

MANAGING EXTREMES

Willis Re

STANDARD & POOR'S ECONOMIC CAPITAL MODEL REVIEW PROMISES CAPITAL REWARDS



Standard & Poor's Economic Capital Model Review Promises Capital Rewards

Standard & Poor's has offered a carrot to insurers who have invested heavily in Economic Capital Modelling. Results from an internal model can potentially be used to reduce S&P capital requirements. However, the process is not without cost. S&P imposes stringent requirements upon both the model and the Enterprise Risk Management framework within which the model operates. The bar is put high, but this is consistent with the direction in which many companies are heading in response to Solvency II and similar regulatory initiatives. With the likely introduction of 'transitional arrangements' to the Solvency II process, it may be that rating agency demands and inducements will become the key driver for further Economic Capital Model development, and offer the most immediate rewards.

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Background

S&P started including an evaluation of insurers' Enterprise Risk Management (ERM) in its ratings in late 2005. This process was based on a stick-and-carrot approach: for companies that fared well under the stick of ERM evaluation there was the carrot of potentially lower capital requirements.

But only now has the carrot side of the equation become clearer. On January 24, S&P published the basis for an economic capital review and adjustment process, announcing that the process was being implemented immediately ('A New Level Of Enterprise Risk Management Analysis: Methodology For Assessing Insurers' Economic Capital Models', available at www.standardandpoors.com/).

ERM is still key

The ERM review is still fundamental. Insurers must already have a score of 'Strong' or 'Excellent' from their ERM review before they are eligible for any consideration of their capital model. That 'Strong' or 'Excellent' score implies that those firms have already passed S&P's version of the Solvency II internal model use test – which S&P calls Strategic Risk Management (SRM). Those firms with 'Strong' and 'Excellent' ERM ratings can all expect to have their economic capital models reviewed.

The new name for this process is the Level III ERM review. The Level I review is the original ERM process which was initiated in 2005. In 2006, S&P introduced the Level II process, a more detailed review applied to firms with high levels of risk and/or complexity. That Level II review included a more detailed look at the firms' risk control processes.

From now on, insurers whose economic capital models (ECMs) are judged 'credible' in a Level III ERM review may obtain a reduction of their capital requirements for each rating level, as determined by S&P's proprietary risk-based capital (RBC) model.

Economic capital models

Increasingly sophisticated ECMs have been developed by larger insurers for the last two decades, but their use is likely to spread further as the deadline for Solvency II approaches, even if diluted by transition arrangements. Under the new regulatory regime, EU insurers will be allowed to determine their solvency margin based on their own ECMs, subject to supervisors' approval of the models. The potential benefits – lower capital charges and full recognition of non-proportional reinsurance, for example – create obvious incentives for the adoption of ECMs by a wide range of companies.

While capable of capturing an insurer's risk profile in a more accurate way than traditional RBC models, such as those used by the main rating agencies, ECMs are also much more difficult to understand and assess for investors and outside analysts. By adding an ECM review methodology to its rating toolkit, S&P aims at establishing itself as leader in ECM assessment. Other rating agencies are likely to follow suit. For example, A.M. Best recently added an ECM section to its Supplemental Rating Questionnaire for U.S. insurers. It remains to be seen how this process will unfold and how much trust investors and markets will put into the different assessments.

Which models will qualify for a review?

