Institute
and Faculty
of Actuaries

Actuarial Considerations in Asian Market

Xiaoxuan (Sherwin) LI, FIA, FCAS, CCRA, China Re P&C
Sie Liang LAU, FIA, SCOR Global P&C

03 September 2018

CONTENTS

Institute and Faculty of Actuaries

C-ROSS Phase II

- China Insurance Regulatory Commission (CIRC) launched China Risk-Oriented Solvency System (C-ROSS) in March 2012.
  - In February 2015, CIRC released 17 regulatory rules covering the major technical standards of C-ROSS and meanwhile the insurance industry entered the transitional period from the first-generation solvency system to C-ROSS.
  - On January 1st, 2016, C-ROSS was officially enacted, greatly enhancing the risk management ability of insurance companies.
- In order to further improve the framework of the new-generation solvency system, CIRC decided to start the project of C-ROSS Phase II and issued the Plan of C-ROSS Phase II Construction in September 2017.

Institute and Faculty of Actuaries

C-ROSS Phase II

- Three major tasks are identified.

01 Improvement of regulatory rules

02 Perfection of enforcement mechanisms

03 Strengthening of regulatory cooperation

Institute and Faculty of Actuaries

C-ROSS Phase II

- Fifteen points are addressed under the three major tasks. Some key points include:

1

New rules for Insurance groups, mutual insurers and captive insurers

2

Improve the valuation of actual capital

3

Adjust the standards of market risk, credit risk and insurance risk

Institute and Faculty of Actuaries

C-ROSS Phase II

- The Plan of C-ROSS Phase II Construction issued by CIRC also refers to the principles of implementation of C-ROSS Phase II. The regulator will form several different working groups studying those points, and will release findings within around three years.
- In December 2017, CIRC established the Advisory Experts Committee of Solvency Regulation.
- With the completion of those preparatory works, C-ROSS Phase II construction has been running since July 2018, ushering the insurance industry of China into a new era.

Institute and Faculty of Actuaries

VAT Taxation Reform

- The taxation system of China insurance market was changed to VAT system from premium income system on May 1st, 2016.
- This change affects reinsurance field more than primary insurane field.

Premium Income Taxation	Value-Added Taxation
• Primary insurers pay taxes and its surcharge. • Reinsurers do not care about taxes.	• Both primary insurers and reinsurers in China pay taxes and its surcharge. • Overseas reinsurers do not pay.

Institute and Faculty of Actuaries

VAT Taxation Reform

- Under premium income taxation, a primary insurance policy and it reinsurance policy (fronting) are shown as below.

Item	Amount
Premium	100
Taxes and Surcharge	5.5
Expenses(excluding tax)	29.5
Claims	63
Profit	2

Item	Amount
Reins Premium	100
Reins Commission	35
Reins Claims	63
Reins Profit	2

VAT Taxation Reform

- Under VAT taxation, a primary insurance policy and it reinsurance policy(fronting) are shown as below.

Primary policy：

Premuim	94.34
VAT	5.66
Expenses	11+17.84=28.77
Claims	63
VAT Surcharge	5.66*10%=0.566
Profit	94.34-28.77-63-0.566=2

For Domestic Reinsurer：

Reins Premium	94.34
VAT	-
Reins Commission	28.77+0.566=29.34
Reins Claims	63
VAT Surcharge	-
Reins Profit	94.34-29.34-63=2

For Overseas Reinsurer：

Reins Premium	94.34
VAT	5.66
Reins Commission	28.77
Reins Claims	63
VAT Surcharge	5.66*10%=0.566
Reins Profit	94.34-28.77-63-0.566=2

Institute and Faculty of Actuaries

VAT Taxation Reform

- Besides proportional reinsurance businesses, non-proportional reinsurance businesses are affected, too.

Domestic Reinsurers

- Quotation: 100
- Surcharge: 0.72
- Net Benefit: 99.28

Overseas Rinsurers

- Quotation: 99.28
- Surcharge: 0
- Net Benefit: 99.28

Institute and Faculty of Actuaries

Solvency Requirements in Hong Kong

- Since the 1980s, Hong Kong has followed a rule-based capital adequacy regime for insurers, which sets a predefined formula to determine the solvency margin requirement. The formula is based on a Solvency I framework. The factors are stipulated by the regulator and do not reflect the underlying risks of the insurance business.

