RESEARCH

Insurance Risk-Based Capital Model: What's Changed

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(**Editor's Note:** This article, originally published on May 23, 2007, has been republished to include the section headed "Hybrid Ratio (GAAP Model Only)" at the end of the document.)

Standard & Poor's Ratings Services is updating the way it assesses the capital adequacy of insurance companies worldwide. In November 2006, the draft version of the updated insurance capital model was released under the request for comment process. This process encouraged market feedback on all aspects of the model and was complemented by industry- and company-level meetings. The feedback has proven invaluable in refining the model, and the results can be seen in their entirety in the article titled, "New Risk-Based Insurance Capital Model," recently published on RatingsDirect.

The more material amendments and additions to the model include explicit credit for diversification, a refined approach to asset liability management (ALM), and revised property/casualty (P/C) charges. Though this publication represents the culmination of the request for comment process, the model will be subject to revision from time to time based on market developments.

New Model Ratings Impact

The model is not expected to lead to widespread rating actions. It will be run in parallel with the current model until the end of this year. However, with all the charges having been reviewed and updated there will be some impact to the model results on capital adequacy. The materiality of these will depend on the risk profile of the company in question and how well it seeks to manage its risks relative to its capital base.

Areas that will see increased charges are the higher risk exposures such as long-tail liability reserves, equity holdings, large asset liability duration mismatch, longevity exposures, and natural peril catastrophic risks (albeit the latter was introduced ahead of the new model).

Areas that will see reduced charges are the lower risk exposures such as short-tail nonlife reserves, short-term nonlife bonds, and selected life and health reserves in certain markets.

Diversification

Historically, Standard & Poor's has embedded credit for diversification implicitly within the rating process. In building up a financial strength rating opinion, the benefit of diversification has emerged through an assessment of factors such as competitive position and earnings. The updated model will now include an explicit allowance for diversification. This is in addition to the implicit diversification credit embedded in many of the charges (e.g., equity, mortality) where indices and industry level data are being used.

Correlation matrices were developed following analysis of internal, company, and industry level data. The capital model will apply a standard approach to each company and not seek to actively differentiate the diversification by the quality of management or the underlying operations. Furthermore, focus is more on spread of risk rather than absolute size. This more qualitative assessment is carried out elsewhere within the analysis, in particular through the ERM process.

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Capital relief is given across sector and between product type (nonlife) and risk type (life) as well as for investment risks. No explicit credit is currently given for the geographic spread of business.

The credit given under the model for diversification is lower than that experienced when reviewing company and industry models. This reflects a more conservative view on how to project correlations in the tail, with the matrices specifically designed for this model. The diversification credit calculated brings the sum of the capital requirement for each risk at the various rating levels back to a level commensurate with the target rating. The conservatism in the diversification credit also reflects some implicit diversification in the chosen confidence intervals for each risk charge. To give some quantification to the potential diversification credit available under the updated model we would expect that a well-diversified composite group could receive up to about 18% capital relief, with a life or nonlife entity receiving up to about 10%.

One specific area of the model where capital requirements will increase relates to U.K. participating business. This will better align the diversification embedded in the company's own modeling to that of Standard & Poor's. The manner in which this is being reflected is through an increase to the Risk Capital Margin loading to 50% from 25%.

ALM (GAAP Model Only)

The ALM charge has been refined to better reflect local market interest rates and product features. In particular, some markets where participating life business prevails have seen a significant reduction to the original charge.

The approach on the nonlife and shareholder ALM charge remains unchanged. However, a new feature has been added to the model to more accurately reflect the potential net exposure to interest rate risk on life, nonlife, and shareholder bonds.

The ALM charge in the Standard & Poor's capital model consists of two elements.

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 movements associated with each confidence level ('BBB', 'A', 'AA', 'AAA'). For further information on the method for deriving this charge, please refer to the RatingsDirect article dated Dec. 7, 2006, entitled " Measuring Capital Adequacy For Asset-Liability Risk." In the GAAP version of the model, this element of the charge is based on GBP and euro data, rather than swap curves and credit spreads of the US$ market. At present, this results in European charges that are about 20% less than the U.S. charges, due to lower observed underlying yield volatility in European markets.

The second element is an assumed durational mismatch between assets and liabilities.

For life insurance, this ranges between one and four 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, and assumptions regarding the mix of participating to nonparticipating business have been made for each market.

The revised capital model also 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 revised model tests the aggregate impact of a downward shock on life, nonlife, 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.

Liability-Related Risks P/C (Nonlife) Charges

Underwriting risk based on premiums

Instead of using the highest observed accident year loss ratio over the 1994-2003 period, Standard & Poor's selected the second-highest observed accident year loss ratio. This change modifies the level of conservatism built into the model. In double-checking our statistics used in the November release, it was stated that a 3% discount rate was used, which was not the case. Therefore this reference has been

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deleted, but the data set remained unchanged.

Reserve risk

In developing the loss development metric (LDM), a LIBOR rate was used instead of a fixed 3% discount. One of three LIBOR rates was used that better matched the reserve's estimated duration. Another change made was that for workers' compensation, medical malpractice claims made, passenger auto liability, and homeowners'/farmowners', where substantial volatility in the tail exists, a factor from a higher percentile (ranging from 80th to 90th percentile) was selected. This added more precision in approach as compared with a surcharge added to the 75th percentile as originally framed.

Equity

The number of equity indices modeled has increased and regional indices have been included. The modeling approach is unchanged. In addition, an explicit charge has been established for private equity and hedge fund investments.

Diversification within cross-border equity portfolios has been recognized through applying the log-normal regime switching approach to regional equity indices. Again, monthly data was taken from the Morgan Stanley Capital International (MSCI) indices. 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., France) and about 75% of its weight over five countries (plus Germany, Switzerland, Spain). An equity portfolio would need to broadly mirror the proportions and geographic split to warrant the regional index charge.

Longevity

The longevity charge has been lowered to 5% at 'BBB' (from 6.25%) and primarily reflects the analysis of a broader set of data.

For the revised longevity charge, several approaches were considered, which gave rise to a range of possible charges for this risk. Actual life expectancy data were reviewed for each major European market and their development was plotted over 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. As in the request for comment, some additional assumptions underlie the setting of this charge. The first is that however prudent an insurer's longevity assumptions are currently, that level of prudence will be maintained in the event of a change in underlying life expectancy (i.e., 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). The second is 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. Standard & Poor's observes such reserve additions occurring at about five yearly 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.

Owner Occupied Property

The charge for owner occupied property will apply a 5% liquidity premium at 'BBB' over the real estate charge for the specific market in which the property is held. The revised view better reflects the value such property represents and the opportunity companies have to enter into sale/leaseback arrangements to unlock this value.

Mortgages (GAAP Model Only)

Standard & Poor's recognizes that the capital risk to an insurer holding a mortgage asset depends on the degree to which that mortgage is backed by collateral. Since 2003, our capital model for Germany,

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Switzerland, and Austria has differentiated its charges on mortgages, based on their loan-to-value ratio. We are now applying this approach to all European markets. The charges will still be distinguished between performing and nonperforming loans; however, at this time no distinction is being drawn between commercial and residential mortgages in the model.

Hybrid Ratio (GAAP Model Only)

The European hybrid ratio has an amended definition of qualifying hybrid in the denominator. It now reflects regulatory qualifying hybrid, as opposed to Standard & Poor's qualifying hybrid previously. The amendment achieves greater parity in treatment between the U.S. and European hybrid ratios.

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