

ASIA **ERM** NEWSLETTER



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MILLIMAN ASIA ERM NEWSLETTER



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THE *MILLIMAN ASIA ERM NEWSLETTER*. BRINGS YOU THE LATEST DEVELOPMENTS AND INSIGHTS INTO THE BURNING ISSUES FROM THE RAPIDLY EVOLVING FIELD OF ENTERPRISE RISK MANAGEMENT (ERM) FROM ACROSS THE ASIA PACIFIC REGION.

In this edition, we bring you ERM-related updates from China, Indonesia and Taiwan. These three diverse markets are grappling with a common challenge—setting up or enhancing risk-based supervisory frameworks. The final versions of these frameworks are expected to require companies to adopt risk-based economic capital regimes and Own Risk and Solvency Assessment (ORSA), raising significant challenges while at the same time increasing the profile of risk professionals working in these countries.

The Milliman Insight section in this edition features two articles. The first brings you an update on developments on China's Risk Oriented Solvency System, which is currently being tested and is expected to be rolled out in 2016. The second article provides a summary of a roundtable discussion that Milliman hosted recently regarding the second consultation paper on the upcoming revision to the risk-based capital framework in Singapore.

We hope you find this edition interesting and look forward to receiving your feedback.

COUNTRY SPOTLIGHT

CHINA

REGULATIONS

Over the past decade, the China Insurance Regulatory Commission (CIRC) has issued a number of regulations in relation to risk management of insurance companies.

In October 2010, CIRC released the Guidelines on Implementation of Enterprise Risk Management for life insurers, health insurers and pension providers. The key provisions include the following:

- The ultimate responsibility of risk management rests with the board of directors.
- Setting up a risk management sub-committee is mandatory.
- A chief risk officer or senior management team member should be in charge of risk management.
- The three lines of defence model should be adopted.
- Risks should be classified into seven categories, as defined in the guidelines.
- Insurance companies should define a company-level risk appetite and establish risk tolerance and risk limits.
- Insurance companies should use economic capital as the core metric in risk measurement.
- A comprehensive enterprise risk management report approved by the board should be submitted to CIRC by 30 April annually.

CIRC is currently working towards implementing a risk-based capital framework. The new solvency regime, the China Risk Oriented Solvency System (C-ROSS), will be based on a three-pillar system and will require insurance companies to maintain economic capital commensurate with their specific risks. CIRC plans to release a technical exposure draft by the end of 2014 for review and industry consultation, and plans to spend an additional one to two years testing the system before the final implementation.

Ping An Insurance (Group) Company of China has been selected as a Global Systematically Important Insurer (G-SII) by the International Association of Insurance Supervisors (IAIS), making it the only insurer operating in developing markets to be selected so far.

CONFERENCES AND EVENTS

On 5 December 2013, the South China Actuarial Workshop was held in Shenzhen. The audience included senior actuaries from leading insurance companies in the region. Wing Wong delivered a presentation entitled 'New Perspective of Risk Management—Application of Complex Science in Risk Management'. The presentation was well-received.

TAIWAN

REGULATIONS

The Insurance Bureau is in the process of introducing ERM guidelines in a phased manner. As part of Phase 1, all insurers were required to set up an independent risk management division and implement a risk management framework, including risk appetite statements and risk limits, by the end of 2012. As part of Phase 2, insurers are required to implement economic capital and ORSA, including 'sophisticated' credit management tools and quantitative analysis of operational risks. The regulator has not indicated a formal deadline for the implementation of Phase 2.

RECENT PROJECTS

Milliman was recently engaged by a life insurance company to help it assess its sales risks, understand the sources of sales risk, and identify uncertainties that could affect the firm's ability to meet its sales budget for the year. This project gave us the opportunity to demonstrate the value of our approach of combining the techniques of cognitive mapping and Bayesian networks to develop structural/causal models for the assessment and analysis of operational risks. We used this approach to combine information from business experts and available qualitative and quantitative data to visualise the complexities and dynamics of the company's operations in a way that made sense to the business managers. This methodology helped us to advise the company on the possible management actions that were most likely to improve the chances of meeting its sales targets.

