPENDICES

Appendix 1: Changed Assumptions For Asset-Based Charges In The Global Insurance Risk-Based Capital Model

222. S&P Global Ratings periodically reviews the appropriateness and level of the factor-based charges in its enhanced risk-based capital model. In this review, we focused on asset charges (including ALM) within the IFRS/GAAP and U.S. statutory models. We also reviewed our methodologies for appropriateness and updated charges to reflect the four years most recent market data. We expanded the model to introduce regional versions for Asia-Pacific, Latin America, and Canada.

223. Details of the changes in charge factors are given below.

Equity risk charge

- Update calculations for data to end 2009.
- Reduce number of categories to five from six, with revised charge factors.
- Revised categorization for some countries.
- Harmonize approach to charge factors for bank ratings risk-based model and insurance risk-based model.
- Refined approach for private equity charges.

ALM risk charge

- Update calculations for data to end 2009.
- Refine method for calculating volatility charge to allow for observed (negative) correlation between spread movements and underlying interest rate movements.
- Introduce additional categories for life insurance for countries where the typical durational mismatch is assumed to be about seven years (Category 5) or 10 years (Category 6).
- Revised interest/spread volatility charge for one-year mismatch equalized for all countries.

Credit (appendix 3)

- Update calculations for data to end 2009.
- Minor technical changes to refine calculation method, regarding grouping of data, recovery rates, and smoothing of output, but no changes to principles of the methodology.

Property/real estate

- Update calculations for data to end 2009, where available.

- Maintain three categories, but introduce incrementally higher charges in each and revise categorization for certain countries.

Other charges

- Factor charges for bank deposits, reinsurance recoverables, preferred shares, and (unsecured) loans depend on credit default charge factors and have been revised accordingly.

Region-specific variations

224. **Total adjusted capital.** The following will be included as additional components of TAC:

- Korea: Include up to 50% DAC in respect of (defined) long-term non-life insurance. For these contracts, DAC is effectively collateralized and therefore considered to be almost certainly recoverable.
- Taiwan: "Special reserve of voluntary business" to be input as equalization reserve. This will allow it to be captured as loss-absorbing for all risks, which is consistent with the treatment of similar reserves under local GAAP in various European markets.
- Japan: "Contingency reserve," "catastrophic loss reserve," "price fluctuation reserve," "unallocated policyholders' dividend reserve," and "excess liability reserve" also to be captured as equivalent to equalization reserves for all risks.
- Canada: To capture value-in-force for life assurance business in Canada, we will use the explicit reserve margins held above best estimate reserves, known as provisions for adverse deviations (PFADs) as a proxy. This adjustment will be added to a suitably-revised embedded value section of the model input sheet, rather than as an equity-like reserve. In line with the treatment of VIF we will include up to 50% credit in the calculation of TAC.
- Mexico: "Prevision reserve" will be counted as equalization reserves for all risks.

225. **Non-life (P&C) premium and reserve charges.** The following premium and reserve charges apply:

- The descriptions of business lines and their charges have been changed to reflect local markets, with separate descriptions (and charges) for Asia-Pacific and Australia/New Zealand in the Asia-Pacific version of the enhanced model and Canadian descriptions (and charges) for the Canadian version of the model.
- The charge factors were set with reference to the data-driven U.S. P&C charges, adjusted for differences in contract features, local regulation and practices and observed experience.
- Local business lines mapped to relevant risk classes for purposes of overall diversification benefit.

226. **ALM.** The following ALM charges apply:

- Japan: In circumstances where we consider--in conjunction with S&P Global Ratings' economic research group--that unusual economic conditions prevail, such as prolonged deflationary or hyper-inflationary conditions, analytical adjustments may be applied to asset charges, interest rate assumptions, and volatility charges to appropriately reflect risks in the context of the operating environment. When the economic circumstances revert to more-normal economic conditions, standardized charges would again apply. Such adjustments will necessarily be

specific, case by case and country by country, and will be published separately. For example, Japan has been experiencing deflationary conditions for several years; observed interest rate and spread volatility in Japan has been materially lower than that seen in the U.S. Accordingly, an adjusted interest rate and spread charge of 0.903% (per year of mismatch at 'BBB' level) has been applied. This is lower than the standard interest rate and spread charge applied (1.505% per year of mismatch at 'BBB' level). Our assumed durational mismatch for Japan is five years. The interest rate and spread charge applied in this case recognizes prevailing 10-year corporate bond yields of about 1.6% as at the end of 2009 (compared to about 5% in the U.S.) and S&P Global Ratings assumes that this relationship will remain for the purposes of calculating this charge.

227. **Other.** Other charges that apply:

- U.S.: Although warranty business experience is not readily ascertainable from U.S. statutory data (warranty business was added as a separately reported line of business in 2008), our developed premium and loss reserve charges are an average of auto physical damage and products liability occurrence charges. This conclusion reflects our view of warranty business as having a high frequency/low severity property only (product repair or replacement) exposure and the law of large numbers generally works well. Pipeline claims are usually small in total costs relative to total exposures. Nevertheless, atypically for insurance, there is no industrywide organization writing standardized warranty wording for companies to adopt or rewrite. In addition, there is no industrywide warranty policy repository that collects historical claim and premium information to evaluate risks by product (as Insurance Services Office Inc. [ISO] does for property/casualty products). Due to the moderately long-tail nature of these policies, the losses may not be reported for up to six years from the time of their inception. Hence, we embed the products' liability occurrence charge in our factors.
- U.K.: The loading factor related to the U.K. with-profits risk capital margin has been increased to 75% from 50%. The update broadly seeks to capture the increase in asset risk charges seen elsewhere in the model.

Appendices 2-7

228. Appendices 2-7 set out the charge factors used in the underlying capital models, rounded to two decimal places for presentational purposes.

Appendix 2: U.S. Life And Health Capital Adequacy Factors

Appendix 2

U.S. Life And Health Capital Adequacy Factors

	(%)			
	AAA	**AA**	**A**	**BBB**
Bond				
Less than 1 year				
NAIC1	0.23	0.21	0.19	0.15
NAIC2	0.76	0.69	0.65	0.53
NAIC3	3.31	3.03	2.84	2.34

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
NAIC4	11.85	10.97	10.38	8.82
NAIC5	54.78	50.96	48.37	41.61
NAIC6	37.50	31.00	26.50	15.00
1.01 to 5 years				
NAIC1	0.56	0.51	0.48	0.39
NAIC2	2.74	2.52	2.37	1.98
NAIC3	11.85	10.99	10.41	8.90
NAIC4	29.47	27.55	26.24	22.84
NAIC5	66.33	62.46	59.84	52.99
NAIC6	37.50	31.00	26.50	15.00
5.01 to 10 years				
NAIC1	1.31	1.23	1.15	0.97
NAIC2	5.30	5.04	4.78	4.20
NAIC3	21.00	20.03	19.08	16.97
NAIC4	37.68	36.25	34.84	31.71
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
10.01 to 20 years				
NAIC1	1.80	1.69	1.57	1.37
NAIC2	6.08	5.84	5.60	5.23
NAIC3	25.82	24.64	23.29	21.18
NAIC4	39.56	38.46	36.89	34.01
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
More than 20 years				
NAIC1	2.34	2.16	2.01	1.81
NAIC2	6.10	5.92	5.77	5.57
NAIC3	27.82	26.35	25.14	23.56
NAIC4	39.56	38.46	36.89	34.24
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
Unaffiliated preferred stock				
NAIC1	2.80	2.67	2.48	2.17
NAIC2	7.66	7.38	6.98	6.31
NAIC3	30.40	29.34	27.81	25.26

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	NAIC4	47.47	46.15	44.27	40.82
	NAIC5	86.49	81.71	78.47	70.00
	NAIC6	35.70	31.80	29.20	22.40
Commercial mortgages: Please see "Methodology For Assessing Capital Charges for Commercial Morgage Loans held by U.S Insurance Companies" published on May 31, 2012 for the applicable capital charges.					
Residential mortgages					
	Insured mortgages				
	In good standing	0.13	0.12	0.11	0.10
	90 days overdue	0.26	0.25	0.23	0.20
Other residential mortgages					
	In good standing	0.65	0.62	0.57	0.50
	90 days overdue	1.31	1.23	1.15	1.00
Corporate-owned life insurance (COLI) assets					
	General account COLI with insurer rated 'A' or higher	1.80	1.64	1.50	1.33
	GA COLI with insurer rated 'BBB'	6.64	6.13	5.64	5.03
Schedule BA asset charges					
	Schedule BA Mortgage Loans and Real Estate	32.60	29.00	26.40	20.00
	Schedule BA asset classified as bonds				
	Standard & Poor's rating of 'A' and above	1.31	1.23	1.15	0.97
	Standard & Poor's rating of 'BBB' and above	5.30	5.04	4.78	4.20
	Standard & Poor's rating of 'BB' and above	21.00	20.03	19.08	16.97
	Standard & Poor's rating of 'B' and above	37.68	36.25	34.84	31.71
	Standard & Poor's rating of 'CCC' and above	76.88	72.63	69.75	62.22
	Standard & Poor's rating of 'CC' and above	37.50	31.00	26.50	15.00
	Schedule BA asset classified as preferred stock				
	Standard & Poor's rating of 'A' and above	2.80	2.67	2.48	2.17
	Standard & Poor's rating of 'BBB' and above	7.66	7.38	6.98	6.31
	Standard & Poor's rating of 'BB' and above	30.40	29.34	27.81	25.26

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	Standard & Poor's rating of 'B' and above	47.47	46.15	44.27	40.82
	Standard & Poor's rating of 'CCC' and above	86.49	81.71	78.47	70.00
	Standard & Poor's rating of 'CC' and above	35.70	31.80	29.20	22.40
	Affiliated life asset valuation reserve	100.00	100.00	100.00	100.00
	Schedule BA asset classified as common stock				
	Unaffiliated common stock	47.00	42.00	38.00	27.00
	Affiliated common stock	100.00	100.00	100.00	100.00
	Other schedule BA assets	48.90	43.50	39.60	30.00
Asset Market Risk					
	Common stock				
	Unaffiliated	47.00	42.00	38.00	27.00
	Affiliated	100.00	100.00	100.00	100.00
Convexity Risk (Used where company-specific model not available)					
	Mortgage-backed securities	8.10	7.20	6.60	5.00
	Callable corporate bonds	3.30	2.90	2.60	2.00
	Home equity ABS	3.30	2.90	2.60	2.00
	All other ABS	1.60	1.40	1.30	1.00
	Real estate equity and long-term assets				
	Investment real estate	29.30	26.02	23.80	18.00
	Owner-occupied (home office) real estate	37.40	33.20	30.40	23.00
	Foreclosed encumbrances	24.50	21.80	19.80	15.00
	Investment encumbrances	16.30	14.50	13.20	10.00
	Property and equipment used to deliver health care cervices	16.30	14.50	13.20	10.00
Reinsurance Credit Risk					
	Reinsurance recoverables				
	'AAA' rated reinsurer	0.17	0.15	0.14	0.11
	'AA' rated reinsurer	0.21	0.19	0.17	0.14
	'A' rated reinsurer	0.28	0.25	0.24	0.19
	'BBB' rated reinsurer	0.76	0.69	0.65	0.53
	'BB' rated reinsurer	3.31	3.03	2.84	2.34
	'B' rated reinsurer	11.85	10.97	10.38	8.82

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	'CCC'/'CC' rated reinsurer	54.78	50.96	48.37	41.61
	'D'/'SD' rated reinsurer	80.00	75.00	70.00	65.00
	Nonrated reinsurer	11.85	10.97	10.38	8.82
Miscellaneous Asset Risk					
	Premium notes	8.10	7.20	6.60	5.00
	Cash and equivalents	0.13	0.12	0.11	0.09
	Short-term Investments	0.13	0.12	0.11	0.09
	Write-ins for invested assets and other than invested assets	8.10	7.20	6.60	5.00
	Noncontrolled assets				
	FHLB	0.00	0.00	0.00	0.00
	Other	1.00	1.00	1.00	1.00
	Surplus in nonguaranteed separate accounts	0.10	0.10	0.10	0.10
	Separate account expense allowance under Commissioners' Reserve Valuation Method/ Commissioners' Annuity Reserve Valuation Method				
	Current surrender charge based on fund balance	0.10	0.10	0.10	0.10
	Current surrender charge based on fund contribution	0.02	0.02	0.02	0.02
	Off-balance-sheet items				
	Contingent liabilities	8.10	7.20	6.60	5.00
	Long-term leases	8.10	7.20	6.60	5.00
Accident, Health, And Mortality Risk (Mortality Risk)					
(Excluding life policies with critical illness acceleration riders)					
	Net amount at risk less than $1 bil.	0.37	0.33	0.30	0.23
	$1 bil. to $5 bil.	0.25	0.22	0.20	0.15
	$5 bil. to $10 bil.	0.19	0.17	0.15	0.11
	$10 bil. to $50 bil.	0.16	0.14	0.13	0.10
	$50 bil. to $100 bil.	0.12	0.11	0.10	0.08
	More than $100 bil.	0.09	0.08	0.08	0.06
Accident, Health, And Mortality Risk (Critical Illness)					
(Including riders to life insurance policies)					
	Highly-developed life markets				

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	Less than $1 bil.	1.12	0.99	0.91	0.69
	$1 bil. to $5 bil.	0.75	0.66	0.61	0.46
	$5 bil. to $10 bil.	0.56	0.50	0.45	0.34
	$10 bil. to $50 bil.	0.47	0.41	0.38	0.29
	$50 bil. to $100 bil.	0.37	0.33	0.30	0.23
	More than $100 bil.	0.28	0.25	0.23	0.17
	Medium-developed life markets				
	Less than $1 bil.	1.40	1.24	1.13	0.86
	$1 bil. to $5 bil.	0.93	0.83	0.76	0.57
	$5 bil. to $10 bil.	0.70	0.62	0.57	0.43
	$10 bil. to $50 bil.	0.58	0.52	0.47	0.36
	$50 bil. to $100 bil.	0.47	0.41	0.38	0.29
	More than $100 bil.	0.35	0.31	0.28	0.22
	Less-developed life markets				
	Less than $1 bil.	1.68	1.49	1.36	1.03
	$1 bil. to $5 bil.	1.12	0.99	0.91	0.69
	$5 bil. to $10 bil.	0.84	0.74	0.68	0.51
	$10 bil. to $50 bil.	0.70	0.62	0.57	0.43
	$50 bil. to $100 bil.	0.56	0.50	0.45	0.34
	More than $100 bil.	0.42	0.37	0.34	0.26
Accident, Health, And Mortality Risk (Morbidity)					
Comprehensive medical and dental earned premiums					
	Full risk and experience rated group and individual health				
	First $2,500 mil.	13.30	11.90	10.90	8.20
	More than $2,500 mil.	10.40	9.30	8.50	6.40
	Federal Employee Health Benefit Program				
	All premiums	5.30	4.50	3.80	3.00
	Medicare and Medicaid				
	First $2,500 mil.	15.40	13.70	12.50	9.50
	More than $2,500 mil.	11.90	10.70	9.70	7.40
	Dental				
	All premiums	11.17	9.90	9.10	6.90

