



BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON BERMUDA SOLVENCY CAPITAL REQUIREMENT
(‘BSCR’)
JULY 18, 2007

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0. Introduction

This paper outlines the Bermuda Monetary Authority's ("the Authority") proposal to introduce its new risk based approach ("Bermuda Solvency Capital Requirement") in determining insurer solvency capital requirement.

The views of the insurance industry and of other interested persons on the proposals set out in this paper are invited. Comments should be sent to the Authority, addressed for the attention of Kevin Anderson (kanderson@bma.bm) or Dianne Burgess (dburgess@bma.bm), not later than September 15, 2007.

1. Executive Summary

1. The Authority is currently considering the introduction of a number of amendments to its approach to the assessment of insurer solvency. This will involve various changes to the detailed provisions currently set out in the Act and related Regulations. The changes are intended to permit the introduction of a more appropriate risk-based solvency test for Bermuda's major commercial insurers and reinsurers.
2. In the first instance, the Authority proposes to apply the new test to all class 4 insurers. At a slightly later stage, it envisages the approach being extended to those class 3 insurers that are conducting commercial business.
3. In moving in this direction, the Authority is also giving consideration to the need for some related changes in the present legislative framework. These relate to three aspects: the introduction of some measure of discretion around the definition and application of capital tests for insurers; the introduction of more graduated intervention tools, providing greater clarity as to proportionate supervisory action in dealing with breaches of capital requirements; and amendments to the Statutory Financial Return for those insurers that become subject to the new risk-based capital test.

2. Background

4. Sections 6 and 7 of the Act require insurers to meet a margin of solvency, as well as minimum amounts of paid up capital for registration. The Insurance Returns and Solvency Regulations 1980 ('the Regulations') proceed, among other matters, to define and set the minimum margin of solvency for the different classes of insurer. Failure to meet the minimum margin of solvency, or minimum solvency margin ('MSM'), represents a breach of the statutory requirements, triggering the Authority's powers to apply for a winding-up and to deregister an insurer. In practice, where breaches occur, the Authority would normally seek to identify the nature and scale of the problem and to secure agreement on early and appropriate remedial action. Where such remediation is not feasible, or where the risks faced by policyholders are too large, the Authority takes formal action.
5. The minimum solvency provisions under the Act seek to make provision for the scale and nature of risk in an insurer's business in setting the required margin. However, the provisions are not tailored to correlate accurately the risks faced by an insurer in its business. For major commercial insurers, therefore, they no longer offer a fully adequate means for relating the capital resources to the risks inherent in the business. The

Authority believes that it is now necessary to introduce a more fully risk-based measure that can be applied to those insurers underwriting major commercial business.

6. A great deal of work is currently under way by standard-setters, rating agencies, national supervisory authorities and individual insurers, aiming to establish more effective risk-based models to measure the adequacy of insurers' capital. The Authority has been closely involved in a number of these initiatives, in particular through its involvement in the work of the International Association of Insurance Supervisors and its assessment of the approaches being developed in a number of major markets. The efforts remain subject to ongoing refinement, given the necessarily complex issues involved and the continuing evolution of both underlying risks and of the methods available for mitigating them. In light of the nature and scale of the Bermuda market, the Authority has taken the decision to develop an appropriate risk-based measurement tool which can be applied in Bermuda. However, where insurers apply in-house models that deal more effectively with their particular risks, which are embedded fully within their control arrangements, and which they can demonstrate meet rigorous standards that the Authority will formulate, it is proposed that they would be able to seek consent to replace the standard risk-based model with an approved internal model as discussed in more detail in the Authority's Company Specific Internal Models for the Purpose of Determining Regulatory Capital Requirement consultation paper.