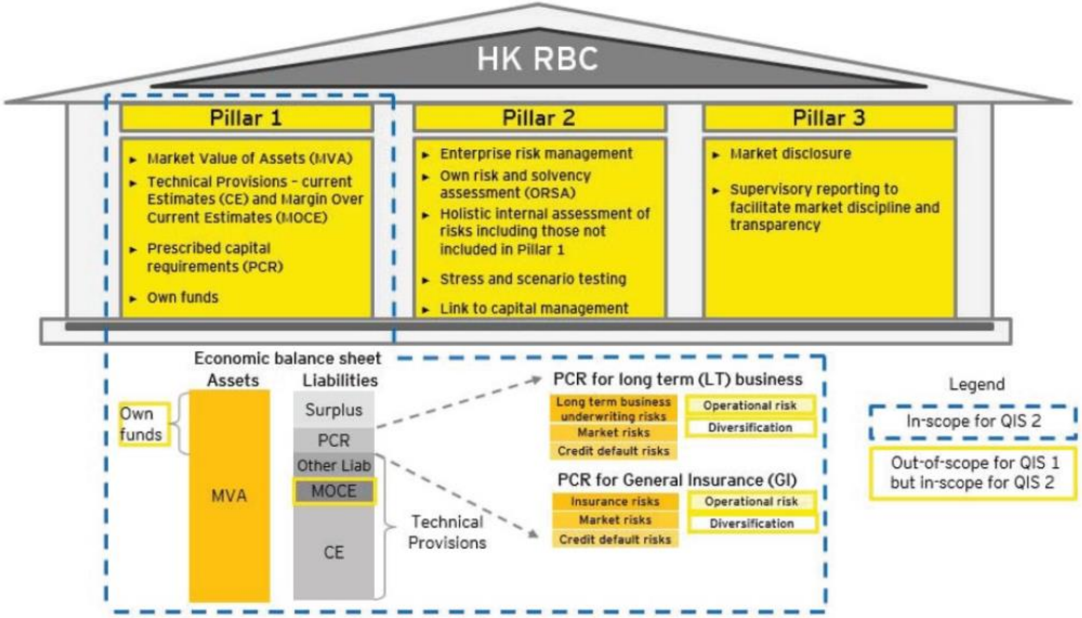
- For general insurance companies, the solvency margin is determined by the greater of 1) and 2) below and is subject to a minimum of HKD 10m, or HKD 20m for certain statutory classes:

*Solvency margin=max(20%*Prem within 200m+10%*Prem in excess of 200m, 20%*Claims O/S within 200m+10%*Claims O/S in excess of 200m)*

Institute and Faculty of Actuaries

Solvency Requirements in Hong Kong

- The Insurance Authority in Hong Kong is developing its capital framework toward a risk-based capital regime that is tailored for the Hong Kong insurance industry (HK RBC).



Institute and Faculty of Actuaries

Solvency Requirements in India

- At present, India follows a factor-based solvency model for insurers. There is a set formula to arrive at the solvency, with the factors determined by the regulator. The method for establishing capital requirements is easy, with no consideration of the underlying risk.

- For general insurance companies, the capital required has been set as below:

*Required Capital=max(INR0.5 billion, 20%*net premium income, 30%*net incurred claims)*

Institute and Faculty of Actuaries

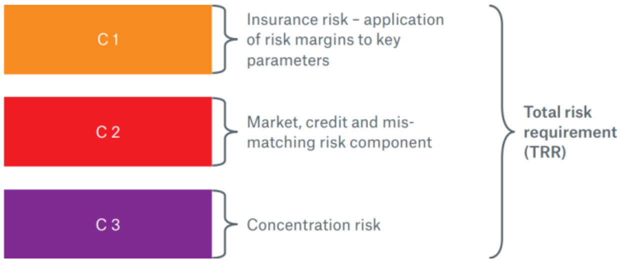
Solvency Requirements in India

- The challenge with the current solvency framework is that it does not recognize portfolio size, type of business, quality of management or underlying risk, and it provides little incentive for companies to practice better risk management.
- Considering these deficiencies, the current factor-based solvency system will move toward Solvency II and an RBC regime in the future.
- The regulator has introduced an economic capital framework. The new model would require an insurance company to establish a risk management framework and shift to risk-based pricing.

Institute and Faculty of Actuaries

Solvency Requirements in Singapore

- The RBC framework for insurers was first introduced in Singapore in 2004. It adopts a risk-focused approach to assessing capital adequacy and seeks to reflect most of the relevant risks that insurers face.
- While the RBC framework has served the Singapore insurance industry well, MAS has embarked on a review of the framework (coined as "RBC 2 review") in light of evolving market practices and global regulatory developments.
- Two industry consultations were conducted so far in which the MAS proposed a number of changes and an RBC 2 roadmap for implementation.