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	Administrative services only/administrative services contract(premium equivalents)				
	First $500 mil.	3.26	2.89	2.64	2.00
	More than $500 mil.	1.22	1.08	0.99	0.80
	More than $5,000 mil.	0.33	0.29	0.26	0.20
Other accident and health earned premiums					
	Stop Loss Reinsurance	53.71	47.70	43.63	33.00
	Medicare supplemental				
	First $25 mil.	19.53	17.34	15.87	12.00
	More than $25 mil.	13.02	11.56	10.58	8.00
	Hospital indemnity, accidental death and dismemberment, and other limited benefits not anticipating rate increases	13.02	11.56	10.58	8.00
	Other limited benefits anticipating rate increases	19.53	17.34	15.87	12.00
	For Medicare Part D (with standard benefits)				
	First $25 mil.	9.60	8.30	6.90	5.50
	More than $25 mil.	7.40	6.30	5.30	4.20
	For Medicare Part D (with risk corridor protection only)				
	First $25 mil.	12.70	11.30	10.30	7.80
	More than $25 mil.	9.80	8.70	7.90	6.00
	All Other Medicare Part D	19.50	17.30	15.90	12.00
Disability income earned premiums					
	Noncancelable disability income				
	First $50 mil.	73.24	65.04	59.50	45.00
	More than $50 mil.	29.30	26.02	23.80	18.00
	Other individual income				
	First $50 mil.	48.83	43.36	39.67	30.00
	More than $50 mil.	14.65	13.01	11.90	9.00
	Group long term				
	First $50 mil.	29.30	26.02	23.80	18.00
	More than $50 mil.	6.51	5.78	5.29	4.00

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	Group short term				
	First $50 mil.	9.80	8.70	7.90	6.00
	More than $50 mil.	6.50	5.80	5.30	4.00
	Credit monthly O/S balance				
	First $50 mil.	40.69	36.14	33.06	25.00
	More than $50 mil.	6.50	5.80	5.30	4.00
	Credit single premium with unearned premium reserve				
	First $50 mil.	19.60	17.40	15.80	12.00
	More than $50 mil.	6.50	5.80	5.30	4.00
	Credit single without unearned premium reserve				
	First $50 mil.	29.30	26.02	23.80	18.00
	More than $50 mil.	6.50	5.80	5.30	4.00
	Other disability income				
	First $50 mil.	48.83	43.36	39.67	30.00
	More than $50 mil.	14.70	13.10	11.90	9.00
Long-term care					
	Claims				
	First $35 mil.	40.69	36.14	33.06	25.00
	More than $35 mil.	13.00	11.60	10.60	8.00
	Earned premium				
	First $50 mil.	19.53	17.40	15.87	12.00
	More than $50 mil.	5.90	5.20	4.80	3.60
Accident and health claim reserves					
	All accident and health lines	8.14	7.23	6.60	5.00
Asset/Liability Risk					
Applied against policy reserves					
	Funding liabilities with no embedded options				
	Medium-term notes	2.90	2.60	2.40	1.80
	Funding agreements	2.90	2.60	2.40	1.80
	Funding agreement-backed MTNs	2.90	2.60	2.40	1.80
	Structured settlements				
	With life contingencies	3.80	3.30	3.10	2.30

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	**AA**	**A**	**BBB**
	Without life contingencies	2.90	2.60	2.40	1.80
	Benefit Responsive guaranteed investment contracts				
	Window guaranteed investment contracts	3.80	3.30	3.10	2.30
	Nonwindow guaranteed investment contracts (deposits certain)	3.20	2.80	2.60	2.00
	Institutional Fixed Rate Deferred Annuities				
	Institutional fixed rate deferred annuities with life contingencies	4.90	4.40	4.00	3.00
	Fixed Rate Deferred Annuities - Retail				
	Partial market value adjustment (with surrender charge)	4.40	3.90	3.60	2.70
	Full market value (with surrender charge)	4.40	3.90	3.60	2.70
	No market value (with surrender charge)	4.50	4.00	3.60	2.80
	Partial partial market value (without surrender charge)	5.00	4.40	4.00	3.10
	Full market value (without surrender charge)	4.90	4.40	4.00	3.00
	No market value (without surrender charge)	5.10	4.50	4.10	3.10
	Fixed Rate Immediate Payout Annuities (SPIA)				
	Retail SPIAs with life contingency	4.30	3.80	3.50	2.70
	Retail SPIAs without life contingency	3.50	3.10	2.80	2.10
	Pension Annuities - with life contingency	4.30	3.80	3.50	2.70
	Pension Annuities - without life contingency	3.50	3.10	2.80	2.10
	Indexed annuities	2.50	2.20	2.00	1.50
	Two-tier annuities				
	Indexed deferral period	3.30	2.90	2.70	2.00
	Fixed rate deferral period	4.40	3.90	3.60	2.70
	Accident and health active life reserves				
	Disability income	2.00	1.70	1.60	1.20
	Long-term care	2.00	1.70	1.60	1.20

Appendix 2

U.S. Life And Health Capital Adequacy Factors (cont.)

		(%)			
		AAA	AA	A	BBB
	Synthetic guaranteed investment contracts				
	No credit risk retention	0.38	0.20	0.19	0.13
	With credit risk retention	0.70	0.49	0.35	0.24
Operational Risk					
	Total liabilities minus accident & health liabilities	0.20	0.20	0.20	0.20
	Accident and health direct premiums written	0.50	0.50	0.50	0.50
Variable annuity guarantee risk (where stochastic results not available)					
	Return of premium death benefits	0.77	0.56	0.42	0.18
	Death benefits enhanced (roll-up or ratchet)	3.99	3.37	2.85	1.61
	Withdrawal benefits	5.52	3.46	2.73	1.37
	Accumulation benefits	2.29	1.66	1.24	0.52
	Income benefits	2.67	2.11	1.62	0.71
	Others	3.05	2.23	1.77	0.88

N.A.--Not available. *5% loading above country-specific charge. #Incremental charge in addition to country-specific charge.

Appendix 3: U.S. Non-Life Capital Adequacy Factors

Appendix 3

U.S. Non-Life Capital Adequacy Factors

	(%)			
	AAA	AA	A	BBB
Bond				
Less than 1 year				
NAIC1	0.23	0.21	0.19	0.15
NAIC2	0.76	0.69	0.65	0.53
NAIC3	3.31	3.03	2.84	2.34
NAIC4	11.85	10.97	10.38	8.82
NAIC5	54.78	50.96	48.37	41.61
NAIC6	37.50	31.00	26.50	15.00
1.01 to 5 years				
NAIC1	0.56	0.51	0.48	0.39
NAIC2	2.74	2.52	2.37	1.98

Appendix 3

U.S. Non-Life Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
NAIC3	11.85	10.99	10.41	8.90
NAIC4	29.47	27.55	26.24	22.84
NAIC5	66.33	62.46	59.84	52.99
NAIC6	37.50	31.00	26.50	15.00
5.01 to 10 years				
NAIC1	1.31	1.23	1.15	0.97
NAIC2	5.30	5.04	4.78	4.20
NAIC3	21.00	20.03	19.08	16.97
NAIC4	37.68	36.25	34.84	31.71
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
10.01 to 20 years				
NAIC1	1.80	1.69	1.57	1.37
NAIC2	6.08	5.84	5.60	5.23
NAIC3	25.82	24.64	23.29	21.18
NAIC4	39.56	38.46	36.89	34.01
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
More than 20 years				
NAIC1	2.34	2.16	2.01	1.81
NAIC2	6.10	5.92	5.77	5.57
NAIC3	27.82	26.35	25.14	23.56
NAIC4	39.56	38.46	36.89	34.24
NAIC5	76.88	72.63	69.75	62.22
NAIC6	37.50	31.00	26.50	15.00
Unaffiliated preferred stock				
Where ratings available				
NAIC1	4.80	4.52	4.28	4.01
NAIC2	8.71	8.47	8.28	8.03
NAIC3	38.56	36.71	35.18	33.31
NAIC4	47.47	46.15	44.27	42.55
NAIC5	86.49	81.71	78.47	70.00
NAIC6	35.70	31.80	29.20	22.40
Composite change if breakdown not available	38.56	36.71	35.18	33.31

Appendix 3

U.S. Non-Life Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
Mortgage loans: For companies with material exposures of U.S commercial mortgage loans we use the charges applicable to U.S Commercial Mortgage loans in "Methodology For Assessing Capital Charges For Commercial Mortgage Loans Held By U.S Insurance Companies," published on May 31, 2012.				
First liens	8.10	7.20	6.60	5.00
Other than first liens	8.10	7.20	6.60	5.00
Asset Market Risk				
Common stock				
Unaffiliated	47.00	42.00	38.00	27.00
Affiliated	100.00	100.00	100.00	100.00
Convexity Risk				
Mortgage-backed securities	8.10	7.20	6.60	5.00
Real Estate And Long-Term Assets				
Real estate investment for income	29.30	26.10	23.80	18.00
Owner-occupied (home office) real estate	34.30	31.10	28.80	23.00
Reinsurance Credit Risk				
Reinsurance recoverables				
'AAA' rated reinsurer	1.17	1.10	0.99	0.82
'AA' rated reinsurer	1.60	1.51	1.38	1.16
'A' rated reinsurer	2.16	2.06	1.93	1.70
'BBB' rated reinsurer	5.96	5.74	5.43	4.91
'BB' rated reinsurer	23.64	22.82	21.63	19.64
'B' rated reinsurer	39.56	38.46	36.89	34.01
'CCC'/'CC' rated reinsurer	76.88	72.63	69.75	62.22
'D'/'SD' rated reinsurer	80.00	75.00	70.00	65.00
Nonrated reinsurer	39.56	38.46	36.89	34.01
Miscellaneous Asset Risk				
Cash	0.03	0.03	0.03	0.02
Schedule BA part 1 bonds plus mortgage plus real estate plus common stock	32.60	29.00	26.40	20.00
Other Schedule BA invested assets (excluding Cap 17)	48.90	43.50	39.60	30.00
Aggregate write-ins for invested assets plus receivable for securities	8.10	7.20	6.60	5.00
Federal income tax recoverable	8.10	7.20	6.60	5.00
Amounts receivable relating to uninsured accident and health plans	8.10	7.20	6.60	5.00
Aggregate write-ins for other than invested assets	8.10	7.20	6.60	5.00

Appendix 3

U.S. Non-Life Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
Net deferred tax asset	8.10	7.20	6.60	5.00
Off-balance-sheet items				
Contingent liabilities	8.10	7.20	6.60	5.00
Long-term leases	8.10	7.20	6.60	5.00
Property/Casualty Premium Risk				
Direct business and proportional reinsurance				
Homeowners' multi-peril	34.61	30.74	28.12	21.27
Farm owners' multi-peril	34.61	30.74	28.12	21.27
Private passenger auto liability	14.48	12.86	11.76	8.89
Fire	14.65	13.01	11.90	9.00
Allied lines	14.65	13.01	11.90	9.00
Mortgage guaranty	53.71	47.70	43.63	33.00
Financial guaranty	53.71	47.70	43.63	33.00
Inland marine	14.65	13.01	11.90	9.00
Earthquake	14.65	13.01	11.90	9.00
Burglary and theft	14.65	13.01	11.90	9.00
Accident and health	53.71	47.70	43.63	33.00
Credit	53.71	47.70	43.63	33.00
Auto physical damage	17.52	15.56	14.23	10.76
Fidelity and Surety	14.65	13.01	11.90	9.00
International	44.76	39.75	36.36	27.50
Commercial auto liability	30.74	27.30	24.97	18.89
Medical malpractice - occurrence	87.51	77.71	71.09	53.76
Medical malpractice - claims made	63.89	56.74	51.90	39.25
Ocean marine and aircraft	24.74	21.97	20.10	15.20
Boiler and machinery	24.74	21.97	20.10	15.20
Other liability - occurrence	49.20	43.69	39.97	30.23
Other liability - claims made	37.61	33.40	30.56	23.11
Products liability - occurrence	52.86	46.95	42.95	32.48
Products liability - claims made	40.51	35.98	32.91	24.89
Commercial multiple peril	21.26	18.88	17.27	13.06
Workers' compensation	29.25	25.98	23.76	17.97
Nonproportional reinsurance (treaty and facultative)				
Homeowners' multi-peril	43.26	38.42	35.15	26.58

Appendix 3

U.S. Non-Life Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
Farm owners' multi-peril	43.26	38.42	35.15	26.58
Private passenger auto liability	18.10	16.07	14.70	11.12
Fire	14.65	13.01	11.90	9.00
Allied lines	14.65	13.01	11.90	9.00
Mortgage guaranty	67.14	59.62	54.54	41.25
Financial guaranty	67.14	59.62	54.54	41.25
Inland marine	14.65	13.01	11.90	9.00
Earthquake	14.65	13.01	11.90	9.00
Burglary and theft	14.65	13.01	11.90	9.00
Accident and health	53.71	47.70	43.63	33.00
Credit	67.14	59.62	54.54	41.25
Auto physical damage	17.52	15.56	14.23	10.76
Fidelity and surety	18.31	16.26	14.88	11.25
International	55.95	49.69	45.45	34.38
Commercial auto liability	30.74	27.30	24.97	18.89
Medical malpractice - occurrence	109.38	97.14	88.86	67.21
Medical malpractice - claims made	79.86	70.92	64.88	49.07
Ocean marine and aircraft	30.93	27.47	25.13	19.00
Boiler and machinery	24.74	21.97	20.10	15.20
Other liability - occurrence	61.50	54.62	49.96	37.79
Other liability - claims made	47.01	41.75	38.19	28.89
Products liability-occurrence	66.08	58.68	53.68	40.60
Products liability - claims made	50.64	44.97	41.14	31.11
Commercial multiple peril	26.58	23.60	21.59	16.33
Workers' compensation	36.56	32.47	29.70	22.46
Warranty	35.19	31.26	28.59	21.62
Property/Casualty Reserve Risk				
Reserve risk charge				
Lines of business				
Homeowners'/farm owners'	18.55	16.48	15.07	11.40
Private passenger auto liability/medical	15.79	14.02	12.83	9.70
Special property	45.57	40.47	37.02	28.00
Auto physical damage	45.57	40.47	37.02	28.00
Fidelity/surety	45.57	40.47	37.02	28.00
Other (credit, accident and health, write-ins)	45.57	40.47	37.02	28.00

Appendix 3

U.S. Non-Life Capital Adequacy Factors (cont.)