7. It should be noted, by way of background, that the Bermuda insurance market is already extremely well capitalized and that insurers and the Authority have developed sound arrangements for monitoring, managing and mitigating the risks that are taken on by Bermuda insurers and ensuring that adequate capital is held against them. As a result, the incidence of problem situations in the Bermuda market has been low, with policyholder losses extremely rare - this in spite of the recent severe 2005 hurricane season, specifically KRW, and even with Bermuda being one of the largest reinsurance centres in the world, and supplying the largest property catastrophe reinsurance capacity to the US of all non-US markets. The overwhelming majority of registered insurers already operate at capital levels that are well in excess of the MSM stipulated under the Insurance Act and the Regulations, levels that were set some years ago. Accordingly, for the most part, in developing and introducing new risk-based solvency tests, the Authority sees no need to alter the overall relationship between aggregate capital held and risks underwritten in the Bermuda market.

3. New Risk-based Framework

8. In seeking to develop an appropriate risk-based capital measurement tool for the Bermuda market, the Authority has been working with a major consultancy firm. The project has also been carried forward in close liaison with the Association of Bermuda Insurers and Reinsurers ('ABIR'). At the same time, the work has benefited from

extensive support and cooperation from individual ABIR member firms in the provision of data to assist with the detailed design and calibration of the model. The result has been the development of a standard mathematical model that can relate more accurately the risks taken on by insurers to the capital that is dedicated to their business. The particular framework that has been developed seeks to apply a standard measurement format to the risk associated with an insurer's assets, liabilities and premiums, including a formula to take account of catastrophe risk exposure. Given the importance of keeping the risks of failure of Bermuda institutions to their traditional extremely low levels, the Authority has sought to apply a rigorous approach: in particular, the framework is predicated on a 99% TVaR, approximately equivalent to 99.6% VaR, with a time horizon of 1 year with full run off. The catastrophe risk charge is based on a 99% TVaR aggregate loss. At the same time, the model offers some degree of capital benefit where insurers diversify their underlying risk via the development of different business lines. The model provides up to a 40% credit to the premium risk charge on account of line of business diversification. Further, the charges (fixed income investments, equity investments, interest rate risk, credit risk, premium risk, reserve risk and catastrophe risk) are initially aggregated then benefit is provided through the application of a 'square root' methodology. Under the 'square root' there is also some benefit for correlation between the credit and reserve risk charges.

9. In recent months, the Authority has been working closely with a selection of individual class 4 insurers to check that the model is appropriately calibrated for these businesses. This has involved the provision to the Authority by firms of test data showing the application of the model to their different books of business. Following this process the Authority is now satisfied that the model is calibrated appropriately for the class 4 sector. Subsequently, the Authority will conduct a similar process with those class 3 companies that are writing major commercial business with a view to determining an appropriate calibration of the model that could then be applied as a solvency test for these institutions.

10. The Authority believes that all insurers should operate on an ongoing basis with a view to maintaining their capital and reserves at a prudent level in excess of the minimum statutory level in order to minimize the risk of a shortfall in capital emerging. Accordingly, in moving to implement the new risk-based capital approach, the Authority proposes to implement an approach under which insurers will be explicitly required to operate at or above a threshold capital level - a 'target' level - set in excess of the minimum amount calculated in accordance with the risk-based capital model. It is proposed to set this 'target' level at 120% of the risk-based capital requirement. Where an insurer falls below the target capital level, this provides an 'early warning' of potential emerging concerns. The Authority proposes that the supervisory framework would offer scope for early supervisory action in such circumstances e.g. to require companies to develop action plans for enhancing their margin of solvency, or to provide more frequent

or additional reporting to the Authority. Equally, to deal with cases in which the minimum risk-based capital requirement is itself breached, the Authority is considering introducing into the Act some provisions seeking to link the seriousness of the breach more directly to the scope and nature of the regulatory actions that may be taken e.g. through section 32 directions. The Authority proposes the same approach above where a company has approval to use an in-house model. It should be noted that regardless of the results of either the standard risk-based capital test or in-house model, an insurer would be deemed insolvent if its available capital is below the existing MSM as defined in the Regulations.

