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Determine required solvency capital
for P&C insurers in China market



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1 Background

- CIRC's Regulatory Strategies:

--- Three pillar framework has been accepted

(1) Solvency (2) Governance (3) Market Conduct

- On solvency pillar

1) Reserving standard has been implemented from 2005

2) A series of valuation rules for admissible assets and liabilities has been issued for actuarial solvency

3) But Statutory required/minimum solvency standard has not been updated since 2000.

1 Background: 3 elements in pillar 1

CIRC Solvency Report rules No. 1 --- 13

2) actual capital



3) Minimum capital/SM

CIRC: Insurance Administration 2000

CIRC [No.1, 2003]: Solvency Regulation

1) Reserving rules

CIRC [No.13, 2004]:

Technical Provisions in Non-life

1 Background: about the minimum SM

Two versions issued so far, but still not well made.

1st version: Insurance Administration 1996 by PBOC

- simple percentages of business volume
- a simplified model of the early USA models
- too high to be implemented

2nd version: Insurance Administration 2000 by CIRC,
and kept in

CIRC [No.1, 2003]: Solvency Regulation

- Solvency Margin (+ Regulatory indicators)
- A simplified model of EU Directive 73/239/EEC (Solvency 0)
- in use, but not so satisfied

2 Towards a reasonable standard

What is a reasonable level of minimum capital requirement (or solvency margin) ?

- must be risk-oriented, but
- risk capital is charged on those well recognized, significant, quantitatively measured risk step by step, not all in one time and one model.

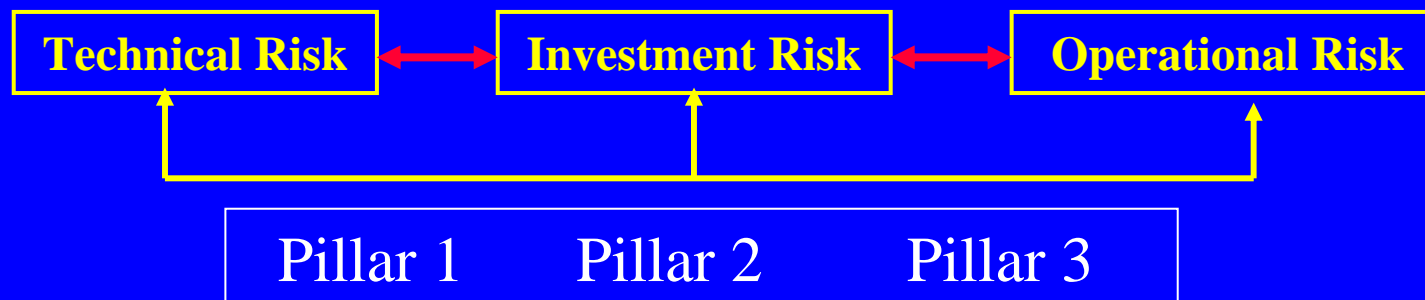
3 Study issues

(1) Risk analysis of P&C insurance industry

P&C insurers and market share in 2006

No.	1	2	3	4	5	6	7	8	9	others
%	45	11.5	10.7	9.5	4	4	2.5	2.2	1.8	14.8

Evolving and dynamic risk profile



3 Study issues

(2) Determine the risks for capital charge

	Risk	Capital charge	Estimated
R ₁	Investment	yes	25--35%
R ₂	Underwriting	yes	65—75%
	R _{2a} Reserving		
	R _{2b} Pricing		
R ₃	Credit (cat/reinsurance etc)	not yet	
R ₄	Operational/governance		
R ₅	A/L matching		

3 Study issues

(3) From company factors to industry standard:
3A: claims data for underwriting risk

claims data collected

Sample Insurer	Market share in 2004	Data records and form	No of Records
No.1	58%	1h/2001 --- 1h/2005	10
No.2	12%	4q/2000 --- 3q/2005	20
No.3	9%	a/1997 --- a/2005	9
No.4	0.82%	h/2002 --- h/2005	10
No.5	0.88%	1q/2001 --- 3q/2005	19
No.6	0.04%	h/2000 --- h/2004	10
No.7	0.04%	h/2000 --- h/2004	10

3 Study issues

3B: Estimate risk factors R_{2a}, R_{2b}

1) Reserve risk R_{2a}

Reserve distribution --- Bootstrap

$$R_{2a} = \frac{L(\alpha) - OS_n}{OS_n}$$

2) Pricing risk R_{2b}

Loss ratio distribution --- Parameter bootstrap

$$R_{2b} = \max\{LR_\alpha + ER - 1, 0\}$$

3) Confidence levels--- 95%, 99%

3 Study issues

3C: From company factors to industry standard

- (1) simple average
- (2) weighted average
- (3) above two compared, adjusted based on individual analysis on each business line

4 Initial results

Required capitals for sample companies (RMB'000, $\alpha=95\%$)

Capital charge		Sample companies					
		No.1	No.2	No.3	No.4	No.6	No.7
Reserving risk		3,086,635	1,056,597	1,086,407	62,259	5,816	8,293
Pricing risk		13,150,594	2,291,339	1,796,893	217,574	7,699	9,516
adjusted	$\rho=0.26$	7,133,947	1,380,721	1,164,525	120,684	5,394	7,078

SMSM (2004)	8,437,200	1,554,246	1,105,410	111,440	5,518	9,423
R2a + R2b/ SMSM (%)	84.55%	88.84%	105.35%	108.29%	97.76%	75.11%