	(%)			
	AAA	**AA**	**A**	**BBB**
Financial guaranty/mortgage guaranty	45.57	40.47	37.02	28.00
International	24.41	21.68	19.83	15.00
Commercial auto/truck liability/medical	19.53	17.35	15.87	12.00
Medical malpractice - occurrence	60.22	53.48	48.92	37.00
Medical malpractice - claims made	35.81	31.80	29.09	22.00
Special liability	26.04	23.13	21.16	16.00
Other liability - occurrence	22.79	20.24	18.51	14.00
Other liability - claims made	27.67	24.57	22.48	17.00
Products liability - occurrence	39.06	34.69	31.73	24.00
Products liability - claims made	21.16	18.79	17.19	13.00
Commercial multiple peril	8.46	7.52	6.88	5.20
Workers' compensation	16.44	14.60	13.35	10.10
Warranty	42.32	37.58	34.38	26.00
Operational risk				
Direct premiums written factor	0.5			

*5% loading above country-specific charge. #Incremental charge in addition to country-specific charge.

Appendix 4: European Capital Adequacy Factors

Appendix 4

European Capital Adequacy Factors

		(%)			
		AAA	**AA**	**A**	**BBB**
Market Risk—Equities					
	U.S., U.K., Australia, Switzerland	47.00	42.00	38.00	27.00
	Italy, Portugal, Netherlands, Japan, Denmark, Israel, New Zealand	52.00	47.00	42.00	30.00
	South Africa, Spain, Canada, Hungary, Mexico, Brazil, Chile, Norway, Belgium, France, Sweden, Germany	59.00	54.00	49.00	35.00
	Austria, Philippines, Singapore, Czech Republic, Finland, Korea, Taiwan, Greece, Turkey, Hong Kong, Malaysia, Indonesia, Ireland, Argentina, Peru, Colombia	68.00	63.00	58.00	45.00
	India, Poland, Thailand, Russia, China	77.00	72.00	68.00	55.00
	Europe	47.00	42.00	38.00	27.00
	World, Far East	52.00	47.00	42.00	30.00

Appendix 4

European Capital Adequacy Factors (cont.)

	Emerging Far East	59.00	54.00	49.00	35.00
	Nordic, GCC	68.00	63.00	58.00	45.00
	BRIC, Latin America	77.00	72.00	68.00	55.00
	Hedge funds	58.75	52.50	47.50	33.75
	Private equity #	16.00	14.00	13.00	10.00
Market Risk—Properties					
	Germany, Switzerland, Netherlands, Australia, New Zealand	15.00	13.00	11.00	8.00
	Japan, Other Europe	20.00	18.00	15.00	10.00
	U.K., Ireland, Spain, U.S., Other World	30.00	27.00	24.00	18.00
	Owner-occupied property*	38.10	34.24	30.60	23.00
Credit Risk—Bonds					
Less than 1 year					
	AAA Security	0.17	0.15	0.14	0.11
	AA Security	0.21	0.19	0.17	0.14
	A Security	0.28	0.25	0.24	0.19
	BBB Security	0.76	0.69	0.65	0.53
	BB Security	3.31	3.03	2.84	2.34
	B Security	11.85	10.97	10.38	8.82
	CCC/C Security	54.78	50.96	48.37	41.61
	Unrated	3.31	3.03	2.84	2.34
1.01 to 5 years					
	AAA Security	0.36	0.32	0.30	0.24
	AA Security	0.49	0.44	0.41	0.34
	A Security	0.74	0.68	0.64	0.53
	BBB Security	2.74	2.52	2.37	1.98
	BB Security	11.85	10.99	10.41	8.90
	B Security	29.47	27.55	26.24	22.84
	CCC/C Security	66.33	62.46	59.84	52.99
	Unrated	11.85	10.99	10.41	8.90
5.01 to 10 years					
	AAA Security	1.01	0.93	0.86	0.69
	AA Security	1.26	1.18	1.09	0.90
	A Security	1.57	1.49	1.40	1.22
	BBB Security	5.30	5.04	4.78	4.20
	BB Security	21.00	20.03	19.08	16.97
	B Security	37.68	36.25	34.84	31.71

Appendix 4

European Capital Adequacy Factors (cont.)

	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	21.00	20.03	19.08	16.97
10.01 to 20 years					
	AAA Security	1.22	1.12	1.02	0.84
	AA Security	1.74	1.61	1.47	1.26
	A Security	2.28	2.16	2.04	1.84
	BBB Security	6.08	5.84	5.60	5.23
	BB Security	25.82	24.64	23.29	21.18
	B Security	39.56	38.46	36.89	34.01
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	25.82	24.64	23.29	21.18
More than 20 years					
	AAA Security	1.45	1.28	1.14	0.96
	AA Security	2.26	2.04	1.86	1.62
	A Security	3.06	2.89	2.75	2.57
	BBB Security	6.10	5.92	5.77	5.57
	BB Security	27.82	26.35	25.14	23.56
	B Security	39.56	38.46	36.89	34.24
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	27.82	26.35	25.14	23.56

Market Risk—Life Bonds

	Assumed duration mismatch (years)				
U.K., U.S., Canada, Spain, Australia, New Zealand	1.00	2.45	2.18	1.99	1.50
Netherlands, France, Italy, Switzerland, Belgium, South Africa	2.00	4.90	4.35	3.98	3.01
Germany, Austria, Central & Eastern Europe, Hong Kong, Singapore	3.00	7.35	6.53	5.97	4.51
Nordic Countries, Mexico, Chile, Brazil, Israel	4.00	9.80	8.70	7.96	6.02
China, Taiwan, Korea, Argentina	7.00	17.15	15.23	13.93	10.53
Thailand	10.00	24.49	21.75	19.90	15.05
Japan	5.00	7.35	6.53	5.97	4.52

Appendix 4

European Capital Adequacy Factors (cont.)

Market Risk—Non-Life Bonds					
	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.25	0.61	0.54	0.50	0.38
Bond duration (1-5 years)	1.50	3.67	3.26	2.98	2.26
Bond duration (5-10 years)	3.75	9.19	8.16	7.46	5.64
Bond duration (more than 10 years)	7.50	18.37	16.31	14.92	11.29
Market Risk—Shareholder Bonds					
	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.50	1.22	1.09	0.99	0.75
Bond duration (1-5 years)	3.00	7.35	6.53	5.97	4.51
Bond duration (5-10 years)	7.50	18.37	16.31	14.92	11.29
Bond duration (more than 10 years)	15.00	36.74	32.63	29.85	22.57
Credit Risk—Reinsurance Recoverables					
Reinsurers rated 'AAA'		1.17	1.10	0.99	0.82
Reinsurers rated 'AA'		1.60	1.51	1.38	1.16
Reinsurers rated 'A'		2.16	2.06	1.93	1.70
Reinsurers rated 'BBB'		5.96	5.74	5.43	4.91
Reinsurers rated 'BB'		23.64	22.82	21.63	19.64
Reinsurers rated 'B'		39.56	38.46	36.89	34.01
Reinsurers rated 'CCC'/'CC'		76.88	72.63	69.75	62.22
Reinsurers rated 'D'/'SD'		80.00	75.00	70.00	65.00
Unrated reinsurers		39.56	38.46	36.89	34.01
Other Funds Under Management (Off Balance Sheet)					
First $2.5 bil.		0.81	0.72	0.66	0.50
Next $7.5 bil.		0.49	0.43	0.40	0.30
Next $15 bil.		0.33	0.29	0.26	0.20
Excess over $25 bil.		0.16	0.14	0.13	0.10
Other Assets					
Mortgages—performing					
LTV <60%		0.81	0.72	0.66	0.50
LTV 60%-85%		8.14	7.23	6.61	5.00
LTV >85%		16.28	14.45	13.22	10.00

Appendix 4

European Capital Adequacy Factors (cont.)

	Mortgages—nonperforming				
	LTV <60%	1.63	1.45	1.32	1.00
	LTV 60%-85%	16.28	14.45	13.22	10.00
	LTV >85%	32.55	28.91	26.44	20.00
	Preference shares	35.77	33.88	32.33	30.29
	Derivatives	1.57	1.49	1.40	1.22
	Loans	27.80	26.11	24.97	21.99
	Bank deposits				
	A- or higher	0.07	0.06	0.06	0.05
	BBB	0.22	0.20	0.19	0.15
	BB	0.94	0.86	0.81	0.67
	B	3.16	2.93	2.77	2.35
	CCC+ or lower	13.70	12.74	12.09	10.40
	Deferred tax assets	8.14	7.23	6.61	5.00
	Deposits with cedants	4.88	4.34	3.97	3.00
	Other assets	8.14	7.23	6.61	5.00
	Fixed assets	100.00	100.00	100.00	100.00
Mortality—Net Sums At Risk					
(excluding life policies with critical illness acceleration riders)					
	Highly developed life markets				
	Less than $1 bil.	0.37	0.33	0.30	0.23
	$1 bil. to $5 bil.	0.25	0.22	0.20	0.15
	$5 bil. to $10 bil.	0.19	0.17	0.15	0.11
	$10 bil. to $50 bil.	0.16	0.14	0.13	0.10
	$50 bil. to $100 bil.	0.12	0.11	0.10	0.08
	More than $100 bil.	0.09	0.08	0.08	0.06
	Medium-developed life markets				
	Less than $1 bil.	0.47	0.41	0.38	0.29
	$1 bil. to $5 bil.	0.31	0.28	0.25	0.19
	$5 bil. to $10 bil.	0.23	0.21	0.19	0.14
	$10 bil. to $50 bil.	0.19	0.17	0.16	0.12
	$50 bil. to $100 bil.	0.16	0.14	0.13	0.10
	More than $100 bil.	0.12	0.10	0.10	0.07
	Less-developed life markets				
	Less than $1 bil.	0.56	0.50	0.45	0.34
	$1 bil. to $5 bil.	0.37	0.33	0.30	0.23
	$5 bil. to $10 bil.	0.28	0.25	0.23	0.17

Appendix 4

European Capital Adequacy Factors (cont.)

	$10 bil. to $50 bil.	0.23	0.21	0.19	0.14
	$50 bil. to $100 bil.	0.19	0.17	0.15	0.11
	More than $100 bil.	0.14	0.12	0.11	0.09
Morbidity—Net Sums At Risk (Critical Illness)					
(including riders to life insurance policies)					
	Highly developed life markets				
	Less than $1 bil.	1.12	0.99	0.91	0.69
	$1 bil. to $5 bil.	0.75	0.66	0.61	0.46
	$5 bil. to $10 bil.	0.56	0.50	0.45	0.34
	$10 bil. to $50 bil.	0.47	0.41	0.38	0.29
	$50 bil. to $100 bil.	0.37	0.33	0.30	0.23
	More than $100 bil.	0.28	0.25	0.23	0.17
	Medium-developed life markets				
	Less than $1 bil.	1.40	1.24	1.13	0.86
	$1 bil. to $5 bil.	0.93	0.83	0.76	0.57
	$5 bil. to $10 bil.	0.70	0.62	0.57	0.43
	$10 bil. to $50 bil.	0.58	0.52	0.47	0.36
	$50 bil. to $100 bil.	0.47	0.41	0.38	0.29
	More than $100 bil.	0.35	0.31	0.28	0.22
	Less-developed life markets				
	Less than $1 bil.	1.68	1.49	1.36	1.03
	$1 bil. to $5 bil.	1.12	0.99	0.91	0.69
	$5 bil. to $10 bil.	0.84	0.74	0.68	0.51
	$10 bil. to $50 bil.	0.70	0.62	0.57	0.43
	$50 bil. to $100 bil.	0.56	0.50	0.45	0.34
	More than $100 bil.	0.42	0.37	0.34	0.26
Longevity Risk					
	Longevity risk	8.10	7.24	6.60	5.00
Life Reserve Risk					
	Participating business				
	Participating business (excluding annuities)	3.26	2.89	2.64	2.00
	Participating annuities	3.26	2.89	2.64	2.00
	Nonparticipating business (excluding annuities)				
	Protection	1.06	0.94	0.86	0.65
	Savings	3.26	2.89	2.64	2.00
	Permanent health insurance	1.06	0.94	0.86	0.65
	Nonparticipating annuities				

Appendix 4

European Capital Adequacy Factors (cont.)

	Immediate annuities	0.73	0.65	0.60	0.45
	Deferred annuities (without guarantees)	1.06	0.94	0.86	0.65
	Deferred annuities (with guarantees)	3.26	2.89	2.64	2.00
	Linked business with investment guarantees	3.26	2.89	2.64	2.00
	Linked business with expense guarantees only	1.63	1.45	1.32	1.00
	Linked business without guarantees	1.06	0.94	0.86	0.65
Non-Life Net Premium Risk					
European Risks	Primary and proportional reinsurance business				
	Health-based on morbidity tables	20.00	17.00	16.00	12.00
	Accident and health—other	24.00	22.00	20.00	15.00
	Motor	16.00	14.00	13.00	10.00
	Marine	36.00	32.00	29.00	22.00
	Aviation	52.00	46.00	42.00	32.00
	Transport	20.00	17.00	16.00	12.00
	Property	29.00	26.00	24.00	18.00
	Liability	37.00	33.00	30.00	23.00
	Pecuniary	29.00	26.00	24.00	18.00
	Credit	122.00	108.00	99.00	75.00
	Nonproportional reinsurance (treaty and facultative)				
	Health-based on morbidity tables	29.00	26.00	24.00	18.00
	Accident and health—other	37.00	33.00	30.00	23.00
	Motor	24.00	22.00	20.00	15.00
	Marine	54.00	48.00	44.00	33.00
	Aviation	78.00	69.00	63.00	48.00
	Transport	29.00	26.00	24.00	18.00
	Property	44.00	39.00	36.00	27.00
	Liability	57.00	51.00	46.00	35.00
	Pecuniary	44.00	39.00	36.00	27.00
	Credit	183.00	163.00	149.00	112.50
	Finite	7.00	6.00	5.00	4.00
U.S. Risks	Primary and proportional reinsurance business				
	Homeowners' multi-peril	34.61	30.74	28.12	21.27
	Farm owners' multi-peril	34.61	30.74	28.12	21.27
	Private passenger auto liability	14.48	12.86	11.76	8.89
	Fire	14.65	13.01	11.90	9.00
	Allied lines	14.65	13.01	11.90	9.00
	Mortgage guaranty	53.71	47.70	43.63	33.00

Appendix 4

European Capital Adequacy Factors (cont.)