INDONESIA

REGULATIONS

The local regulator, the Financial Services Authority (OJK), is in the process of setting up a risk-based supervision framework, in cooperation with the Australian Prudential Regulation Authority (APRA). With the aim of enhancing the current supervisory regulations, the new framework would seek to better identify and measure the risk and financial soundness of non-bank financial institutions (which includes insurance companies) and provide the OJK with clear and defined authority to intervene when necessary. The specifics of the framework are still being discussed and would be tested in 2014, with an expected implementation date of January 2015. However, as per industry sources, the implementation date may be pushed back to allow the industry more time for preparation. In general, the proposed supervisory framework would include areas such as strategy, operations, asset and liability management, insurance risk and financing risk.

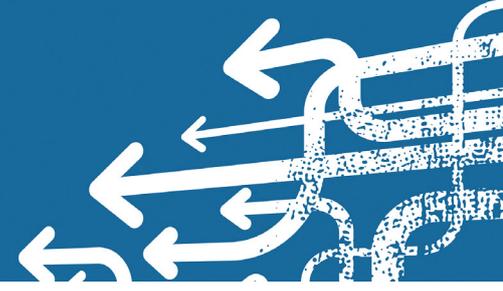
EMERGING RISK

According to a recent study released by Swiss Re, river floods and earthquakes pose the biggest risk to Jakarta, with close to 28 million people potentially affected. The study also stated that even though many people believe that both climate change and global warming are rapidly increasing as natural disaster risks, a significant part of the economy is still uninsured. Swiss Re estimates that in the event that an earthquake or a major flood were to hit Jakarta today, the gap between economic and insured losses could reach US\$10 billion, and by 2023, this number could triple to US\$28 billion.

CONFERENCES AND EVENTS

The Society of Actuaries of Indonesia, in conjunction with OJK, organised an industry seminar on ERM themed 'Taking Risk Management to the Next Level'. The well-attended event was held on 20 March 2014 and sponsored by PT Prudential Life Assurance (Prudential Indonesia). Milliman consultants Richard Holloway and Amar Mehta were speakers at the event and gave a presentation on 'Financial Risk Management and Economic Capital'.

MILLIMAN INSIGHT



UPDATE ON THE CHINA C-ROSS SYSTEM

BACKGROUND

In 2003 the CIRC initiated a build-up of China's first-generation solvency regulation system, a factor-based solvency system similar to Europe's Solvency I regime. The regime was established in 2007, and played a very important role in the early stage of market development. However, it suffered from the same shortcomings as the Solvency I system, i.e., that the solvency capital requirements for an insurance company were not directly linked to the actual risks taken by the company.

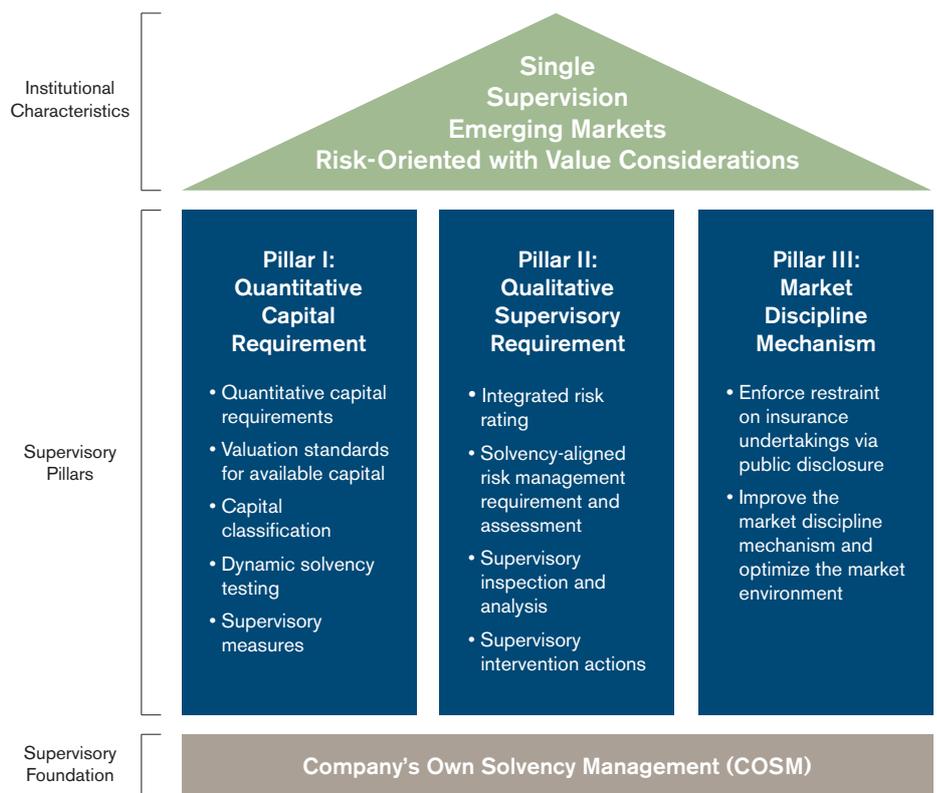
In 2012, CIRC announced plans and an implementation timeline for a risk-based solvency framework. In May 2013, it issued the Overall Framework of the Second-Generation Solvency Supervision System of China. China's new solvency regime, the China Risk Oriented Solvency System (C-ROSS), is based on a three-pillar system that requires insurance companies to maintain capital commensurate with their specific risks. The three pillars, as shown in Figure 1, are quantitative capital requirements, qualitative regulatory requirements and a market discipline mechanism. The new regime will require companies to hold capital based on a detailed assessment of their risks, including investment, insurance and market risks. In addition, capital requirements will be based on industry cycles and stages of business development.