11. While the product of the risk-based capital test is mechanistic, the Authority also believes it necessary to provide some limited degree of discretion for it to impose additional capital requirements on insurers in particular cases. One option would be to permit the Authority to substitute a higher risk-based capital requirement than might be required by a strict application of the model. Alternatively, however, in the context of the 'target' capital approach that is proposed, certain discretion could be achieved by the Authority being able to stipulate a target requirement higher than the standard 120% of risk-based capital that it is proposed to apply. The Authority would view this discretion as being available essentially in limited sets of circumstances. The Authority proposes that the new risk-based capital model should be supplemented by a requirement for insurers to conduct certain stress and scenario testing in order to assess their potential vulnerability to defined extreme events. The Authority may set and define the standard stress and scenario tests that should apply, and insurers would share the results with the Authority. The Authority may also require insurers to submit the stress and scenario tests the insurers perform in the normal course of their risk management procedures. Where the results of scenario and stress-testing indicated potential capital vulnerability, the Authority would be able to require a higher solvency 'cushion' by increasing the 120% figure. The same would apply where the Authority has specific concerns about weaknesses in the control environment within an insurer. Moreover, the Authority may require the 'target' capital level to be increased where the risk-based capital test, in the opinion of the Authority, does not adequately reflect an insurer's risk-profile. Alternatively, insurers may make application to the Authority to have the 'target' requirement lowered where an insurer believes that an assumption applied in the risk-based capital test is more stringent than warranted by the risk characteristics of the insurer. The Authority will consider the application then make a final decision on the matter. The Authority views the introduction of some limited discretion of this kind in the setting of capital requirements for the prudent running of the business as being increasingly important as it implements a supervisory regime that involves much greater scope for supervisory judgment than has been the case historically.

4. Reporting Arrangements

12. Where insurers become subject to the risk-based capital calculation or use an approved in-house model, it is proposed that they should also provide the Authority with a more detailed Statutory Financial Return (SFR), both hard and soft copies, in order to provide the Authority with sufficient analysis of their underlying business to assist in assessing the result of the risk-based capital test and in-house model results. The intention is to incorporate certain additional core data into the SFR for these persons. In addition, however, the Authority would, as at present, be able to make use of its statutory powers to require such supplementary data and information as might be required in connection with the application of the risk-based test and in-house model, and the related scenario and stress-testing.

13. It is proposed to expand the SFR for such persons to include regular reporting of data in a range of relevant categories, including (note: predefined lines of business can be found at Appendix B):

Actual financial results for statutory filing year

- a) Gross premium by predefined lines of business
- b) Net written premium gross of commission by predefined lines of business
- c) Reserves by predefined lines of business
- d) Aggregate exposures by predefined lines of business for specified territories (see Appendix A)
- e) Operating results and loss triangles by predefined lines of business
- f) Equity assets by asset class and related market values
- g) Fixed income investments by asset class, and related market values
- h) Estimated effective duration and convexity of fixed income investment portfolio
- i) Reinsurance and recoverables by reinsurer and A.M. Best rating category

Projected financial results for year following statutory filing year

- j) MD&A and proforma financial statements
- k) Details of the strategic planning process, and risk management program including exposure limits by predetermined lines of business
- l) Estimate of Average Annual Losses assessed via catastrophe model
- m) Standard and company specific stress and scenario test results (manmade and natural catastrophes, FX)
- n) PML estimate of annual aggregate catastrophe exposures from all property-related risks and all perils assessed, including ILWs, catastrophe bonds, etc.
- o) Gross and net Exceedance Probability curves allowing the Authority to determine PMLs at various probabilities
- p) Projected losses ex-catastrophe
- q) Derivative disclosures (including embedded)

14. It should be noted that the Authority does not propose to change the provisions of Section 56 of the Act that would allow an insurer to submit a modified statutory filing upon making application to and obtaining the approval of the Authority.

5. Proposed Next Steps

15. The standard risk-based model and user instructions will be issued to the Bermuda market class 4 insurers in July/early August 2007 for the insurers to review and provide comments to the Authority by September 15, 2007.