	Inland marine	14.65	13.01	11.90	9.00
	Financial guaranty	53.71	47.70	43.63	33.00
	Earthquake	14.65	13.01	11.90	9.00
	Group accident and health	53.71	47.70	43.63	33.00
	Credit accident and health	53.71	47.70	43.63	33.00
	Burglary and theft	14.65	13.01	11.90	9.00
	Credit	53.71	47.70	43.63	33.00
	Auto physical damage	17.52	15.56	14.23	10.76
	Fidelity and surety	14.65	13.01	11.90	9.00
	Warranty	35.19	31.26	28.59	21.62
	International	44.76	39.75	36.36	27.50
	Commercial auto liability	30.74	27.30	24.97	18.89
	Medical malpractice—occurrence	87.51	77.71	71.09	53.76
	Medical malpractice—claims made	63.89	56.74	51.90	39.25
	Special liability	24.74	21.97	20.10	15.20
	Aircraft	24.74	21.97	20.10	15.20
	Boiler and machinery	24.74	21.97	20.10	15.20
	Other liability—occurrence	49.20	43.69	39.97	30.23
	Other liability—claims made	37.61	33.40	30.56	23.11
	Products liability—occurrence	52.86	46.95	42.95	32.48
	Products liability—claims made	40.51	35.98	32.91	24.89
	Commercial multiple peril	21.26	18.88	17.27	13.06
	Workers' compensation	29.25	25.98	23.76	17.97
	Nonproportional reinsurance (treaty and facultative)				
	Homeowners' multi-peril	43.26	38.42	35.15	26.58
	Farm owners' multi-peril	43.26	38.42	35.15	26.58
	Private passenger auto liability	18.10	16.07	14.70	11.12
	Fire	14.65	13.01	11.90	9.00
	Allied lines	14.65	13.01	11.90	9.00
	Mortgage guaranty	67.14	59.62	54.54	41.25
	Inland marine	14.65	13.01	11.90	9.00
	Financial guaranty	67.14	59.62	54.54	41.25
	Earthquake	14.65	13.01	11.90	9.00
	Group accident and health	53.71	47.70	43.63	33.00
	Credit accident and health	53.71	47.70	43.63	33.00
	Burglary and theft	14.65	13.01	11.90	9.00
	Credit	67.14	59.62	54.54	41.25

Appendix 4

European Capital Adequacy Factors (cont.)

	Auto physical damage	17.52	15.56	14.23	10.76
	Fidelity	18.31	16.26	14.88	11.25
	Surety	18.31	16.26	14.88	11.25
	Warranty	35.19	31.26	28.59	21.62
	International	55.95	49.69	45.45	34.38
	Commercial auto liability	30.74	27.30	24.97	18.89
	Medical malpractice—occurrence	109.38	97.14	88.86	67.21
	Medical malpractice—claims made	79.86	70.92	64.88	49.07
	Special liability	30.93	27.47	25.13	19.00
	Aircraft	30.93	27.47	25.13	19.00
	Boiler and machinery	24.74	21.97	20.10	15.20
	Other liability—occurrence	61.50	54.62	49.96	37.79
	Other liability—claims made	47.01	41.75	38.19	28.89
	Products liability—occurrence	66.08	58.68	53.68	40.60
	Products liability—claims made	50.64	44.97	41.14	31.11
	Commercial multiple peril	26.58	23.60	21.59	16.33
	Workers' compensation	36.56	32.47	29.70	22.46
Non-Life Loss Reserve Risk					
European Risks	Primary and proportional reinsurance business				
	Health-based on morbidity tables	8.00	7.00	6.00	5.00
	Accident and health—other	33.00	29.00	26.00	20.00
	Motor	18.00	16.00	15.00	11.00
	Marine, aviation, and transport	26.00	23.00	21.00	16.00
	Property	11.00	10.00	9.00	7.00
	Liability	24.00	22.00	20.00	15.00
	Pecuniary	33.00	29.00	26.00	20.00
	Credit	41.00	36.00	33.00	25.00
	Nonproportional reinsurance (treaty and facultative)				
	Health-based on morbidity tables	8.00	7.00	6.00	5.00
	Accident and health—other	33.00	29.00	26.00	20.00
	Motor	18.00	16.00	15.00	11.00
	Marine, aviation, and transport	26.00	23.00	21.00	16.00
	Property	11.00	10.00	9.00	7.00
	Liability	24.00	22.00	20.00	15.00
	Pecuniary	33.00	29.00	26.00	20.00
	Credit	41.00	36.00	33.00	25.00
	Finite	10.00	9.00	8.00	6.00

Appendix 4

European Capital Adequacy Factors (cont.)

U.S. Risks	Primary, proportional and nonproportional reinsurance business				
	Homeowners'/Farm owners'	18.55	16.48	15.07	11.40
	Private passenger auto liability/medical	15.79	14.02	12.83	9.70
	Comb. 2 Yr. Lines (SP, APD, F/S, Credit, A&H, F&M GRTY, Other)	45.57	40.47	37.02	28.00
	International	24.41	21.68	19.83	15.00
	Commercial auto/truck liability/medical	19.53	17.35	15.87	12.00
	Medical malpractice—occurrence	60.22	53.48	48.92	37.00
	Medical malpractice—claims made	35.81	31.80	29.09	22.00
	Special liability	26.04	23.13	21.16	16.00
	Other liability—occurrence	22.79	20.24	18.51	14.00
	Other liability—claims made	27.67	24.57	22.48	17.00
	Products liability—occurrence	39.06	34.69	31.73	24.00
	Products liability—claims made	21.16	18.79	17.19	13.00
	Commercial multiple peril	8.46	7.52	6.88	5.20
	Workers' compensation	16.44	14.60	13.35	10.10
U.K. With-Profits Risk Charges					
	Value in force haircut	50.00	50.00	50.00	50.00
	Haircut on investment in subsidiaries	100.00	100.00	100.00	100.00
	Risk capital margin loading	75.00	75.00	75.00	75.00
	Longevity risk charge	8.10	7.24	6.60	5.00
	Reserve risk charge	0.73	0.65	0.60	0.45
	Risk capital margin scaling factor	162.76	144.54	132.22	100.00
German Health Insurance Risk Charges					
	Net aging reserves	4.07	3.61	3.31	2.50

*5% loading above country-specific charge. #Incremental charge in addition to country-specific charge.

Appendix 5: Canadian Capital Adequacy Factors

Appendix 5

Canadian Capital Adequacy Factors

		(%)			
		AAA	**AA**	**A**	**BBB**
Market Risk—Equities					
	U.S., U.K., Australia, Switzerland	47.00	42.00	38.00	27.00

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	Italy, Portugal, Netherlands, Japan, Denmark, Israel, New Zealand	52.00	47.00	42.00	30.00
	South Africa, Spain, Canada, Hungary, Mexico, Brazil, Chile, Norway, Belgium, France, Sweden, Germany	59.00	54.00	49.00	35.00
	Austria, Philippines, Singapore, Czech Republic, Finland, Korea, Taiwan, Greece, Turkey, Hong Kong, Malaysia, Indonesia, Ireland, Argentina, Peru, Colombia	68.00	63.00	58.00	45.00
	India, Poland, Thailand, Russia, China	77.00	72.00	68.00	55.00
	Europe	47.00	42.00	38.00	27.00
	World, Far East	52.00	47.00	42.00	30.00
	Emerging Far East	59.00	54.00	49.00	35.00
	Nordic, GCC	68.00	63.00	58.00	45.00
	BRIC, Latin America	77.00	72.00	68.00	55.00
	Hedge funds	58.75	52.50	47.50	33.75
	Private equity¶	16.00	14.00	13.00	10.00
Market Risk—Properties					
	Germany, Switzerland, Netherlands, Australia, New Zealand	15.00	13.00	11.00	8.00
	Japan, Other Europe	20.00	18.00	15.00	10.00
	U.K., Ireland, Spain, U.S., Other World	30.00	27.00	24.00	18.00
	Owner-occupied property*	38.10	34.24	30.60	23.00
Credit Risk—Bonds					
Less than 1 year					
	AAA Security	0.17	0.15	0.14	0.11
	AA Security	0.21	0.19	0.17	0.14
	A Security	0.28	0.25	0.24	0.19
	BBB Security	0.76	0.69	0.65	0.53
	BB Security	3.31	3.03	2.84	2.34
	B Security	11.85	10.97	10.38	8.82
	CCC/C Security	54.78	50.96	48.37	41.61
	Unrated	3.31	3.03	2.84	2.34
1.01 to 5 years					
	AAA Security	0.36	0.32	0.30	0.24
	AA Security	0.49	0.44	0.41	0.34
	A Security	0.74	0.68	0.64	0.53
	BBB Security	2.74	2.52	2.37	1.98
	BB Security	11.85	10.99	10.41	8.90
	B Security	29.47	27.55	26.24	22.84

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	CCC/C Security	66.33	62.46	59.84	52.99
	Unrated	11.85	10.99	10.41	8.90
5.01 to 10 years					
	AAA Security	1.01	0.93	0.86	0.69
	AA Security	1.26	1.18	1.09	0.90
	A Security	1.57	1.49	1.40	1.22
	BBB Security	5.30	5.04	4.78	4.20
	BB Security	21.00	20.03	19.08	16.97
	B Security	37.68	36.25	34.84	31.71
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	21.00	20.03	19.08	16.97
10.01 to 20 years					
	AAA Security	1.22	1.12	1.02	0.84
	AA Security	1.74	1.61	1.47	1.26
	A Security	2.28	2.16	2.04	1.84
	BBB Security	6.08	5.84	5.60	5.23
	BB Security	25.82	24.64	23.29	21.18
	B Security	39.56	38.46	36.89	34.01
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	25.82	24.64	23.29	21.18
More than 20 years					
	AAA Security	1.45	1.28	1.14	0.96
	AA Security	2.26	2.04	1.86	1.62
	A Security	3.06	2.89	2.75	2.57
	BBB Security	6.10	5.92	5.77	5.57
	BB Security	27.82	26.35	25.14	23.56
	B Security	39.56	38.46	36.89	34.24
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	27.82	26.35	25.14	23.56
Market Risk—Life Bonds					
	Assumed duration mismatch (years)				
U.K., U.S., Canada, Spain, Australia, New Zealand	1.00	2.45	2.18	1.99	1.50
Netherlands, France, Italy, Switzerland, Belgium, South Africa	2.00	4.90	4.35	3.98	3.01

Appendix 5

Canadian Capital Adequacy Factors (cont.)

Germany, Austria, Central & Eastern Europe, Hong Kong, Singapore	3.00	7.35	6.53	5.97	4.51
Nordic Countries, Mexico, Chile, Brazil, Israel	4.00	9.80	8.70	7.96	6.02
China, Taiwan, Korea, Argentina	7.00	17.15	15.23	13.93	10.53
Thailand	10.00	24.49	21.75	19.90	15.05
Japan	5.00	7.35	6.53	5.97	4.52
Market Risk—Non-Life Bonds					
Assumed duration mismatch (years)					
Bond duration (less than 1 year)	0.25	0.61	0.54	0.50	0.38
Bond duration (1-5 years)	1.50	3.67	3.26	2.98	2.26
Bond duration (5-10 years)	3.75	9.19	8.16	7.46	5.64
Bond duration (more than 10 years)	7.50	18.37	16.31	14.92	11.29
Market Risk—Shareholder Bonds					
Assumed duration mismatch (years)					
Bond duration (less than 1 year)	0.50	1.22	1.09	0.99	0.75
Bond duration (1-5 years)	3.00	7.35	6.53	5.97	4.51
Bond duration (5-10 years)	7.50	18.37	16.31	14.92	11.29
Bond duration (more than 10 years)	15.00	36.74	32.63	29.85	22.57
Credit Risk—Reinsurance Recoverables					
Reinsurers rated 'AAA'		1.17	1.10	0.99	0.82
Reinsurers rated 'AA'		1.60	1.51	1.38	1.16
Reinsurers rated 'A'		2.16	2.06	1.93	1.70
Reinsurers rated 'BBB'		5.96	5.74	5.43	4.91
Reinsurers rated 'BB'		23.64	22.82	21.63	19.64
Reinsurers rated 'B'		39.56	38.46	36.89	34.01
Reinsurers rated 'CCC'/'CC'		76.88	72.63	69.75	62.22
Reinsurers rated 'D'/'SD'		80.00	75.00	70.00	65.00
Unrated reinsurers		39.56	38.46	36.89	34.01

Appendix 5

Canadian Capital Adequacy Factors (cont.)

Other Funds Under Management (Off Balance Sheet)					
	First $2.5 bil.	0.81	0.72	0.66	0.50
	Next $7.5 bil.	0.49	0.43	0.40	0.30
	Next $15 bil.	0.33	0.29	0.26	0.20
	Excess over $25 bil.	0.16	0.14	0.13	0.10
Other Assets					
	Mortgages—performing				
	LTV <60%	0.81	0.72	0.66	0.50
	LTV 60%-85%	8.14	7.23	6.61	5.00
	LTV >85%	16.28	14.45	13.22	10.00
	Mortgages—nonperforming				
	LTV <60%	1.63	1.45	1.32	1.00
	LTV 60%-85%	16.28	14.45	13.22	10.00
	LTV >85%	32.55	28.91	26.44	20.00
	Preference shares	35.77	33.88	32.33	30.29
	Derivatives	1.57	1.49	1.40	1.22
	Loans	27.80	26.11	24.97	21.99
	Bank deposits				
	A- or higher	0.07	0.06	0.06	0.05
	BBB	0.22	0.20	0.19	0.15
	BB	0.94	0.86	0.81	0.67
	B	3.16	2.93	2.77	2.35
	CCC+ or lower	13.70	12.74	12.09	10.40
	Deferred tax assets	8.14	7.23	6.61	5.00
	Deposits with cedents	4.88	4.34	3.97	3.00
	Other assets	8.14	7.23	6.61	5.00
	Fixed assets	100.00	100.00	100.00	100.00
Mortality—Net Sums At Risk					
(excluding life policies with critical illness acceleration riders)					
	Highly developed life markets				
	Less than $1 bil.	0.37	0.33	0.30	0.23
	$1 bil. to $5 bil.	0.25	0.22	0.20	0.15
	$5 bil. to $10 bil.	0.19	0.17	0.15	0.11
	$10 bil. to $50 bil.	0.16	0.14	0.13	0.10
	$50 bil. to $100 bil.	0.12	0.11	0.10	0.08
	More than $100 bil.	0.09	0.08	0.08	0.06
	Medium-developed life markets				