LATEST DEVELOPMENTS

Since 2012, 15 projects related to C-ROSS have been initialised by CIRC to study the experiences in other markets, examine the situation in China, design the road maps and approaches for different risk components and modules, and establish technical standards.

Figure 2 shows CIRC's rollout plan up to the end of 2014. All technical standards are expected to be completed within 2014. To date, three out of the 15 projects have been completed. The property and casualty (P&C) sector has made significant progress.

FIGURE 1: PILLARS OF C-ROSS



Source: China Insurance Regulatory Commission. China Risk Oriented Solvency System conceptual framework. Accessed June 17, 2014 at: <http://www.circ.gov.cn/web/site0/tab4569/info3905736.htm>.

The C-ROSS is scheduled to be launched around 2016.

On the P&C side, on 25 April 2014 CIRC released the solvency regulatory rules drafts No.1 to No. 8 for insurers and reinsurers to conduct quantitative testing and provide feedback.

The eight solvency regulatory rules are:

- No.1: Available Capital
- No.2: Minimum Capital Requirement
- No.3: Minimum Capital Requirement of Insurance Risk
- No.4: Minimum Capital Requirement of Market Risk
- No.5: Minimum Capital Requirement of Credit Risk
- No.6: Classified Supervision (integrated risk rating)
- No.7: Solvency Aligned Risk Management Requirement and Assessment (SARMRA)
- No.8: Liquidity Risk

These regulatory rules have the following features:

- Risk-oriented: Regulation is expected to change from rules-driven to risk-oriented. Rules No. 1 through No. 5 cover quantitative risks of insurance companies, while rules No. 6 through No. 8 deal with those risks not easily quantified.
- China-specific: Having extensively studied the experience of other markets, quantitative analyses are based on actual data in China to reflect those risks that are specific to China as an emerging market. The capital requirement will be factor-driven rather than requiring expensive and complicated internal models to be developed by all insurance companies.
- Comparable to international practice: For example, the three-pillar system is widely used as the framework for regulation in the banking industry, and is expected to be the trend for insurance industry as well.