Institute and Faculty of Actuaries

Solvency Requirements in South Korea

- The regulatory authority for the Korean financial services industry, the Financial Supervisory Service (FSS), introduced RBC in April 2009, replacing the Solvency I requirement.
- In the rapidly changing insurance market, FSS has to review the RBC regime continuously to ensure that it serves the intended purpose.
- The capital for each risk wass defined as VaR 95% and will be updated to 99% in the future.

$$\text{Required Capital} = \sqrt{Insurance^2 + (Interest + Credit)^2 + Market^2} + Operation$$

Institute and Faculty of Actuaries

CONTENTS

Institute and Faculty of Actuaries

Timeline of Motor Insurance Reform in China

May 2015

Phase I : CIRC issued <Guidance on further deepen the reform of car insurance>, which formally kicks off the rate reform starting on 1 May, 2015

July 2017

Phase II : CIRC issued < Notification relevant to adjustment and management of motor insurance rates>

March 2018

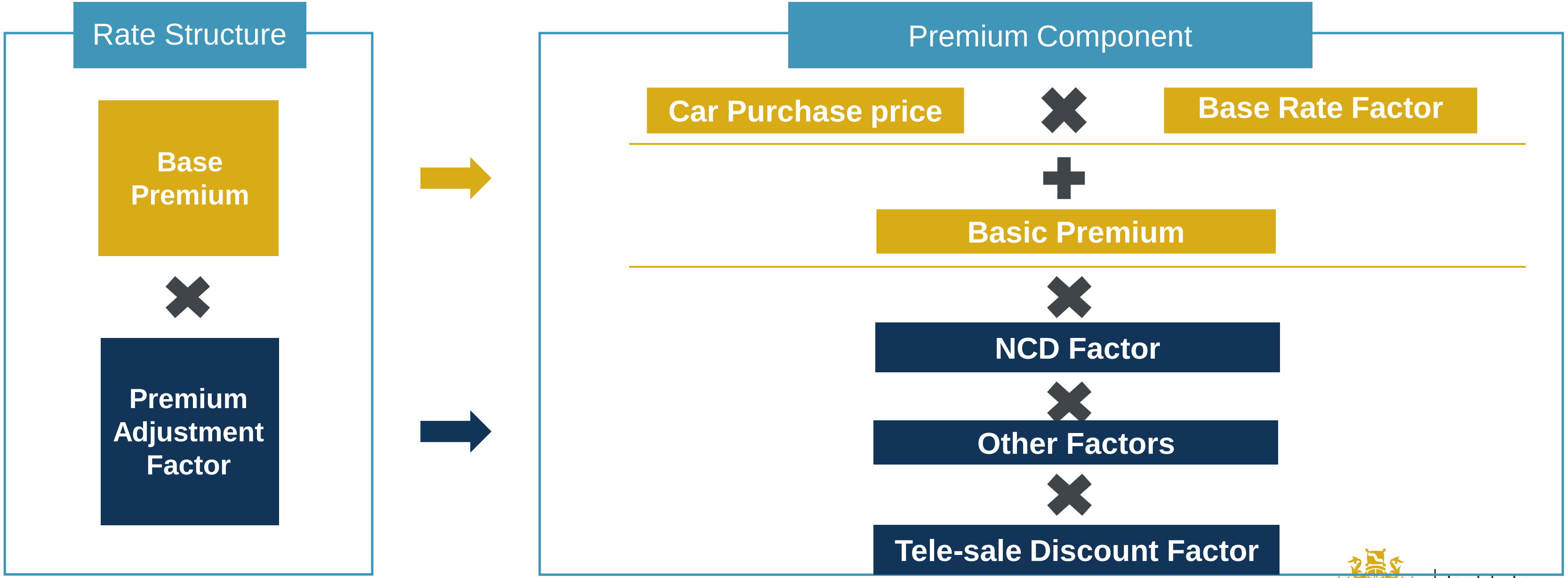
Phase III : CIRC has issued < Notification relevant to adjustment of motor insurance own discount rating factor to partial area>

April 2018

CBIRC : has recently issued < Notification relevant to the pilot of independent pricing reform of commercial auto insurance>

Institute and Faculty of Actuaries

Previous Motor Insurance Rate Structure



Current Motor Insurance Rate Structure

Rate Structure

Base Premium

✖

Premium Adjustment Factor

Premium Component

Base Pure Premium

÷

1-Expense Load Factor

- Transition from the previous base rates
- Introduce car symbol/year factor
- Based on industry average expense ratio or company's own experience