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	Less than $1 bil.	0.47	0.41	0.38	0.29
	$1 bil. to $5 bil.	0.31	0.28	0.25	0.19
	$5 bil. to $10 bil.	0.23	0.21	0.19	0.14
	$10 bil. to $50 bil.	0.19	0.17	0.16	0.12
	$50 bil. to $100 bil.	0.16	0.14	0.13	0.10
	More than $100 bil.	0.12	0.10	0.10	0.07
	Less-developed life markets				
	Less than $1 bil.	0.56	0.50	0.45	0.34
	$1 bil. to $5 bil.	0.37	0.33	0.30	0.23
	$5 bil. to $10 bil.	0.28	0.25	0.23	0.17
	$10 bil. to $50 bil.	0.23	0.21	0.19	0.14
	$50 bil. to $100 bil.	0.19	0.17	0.15	0.11
	More than $100 bil.	0.14	0.12	0.11	0.09
Morbidity—Net Sums At Risk (Critical Illness)					
(including riders to life insurance policies)					
	Highly developed life markets				
	Less than $1 bil.	1.12	0.99	0.91	0.69
	$1 bil. to $5 bil.	0.75	0.66	0.61	0.46
	$5 bil. to $10 bil.	0.56	0.50	0.45	0.34
	$10 bil. to $50 bil.	0.47	0.41	0.38	0.29
	$50 bil. to $100 bil.	0.37	0.33	0.30	0.23
	More than $100 bil.	0.28	0.25	0.23	0.17
	Medium-developed life markets				
	Less than $1 bil.	1.40	1.24	1.13	0.86
	$1 bil. to $5 bil.	0.93	0.83	0.76	0.57
	$5 bil. to $10 bil.	0.70	0.62	0.57	0.43
	$10 bil. to $50 bil.	0.58	0.52	0.47	0.36
	$50 bil. to $100 bil.	0.47	0.41	0.38	0.29
	More than $100 bil.	0.35	0.31	0.28	0.22
	Less-developed life markets				
	Less than $1 bil.	1.68	1.49	1.36	1.03
	$1 bil. to $5 bil.	1.12	0.99	0.91	0.69
	$5 bil. to $10 bil.	0.84	0.74	0.68	0.51
	$10 bil. to $50 bil.	0.70	0.62	0.57	0.43
	$50 bil. to $100 bil.	0.56	0.50	0.45	0.34
	More than $100 bil.	0.42	0.37	0.34	0.26

Appendix 5

Canadian Capital Adequacy Factors (cont.)

Longevity Risk					
	Longevity risk	8.10	7.24	6.60	5.00
Life Reserve Risk					
	Participating business				
	Participating business (excluding annuities)	3.26	2.89	2.64	2.00
	Participating annuities	3.26	2.89	2.64	2.00
	Nonparticipating business (excluding annuities)				
	Protection	1.06	0.94	0.86	0.65
	Savings	3.26	2.89	2.64	2.00
	Permanent health insurance	1.06	0.94	0.86	0.65
	Nonparticipating annuities				
	Immediate annuities	0.73	0.65	0.60	0.45
	Deferred annuities (without guarantees)	1.06	0.94	0.86	0.65
	Deferred annuities (with guarantees)	3.26	2.89	2.64	2.00
	Linked business with investment guarantees	3.26	2.89	2.64	2.00
	Linked business with expense guarantees only	1.63	1.45	1.32	1.00
	Linked business without guarantees	1.06	0.94	0.86	0.65
Non-Life Net Premium Risk					
Canadian Risks	Primary and proportional reinsurance business				
	Auto--liability, personal accident & other	17.54	15.59	14.26	10.79
	Auto--liability	17.56	15.60	14.27	10.80
	Auto--personal accident	17.56	15.60	14.27	10.80
	Auto--other	17.50	15.55	14.22	10.76
	Property--personal, hail	20.81	18.49	16.92	12.80
	Property--commercial	24.39	21.67	19.82	15.00
	Liability	37.40	33.23	30.40	23.00
	Accident & Sickness	30.08	26.73	24.45	18.50
	Fidelity, surety	14.63	13.00	11.89	9.00
	Aircraft, marine	24.72	21.96	20.09	15.20
	Boiler and machinery	24.72	21.97	20.09	15.20
	Credit, credit protection, title	53.66	47.68	43.61	33.00
	Nonproportional reinsurance (treaty and facultative)				
	Auto--liability, personal accident & other	26.31	23.38	21.38	16.18
	Auto--liability	26.34	23.41	21.41	16.20
	Auto--personal accident	26.34	23.41	21.41	16.20
	Auto--other	26.25	23.32	21.33	16.14
	Property--personal, hail	31.22	27.74	25.37	19.20

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	Property--commercial	36.59	32.51	29.74	22.50
	Liability	56.10	49.85	45.60	34.50
	Accident & sickness	45.12	40.09	36.67	27.75
	Fidelity, surety	21.95	19.51	17.84	13.50
	Aircraft, marine	37.07	32.94	30.13	22.80
	Boiler and machinery	37.08	32.95	30.14	22.80
	Credit, credit protection, title	80.49	71.52	65.42	49.50
European Risks	Primary and proportional reinsurance business				
	Health-based on morbidity tables	20.00	17.00	16.00	12.00
	Accident and health--other	24.00	22.00	20.00	15.00
	Motor	16.00	14.00	13.00	10.00
	Marine	36.00	32.00	29.00	22.00
	Aviation	52.00	46.00	42.00	32.00
	Transport	20.00	17.00	16.00	12.00
	Property	29.00	26.00	24.00	18.00
	Liability	37.00	33.00	30.00	23.00
	Pecuniary	29.00	26.00	24.00	18.00
	Credit	122.00	108.00	99.00	75.00
	Nonproportional reinsurance (treaty and facultative)				
	Health-based on morbidity tables	29.00	26.00	24.00	18.00
	Accident and health--other	37.00	33.00	30.00	23.00
	Motor	24.00	22.00	20.00	15.00
	Marine	54.00	48.00	44.00	33.00
	Aviation	78.00	69.00	63.00	48.00
	Transport	29.00	26.00	24.00	18.00
	Property	44.00	39.00	36.00	27.00
	Liability	57.00	51.00	46.00	35.00
	Pecuniary	44.00	39.00	36.00	27.00
	Credit	183.00	163.00	149.00	112.50
	Finite	7.00	6.00	5.00	4.00
Non-Life Loss Reserve Risk					
Canadian Risks					
	Primary and proportional reinsurance business				
	Auto--liability, personal accident & other	17.79	15.81	14.46	10.94
	Auto--liability	16.33	14.51	13.28	10.05
	Auto--personal accident	16.33	14.51	13.28	10.05
	Auto--other	45.53	40.46	37.01	28.00

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	Property--personal, hail	12.20	10.84	9.91	7.50
	Property--commercial	12.20	10.84	9.91	7.50
	Liability	24.39	21.67	19.82	15.00
	Accident & sickness	19.51	17.34	15.86	12.00
	Fidelity, surety	39.03	34.68	31.72	24.00
	Boiler & machinery	26.02	23.12	21.15	16.00
	Aircraft	26.02	23.12	21.15	16.00
	Marine	26.02	23.12	21.15	16.00
	Credit, credit protection, title	39.03	34.68	31.72	24.00
	Nonproportional reinsurance (treaty and facultative)				
	Auto--liability, personal accident & other	17.79	15.81	14.46	10.94
	Auto--liability	16.33	14.51	13.28	10.05
	Auto--personal accident	16.33	14.51	13.28	10.05
	Auto--other	45.53	40.46	37.01	28.00
	Property--personal, hail	12.20	10.84	9.91	7.50
	Property--commercial	12.20	10.84	9.91	7.50
	Liability	24.39	21.67	19.82	15.00
	Accident & sickness	19.51	17.34	15.86	12.00
	Fidelity, surety	39.03	34.68	31.72	24.00
	Boiler & machinery	26.02	23.12	21.15	16.00
	Aircraft	26.02	23.12	21.15	16.00
	Marine	26.02	23.12	21.15	16.00
	Credit, credit protection, title	39.03	34.68	31.72	24.00
European Risks	Primary and proportional reinsurance business				
	Health-based on morbidity tables	8.00	7.00	6.00	5.00
	Accident and health--other	33.00	29.00	26.00	20.00
	Motor	18.00	16.00	15.00	11.00
	Marine, aviation, and transport	26.00	23.00	21.00	16.00
	Property	11.00	10.00	9.00	7.00
	Liability	24.00	22.00	20.00	15.00
	Pecuniary	33.00	29.00	26.00	20.00
	Credit	41.00	36.00	33.00	25.00
	Nonproportional reinsurance (treaty and facultative)				
	Health-based on morbidity tables	8.00	7.00	6.00	5.00
	Accident and health--other	33.00	29.00	26.00	20.00
	Motor	18.00	16.00	15.00	11.00
	Marine, aviation, and transport	26.00	23.00	21.00	16.00

Appendix 5

Canadian Capital Adequacy Factors (cont.)

	Property	11.00	10.00	9.00	7.00
	Liability	24.00	22.00	20.00	15.00
	Pecuniary	33.00	29.00	26.00	20.00
	Credit	41.00	36.00	33.00	25.00
	Finite	10.00	9.00	8.00	6.00

*5% loading above country-specific charge. ¶Incremental charge in addition to country-specific charge.

Appendix 6: Asia-Pacific Capital Adequacy Factors

Appendix 6

Asia-Pacific Capital Adequacy Factors

		(%)			
		AAA	**AA**	**A**	**BBB**
Market Risk—Equities					
	U.S., U.K., Australia, Switzerland	47.00	42.00	38.00	27.00
	Italy, Portugal, Netherlands, Japan, Denmark, Israel, New Zealand	52.00	47.00	42.00	30.00
	South Africa, Spain, Canada, Hungary, Mexico, Brazil, Chile, Norway, Belgium, France, Sweden, Germany	59.00	54.00	49.00	35.00
	Austria, Philippines, Singapore, Czech Republic, Finland, Korea, Taiwan, Greece, Turkey, Hong Kong, Malaysia, Indonesia, Ireland, Argentina, Peru, Colombia	68.00	63.00	58.00	45.00
	India, Poland, Thailand, Russia, China	77.00	72.00	68.00	55.00
	Europe	47.00	42.00	38.00	27.00
	World, Far East	52.00	47.00	42.00	30.00
	Emerging Far East	59.00	54.00	49.00	35.00
	Nordic, GCC	68.00	63.00	58.00	45.00
	BRIC, Latin America	77.00	72.00	68.00	55.00
	Hedge funds	58.75	52.50	47.50	33.75
	Private equity¶	16.00	14.00	13.00	10.00
Market Risk—Properties					
	Germany, Switzerland, Netherlands, Australia, New Zealand	15.00	13.00	11.00	8.00
	Japan, Other Europe	20.00	18.00	15.00	10.00
	U.K., Ireland, Spain, U.S., Other World	30.00	27.00	24.00	18.00
	Owner-occupied property*	38.10	34.24	30.60	23.00

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

Credit Risk—Bonds					
Less than 1 year					
	AAA Security	0.17	0.15	0.14	0.11
	AA Security	0.21	0.19	0.17	0.14
	A Security	0.28	0.25	0.24	0.19
	BBB Security	0.76	0.69	0.65	0.53
	BB Security	3.31	3.03	2.84	2.34
	B Security	11.85	10.97	10.38	8.82
	CCC/C Security	54.78	50.96	48.37	41.61
	Unrated	3.31	3.03	2.84	2.34
1.01 to 5 years					
	AAA Security	0.36	0.32	0.30	0.24
	AA Security	0.49	0.44	0.41	0.34
	A Security	0.74	0.68	0.64	0.53
	BBB Security	2.74	2.52	2.37	1.98
	BB Security	11.85	10.99	10.41	8.90
	B Security	29.47	27.55	26.24	22.84
	CCC/C Security	66.33	62.46	59.84	52.99
	Unrated	11.85	10.99	10.41	8.90
5.01 to 10 years					
	AAA Security	1.01	0.93	0.86	0.69
	AA Security	1.26	1.18	1.09	0.90
	A Security	1.57	1.49	1.40	1.22
	BBB Security	5.30	5.04	4.78	4.20
	BB Security	21.00	20.03	19.08	16.97
	B Security	37.68	36.25	34.84	31.71
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	21.00	20.03	19.08	16.97
10.01 to 20 years					
	AAA Security	1.22	1.12	1.02	0.84
	AA Security	1.74	1.61	1.47	1.26
	A Security	2.28	2.16	2.04	1.84
	BBB Security	6.08	5.84	5.60	5.23
	BB Security	25.82	24.64	23.29	21.18
	B Security	39.56	38.46	36.89	34.01
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	25.82	24.64	23.29	21.18

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

More than 20 years

	AAA Security	1.45	1.28	1.14	0.96
	AA Security	2.26	2.04	1.86	1.62
	A Security	3.06	2.89	2.75	2.57
	BBB Security	6.10	5.92	5.77	5.57
	BB Security	27.82	26.35	25.14	23.56
	B Security	39.56	38.46	36.89	34.24
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	27.82	26.35	25.14	23.56

Market Risk—Life Bonds

	Assumed duration mismatch (years)				
U.K., U.S., Canada, Spain, Australia, New Zealand	1.00	2.45	2.18	1.99	1.50
Netherlands, France, Italy, Switzerland, Belgium, South Africa	2.00	4.90	4.35	3.98	3.01
Germany, Austria, Central & Eastern Europe, Hong Kong, Singapore	3.00	7.35	6.53	5.97	4.51
Nordic Countries, Mexico, Chile, Brazil, Israel	4.00	9.80	8.70	7.96	6.02
China, Taiwan, Korea, Argentina	7.00	17.15	15.23	13.93	10.53
Thailand	10.00	24.49	21.75	19.90	15.05
Japan	5.00	7.35	6.53	5.97	4.52

Market Risk—Non-Life Bonds

	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.25	0.61	0.54	0.50	0.38
Bond duration (1-5 years)	1.50	3.67	3.26	2.98	2.26
Bond duration (5-10 years)	3.75	9.19	8.16	7.46	5.64
Bond duration (more than 10 years)	7.50	18.37	16.31	14.92	11.29