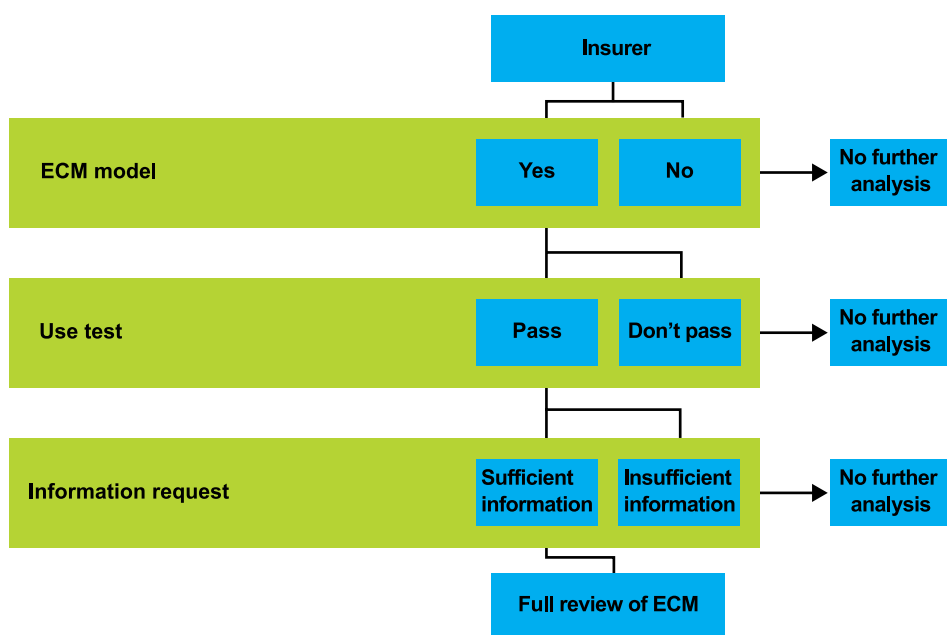
Contrary to what might be expected, S&P will not examine all ECMs developed by the insurers to which it assigns ratings.

To qualify for an ECM review, an insurer has to (cf. Chart 1):

1. have an ERM score of 'Strong' or higher;
2. prove that it uses its ECM for risk management and decision making, not just for capital adequacy determination;
3. provide sufficient information about the model to S&P.

Conditions 1 and 2 suggest that the ECM can provide a credible view of the insurer's capitalization on a prospective basis. If either the model is not actually used for decision making or the insurer has not proved able to hold its risk exposures within predetermined and consistently chosen tolerance levels – a crucial requirement of 'Strong' ERM – then the capital position calculated by the model could be drastically different from the actual one at a future time – for example, between two successive rating reviews. As examples of management decisions which it expects to be closely linked to the ECM results, S&P mentions strategic asset allocation, product design, capacity determination and reinsurance buying.

Chart 1
Decision tree for the extent of ERM level III reviews for insurers



ERM – Enterprise risk management. ECM – Economic capital model.
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The third requirement – sufficient information about the ECM – seems to imply that an insurer can avoid the ECM review if it fears an unfavourable outcome (we will see shortly what form this could take). Not reviewing an ECM which is actually used by an insurer with a 'Strong' or 'Excellent' ERM, however, looks hardly consistent with a thorough and comprehensive ERM assessment and would almost certainly reflect poorly on the firm's ERM rating. Therefore a firm with a Strong or Excellent ERM rating must be able to provide information about an ECM that supports their rating or risk losing their ERM designation.

The review outcome: The M-factor

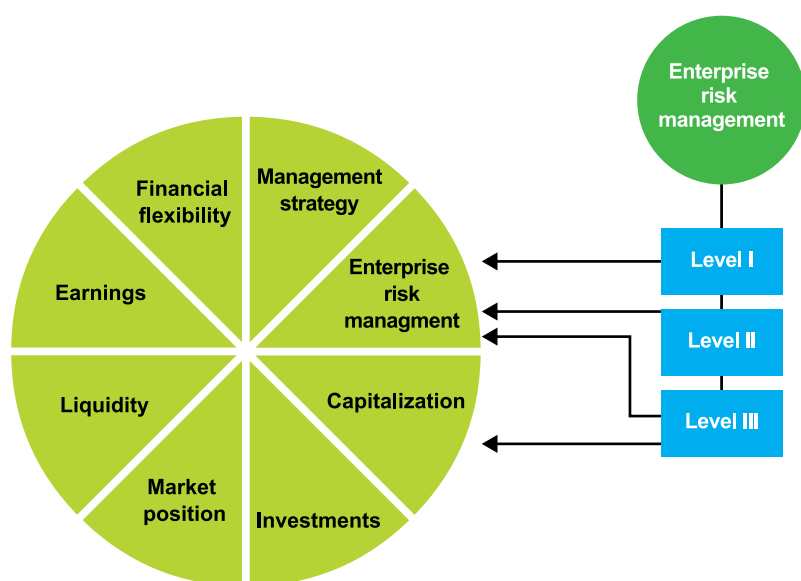
The most visible outcome of the ECM review is the ‘M-factor’, which measures the level of credibility of an insurer’s ECM in S&P’s opinion.