✖

NCD Factor

✖

Own U/W Factor

✖

Own Dist. Channel Factor

- Enhancement to No Claim Discount (NCD)
- Delete the thirteen rating factors (other than NCD) from the old rate structure, introduce the Own Underwriting Factor set by companies
- Introduce the Own Distribution Channel Factor set by companies

Institute and Faculty of Actuaries

Three Phases of Motor Insurance Reform

- The path of the rate change reform:

CBIRC： April 2018

Pilot: Free rate making in SX/QH/GX

Phase III： March 2018

Range of Factors	Min U/W Factors	Min Dist. Channel
SC	0.65	0.65
6 provinces	0.7	0.7
XJ	0.75	0.75

Phase II： July 2017

Range of Factors	Min U/W Factors	Min Dist. Channel
SZ	0.7	0.7
8 provinces	0.75	0.75
HN	0.8	0.75
Others	0.85	0.75

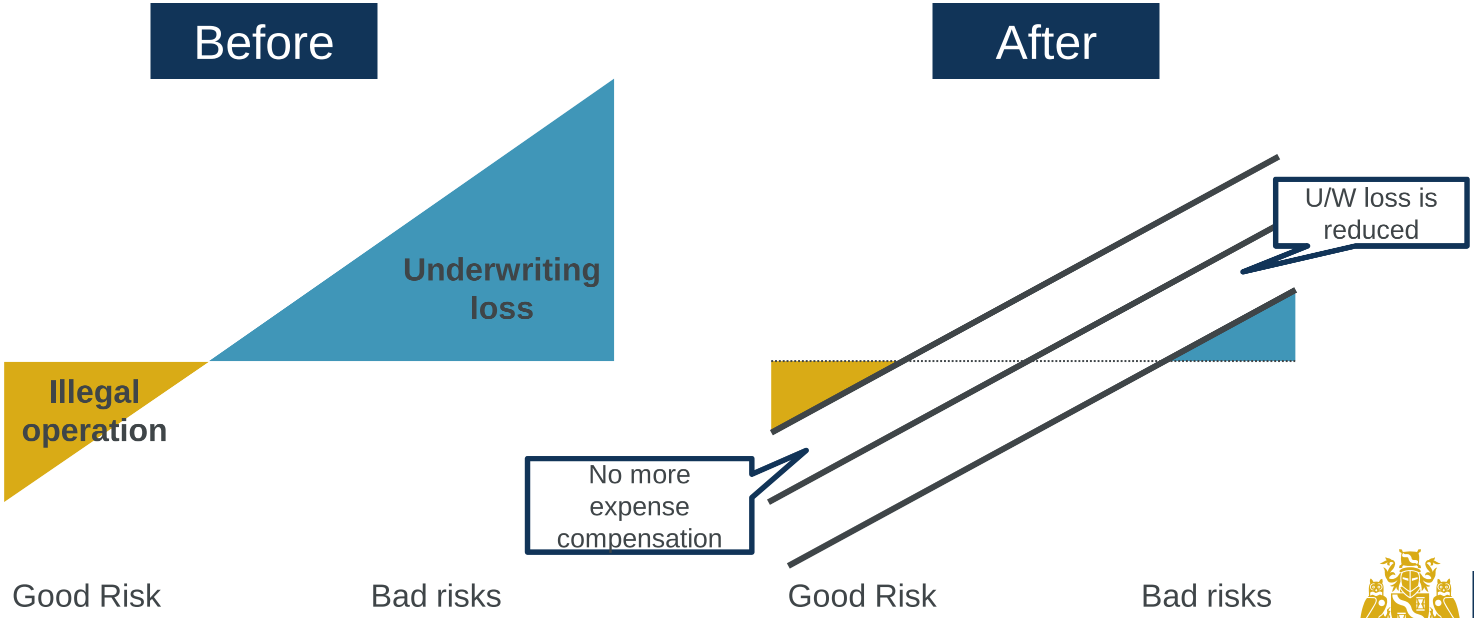
Phase I： May 2015

Range of Factors	Before 2015	Phase I
NCD	0.7-1.3	0.6-2.0
Own U/W Factor	None	0.85-1.15
Own Dist. Channel Factor	None	0.85-1.15
Min adj. factor	0.7	0.43
Max adj. factor	1.86	2.65