Market Risk—Shareholder Bonds

	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.50	1.22	1.09	0.99	0.75

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

Bond duration (1-5 years)	3.00	7.35	6.53	5.97	4.51
Bond duration (5-10 years)	7.50	18.37	16.31	14.92	11.29
Bond duration (more than 10 years)	15.00	36.74	32.63	29.85	22.57
Credit Risk—Reinsurance Recoverables					
Reinsurers rated 'AAA'		1.17	1.10	0.99	0.82
Reinsurers rated 'AA'		1.60	1.51	1.38	1.16
Reinsurers rated 'A'		2.16	2.06	1.93	1.70
Reinsurers rated 'BBB'		5.96	5.74	5.43	4.91
Reinsurers rated 'BB'		23.64	22.82	21.63	19.64
Reinsurers rated 'B'		39.56	38.46	36.89	34.01
Reinsurers rated 'CCC'/'CC'		76.88	72.63	69.75	62.22
Reinsurers rated 'D'/'SD'		80.00	75.00	70.00	65.00
Unrated reinsurers		39.56	38.46	36.89	34.01
Other Funds Under Management (Off Balance Sheet)					
First $2.5 bil.		0.81	0.72	0.66	0.50
Next $7.5 bil.		0.49	0.43	0.40	0.30
Next $15 bil.		0.33	0.29	0.26	0.20
Excess over $25 bil.		0.16	0.14	0.13	0.10
Other Assets					
Mortgages—performing					
LTV <60%		0.81	0.72	0.66	0.50
LTV 60%-85%		8.14	7.23	6.61	5.00
LTV >85%		16.28	14.45	13.22	10.00
Mortgages—nonperforming					
LTV <60%		1.63	1.45	1.32	1.00
LTV 60%-85%		16.28	14.45	13.22	10.00
LTV >85%		32.55	28.91	26.44	20.00
Preference shares		35.77	33.88	32.33	30.29
Derivatives		1.57	1.49	1.40	1.22
Loans		27.80	26.11	24.97	21.99
Bank deposits					
A- or higher		0.07	0.06	0.06	0.05
BBB		0.22	0.20	0.19	0.15
BB		0.94	0.86	0.81	0.67
B		3.16	2.93	2.77	2.35

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

	CCC+ or lower	13.70	12.74	12.09	10.40
	Deferred tax assets	8.14	7.23	6.61	5.00
	Deposits with cedents	4.88	4.34	3.97	3.00
	Other assets	8.14	7.23	6.61	5.00
	Fixed assets	100.00	100.00	100.00	100.00
Mortality—Net Sums At Risk					
(excluding life policies with critical illness acceleration riders)					
	Highly developed life markets				
	Less than $1 bil.	0.37	0.33	0.30	0.23
	$1 bil. to $5 bil.	0.25	0.22	0.20	0.15
	$5 bil. to $10 bil.	0.19	0.17	0.15	0.11
	$10 bil. to $50 bil.	0.16	0.14	0.13	0.10
	$50 bil. to $100 bil.	0.12	0.11	0.10	0.08
	More than $100 bil.	0.09	0.08	0.08	0.06
	Medium-developed life markets				
	Less than $1 bil.	0.47	0.41	0.38	0.29
	$1 bil. to $5 bil.	0.31	0.28	0.25	0.19
	$5 bil. to $10 bil.	0.23	0.21	0.19	0.14
	$10 bil. to $50 bil.	0.19	0.17	0.16	0.12
	$50 bil. to $100 bil.	0.16	0.14	0.13	0.10
	More than $100 bil.	0.12	0.10	0.10	0.07
	Less-developed life markets				
	Less than $1 bil.	0.56	0.50	0.45	0.34
	$1 bil. to $5 bil.	0.37	0.33	0.30	0.23
	$5 bil. to $10 bil.	0.28	0.25	0.23	0.17
	$10 bil. to $50 bil.	0.23	0.21	0.19	0.14
	$50 bil. to $100 bil.	0.19	0.17	0.15	0.11
	More than $100 bil.	0.14	0.12	0.11	0.09
Morbidity—Net Sums At Risk (Critical Illness)					
(including riders to life insurance policies)					
	Highly developed life markets				
	Less than $1 bil.	1.12	0.99	0.91	0.69
	$1 bil. to $5 bil.	0.75	0.66	0.61	0.46
	$5 bil. to $10 bil.	0.56	0.50	0.45	0.34
	$10 bil. to $50 bil.	0.47	0.41	0.38	0.29
	$50 bil. to $100 bil.	0.37	0.33	0.30	0.23
	More than $100 bil.	0.28	0.25	0.23	0.17

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

	Medium-developed life markets				
	Less than $1 bil.	1.40	1.24	1.13	0.86
	$1 bil. to $5 bil.	0.93	0.83	0.76	0.57
	$5 bil. to $10 bil.	0.70	0.62	0.57	0.43
	$10 bil. to $50 bil.	0.58	0.52	0.47	0.36
	$50 bil. to $100 bil.	0.47	0.41	0.38	0.29
	More than $100 bil.	0.35	0.31	0.28	0.22
	Less-developed life markets				
	Less than $1 bil.	1.68	1.49	1.36	1.03
	$1 bil. to $5 bil.	1.12	0.99	0.91	0.69
	$5 bil. to $10 bil.	0.84	0.74	0.68	0.51
	$10 bil. to $50 bil.	0.70	0.62	0.57	0.43
	$50 bil. to $100 bil.	0.56	0.50	0.45	0.34
	More than $100 bil.	0.42	0.37	0.34	0.26
Longevity Risk					
	Longevity risk	8.10	7.24	6.60	5.00
Life Reserve Risk					
	Participating business				
	Participating business (excluding annuities)	3.26	2.89	2.64	2.00
	Participating annuities	3.26	2.89	2.64	2.00
	Nonparticipating business (excluding annuities)				
	Protection	1.06	0.94	0.86	0.65
	Savings	3.26	2.89	2.64	2.00
	Permanent health insurance	1.06	0.94	0.86	0.65
	Nonparticipating annuities				
	Immediate annuities	0.73	0.65	0.60	0.45
	Deferred annuities (without guarantees)	1.06	0.94	0.86	0.65
	Deferred annuities (with guarantees)	3.26	2.89	2.64	2.00
	Linked business with investment guarantees	3.26	2.89	2.64	2.00
	Linked business with expense guarantees only	1.63	1.45	1.32	1.00
	Linked business without guarantees	1.06	0.94	0.86	0.65
Non-Life Net Premium Risk					
Asia-Pacific (excl. Australia and New Zealand) Risks	Primary and proportional reinsurance business				
	Accident & health	27.00	24.00	22.00	17.00
	Auto	21.00	19.00	17.00	13.00
	Marine, Aviation	36.00	32.00	29.00	22.00

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

	Property	29.00	26.00	24.00	18.00
	Liability	30.00	27.00	24.00	18.00
	Liability--long tail	45.00	40.00	36.00	28.00
	Credit	79.00	70.00	64.00	49.00
	Engineering	35.00	31.00	29.00	22.00
	Long-term property	32.00	29.00	26.00	20.00
	Long-term accident and health	35.00	31.00	28.00	21.00
	Nonproportional reinsurance (treaty and facultative)				
	Accident & health	34.00	30.00	27.00	21.00
	Auto	26.00	23.00	21.00	16.00
	Marine, Aviation	45.00	40.00	36.00	28.00
	Property	37.00	33.00	30.00	23.00
	Liability	37.00	33.00	30.00	23.00
	Liability--long tail	56.00	50.00	46.00	35.00
	Credit	99.00	88.00	81.00	61.00
	Engineering	44.00	39.00	36.00	27.00
	Long-term property	40.00	36.00	33.00	25.00
	Long-term accident and health	44.00	39.00	35.00	27.00
Australia and New Zealand Risks	Primary and proportional reinsurance business				
	Domestic motor vehicle	12.80	11.60	10.40	8.00
	Commercial motor vehicle	17.60	15.95	14.30	11.00
	Marine	19.20	17.40	15.60	12.00
	Aviation	19.20	17.40	15.60	12.00
	Houseowners/Householders	16.00	14.50	13.00	10.00
	CTP motor vehicle	22.40	20.30	18.20	14.00
	Public and product liability	25.60	23.20	20.80	16.00
	Professional indemnity	30.40	27.55	24.70	19.00
	Employers liability	22.40	20.30	18.20	14.00
	Consumer credit	24.00	21.75	19.50	15.00
	Mortgage	24.00	21.75	19.50	15.00
	Other accident	20.80	18.85	16.90	13.00
	Travel	20.80	18.85	16.90	13.00
	Fire and ISR	19.20	17.40	15.60	12.00
	Nonproportional reinsurance (treaty and facultative)				
	Domestic motor vehicle	40.00	36.25	32.50	25.00
	Commercial motor vehicle	40.00	36.25	32.50	25.00

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

	Marine	41.60	37.70	33.80	26.00
	Aviation	41.60	37.70	33.80	26.00
	Houseowners/Householders	40.00	36.25	32.50	25.00
	CTP motor vehicle	51.20	46.40	41.60	32.00
	Public and product liability	51.20	46.40	41.60	32.00
	Professional indemnity	51.20	46.40	41.60	32.00
	Employers liability	51.20	46.40	41.60	32.00
	Consumer credit	59.20	53.65	48.10	37.00
	Mortgage	59.20	53.65	48.10	37.00
	Other accident	59.20	53.65	48.10	37.00
	Travel	59.20	53.65	48.10	37.00
	Fire and ISR	40.00	36.25	32.50	25.00
Non-Life Loss Reserve Risk					
Asia-Pacific (excl. Australia and New Zealand) Risks	Primary, proportional and non-proportional reinsurance business				
	Accident & health (A&H)/long-term A&H	29.54	26.23	24.00	18.15
	Auto	23.27	20.67	18.91	14.30
	Marine, aviation	39.39	34.98	32.00	24.20
	Property/long-term property	32.23	28.62	26.18	19.80
	Liability	35.94	31.91	29.19	22.08
	Liability--long tail	67.38	59.84	54.74	41.40
	Credit Ins	87.28	77.51	70.90	53.63
	Engineering	42.19	37.47	34.27	25.92
Australia and New Zealand Risks	Primary and proportional reinsurance business				
	Domestic motor vehicle	11.20	10.15	9.10	7.00
	Commercial motor vehicle	14.40	13.05	11.70	9.00
	Marine	16.00	14.50	13.00	10.00
	Aviation	16.00	14.50	13.00	10.00
	Houseowners/householders	12.80	11.60	10.40	8.00
	CTP motor vehicle	19.20	17.40	15.60	12.00
	Public and product liability	20.80	18.85	16.90	13.00
	Professional indemnity	22.40	20.30	18.20	14.00
	Employers liability	20.80	18.85	16.90	13.00
	Consumer credit	16.00	14.50	13.00	10.00
	Mortgage	16.00	14.50	13.00	10.00
	Other accident	14.40	13.05	11.70	9.00

Appendix 6

Asia-Pacific Capital Adequacy Factors (cont.)

	Travel	16.00	14.50	13.00	10.00
	Fire and ISR	16.00	14.50	13.00	10.00
	Nonproportional reinsurance				
	Domestic motor vehicle	27.20	24.65	22.10	17.00
	Commercial motor vehicle	27.20	24.65	22.10	17.00
	Marine	36.80	33.35	29.90	23.00
	Aviation	36.80	33.35	29.90	23.00
	Houseowners/householders	27.20	24.65	22.10	17.00
	CTP motor vehicle	44.80	40.60	36.40	28.00
	Public and product liability	44.80	40.60	36.40	28.00
	Professional indemnity	44.80	40.60	36.40	28.00
	Employers liability	44.80	40.60	36.40	28.00
	Consumer credit	46.40	42.05	37.70	29.00
	Mortgage	46.40	42.05	37.70	29.00
	Other accident	46.40	42.05	37.70	29.00
	Travel	46.40	42.05	37.70	29.00
	Fire and ISR	27.20	24.65	22.10	17.00

*5% loading above country-specific charge. ¶Incremental charge in addition to country-specific charge.

Appendix 7: Latin American Capital Adequacy Factors

Appendix 7

Latin American Capital Adequacy Factors

		(%)			
		AAA	**AA**	**A**	**BBB**
Market Risk—Equities					
	U.S., U.K., Australia, Switzerland	47.00	42.00	38.00	27.00
	Italy, Portugal, Netherlands, Japan, Denmark, Israel, New Zealand	52.00	47.00	42.00	30.00
	South Africa, Spain, Canada, Hungary, Mexico, Brazil, Chile, Norway, Belgium, France, Sweden, Germany	59.00	54.00	49.00	35.00
	Austria, Philippines, Singapore, Czech Republic, Finland, Korea, Taiwan, Greece, Turkey, Hong Kong, Malaysia, Indonesia, Ireland, Argentina, Peru, Colombia	68.00	63.00	58.00	45.00
	India, Poland, Thailand, Russia, China	77.00	72.00	68.00	55.00
	Europe	47.00	42.00	38.00	27.00
	World, Far East	52.00	47.00	42.00	30.00

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Emerging Far East	59.00	54.00	49.00	35.00
	Nordic, GCC	68.00	63.00	58.00	45.00
	BRIC, Latin America	77.00	72.00	68.00	55.00
	Hedge funds	58.75	52.50	47.50	33.75
	Private equity¶	16.00	14.00	13.00	10.00
Market Risk—Properties					
	Germany, Switzerland, Netherlands, Australia, New Zealand	15.00	13.00	11.00	8.00
	Japan, Other Europe	20.00	18.00	15.00	10.00
	U.K., Ireland, Spain, U.S., Other World	30.00	27.00	24.00	18.00
	Owner-occupied property*	38.10	34.24	30.60	23.00
Credit Risk—Bonds					
Less than 1 year					
	AAA Security	0.17	0.15	0.14	0.11
	AA Security	0.21	0.19	0.17	0.14
	A Security	0.28	0.25	0.24	0.19
	BBB Security	0.76	0.69	0.65	0.53
	BB Security	3.31	3.03	2.84	2.34
	B Security	11.85	10.97	10.38	8.82
	CCC/C Security	54.78	50.96	48.37	41.61
	Unrated	3.31	3.03	2.84	2.34
1.01 to 5 years					
	AAA Security	0.36	0.32	0.30	0.24
	AA Security	0.49	0.44	0.41	0.34
	A Security	0.74	0.68	0.64	0.53
	BBB Security	2.74	2.52	2.37	1.98
	BB Security	11.85	10.99	10.41	8.90
	B Security	29.47	27.55	26.24	22.84
	CCC/C Security	66.33	62.46	59.84	52.99
	Unrated	11.85	10.99	10.41	8.90
5.01 to 10 years					
	AAA Security	1.01	0.93	0.86	0.69
	AA Security	1.26	1.18	1.09	0.90
	A Security	1.57	1.49	1.40	1.22
	BBB Security	5.30	5.04	4.78	4.20
	BB Security	21.00	20.03	19.08	16.97
	B Security	37.68	36.25	34.84	31.71

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	21.00	20.03	19.08	16.97
10.01 to 20 years					
	AAA Security	1.22	1.12	1.02	0.84
	AA Security	1.74	1.61	1.47	1.26
	A Security	2.28	2.16	2.04	1.84
	BBB Security	6.08	5.84	5.60	5.23
	BB Security	25.82	24.64	23.29	21.18
	B Security	39.56	38.46	36.89	34.01
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	25.82	24.64	23.29	21.18
More than 20 years					
	AAA Security	1.45	1.28	1.14	0.96
	AA Security	2.26	2.04	1.86	1.62
	A Security	3.06	2.89	2.75	2.57
	BBB Security	6.10	5.92	5.77	5.57
	BB Security	27.82	26.35	25.14	23.56
	B Security	39.56	38.46	36.89	34.24
	CCC/C Security	76.88	72.63	69.75	62.22
	Unrated	27.82	26.35	25.14	23.56

Market Risk—Life Bonds

	Assumed duration mismatch (years)				
U.K., U.S., Canada, Spain, Australia, New Zealand	1.00	2.45	2.18	1.99	1.50
Netherlands, France, Italy, Switzerland, Belgium, South Africa	2.00	4.90	4.35	3.98	3.01
Germany, Austria, Central & Eastern Europe, Hong Kong, Singapore	3.00	7.35	6.53	5.97	4.51
Nordic Countries, Mexico, Chile, Brazil, Israel	4.00	9.80	8.70	7.96	6.02
China, Taiwan, Korea, Argentina	7.00	17.15	15.23	13.93	10.53
Thailand	10.00	24.49	21.75	19.90	15.05
Japan	5.00	7.35	6.53	5.97	4.52

Appendix 7

Latin American Capital Adequacy Factors (cont.)

