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Capital Requirements by Regulatory Regime

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Objectives of session

Understand the impact of regulatory requirements on:

- Appetite and tolerance for capital at risk;
- Risk and capital management actions; and
- Broader implications for US Group RBC and ICS.

Understand similarities and differences between US, Bermuda and EEA regulatory capital requirements, including:

- Available capital considering balance sheet valuations
- Required capital based upon RBC formulas
- Levels and forms of regulatory intervention

Available capital versus RBC – US and UK

US RBC ($B)	2015 w/ cat	2015 no cat	2014 w/ cat	2014 no cat
Available Capital	833.5	833.5	830.1	830.1
Required Capital (CAL)	267.5	247.8	267.8	247.4
Solvency Ratio	312%	336%	310%	336%

Source: NAIC Aggregated P&C RBC Data

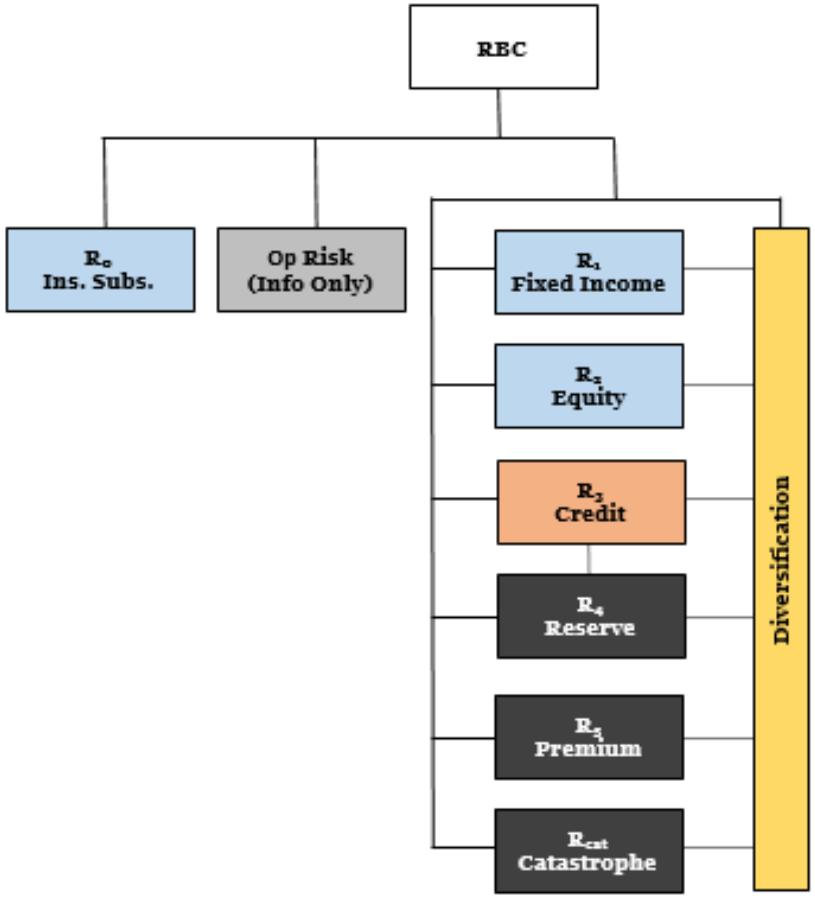
UK Solvency Ratios	Small	Medium	Large	Total
ICAS	190%	147%	195%	181%
SII Standard Formula	154%	137%	193%	173%

Source: PRA The Solvency 2 Regulation

Regulatory capital requirements - overview

Regime	US RBC	Bermuda BSCR	EEA SII SCR
RBC objective	• Minimum amount of capital required to support size and risk profile of insurer	• Target capital required for adequate policyholder protection considering the risk profile of the insurer	• Target capital required for adequate policyholder protection considering the risk profile of the insurer
RBC calibration	• No single calibration, certain factors 1% EPD	• 99 TVaR	• 99.5 VaR
Risk categories	• Fixed income, equity, credit, premium, reserve, affiliates, catastrophe (new), operational (draft)	• Fixed income, equity, interest, credit, premium, reserve, catastrophe, operational	• Spread, equity, interest, property, currency, concentration, credit, premium, reserve, catastrophe, operational
Dependency	• Assumed independence between risk categories, except credit and reserve risk	• Assumed independence between risk categories, except credit and reserve risk	• Assumed correlations between and within risk categories
Regulatory intervention	• CAL = 200% ACL • RAL = 150% ACL • ACL = 100% ACL • MCL = 70% ACL	• ECR (BSCR or ICM), however Target Capital Level is 120% of ECR • May require capital add-ons, adj. to BSCR	• SCR • MCR = linear formula, floor of 25% & cap of 45% of SCR • May compel internal model, require capital add-ons

Required capital – US RBC



- $RBC = R_0 + \sqrt{{R_1}^2 + {R_2}^2 + {R_3}^2 + {R_4}^2 + {R_5}^2 + {R_{cat}}^2}$

  where

  R_o = Insurance affiliate investment and (non-derivative) off-balance sheet risk

  R_1 = Invested asset risk - fixed income investments

  R_2 = Invested asset risk - equity investments

  R_3 = Credit risk (non-reinsurance plus one half reinsurance credit risk)