Institute and Faculty of Actuaries

Impact on the market

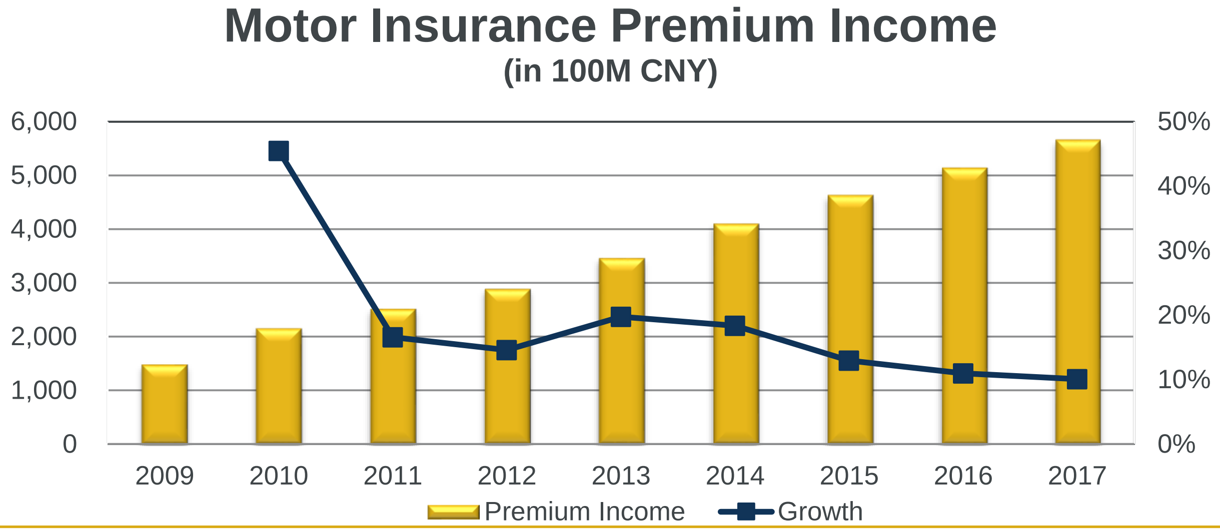
- The overall performance of motor insurance :



Institute and Faculty of Actuaries

Impact on the market

- Impact to rate and premium volume:
  - Average rate discount: NCD vs own discount
  - Average premium per policy: MPD vs TPL
  - Premium distribution by sales channel



Institute and Faculty of Actuaries

Impact on the market

Impact to claim loss:

NCD Bonus:
claim frequency
decrease
sharply

Avg. Claim Cost
increase a lot

Impact to overall u/w performance:

Loss ratio

Expense ratio

Motor Insurance Reforms in Malaysia

- In July 2016, reforms of liberalisation got started in Malaysia's insurance market and insurers were given authorisation to introduce new products, as well as add-on covers at market-driven prices.
- On 1st July 2017, the second phase of reforms to gradually ease tariffs in the motor and fire insurance segments came into effect as part of a larger effort to liberalise Malaysia's insurance market.
- The second round of reforms rids the segments of the rigid tariff structure, allowing for insurers to charge premiums aligning with the risk profile of clients.
- This is particularly applicable in the motor segment, in which underwriters can reward drivers with clean records and protect themselves against clients with a history of accidents or misdemeanours.