Market Risk—Non-Life Bonds					
	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.25	0.61	0.54	0.50	0.38
Bond duration (1-5 years)	1.50	3.67	3.26	2.98	2.26
Bond duration (5-10 years)	3.75	9.19	8.16	7.46	5.64
Bond duration (more than 10 years)	7.50	18.37	16.31	14.92	11.29
Market Risk—Shareholder Bonds					
	Assumed duration mismatch (years)				
Bond duration (less than 1 year)	0.50	1.22	1.09	0.99	0.75
Bond duration (1-5 years)	3.00	7.35	6.53	5.97	4.51
Bond duration (5-10 years)	7.50	18.37	16.31	14.92	11.29
Bond duration (more than 10 years)	15.00	36.74	32.63	29.85	22.57
Credit Risk—Reinsurance Recoverables					
Reinsurers rated 'AAA'		1.17	1.10	0.99	0.82
Reinsurers rated 'AA'		1.60	1.51	1.38	1.16
Reinsurers rated 'A'		2.16	2.06	1.93	1.70
Reinsurers rated 'BBB'		5.96	5.74	5.43	4.91
Reinsurers rated 'BB'		23.64	22.82	21.63	19.64
Reinsurers rated 'B'		39.56	38.46	36.89	34.01
Reinsurers rated 'CCC'/'CC'		76.88	72.63	69.75	62.22
Reinsurers rated 'D'/'SD'		80.00	75.00	70.00	65.00
Unrated reinsurers		39.56	38.46	36.89	34.01
Other Funds Under Management (Off Balance Sheet)					
First $2.5 bil.		0.81	0.72	0.66	0.50
Next $7.5 bil.		0.49	0.43	0.40	0.30
Next $15 bil.		0.33	0.29	0.26	0.20
Excess over $25 bil.		0.16	0.14	0.13	0.10
Other Assets					
Mortgages—performing					
LTV <60%		0.81	0.72	0.66	0.50
LTV 60%-85%		8.14	7.23	6.61	5.00
LTV >85%		16.28	14.45	13.22	10.00

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Mortgages—nonperforming				
	LTV <60%	1.63	1.45	1.32	1.00
	LTV 60%-85%	16.28	14.45	13.22	10.00
	LTV >85%	32.55	28.91	26.44	20.00
	Preference shares	35.77	33.88	32.33	30.29
	Derivatives	1.57	1.49	1.40	1.22
	Loans	27.80	26.11	24.97	21.99
	Bank deposits				
	A- or higher	0.07	0.06	0.06	0.05
	BBB	0.22	0.20	0.19	0.15
	BB	0.94	0.86	0.81	0.67
	B	3.16	2.93	2.77	2.35
	CCC+ or lower	13.70	12.74	12.09	10.40
	Deferred tax assets	8.14	7.23	6.61	5.00
	Deposits with cedents	4.88	4.34	3.97	3.00
	Other assets	8.14	7.23	6.61	5.00
	Fixed assets	100.00	100.00	100.00	100.00
Mortality—Net Sums At Risk					
(excluding life policies with critical illness acceleration riders)					
	Highly developed life markets				
	Less than $1 bil.	0.37	0.33	0.30	0.23
	$1 bil. to $5 bil.	0.25	0.22	0.20	0.15
	$5 bil. to $10 bil.	0.19	0.17	0.15	0.11
	$10 bil. to $50 bil.	0.16	0.14	0.13	0.10
	$50 bil. to $100 bil.	0.12	0.11	0.10	0.08
	More than $100 bil.	0.09	0.08	0.08	0.06
	Medium-developed life markets				
	Less than $1 bil.	0.47	0.41	0.38	0.29
	$1 bil. to $5 bil.	0.31	0.28	0.25	0.19
	$5 bil. to $10 bil.	0.23	0.21	0.19	0.14
	$10 bil. to $50 bil.	0.19	0.17	0.16	0.12
	$50 bil. to $100 bil.	0.16	0.14	0.13	0.10
	More than $100 bil.	0.12	0.10	0.10	0.07
	Less-developed life markets				
	Less than $1 bil.	0.56	0.50	0.45	0.34
	$1 bil. to $5 bil.	0.37	0.33	0.30	0.23
	$5 bil. to $10 bil.	0.28	0.25	0.23	0.17

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	$10 bil. to $50 bil.	0.23	0.21	0.19	0.14
	$50 bil. to $100 bil.	0.19	0.17	0.15	0.11
	More than $100 bil.	0.14	0.12	0.11	0.09
Morbidity—Net Sums At Risk (Critical Illness)					
(including riders to life insurance policies)					
	Highly developed life markets				
	Less than $1 bil.	1.12	0.99	0.91	0.69
	$1 bil. to $5 bil.	0.75	0.66	0.61	0.46
	$5 bil. to $10 bil.	0.56	0.50	0.45	0.34
	$10 bil. to $50 bil.	0.47	0.41	0.38	0.29
	$50 bil. to $100 bil.	0.37	0.33	0.30	0.23
	More than $100 bil.	0.28	0.25	0.23	0.17
	Medium-developed life markets				
	Less than $1 bil.	1.40	1.24	1.13	0.86
	$1 bil. to $5 bil.	0.93	0.83	0.76	0.57
	$5 bil. to $10 bil.	0.70	0.62	0.57	0.43
	$10 bil. to $50 bil.	0.58	0.52	0.47	0.36
	$50 bil. to $100 bil.	0.47	0.41	0.38	0.29
	More than $100 bil.	0.35	0.31	0.28	0.22
	Less-developed life markets				
	Less than $1 bil.	1.68	1.49	1.36	1.03
	$1 bil. to $5 bil.	1.12	0.99	0.91	0.69
	$5 bil. to $10 bil.	0.84	0.74	0.68	0.51
	$10 bil. to $50 bil.	0.70	0.62	0.57	0.43
	$50 bil. to $100 bil.	0.56	0.50	0.45	0.34
	More than $100 bil.	0.42	0.37	0.34	0.26
Longevity Risk					
	Longevity risk	8.10	7.24	6.60	5.00
Life Reserve Risk					
	Participating business				
	Participating business (excluding annuities)	3.26	2.89	2.64	2.00
	Participating annuities	3.26	2.89	2.64	2.00
	Nonparticipating business (excluding annuities)				
	Protection	1.06	0.94	0.86	0.65
	Savings	3.26	2.89	2.64	2.00
	Permanent health insurance	1.06	0.94	0.86	0.65
	Nonparticipating annuities				

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Immediate annuities	0.73	0.65	0.60	0.45
	Deferred annuities (without guarantees)	1.06	0.94	0.86	0.65
	Deferred annuities (with guarantees)	3.26	2.89	2.64	2.00
	Linked business with investment guarantees	3.26	2.89	2.64	2.00
	Linked business with expense guarantees only	1.63	1.45	1.32	1.00
	Linked business without guarantees	1.06	0.94	0.86	0.65
Non-Life Net Premium Risk					
Latin American Risks	Primary and proportional reinsurance business				
	Health--based on morbidity tables	35.81	31.80	29.09	22.00
	Accident & health--other	22.79	20.24	18.51	14.00
	Motor	24.41	21.68	19.83	15.00
	Marine	35.81	31.80	29.09	22.00
	Transport	35.81	31.80	29.09	22.00
	Fire	43.94	39.03	35.70	27.00
	Liability	63.48	56.37	51.57	39.00
	Nonproportional reinsurance (treaty and facultative)				
	Health--based on morbidity tables	53.71	47.70	43.63	33.00
	Accident & health--other	34.18	30.35	27.77	21.00
	Motor	36.62	32.52	29.75	22.50
	Marine	53.71	47.70	43.63	33.00
	Transport	53.71	47.70	43.63	33.00
	Fire	65.92	58.54	53.55	40.50
	Liability	95.21	84.56	77.35	58.50
U.S. Risks	Primary and proportional reinsurance business				
	Homeowners' multi-peril	34.61	30.74	28.12	21.27
	Farm owners' multi-peril	34.61	30.74	28.12	21.27
	Private passenger auto liability	14.48	12.86	11.76	8.89
	Fire	14.65	13.01	11.90	9.00
	Allied lines	14.65	13.01	11.90	9.00
	Mortgage guaranty	53.71	47.70	43.63	33.00
	Inland marine	14.65	13.01	11.90	9.00
	Financial guaranty	53.71	47.70	43.63	33.00
	Earthquake	14.65	13.01	11.90	9.00
	Group accident and health	53.71	47.70	43.63	33.00
	Credit accident and health	53.71	47.70	43.63	33.00
	Burglary and theft	14.65	13.01	11.90	9.00
	Credit	53.71	47.70	43.63	33.00

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Auto physical damage	17.52	15.56	14.23	10.76
	Fidelity and surety	14.65	13.01	11.90	9.00
	Warranty	35.19	31.26	28.59	21.62
	International	44.76	39.75	36.36	27.50
	Commercial auto liability	30.74	27.30	24.97	18.89
	Medical malpractice—occurrence	87.51	77.71	71.09	53.76
	Medical malpractice—claims made	63.89	56.74	51.90	39.25
	Special liability	24.74	21.97	20.10	15.20
	Aircraft	24.74	21.97	20.10	15.20
	Boiler and machinery	24.74	21.97	20.10	15.20
	Other liability—occurrence	49.20	43.69	39.97	30.23
	Other liability—claims made	37.61	33.40	30.56	23.11
	Products liability—occurrence	52.86	46.95	42.95	32.48
	Products liability—claims made	40.51	35.98	32.91	24.89
	Commercial multiple peril	21.26	18.88	17.27	13.06
	Workers' compensation	29.25	25.98	23.76	17.97
	Nonproportional reinsurance (treaty and facultative)				
	Homeowners' multi-peril	43.26	38.42	35.15	26.58
	Farm owners' multi-peril	43.26	38.42	35.15	26.58
	Private passenger auto liability	18.10	16.07	14.70	11.12
	Fire	14.65	13.01	11.90	9.00
	Allied lines	14.65	13.01	11.90	9.00
	Mortgage guaranty	67.14	59.62	54.54	41.25
	Inland marine	14.65	13.01	11.90	9.00
	Financial guaranty	67.14	59.62	54.54	41.25
	Earthquake	14.65	13.01	11.90	9.00
	Group accident and health	53.71	47.70	43.63	33.00
	Credit accident and health	53.71	47.70	43.63	33.00
	Burglary and theft	14.65	13.01	11.90	9.00
	Credit	67.14	59.62	54.54	41.25
	Auto physical damage	17.52	15.56	14.23	10.76
	Fidelity	18.31	16.26	14.88	11.25
	Surety	18.31	16.26	14.88	11.25
	Warranty	35.19	31.26	28.59	21.62
	International	55.95	49.69	45.45	34.38
	Commercial auto liability	30.74	27.30	24.97	18.89
	Medical malpractice—occurrence	109.38	97.14	88.86	67.21

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Medical malpractice—claims made	79.86	70.92	64.88	49.07
	Special liability	30.93	27.47	25.13	19.00
	Aircraft	30.93	27.47	25.13	19.00
	Boiler and machinery	24.74	21.97	20.10	15.20
	Other liability—occurrence	61.50	54.62	49.96	37.79
	Other liability—claims made	47.01	41.75	38.19	28.89
	Products liability—occurrence	66.08	58.68	53.68	40.60
	Products liability—claims made	50.64	44.97	41.14	31.11
	Commercial multiple peril	26.58	23.60	21.59	16.33
	Workers' compensation	36.56	32.47	29.70	22.46
Non-Life Loss Reserve Risk					
Latin American Risks	Primary and proportional reinsurance business				
	Health--based on morbidity tables	32.55	28.91	26.44	20.00
	Accident & health--other	8.14	7.23	6.61	5.00
	Motor	19.53	17.35	15.87	12.00
	Marine	32.55	28.91	26.44	20.00
	Transport	32.55	28.91	26.44	20.00
	Fire	40.69	36.14	33.06	25.00
	Liability	58.59	52.04	47.60	36.00
	Nonproportional reinsurance (treaty and facultative)				
	Health--based on morbidity tables	32.55	28.91	26.44	20.00
	Accident & health--other	8.14	7.23	6.61	5.00
	Motor	19.53	17.35	15.87	12.00
	Marine	32.55	28.91	26.44	20.00
	Transport	32.55	28.91	26.44	20.00
	Fire	40.69	36.14	33.06	25.00
	Liability	58.59	52.04	47.60	36.00
U.S. Risks	Primary, proportional and non-proportional reinsurance business				
	Homeowners'/Farm owners'	18.55	16.48	15.07	11.40
	Private passenger auto liability/medical	15.79	14.02	12.83	9.70
	Comb. 2 Yr. Lines (SP, APD, F/S, Credit, A&H, F&M GRTY, Other)	45.57	40.47	37.02	28.00
	International	24.41	21.68	19.83	15.00
	Commercial auto/truck liability/medical	19.53	17.35	15.87	12.00
	Medical malpractice—occurrence	60.22	53.48	48.92	37.00
	Medical malpractice—claims made	35.81	31.80	29.09	22.00
	Special liability	26.04	23.13	21.16	16.00

Appendix 7

Latin American Capital Adequacy Factors (cont.)