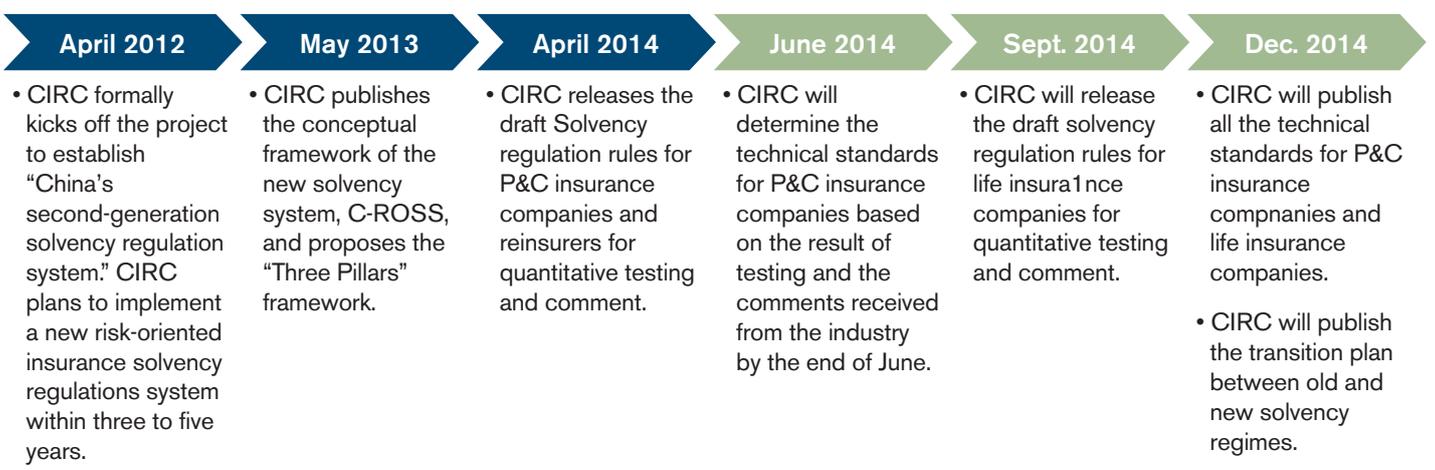
Out of the 15 P&C insurance companies that completed the latest quantitative tests, the solvency position has improved for eight companies. The tests indicate that the solvency position for the industry as a whole could improve. C-ROSS may have a bigger impact on some small to medium-

sized insurers, depending on the mix of business and the quality of the assets held by these companies. We understand that the capital requirement could increase by two or three times for some multinational insurance companies.

For large insurers, some segments of business may see a significant increase in solvency capital requirements, for example, for the personal credit insurance policies due to large risk charges for such type of policies. Insurers with a disproportionately high percentage of property risks in certain geographic areas in China's earthquake belt could also see a significant increase in solvency capital requirements.

Observers note that certain requirements of C-ROSS warrant more careful study and further discussion. In particular, the provision for credit risk appears to be excessive and is higher than the insurance risk capital and market risk capital for certain companies. This is largely driven by the risk charges applied on reinsurance receivables from foreign reinsurers, which are set at 40% with collateral and 70% without collateral. Higher-risk charges might put foreign reinsurance companies in a less competitive position, which may impact both the availability and price of reinsurance.

FIGURE 2: CIRC ROLLOUT SCHEDULE



Source: China Insurance Regulatory Commission. Insurance company solvency regulatory rules for public comment and quantitative tests. Accessed June 17, 2014 at: <http://www.circ.gov.cn/web/site0/tab5207/info3914304.htm>.

RBC 2 INDUSTRY ROUNDTABLE DISCUSSION IN SINGAPORE

BACKGROUND

The much-anticipated second consultation on the proposed changes to the existing risk-based capital (RBC) framework, commonly dubbed as RBC 2, was announced by the Monetary Authority of Singapore (MAS) at the end of March 2014. This consultation paper follows on from the first consultation paper released in June 2012 and takes into account the feedback received from the industry on the first consultation as well as introduces some new proposals. As part of this announcement, MAS also released detailed technical specifications, based on which insurers are expected to conduct the first quantitative impact study (QIS1), in order to assess the impact of the proposals mentioned in the second consultation paper.

The key changes proposed in the second consultation paper are as follows:

- Revised stress factors and allowance for diversification between risks
- The inclusion of operational risk requirement (termed as the C4 requirement)
- The introduction of mismatching adjustments
- Recognition of negative reserves within financial resource adjustments
- A revised calculation of the long-term risk-free discount rate (LTRFDR)

The deadline for providing feedback and submitting the results for the QIS1 is 30 June 2014. MAS intends to finalise the proposed changes to the RBC framework by the end of 2014 and implement the new RBC 2 requirements (with the exception of certain general insurance risk requirements) from

TABLE 1: PARTICIPATING FUND RISK REQUIREMENT

SGD MILLIONS	RBC 1	RBC 2	IMPACT	% CHANGE
Financial Resources	21,652	21,652	-	
Risk requirements:				
C1	1,570	1,570	-	
C2:				
Equity risk	2,953	8,304	5,351	181%
Debt risk (Specific / Credit)	925	4,369	3,443	372%
Debt risk (General / Mismatch)	2,304	3,627	1,333	58%
Loan risk	80	151	71	89%
Property risk	454	851	397	88%
Foreign currency risk	226	339	113	50%
Derivative risk	34	17	(17)	(50%)
Miscellaneous risk	54	56	2	3%
Total for C2	7,029	17,724	10,694	152%
C3	-	-	-	
C1-C2 Diversification	n/a	(1,500)		
C4	n/a	1,779		
Total risk requirements	8,599	19,572	10,973	128%