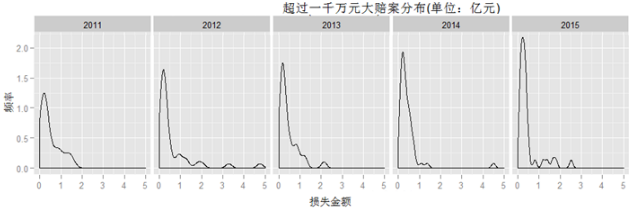
Institute and Faculty of Actuaries

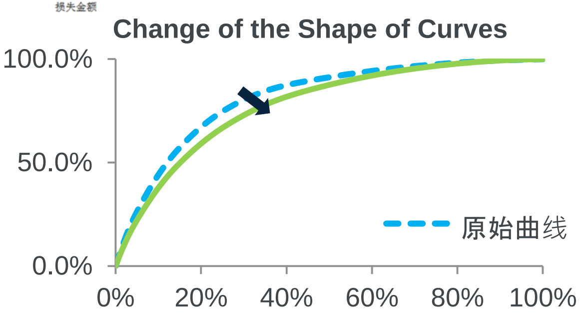
CONTENTS

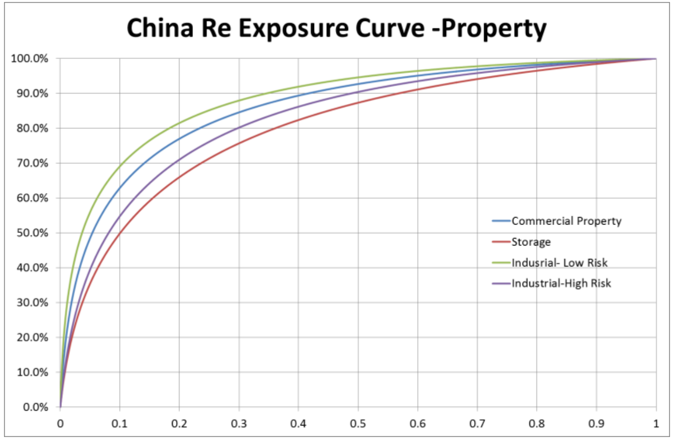
Institute and Faculty of Actuaries

Exposure Curves for Property Lines in China

- China Re released the first set of exposure curves for property lines in September 2013.
- In September 2015, the exposure curves were updated by China Re using the latest data.



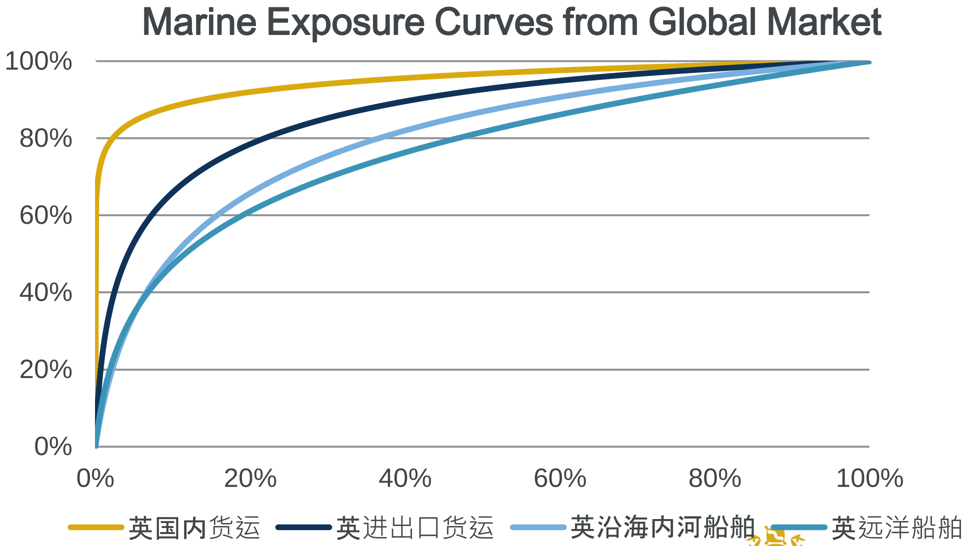




Exposure Curves for Marine Lines in China

- The insurers/reinsurers in China utilised marine exposure curves from global market for pricing marine risk for long.