The M-factor is used to blend the S&P capital requirement with the firm’s ECM results. The higher the M-factor, the higher the weight given to the ECM in the calculation of the amount of assets (or ‘total targeted resources’, TTR, in S&P’s terminology) which the insurer needs to hold to be able to pay its liabilities over a certain time horizon with a specified degree of confidence. The amount of TTR sets a corresponding target capital for each rating level.

In principle, all other things being equal, an insurer can obtain a rating up to one level higher than the one which would be associated with its actual capital adequacy under S&P’s RBC model. For example, an insurer could obtain an ‘AA’ with a level of capital adequacy typically associated to an ‘A’ rating, assuming of course that its ECM comes up with a lower number than S&P’s RBC model.

In addition to these quantities, the ECM review may provide further insight into the insurer’s ERM and strategic management, thus feeding back into the rating process (cf. Chart 2).

Chart 2
The ERM level III review in the rating context



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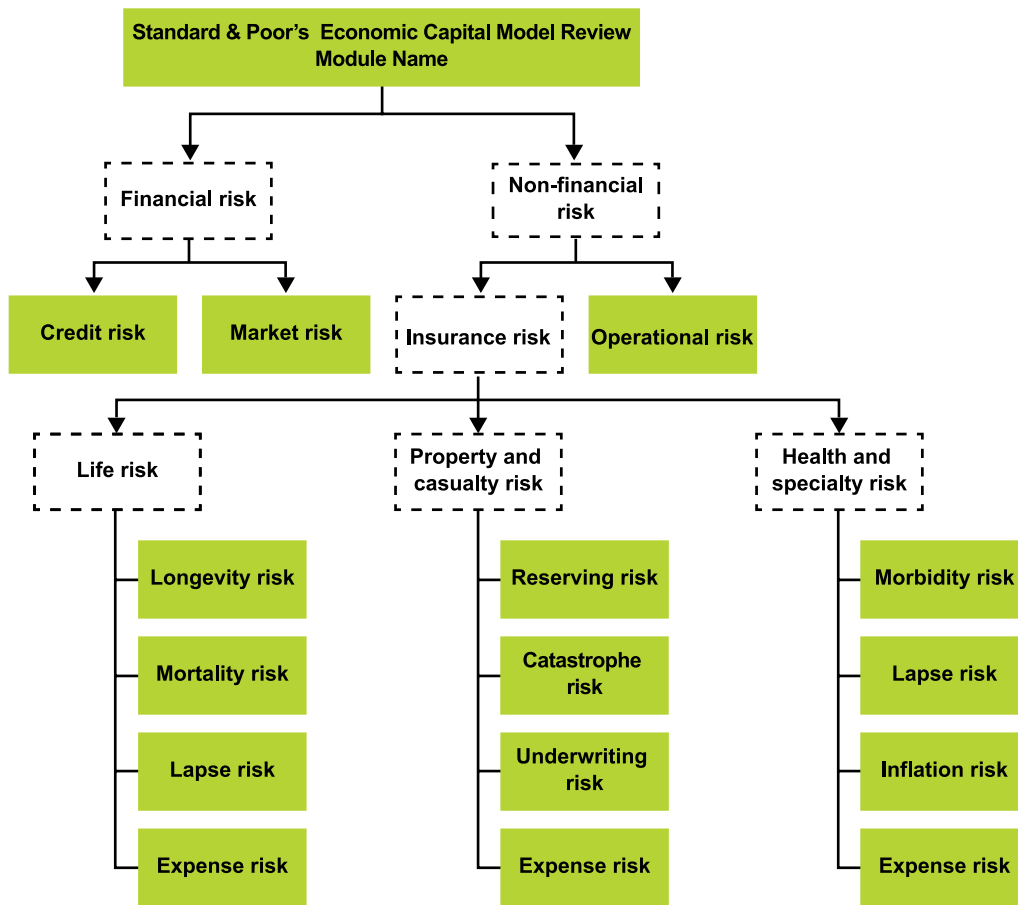
By submitting its ECM to S&P’s review an insurer exposes itself to two dangers, at least in theory. Firstly, the ECM review could reveal risk management issues or inadequate quantification of the insurer’s risk exposures; this, in turn, may prompt S&P to reassess its view of the insurer’s capitalization and management strategy, possibly affecting the insurer’s ratings. Secondly, the insurer’s ECM may prove to be more conservative than S&P’s RBC model; if this is the case, all other things equal, the insurer may end up with higher capital requirements for each rating level than under S&P’s admittedly less sophisticated RBC model.