TABLE 2: NON-PARTICIPATING FUND RISK REQUIREMENT

SGD MILLIONS	RBC 1	RBC 2	IMPACT	% CHANGE
Financial Resources	4,465	4,465	-	
Risk requirements:				
C1	612	612	-	
C2:				
Equity risk	58	163	105	181%
Debt risk (Specific / Credit)	316	2,547	2,231	720%
Debt risk (General / Mismatch)	628	1,364	736	109%
Loan risk	1	0	(0)	(42%)
Property risk	41	77	36	88%
Foreign currency risk	5	7	2	50%
Derivative risk	18	9	(9)	(50%)
Miscellaneous risk	57	45	(12)	(20%)
Total for C2	1,122	4,211	3,089	260%
C3	-	-	-	
C1-C2 Diversification	n/a	(568)		
C4	n/a	426		
Total risk requirements	1,734	4,681	2,947	170%

1 January 2017. In the meantime, MAS expects to hold a third round of consultation on the RBC 2 proposals and conduct a second quantitative impact study during 2014.

RBC 2 ROUNDTABLE DISCUSSION

In May 2014, Milliman hosted a RBC 2 roundtable discussion on the key changes proposed by MAS and the potential impact that they might have. This event brought together industry experts, including representatives from various life insurers, to present their opinions on the key issues surrounding the RBC 2 framework.

Milliman's key findings and analysis

Milliman kicked off the RBC 2 roundtable discussion with a summary of key findings from an internal high-level analysis conducted to investigate the potential impact that the new RBC 2 framework would have on the level of capital required under various insurance funds. The analysis was carried out for the participating and non-participating funds by taking the 2012 year-end¹ aggregate solvency results of the top six companies,

and focused specifically on changes to the market risk requirement (C2 requirement), as this requirement is expected to have the most significant impact on the financial position of companies. In assessing the impact on capital requirements, Milliman also included the newly introduced operational risk requirements and made an allowance for the diversification adjustment proposed by MAS in respect to the insurance risk requirement (C1 requirement) and the market risk requirement. The estimation of the market risk requirement under the proposed RBC2 framework was determined assuming average durations for the asset and liability portfolio (back-solved from the 2012 MAS returns) and a single credit rating was used to determine the estimated credit risk charges. No analysis was carried out in respect to investment linked business as the impact on the changes to market risk requirement is not expected to have a material impact on

the capital requirements. In fact, the financial position for investment-linked business is expected to improve due to the allowance of negative reserves within the financial resource adjustments. The result of our analysis is shown in Tables 1 and 2 on page 5.

These results illustrate that there is a significant increase in total risk requirements for both participating and non-participating funds. The increase in total risk requirement can largely be attributed to the increase in the capital required for equity risk and debt risk. The equity risk charge has increased substantially from 16% (under RBC 1) to between 40% and 50% (under RBC 2). The charge for debt (credit) risk has also been increased significantly. On the other hand, the addition of the C4 operational risk charge is partially offset by the introduction of the C1-C2 diversification allowance.²

The second consultation provides for a matching adjustment. This adjustment has not been included in the analysis as we do not foresee a significant impact from this allowance given the strict requirements proposed by MAS to qualify for this adjustment.

Under the RBC 2 framework, MAS is proposing to keep negative reserves off the balance sheet but to allow a 'regulatory adjustment' to increase the financial resources in respect of negative reserves. This adjustment is proposed to be 50% (25% for investment-linked fund) of the value of the negative reserves after allowing for insurance stresses (i.e., C1 stresses). A high-level estimate of the impact of changes to financial resources after allowing for negative reserves is shown in Table 3.

It should be noted that the allowance for negative reserves as set out in Table 3 has been based on the negative reserves set out in the policy liability summary as presented in the MAS forms. The actual adjustment would be expected to be smaller, as the adjustment will be based on the negative reserves after application of the C1 risk charges.