01	Data source is unknown.
02	Data range is unknown.
03	Risk features are different.

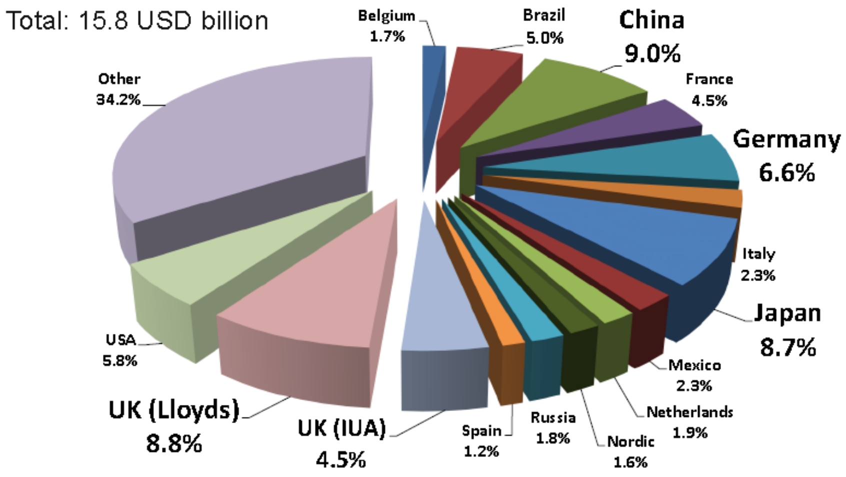


Institute and Faculty of Actuaries

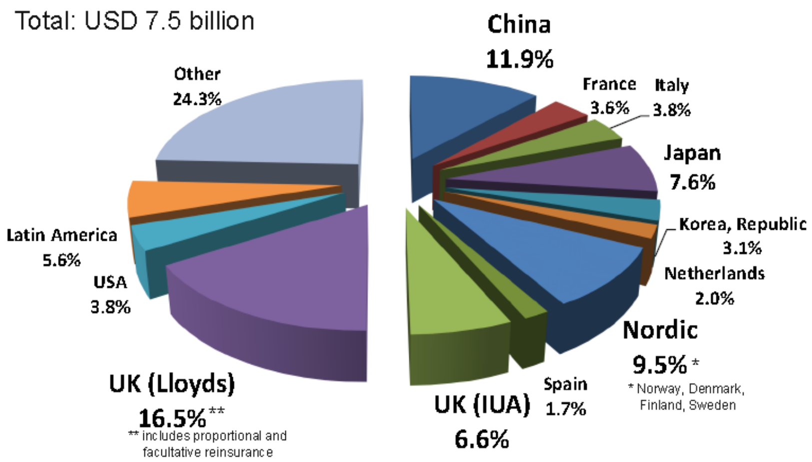
China Marine Insurance Market

- Judging from the data of IUMI, China was the largest marine market in the world in UY 2015.

Global Cargo Market

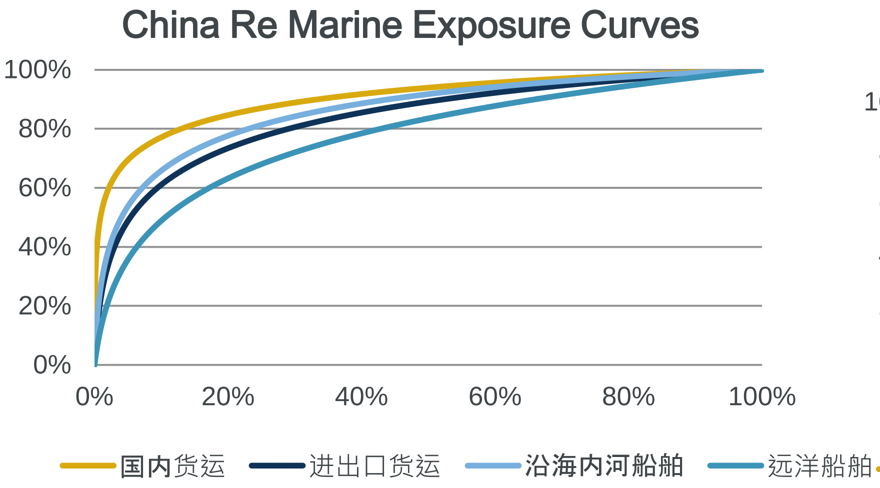


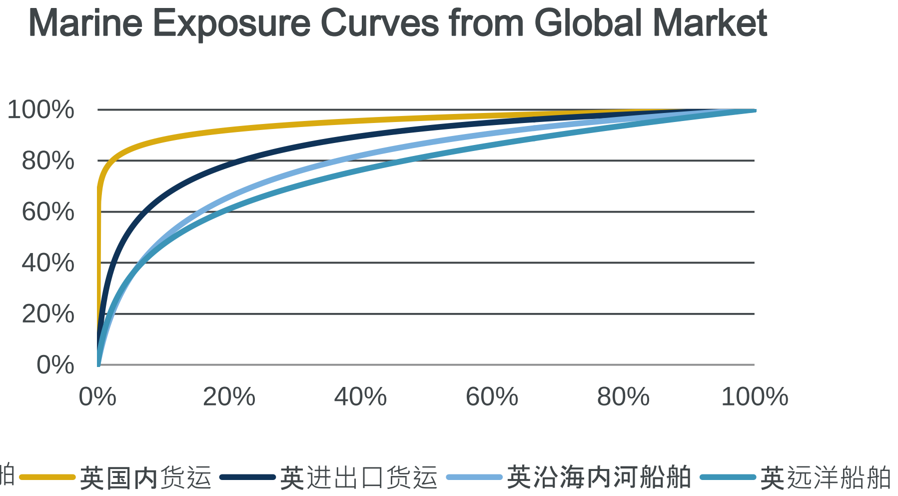
Global Hull Market



China Re Marine Exposure Curves

- China Re P&C released the first group of marine exposure curves in September 2017, based on the insurance data its IDEA Center collected from the industry.





