



BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON INTERNAL MODELS
JULY 18, 2007

BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON INTERNAL MODELS
JULY 18, 2007

Table of Contents

0.	Introduction	2
1.	Executive Summary	3
2.	Bermuda Solvency Capital Requirement (“BSCR”) versus Internal Model	3
3.	Factors to be considered in the Approval Process	4
4.	Submitting the Approved Model with the Statutory Filing	5

0. Introduction

This paper sets out the Bermuda Monetary Authority’s (“the Authority”) proposal on the use of company specific internal models to assist in determining a company’s regulatory capital requirement (“RCR”).

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.

BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON INTERNAL MODELS
JULY 18, 2007

1. Executive Summary

1. The Authority endorses Cornerstone VIII of the Cornerstones for the Formation of Regulatory Financial Requirements (October 2005) paper published by the International Association of Insurance Supervisors (“IAIS”) which outlines the IAIS’ position in relation to internal models: “the solvency regime allows a set of standardized and more advanced approaches to determine the solvency requirements, and includes the use of internal models if appropriate.”

2. In this regard, the Authority plans to allow Class 4 insurers (“the Insurer”), as defined in Section 4 read in conjunction with Section 1 of the Insurance Act 1978 (“the Act”), to submit the results of their company specific internal models beginning from the 2007 statutory year-end filing for the Authority to consider in the determination of RCR.

3. To avail itself of this opportunity, the Insurer must first make application to the Authority and receive the Authority’s approval.

4. Since the Authority regulates at the solo legal entity level, results from internal models must be submitted to the Authority at this level. Where internal models are used for group purposes, such models, if approved, must be able to isolate the results of the Bermuda legal entity. In this case, the Insurer would be required to submit both the results for the group and the solo Bermuda insurer.

5. Prior to approving an internal model, the Insurer must satisfy the Authority with respect to certain conditions. The Authority reserves the right to revoke the approval in the event that the conditions are no longer met or where the Authority deems appropriate.

2. Bermuda Solvency Capital Requirement (“BSCR”) versus Internal Model

6. The Authority believes that an Insurer’s risk profile should determine its capital adequacy. The Insurer’s risk profile arises from a variety of factors, including the quality of its management, corporate governance and the inherent risk of its business. Risk-based capital models are one of a number of tools that assist with both identifying the extent of inherent business risk, and facilitating the capital adequacy assessment.

7. In this regard, the Authority will introduce a risk-based capital model (BSCR) that, among other considerations, will guide the Authority in determining the Insurer’s RCR as outlined in the Authority’s Risk-Based Capital Consultation paper. The BSCR is a standard model that reflects the average inherent business risk of Bermuda’s Class 4 (re)insurance market.

BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON INTERNAL MODELS
JULY 18, 2007

8. However, where the Insurer believes that its own internal model better reflects the inherent risk of its business, it may make application to the Authority for approval of its internal model to be considered in the determination of RCR as opposed to BSCR.

3. Factors to be Considered in the Approval Process

9. The Authority may approve an internal model subject to being satisfied that certain conditions have been established. The Authority also reserves the right to revoke approval in the event that the conditions are not longer met or where the Authority feels that the revocation is appropriate. The Authority will review the internal model regularly to confirm that the model continues to meet the conditions.

10. Since the Authority regulates at the solo legal entity level, the model must be capable of outputs at this level. Where internal models are used for group purposes, such models, if approved, must be able to isolate the results of the Bermuda legal entity. In this case, the Insurer would be required to submit both the results for the group and the solo Bermuda insurer.

11. After the Insurer begins use of an approved internal model for statutory filing, the Insurer would have to make application to the Authority for approval to revert solely to BSCR. An appropriate reason may be that the Insurer's risk profile has significantly changed and its internal model no longer better reflects its inherent risk.

12. Before granting approval, the Authority will consider the extent to which the internal model has been integrated into the Insurer's enterprise risk management ("ERM") program, and endorsed by the Insurer's board of directors ("the Board").

13. The Insurer must demonstrate that the internal model has been approved by the Board, and is used as a tool by both the Board and senior management to assist in determining business strategy, including the identification of economic capital and capital management.

14. The Authority would not approve an internal model where it appears to the Authority that the internal model is only used for RCR and the Insurer cannot sufficiently demonstrate a relationship between the modeled results and decision making at a senior level.

15. The Authority will also consider the appropriateness of the model given the nature, scale and complexity of the Insurer's business. The Authority must be satisfied that the internal model adequately reflects the Insurer's risk profile.

16. The Authority will apply use, calibration and statistical tests prior to approval. The use test involves the Insurer sufficiently demonstrating that the internal model is approved by the Board and evidence of ample reliance for decision-making purposes by both the Board and senior management exists. The calibration test, *inter alia*, would require the Insurer to demonstrate that the internal model is calibrated to approximately 99% TVaR or the approximate equivalent VaR measure over a one year timeframe with full run-off. The Insurer also has to demonstrate that it has built a risk margin into its reserves that is equivalent to the cost of capital (or cost required to transfer its portfolio to another (re)insurer in the event of insolvency). The statistical test, *inter alia*, relates to the Authority being satisfied with the Insurer's data and results validation (ongoing quality control) procedures, including change management and "back-testing".

17. The Authority would require the Insurer to produce detailed documentation with respect to the internal model's design and construction as well as matters relating to the use, calibration and statistical tests mentioned above. The Insurer will have to provide the Authority with the underlying methodology, model assumptions, risk measures, confidence levels in the determination of RCR and any other relevant quantitative and financial parameters.

18. The Authority may approve an internal model that is not calibrated to the approximate equivalent of 99% TVaR where the insurer can demonstrate that its chosen risk measure is appropriate; however, the insurer would have to apply a "regulatory filter" when submitting the internal model results with its statutory filing so that the product received by the Authority is approximately equivalent to 99% TVaR. The Insurer would have to provide the Authority with a reconciliation of the results from its normal risk measure and 99% TVaR.

4. Submitting the Approved Model with the Statutory Filing

19. Upon obtaining the Authority's approval, the Insurer may submit its internal model results with its statutory filing to assist the Authority in determining the Insurer's RCR. The Insurer will also still be required to submit data to allow the Authority to determine the Insurer's BSCR's capital assessment and a reconciliation of the data used for the internal model and the Insurer's audited statutory financial statement numbers.

20. In determining the Insurer's RCR, the Authority (as in the case of those (re)insurers' that only submit BSCR with the statutory filing) will apply a variety of reasonableness tests to verify the results of the model.

21. Should the Authority be unable to satisfy itself with respect to the reasonableness of the internal model result then the Authority will consult with the Insurer in an effort to obtain comfort. If this exercise fails to satisfy the Authority then the Authority will determine the Insurers RCR to be at a level the Authority deems appropriate falling

BERMUDA MONETARY AUTHORITY
CONSULTATION PAPER ON INTERNAL MODELS
JULY 18, 2007

somewhere within the range between the internal model results and that which the Authority would have determined had the Insurer only submitted BSCR.

22. As detailed in the risk-based capital consultation paper, RCR will be set above the Insurer's minimum solvency margin ("MSM") pursuant to the Act and related Regulations. In this regard, the MSM will serve as a capital adequacy floor regardless of the results of both the internal model and BSCR. As outlined in that paper, regulatory actions would apply accordingly.