[Deleted comment is illogical. Solvency II is supposedly calibrated to a BBB standard. Insurer is only likely to fit the logic of the comment if they are rated below BBB]

How is the M-factor determined?

The M-factor summarizes S&P's assessment of an insurer's ECM. Its value is determined by combining the scores assigned to the different 'modules' which comprise the ECM: investment risks and insurance risks, operational risk, asset and liability valuation, and so on (cf. Chart 3)

Chart 3
Criteria modules for analyzing insurers' modeling of exposures to distinct risk types and groups



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All of these scores are weighted according to the importance of each module for the specific firm.

S&P's ECM review will consider two sets of modules. The first one includes ECM characteristics which cannot be related to specific risk exposures ('other modelling considerations' in the S&P jargon), such as how insurance liabilities are calculated, how assets are valued, how diversification and capital fungibility are modelled. The second set comprises the ECM components for the insurer's specific risks: mortality, longevity, premium, reserving, market, credit, and so on.

Each module will receive a score of ‘Basic’, ‘Good’, or ‘Superior’ with respect to each of five criteria:

- methodology
- data quality
- assumptions and parametrization
- process and execution
- testing and validation

Each of these scores is then combined to arrive at a summary rating for the module, which will be used to determine the M-factor, as described above. S&P’s article only hints at the score aggregation procedure. For example, a majority of ‘Basic’ is likely to result in an M-factor equal to zero. Also, the weight actually assigned to each module will depend on the importance of the risk according to the insurer’s ECM, if the ECM is judged to be credible, or to S&P’s RBC model otherwise.

ECM best practice according to S&P

In a nutshell, a ‘credible’ ECM identifies all of the insurer’s material risk exposures and quantifies them by applying robust statistical techniques which allow for extreme events, parameter variability and drastic changes in correlations between different risk drivers under stress conditions. Furthermore, the model can take account of changes in agents’ behaviour, be they policyholders or the insurer’s management, and does not include ‘ad hoc’ or mutually inconsistent assumptions about the behaviour of the insurance and financial markets. From an operational point of view, a credible ECM has passed extensive validation tests and is well documented and understood by its users; its performance is continuously monitored by a dedicated team of well-trained analysts with strong knowledge and experience of all parts of the insurer’s business; and the amount of manual input required to run the model is not material.

At a minimum, an ECM should:

- cover no less than 75% of an insurer’s business, as measured by an appropriate metric;
- be based on plausible assumptions, about diversification benefits in particular;
- be able to replicate an insurer’s risk and capital position both at a point in time and over a specified time interval, without any unexplained material inconsistencies.

S&P is more eloquent on what may be considered ‘Basic’, ‘Good’ or ‘Superior’ practices in each of the five aspects of each module. In fact, specific indications on desirable ECM characteristics are provided for over 20 pages of the agency’s article. It is not difficult to cut through the long exposition, however, and identify some core principles which constitute what S&P considers ECM ‘best practice’.

So S&P has considerable flexibility in determining what it deems to be the appropriate M-factor for a particular insurer, which renders the process is rather opaque to an outside observer.

S&P is silent on the maximum M-factor that is likely to grant in the short or medium term, but values in excess of 20% to 25% are unlikely in the first year or two. As the process matures, the maximum M-factor may increase, but even a low M-factor could have a material impact for an insurer whose rating is capital constrained.

S&P expresses some doubts about the adequacy of an approach that relies solely on a stochastic model. Stress tests are the method that they mention to augment a stochastic model. They provide several examples of stress tests, all of them worst-case scenarios actually observed:

- market and credit risk – the 1987 and 1929 crashes as well as 2008;
- mortality and morbidity – the influenza pandemic of 1918 – 1919;
- natural catastrophe – 1813 New Madrid earthquake; 1923 Tokyo quake; 1938 Great New England Hurricane.

Another essential requirement of a credible ECM is high data quality. A correct quantification of risk exposures requires highly granular data on the business written by the insurer. Also, ‘data cleansing’ procedures and approximations techniques used to smooth exposure data should satisfy good quality standards.