16. Following this consultation process, the Authority proposes to proceed to draft amendments to the Insurance Act and Regulations with a view to providing a new framework for capital adequacy. Amendments to the Act would need to provide for the operation of a 'target' capital level, and certain discretion for the Authority to adjust the target level. It is also hoped to include provision within the revised legislation for the in-house tailored models that meet standards defined by the Authority. As proposed in the paper, the Authority will also be reviewing the provisions in the Act for dealing with breaches, with a view to providing greater clarity and proportionality of supervisory response.

17. The Authority also proposes to retain the present approach whereby the substance of the risk-based model would be enshrined in secondary legislation, although it will wish to discuss further with the Ministry of Finance and law officers whether it may be appropriate to provide for such Regulations to be made by the Authority directly rather than by the Minister. This reflects the fact that changes to the model may well prove necessary from time to time, reflecting changes either in the market-place or in international standards. While the intention would be for the details of the model itself to be in Regulations, as with the current solvency margin test, the Authority also believes it may be important for the legislation to provide the Authority with certain discretion around the calibration of the model – for example, to allow for adjustments to be made with regard to its application to class 3 business. The Authority will be reviewing further the most appropriate means, through a mix of primary and secondary legislation as well as guidance to the market, of providing the necessary certainty and transparency with regard to the capital adequacy requirements.

18. In the meantime, and having taken account of the detailed outcome of consultations, the Authority proposes to proceed to implement the risk-based model for the class 4 sector immediately on an informal basis, pending the introduction of the necessary legislation to amend the current provisions. Until the legislation is changed, class 4 companies would of course remain fully subject to the current statutory MSM; however, companies would be expected to cooperate with the Authority in moving immediately to make use of the risk-based model in monitoring and managing their risks.

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Thereafter, the new legislation would formalize the requirement to report on the new basis in time for statutory filings for the period to end-December 2007.

19. Separately, the Authority will bring forward detailed proposals for supplementing SFR reporting for insurers using the risk-based model and approved in-house models, along the lines of the suggestions included in paragraph 14 above. It will also initiate consultations with commercial insurers in the class 3 sector.

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APPENDIX A – Exposure Territories

Zone	Territories
1	Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, New Jersey, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, and the District of Columbia
2	Alabama, Arkansas, Louisiana, Mississippi, Texas
3	Florida, Georgia, North Carolina, South Carolina
4	Caribbean
5	Arizona, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Minnesota, Missouri, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Utah, Wisconsin, and Wyoming
6	California, Oregon, Washington
7	Hawaii
8	Canada, Alaska
9	United Kingdom
10	Continental Europe
11	Australia / New Zealand
12	Japan
13	Nationwide covers
14	Worldwide covers
15	All exposures not included in Zones 1 through 14

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APPENDIX B – Predefined Lines of Business

Predefined Lines of Business	Lines of Business Mappings
Property catastrophe	Property catastrophe
Property	US property, crop / agriculture, International property
Property non-proportional	US property, crop / agriculture, International property
Personal accident	Personal accident
Personal accident non-proportional	Personal accident
Aviation	Aviation
Aviation non-proportional	Aviation
Credit / surety	Credit / surety
Credit / surety non-proportional	Credit / surety
Energy offshore / marine	Energy offshore, Marine
Entergy offshore / marine non-proportional	Energy offshore, Marine
US casualty	US casualty – motor, US casualty – general, Terrorism, Other
US casualty non-proportional	US casualty – motor, US casualty – general, Terrorism, Other
US professional	US casualty – professional
US professional non-proportional	US casualty – professional
US specialty	US casualty – medical malpractice
US specialty non-proportional	US casualty – medical malpractice
International motor	International casualty - motor
International motor non-proportional	International casualty - motor
International casualty non-motor	International casualty – non-motor
International casualty non-motor non-proportional	International casualty – non-motor
Retro property	Retro property, Retro casualty
Structured / finite reinsurance	Structured / finite reinsurance