TABLE 3: ADJUSTMENTS TO FINANCIAL RESOURCES IN RESPECT TO NEGATIVE RESERVES

SGD MILLIONS	PAR FUND	NON-PAR FUND
Financial Resources before adjustment	21,652	4,465
Adjustment for negative reserves	2,395	2,635
Financial Resources after adjustment	24,047	7,100
Increase	11%	59%

TABLE 4: SUMMARY OF RESULTS, PARTICIPATING FUND

SGD MILLIONS	FINANCIAL RESOURCES	RISK REQUIREMENTS	FSR
Aggregate at 31 December 2012 for RBC 1	21,652	8,599	252%
RBC 2 risk charges (excl. C1 changes)	21,652	19,572	111%
Adjustment for negative reserves (base negative reserves)	24,046	19,572	123%

TABLE 5: SUMMARY OF RESULTS, NON-PARTICIPATING FUND

SGD MILLIONS	FINANCIAL RESOURCES	RISK REQUIREMENTS	FSR
Aggregate at 31 December 2012 for RBC 1	4,465	1,734	257%
RBC 2 risk charges (excl. C1 changes)	4,465	4,681	95%
Adjustment for negative reserves (base negative reserves)	7,100	4,681	152%

¹ 2013 year-end results were not available at the time of the analysis.

² The C1-C2 diversification is a benefit allowance that is calculated by taking the square root of the sum of squares of the C1 and C2 risk charges.

The overall change in the solvency requirements is shown Tables 4 and 5 (noting the same limitation in our estimation of the value of the negative reserves where we used pre-stress values and not the post C1 stress values, which would apply in practice.)

The high-level analysis shows that the fund solvency ratio (FSR) is expected to fall significantly for both the participating fund and the non-participating fund on moving from RBC 1 to the proposed RBC 2 framework.

ROUNDTABLE DISCUSSION

For the roundtable discussion, Milliman presented a comparison between various features of RBC 2 and their Solvency II equivalents. A discussion of each of the various features then took place.

Implied stresses and diversification impact

Milliman presented a comparison between RBC 2 and the Solvency II risk charges, since both regimes were calibrated using a 99.5% value-at-risk assumption. The comparison highlighted that RBC 2 has very similar stress factors (both in respect to insurance stresses as well as market stresses) compared to Solvency II, although they are slightly more severe for some categories. However, the allowance for diversification in RBC 2 is significantly lower than under the standardised Solvency II model. The conclusion drawn from the comparison was that RBC 2 was more prudent than Solvency II. A majority of the audience agreed that the stress factors were too severe, mainly because the allowance of diversification is not adequate.

Matching adjustment (MA)

MAS has introduced the MA as a way to reward companies who can demonstrate satisfactory asset-liability management (ALM) practices and a commitment to hold an appropriate portfolio of bonds to back their liabilities. The MA works as a parallel adjustment applied to the risk-free discount rate used in valuing eligible policy liabilities. The methodology and cash-flow matching criteria applied under RBC 2 are largely similar to those applied under Solvency II. However, there are material differences

in the identification of eligible assets in RBC 2, restricting the eligible assets to fixed-income securities and cash, while the spectrum of eligible assets under Solvency II is much wider.

Due to the shortage of long-term assets in the market, most liabilities in Singapore tend to be significantly longer than the assets supporting them. Given this, most products would not meet the cash-flow matching criteria. The significant increase in credit risk charges under RBC 2 makes it important for companies to be able to use the MA to offset the capital requirements. During the discussion, most participants were of the opinion that it is very difficult to fulfil the eligibility criteria for assets given the strict conditions prescribed by MAS.

Negative reserves within financial resource adjustments

Our preliminary analysis showed that under RBC 2, the treatment of negative reserves is more prudent than under Solvency II. Under Solvency II, insurers are allowed to recognise full negative reserves in their balance sheets, but the RBC 2 framework only recognizes a portion of negative reserves off balance sheet. Moreover, the negative reserves are reduced under RBC 2 to allow for C1 risk.

Most participants agreed that negative reserves would not have a significant impact on the financials of the company, and it would therefore be more beneficial to recognise this on the balance sheet.

Treatment of participating business

For participating businesses, the treatment is broadly unchanged from the first consultation. The current approach of including an allowance in the financial resources equal to 50% of the non-guaranteed bonus provisions has also been left unchanged. As the 50% factor is rather arbitrary, it could be argued that the provision should be more company-specific (e.g., the allowance would be based on the company's assessment of loss absorbency from being able to reduce bonus rates in adverse scenarios). From our discussions with the audience, we understand that for most companies, the modelling and documentation for loss absorbency are in a relatively immature state.