Institute and Faculty of Actuaries

CONTENTS

Institute and Faculty of Actuaries

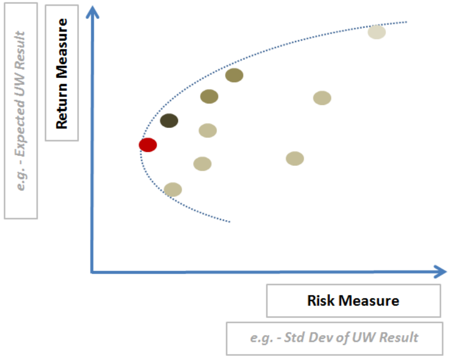
Assessing Reinsurance Adequacy

- Setting Your Risk Appetite
  - Able to withstand vertical losses (EQ, Flood) up to 200 years payback
  - Sufficient reinstatements for number of frequency losses
- Setting Your Retention
  - Rules of Thumb
  - DFA / Economic Capital Modelling approach
- Managing Likelihood of Reinsurer Default
  - Expected loss = RI Recovery x LGD% x PD%
  - Concentration limits per reinsurer
  - Stress & Scenario Testing

Institute and Faculty of Actuaries

Assessing Reinsurance Adequacy
Setting Your Retention

- Common "Rules of Thumb"
  - Applying factors based on financial structure and in line with management view, for each risk and event
  - x% of Net Income
  - y% of Current Assets or Equity
  - z% of Gross Written Premium



- Economic Capital Modelling approach
  - Stochastic analysis to find the optimal retention level
  - Maximising risk-return, via an efficient frontier
  - Reflect risk appetite and metrics (VaR, solvency)

Institute and Faculty of Actuaries

Assessing Reinsurance Adequacy
Factors which Influence the Retention

- Assets, Solvency, Capital and free reserves
- Size of portfolio and premium
- Type of Risks
- Frequency and severity of Risk

- Reinsurance type and cost
- Corporate Strategy
- Market Environment
- Exposure to accumulations/natural perils

Institute and Faculty of Actuaries

CONTENTS

Institute and Faculty of Actuaries

Reinsurance Management
Actuarial Function Under Solvency II

- Nature of the Opinion
  - Explain context, analysis and concerns in reviewing reinsurance; in how performance of the RI would enable firm to achieve target risk profile.
- – Risk Profile
  - Consider how consistent is the risk profile with the reinsurance
- Credit Profile
  - Consider credit worthiness of the reinsurer, in particular “dispute risk”
  - Potential losses due to inability of unwillingness to pay
- Stress Test
  - Consider performance under expected plan and stress scenarios
  - Potential impact of risk aggregation, and exhaustion of cover (vertically from CAT, horizontally from frequency losses).

Institute and Faculty of Actuaries

Reinsurance Management
Actuarial Function Under Solvency II (Continued)

Typical Report Components

	Outline
Executive Summary and Recommendations	Actuarial opinion on whether the RI structure is adequate
Governance	Discuss governance structure, opinion on process of review and approval
Underwriting Risk Profile, Existing Reinsurance Cover	Discuss changes expected to underwriting (mix, premiums...). Risk of vertical, horizontal exhaustion. Risk of not meeting placement terms.
Profitability	Analysis of impact of RI on profitability

Institute and Faculty of Actuaries

Conclusion

Difference Between Direct and Reinsurer During the Reinsurance Renewal

Direct Insurer

- Renewal is a major exercise.
- Assessment in the form of reinsurance optimization at entity level.
- Economic capital approach / solvency based view normally used.
- Reinsurer counterparty risk is important.

Reinsurer

- Account / contract specific pricing and underwriting.
- Technical pricing process, data adjustments, loss assumptions.
- Price needs to meet internal requirements.
- Portfolio level overview and steering.

Institute and Faculty of Actuaries

Conclusion

- Understand the reinsurance pricing process so that the renewal structure reflects your portfolio and risk appetite.
- Importance of data is crucial for a robust assessment, otherwise it could lead to pricing inefficiencies and higher reinsurance cost.
- *More information on this subject can be found in the paper "Analyzing the Disconnect Between the Reinsurance Submission and Global Underwriter's Needs" by the IFoA-CAS International Pricing Research Working Party*
- Assess reinsurance adequacy holistically in line with the risk appetite of your firm, using a DFA approach if possible.
- Flood pricing: Consider how to develop and price this risk to differentiate your firm in transitioning from the tariffed market.

Institute and Faculty of Actuaries

Question & Answer

Introduction of the Speaker

Mr. Xiaoxuan (Sherwin) LI

- Appointed Actuary of China Re P&C and Appointed Actuary of China Re Singapore Branch
- 14 yeas of working experience in insurance industry
- FIA, FCAS, Certified Catastrophe Risk Analyst (CCRA) , Microsoft Certified Systems Engineer (MCSE) , xiaoxuanli@hotmail.com

Mr. Sie Liang LAU

- Senior Underwriter of SCOR Global P&C
- 18 yeas of working experience in insurance industry
- FIA, SLAU@scor.com

Institute and Faculty of Actuaries

Thank you!

Institute and Faculty of Actuaries