Fungibility is a very important consideration to S&P when determining diversification benefits. This is the code word for the ability of a group to move capital from one legal entity to another in times of great stress. Superior handling of fungibility would include looking at regulatory standards for each and every company in the group; reflection of tax and other costs of moving excess capital within the group; and a realistic analysis of contingency plans to sell different parts of the group in time of stress.

Some examples of S&P's views of ECM best practice

- Market Risk Methodology is considered 'Good' if there is a stochastic model which utilizes correlation coefficients that have been determined empirically, and analyses all major risk drivers. S&P looks for a company to modify the dependency structure for extreme market scenarios. Consideration of liquidity of hedge instruments is something that should be incorporated into the model.
- Credit Risk Data Quality is considered 'Superior' if there is a systematic data quality control process of data which includes time periods with severe credit events; separate consideration of default potential and loss given default; and the integration of external data sources.
- Underwriting Risk Assumptions and Parameterization is only considered to be 'Basic' if there is not significant consideration given to the uncertainty inherent in the selection of assumptions and parameters. The use of externally generated assumptions without validation and other signs of ownership of the assumptions might also lead to a 'Basic' score. Failure to augment the assumptions with findings of stress tests might also lead to a 'Basic' score.
- Operational Risk Methodology is thought to be 'Basic' if a factor approach is used, 'Good' if there is a frequency severity stochastic model which reflects risk mitigation activity and 'Superior' if model risk is an additional consideration plus consideration of the impact of operational losses on reputational risks and the follow-on secondary losses.

Solvency II 'equivalence'

At a conference in November 2010 a senior S&P analyst (and co-author of the January 2011 report) commented:

We expect that insurers that have implemented an ERM framework that fully complies with the Solvency II requirements would have a 'strong' risk management culture.

And also

Meeting Solvency II's (internal model) requirements may result in us assessing the quality of an insurer's internal model as 'strong'.

But he went on to note that this is no guarantee, It is possible that the common European standard may be differently interpreted around Europe. Whilst a sign off by a European regulator is likely to be deemed at least adequate by S&P, a strong rating is by no means certain. S&P will always undertake their own review and draw their own conclusions.

Conclusion – are material rating changes likely?

Many insurers see this step as the final pay-off for the work that they have put in over the past five years to develop their ERM programmes and the time that they have spent with S&P explaining the programmes to get the ‘Strong’ or ‘Excellent’ ERM score that is the ticket to entry for the Level III ERM review process. The hoped-for pay-off will be a reduction of capital requirements under the S&P capital adequacy process.

But S&P itself states that it expects only minimal changes to current ratings. There are three reasons for this:

- although the new criteria are immediately effective, they are going to be implemented gradually over the next 12–18 months as part of regular rating reviews;
- S&P will probably take a conservative approach in the first ECM reviews and assign low M-factors, possibly increasing them in the future (quite different from the all-or-nothing system under Solvency II);

- rated insurers may not see material benefits in applying for an ECM review, at least in the beginning.

One intriguing question is how in practice S&P will assess the more technical properties of ECMs going forward – a complex and time-consuming task which also promises to pose significant problems for regulators under Solvency II. Currently the number of insurers with a ‘Good’ ERM assessment and fully-fledged ECMs is relatively low, but it is expected to rapidly increase in response to the carrot-and-stick approaches of both regulators and rating agencies.

Whilst S&P expects that existing documentation will be adequate for the bulk of their assessment, it is clear that the load on insurers and those who regulate and rate them will continue to grow.

How can Willis help?

Willis Re analytics has profound expertise in:

- Rating Agency Assessment Methodologies
- Practical Enterprise Risk Management
- Pragmatic Economic Capital Model Development

That expertise is available to our clients to help formulate, implement and/or improve an ERM and/or ECM strategy appropriate in scale and cost to the specific needs of the client and the demands of its regulator, rating agency(ies) and stakeholders.

We are able to supply and/or recommend software appropriate to your needs and help and support in its parameterisation and implementation.

We can also advise on which reinsurance arrangements are most effective to control rating agency and/or regulatory capital whilst also being consistent with broader business objectives.

Our qualified staff, many ex-S&P or AM Best, are also on hand to give advice on any aspect of the rating process.

We look forward to working with you. The future may be challenging, but the rewards can be great. We aim to help you minimise the pain and realise the gain.

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