Internal models

MAS has stated that it will only allow the use of internal models at a much later stage, i.e., after the implementation of the standardised approach. We presented results from the Solvency II QIS5 study which showed a reduction in solvency requirements for larger scale insurers from the use of internal models. However, most of the audience supported the proposal to not permit internal models at the present time, stating that the cost of developing internal models would far outweigh the benefits to be obtained.

CONCLUSION

Overall, based on our high-level analysis, the introduction of the RBC 2 framework in the form proposed in the second consultation would significantly increase the capital requirements for both the participating and non-participating funds. The general consensus from the roundtable discussion was that there should be further discussions with MAS with regard to risk diversification benefits, mismatching adjustment, allowance for negative reserves in the balance sheet and the treatment of bonus provision in the participating fund.

ERM TOOLS

AT MILLIMAN, WE PRIDE OURSELVES ON CREATING TECHNOLOGY SOLUTIONS THAT HELP OUR CLIENTS BETTER UNDERSTAND THEIR RISKS AND DEVELOP SOLUTIONS THAT ARE NOT ONLY ACTIONABLE, BUT UNDERSTANDABLE. THE FOLLOWING ERM TOOLS ARE BEING SUCCESSFULLY USED BY OUR CLIENTS WORLDWIDE TO BETTER MANAGE THEIR RISKS. PLEASE CONTACT YOUR LOCAL MILLIMAN CONSULTANT IF YOU WOULD LIKE TO DISCUSS HOW THESE TOOLS MAY BE OF BENEFIT TO YOUR ORGANISATION.



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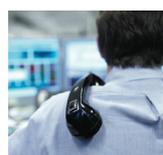
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THOUGHT LEADERSHIP ON ERM

MILLIMAN'S INDEPENDENT THINKING IS BASED ON STRONG THEORETICAL FOUNDATIONS THAT ALLOW US TO DEVELOP PRAGMATIC, IMPLEMENTABLE SOLUTIONS FOR CLIENTS IN THE ASIA PACIFIC AND AROUND THE WORLD WHO ARE COPING WITH TODAY'S MOST CRITICAL ERM ISSUES. THE FOLLOWING ARTICLES AND PRESENTATIONS HIGHLIGHT SOME OF OUR RECENT WORK.



CREATING VALUE THROUGH ENTERPRISE RISK MANAGEMENT

Mark Stephens

For a growing number of forward-thinking companies, ERM is not only about protecting firms from harm, but creating measurable value that can strengthen their position in the market.

Read the full article:

<http://tinyurl.com/l3xgau2>



ERM IN THE MIDDLE EAST: MOVING BEYOND COMPLIANCE

Mark Stephens, Safder Jaffer

Enterprise risk management is still in the development phase in Gulf Cooperation Council (GCC) markets, but insurers are beginning to sense the need to have more robust and systematic risk management processes for the future.

Read the full article:

<http://tinyurl.com/pnlq3sk>



HEAVY MODELS, LIGHT MODELS AND PROXY MODELS: A WORKING PAPER

Cassandra Hannibal, Christopher Hursey, Iain MacIntyre, Matthew Cocke, Matthew Modisett, Parit Jakhria

The use of proxy models within the insurance sector has grown considerably in recent years, particularly in the area of capital management.

Read the full article:

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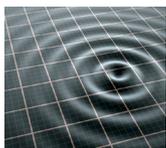
CATASTROPHE MODELS: TRAPS AND PITFALLS

Derek Newton

Catastrophe models are perhaps the best way of understanding the risks posed by natural perils, but no model is perfect.

Read the full article:

<http://tinyurl.com/pszjns5>



IDENTIFYING STRATEGIC ASSET ALLOCATION STRATEGIES FOR TOA RE

Milliman video

Milliman and Conning worked together to build a strategic asset allocation model that helped Toa Re better understand its tolerance for taking on new risks.

See the video:

<http://tinyurl.com/lr6wvzb>



MERGERS AND ACQUISITIONS: ASSESSING ENTERPRISE RISKS

Milliman video

Consultant Steven Schreiber gives an overview of how enterprise risk management comes into play in Milliman's mergers and acquisitions analysis work.

See the video:

<http://tinyurl.com/mkxfhnh>

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JULY 2014

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