	Other liability—occurrence	22.79	20.24	18.51	14.00
	Other liability—claims made	27.67	24.57	22.48	17.00
	Products liability—occurrence	39.06	34.69	31.73	24.00
	Products liability—claims made	21.16	18.79	17.19	13.00
	Commercial multiple peril	8.46	7.52	6.88	5.20
	Workers' compensation	16.44	14.60	13.35	10.10

*5% loading above country-specific charge. ¶Incremental charge in addition to country-specific charge.

Appendix 8: Property/Casualty Correlation Matrix

Appendix 8

Property/Casualty Correlation Matrix

	Accident and Health	Motor	MAT	Property	Liability	Credit
Accident and Health	1	0.5	0.5	0.25	0.5	0.75
Motor	0.5	1	0.75	0.75	0.5	0.5
MAT	0.5	0.75	1	0.75	0.75	0.5
Property	0.25	0.75	0.75	1	0.5	0.25
Liability	0.5	0.5	0.75	0.5	1	0.75
Credit	0.75	0.5	0.5	0.25	0.75	1

Life Correlation Matrix

	Mortality	Morbidity	Longevity	Other Life Risks
Mortality	1	0.5	0.25	0.75
Morbidity	0.5	1	0.25	0.75
Longevity	0.25	0.25	1	0.75
Other Life Risks	0.75	0.75	0.75	1

Risk Type Correlation Matrix

	Life	Property/Casualty
Life	1	0.25
Property/Casualty	0.25	1

Asset Risk Correlation Matrix

	Equities	Real Estate	Bonds
Equities	1	0.75	0.75
Real Estate	0.75	1	0.75
Bonds	0.75	0.75	1

Appendix 9: ALM Risk Controls

This appendix provides examples of how we analyze ALM risk controls. We assess the overall effectiveness of the ALM 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.

An insurer's ALM risk controls are the processes of (i) 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.

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 include 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.

Table 6 provides some examples of the interest rate risk-specific evidence that informs our analysis.

Table 6

ALM 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, and capital at risk) at both the subportfolio and the enterprise level.	The insurer segments asset and liability portfolio into homogeneous subportfolios 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 subportfolios; interest rate risk limits (e.g., cash flow, key rate duration, and convexity mismatch limits) are employed for each subportfolio 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.

Table 6

ALM Risk Controls Assessment (cont.)

Positive	Neutral	Negative
Stress testing analyzes the impact on the insurer's financials, liquidity, and underlying economics of scenarios such as low interest rates, rate spikes, and 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.

Frequently Asked Questions

1. How does S&P Global Ratings adjust economic capital available for off-balance-sheet value of in-force?

When calculating economic capital available (ECA), S&P Global Ratings includes its assessment of value of in-force (VIF), according to this criteria article's two relevant references for VIF relative to ECA and total adjusted capital (TAC):

- Table 1, notably the "up to 100% of off-balance-sheet life VIF (post tax§)" component factored into the computation of ECA; and
- Paragraphs 47 and 48.

The criteria enable S&P Global Ratings' rating committees to apply analytical judgment to determine any adjustments to reported VIF. That's because disclosures and assumptions vary, and may in our view overestimate or underestimate VIF relative to S&P Global Ratings' own assessment.

An insurer may include elements of VIF (for example, deferred acquisition costs (DAC) or value of business acquired (VOBA)) on the balance sheet of its primary financial statements (such as those prepared under International Financial Reporting Standards or IFRS). We credit (or debit) ECA with any excess (or deficiency) of our assessment of VIF, which results from an analysis of VIF reported on the insurer's balance sheet prepared according to IFRS or generally accepted accounting principles (GAAP). In table 1, we refer to this as the adjustment for "off- balance-sheet life VIF."

2. How much VIF is included in TAC?

As stated in paragraph 47, "S&P Global Ratings includes up to 50% of VIF in TAC." VIF here has to be interpreted as all VIF, whether on or off the balance sheet.

Supplementing what we say in table 1, to calculate the amount of VIF in TAC, we first calculate ECA and then deduct 50% of the amount of VIF in ECA. That is, we deduct 50% of any on-balance-sheet VIF in the form of DAC, VOBA, or other on-balance-sheet VIF items, in addition to 50% of the credit (or debit) for (100% of) off-balance-sheet VIF in ECA (see question 1 above).

3. What adjustment is made to TAC for listed nonstrategic affiliates?

The relevant criteria are in paragraph 59 of this article:

First, for purposes of calculating TAC and applying the third and fourth sentences of paragraph 59, S&P Global Ratings adjusts the book value of listed nonstrategic affiliates using the "mark-to-market" value ("market value"). What we call a "mark-to-market" adjustment is equal to the difference of the market value minus the book value, whether this difference is positive or negative.

Second, for listed nonstrategic affiliates, we apply a standard equity volatility charge to the market value. This charge is consistent with the equity charges for the relevant market at the 'BBB' level of confidence, as stated in the appendices 4-7. For example, for a listed, nonmaterial, nonstrategic, or moderately strategic (see "Group Rating Methodology," published July 1, 2019) subsidiary located in the U.S., the U.K., Australia, and Switzerland, this charge is 27%; but for the same subsidiary in Russia or China, it would be 55%.

The net credit or charge to TAC is the "mark-to-market" adjustment minus the equity volatility charge.

4. What charge does S&P Global Ratings apply to owner-occupied property?

The relevant criteria are found in paragraph 107, and in appendices 4-7. In each appendix, there is a line item for "owner-occupied property" that carries a footnote stating the charge: a "5% loading above country-specific charge."

The interpretation of paragraph 107 is that at the 'BBB' level of confidence, S&P Global Ratings increases the country-specific property charge by 500 basis points (bps).

This loading, or premium, is then scaled up at higher confidence levels. For example, in the U.K. at the 'A' level of confidence, the charge is 1.33 x (18.00 + 5.00) = 30.6%, not 1.33x (18.00) + 5.00 = 28.9%.

The charges listed in the appendices are an example of the charges applicable to owner-occupied property in the "U.K., Ireland, Spain, U.S., and Other World," illustrating that at the 'BBB' confidence level, the charge is 18.00% + 500 bps = 23.00%.

In Germany for example, at the 'BBB' level of confidence, the 8.00% charge would be increased to 13.00% (and not to 8.00 x 1.05 = 8.40%).

5. How are the maximum tolerances for double leverage and/or hybrid equity usage limits in table 3 applied?

The rows below "total double leverage tolerance" represent sublimits of the total. For example, in cases where enforcement of structural subordination is low and regulators exclude holding company senior debt from group solvency capital (represented by columns three and four in table 3), the total limit for the sum of high equity content and intermediate equity content hybrids is 35% of capital, with a sublimit of 25% of total capital in the form of intermediate equity content hybrids.

6. Should references to reinsurance be interpreted as business written by reinsurers or business ceded to reinsurers?

References in paragraphs 52 and 152 to "net of reinsurance" should be interpreted as the business or risks retained by an insurer or reinsurer (that is, net of business ceded to reinsurers). To avoid doubt, business written (and retained) by reinsurers is included in the definition "net of reinsurance". The risk charges included in the appendices are applied to exposures "net of reinsurance", such as non-life net premiums (premium risk), non-life net reserves (reserve risk), net sums at risk (mortality and morbidity risk), life net reserves (life reserve risk, including longevity risk), and net aging reserves. The credit risk exposure from ceding risk to reinsurers is covered in paragraphs 103-106.

References in the text and the appendices to "proportional reinsurance", "nonproportional reinsurance", and "stop loss reinsurance" should be interpreted as business written or assumed by reinsurers.

REVISIONS AND UPDATES

This article was originally published on June 7, 2010.

This article is partially superseded by "Methodology: Treatment Of U.S. Life Insurance Reserves And Reserve Financing Transactions," published March 12, 2015. Specifically, paragraphs 27 and 28 in the subsection "Generally accepted accounting principles or statutory"; paragraphs 29 and 30 in the subsection "Consolidated or unconsolidated?"; paragraphs 31-59 and table 1; and "Appendix 2: U.S. Life And Health Capital Adequacy Factors" are partially superseded. This article has also been partially superseded by the articles titled "Methodology: Mortgage Insurer Capital Adequacy," published on March 2, 2015 (which, for the purposes of evaluating mortgage insurer capital adequacy, supersedes these criteria); "Trade Credit Insurance Capital Requirements Under Standard & Poor's Capital Adequacy Model," published on Dec. 6, 2013; "Assessing Property/Casualty Insurers' Loss Reserves," published on Nov. 26, 2013; "Insurers: Rating Methodology," originally published on May 7, 2013, and superseded on July 1, 2019; and "Methodology For Assessing Capital Charges For U.S. RMBS And CMBS Securities Held By Insurance Companies," published on Aug. 29, 2014 (specifically, paragraph 101).

Changes introduced after original publication:

- Following our periodic review completed on May 12, 2014, we updated the author contact information.
- On April 10, 2015, we added a "Frequently Asked Questions" section to the end of this article.
- We republished this article on Dec. 23, 2015, to update references in paragraphs 193, 194, and 196 to Asset Liability Management (ALM) Risk Controls to reflect the classifications in the article titled "Enterprise Risk Management," published on May 7, 2013. For example, the references to "strong" or "excellent" were updated to refer to "positive." In addition, we added a

question and response to the "Frequently Asked Questions" section.

- Following our periodic review completed on March 11, 2016, we updated the contact information and made updates to address partially superseded sections, deleted fully superseded sections (moving them to an appendix for clarity), and updated references to archived criteria. We updated the references to sovereign exposures in paragraph 91 to remove references to historical rating levels. We also moved the "Impact On Outstanding Ratings" and "Effective Date Of Transition" sections to an appendix because they were no longer relevant. We added a reference to "Methodology For The Classification And Treatment Of Insurance Companies' Operational Leverage," published Oct. 31, 2014, to paragraph 21 because this paragraph must now be read in conjunction with that article, as well as added South Africa and Israel to the list of jurisdictions for determining the Market Risk - Life Bond charges in the appendixes.
- Following our periodic review completed on March 15, 2017, we deleted fully superseded sections and deleted a reference to archived criteria in paragraph 121. We also added a reference to "Assessing Property/Casualty Insurers' Loss Reserves," published Nov. 26, 2013, in paragraph 50 because this paragraph should be read in conjunction with that article. We also improved transparency in table 3 by stating that the countries listed are examples that are currently applicable based on their regulatory approaches.
- On May 15, 2017, we corrected a misstatement in Appendix 2 relating to operational risk charges. We have replaced the reference to "Total liabilities" with "Total liabilities minus accident and health liabilities" for the operational risk charge of 20 basis points (bps) of life reserves. We also included the operational risk charge of 50 bps of direct premiums written on U.S. accident and health business, which had previously been incorrectly omitted.
- We republished this article on June 16, 2017, to correct an omission from the previously published editor's note. We also updated the previous editor's notes in the appendix.
- Following our periodic review completed on March 14, 2018, we updated the "Related Criteria And Research" section; deleted text related to the initial publication of the criteria, which was no longer relevant; and deleted superseded criteria text that had previously been moved to the "Revisions And Updates" section.
- On May 9, 2019, we republished this article to correct appendix tables 3-7. In appendix 3, we corrected the warranty reserve risk charge to be consistent with paragraph 227 (average of auto physical damage and product liability occurrence). We corrected the property/casualty premium and reserve risk charges in appendix 3 to round to two decimal points, consistent with paragraph 228. We corrected the preference share charges in appendixes 4, 5, 6, and 7 to be consistent with assumptions outlined in paragraph 89. In appendixes 4 and 7, we corrected the U.S. warranty premium charges to be consistent with paragraph 227. Finally, we corrected the U.S. nonproportional reinsurance (treaty and facultative) premium charges in appendixes 4 and 7 to reflect the application of paragraph 140, which defines when we apply a surcharge to certain business lines.
- On July 1, 2019, we republished this criteria article to make nonmaterial changes in connection with the publication of "Insurers Rating Methodology" (IRM) and "Hybrid Capital: Methodology And Assumptions" (Hybrid Capital). Specifically, we i) deleted outdated and superseded text from paragraphs 21, 26, 46, and 66 and table 2; ii) consolidated criteria text relating to ALM risk controls from Appendix II of "Enterprise Risk Management," which was retired upon the publication of IRM, into a new Appendix 9 in these criteria (and updated the related text in paragraphs 193 and 198); iii) made minor changes and clarifications to the text in order to align with IRM and Hybrid Capital and aid transparency; and iv) added a reference in paragraph 18

and "Related Criteria" to "A New Level Of Enterprise Risk Management Analysis: Methodology For Assessing Insurers' Economic Capital Models" in order to aid transparency. We also updated the relevant criteria references.

- On July 15, 2019, we republished this criteria article to correct a nonmaterial typographical error in paragraph 175. Specifically, we substituted the word "spread" for "yield" in clarifying the formula applying the methodology.
- On May 4, 2020, we republished this criteria article to update Appendices 2-7 and the contact information. Specifically, in Appendices 2-7, we updated references to the charges for reinsurers rated 'CCC' to include the 'CC' category. We also updated references to the charges for reinsurers rated 'R' to 'D' and 'SD' to reflect the withdrawal of the 'R' rating category from our rating definitions on July 5, 2019.
- On Feb. 25, 2021, we republished this criteria article to make nonmaterial changes. We updated the contact information and deleted outdated criteria references in paragraphs 15, 60-64, 66, 111, and 127.
- On Dec. 20, 2021, we republished this criteria article to make nonmaterial changes. These changes are related to the global transition from LIBOR and related indices. Specifically, we replaced an explicit reference to LIBOR in paragraph 146 to reflect the impending phasing out of LIBOR benchmark rates.
- On Jan. 27, 2023, we republished this criteria article to make nonmaterial changes to the "Related Criteria" section.

RELATED CRITERIA AND RESEARCH

Related Criteria

- Hybrid Capital: Methodology And Assumptions, March 2, 2022
- Group Rating Methodology, July 1, 2019
- Insurers Rating Methodology, July 1, 2019
- Methodology: Treatment Of U.S. Life Insurance Reserves And Reserve Financing Transactions, March 12, 2015
- Methodology For Assessing Capital Charges For U.S. RMBS And CMBS Securities Held By Insurance Companies, Aug. 29, 2014
- Trade Credit Insurance Capital Requirements Under Standard & Poor's Capital Adequacy Model, Dec. 6, 2013
- Assessing Property/Casualty Insurers' Loss Reserves, Nov. 26, 2013
- Methodology For Assessing Capital Charges For Commercial Mortgage Loans Held By U.S. Insurance Companies, May 31, 2012
- Methodology For Calculating The Convexity Risk In U.S. Insurance Risk-Based Capital Model, April 27, 2011
- Principles Of Credit Ratings, Feb. 16, 2011
- A New Level Of Enterprise Risk Management Analysis: Methodology For Assessing Insurers'

Economic Capital Models, Jan. 24, 2011