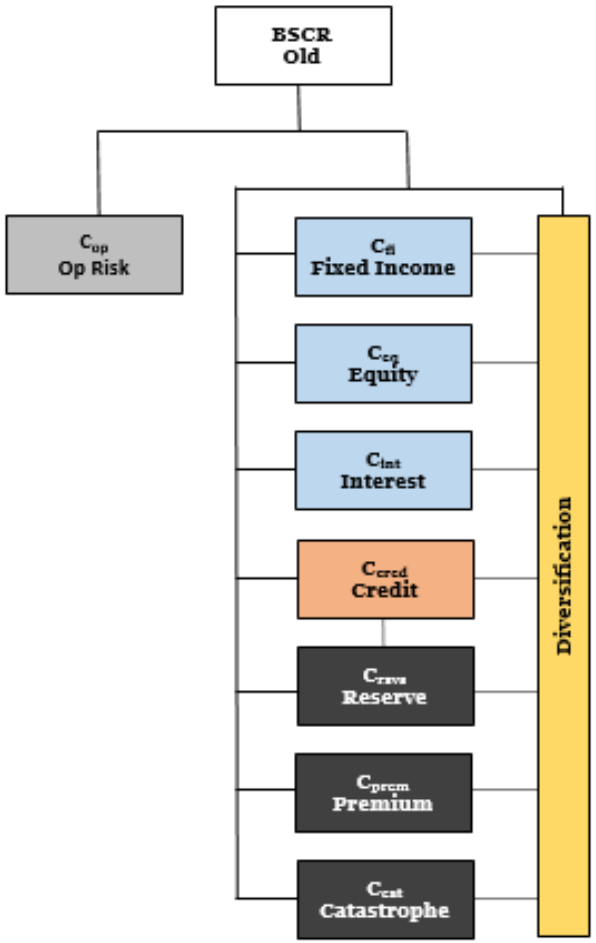
  R_4 = Loss reserve risk, one half reinsurance credit risk, growth risk

  R_5 = Premium risk, growth risk

  R_{cat} = Catastrophe risk, including earthquake and hurricane

- 50% of required capital related to reinsurance recoverables is shifted to reserve risk R_4 from credit risk R_3
- Operational risk - informational only

Required capital – Bermuda BSCR (Old)



- $BSCR = C_{op} + \sqrt{C_{fi}{}^2 + C_{eq}{}^2 + C_{int}{}^2 + C_{prem}{}^2 + (\frac{1}{2}C_{cred}+C_{rsvs})^2 + (\frac{1}{2}C_{cred})^2 + C_{cat}{}^2}$

  where

  C_{op} = Operational risk

  C_{fi} = Fixed income investment risk

  C_{eq} = Equity investment risk

  C_{int} = Interest rate / liquidity risk

  C_{prem} = Premium risk

  C_{rsvs} = Reserve risk

  C_{cred} = Credit risk

  C_{cat} = Catastrophe risk

- BMA may assess capital add-ons/reductions directly to the BSCR for items such as: provisions for reserve deficiencies or premium inadequacies, significant growth in premiums, and quality of risk management surrounding operational risk.

Required capital – Bermuda BSCR (New)

- $$BSCR = C_{adj} + C_{op} + \sqrt{{C_{fi}}^2 + {C_{eq}}^2 + {C_{int}}^2 + {C_{cur}}^2 + {C_{conc}}^2 + {C_{prem}}^2 + (\frac{1}{2}C_{cred}+C_{rsvs})^2 + (\frac{1}{2}C_{cred})^2 + {C_{cat}}^2}$$

  where

  C_{adj} = Regulatory capital requirement for regulated non-insurance financial operating entities

  C_{op} = Operational risk

  C_{fi} = Fixed income investment risk

  C_{eq} = Equity investment risk

  C_{int} = Interest rate / liquidity risk

  C_{curr} = Currency risk

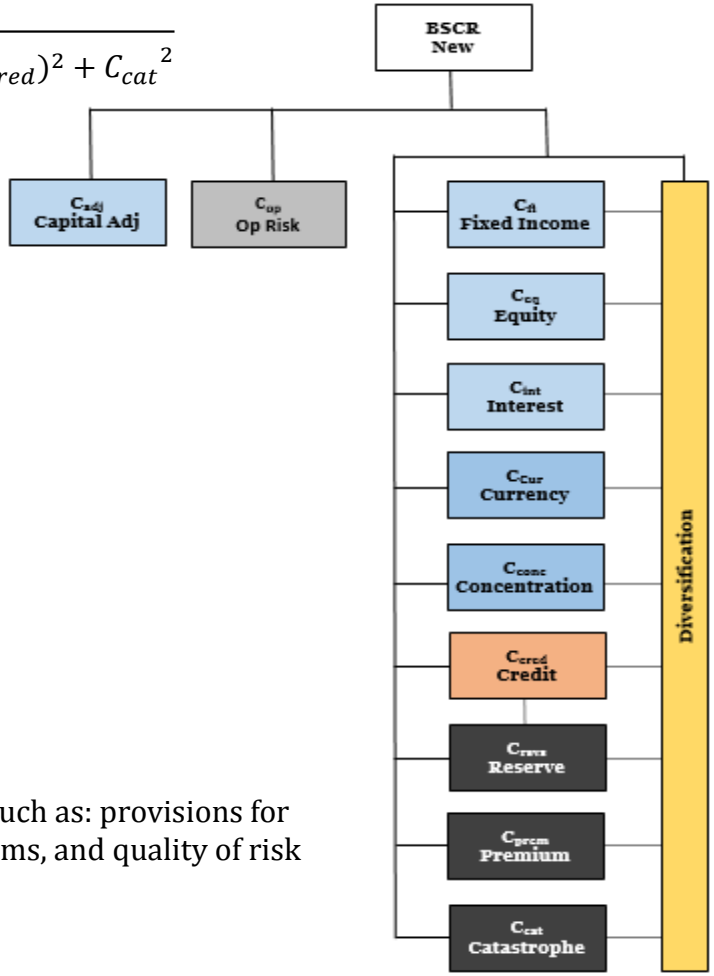
  C_{conc} = Concentration risk

  C_{prem} = Premium risk

  C_{rsvs} = Reserve risk

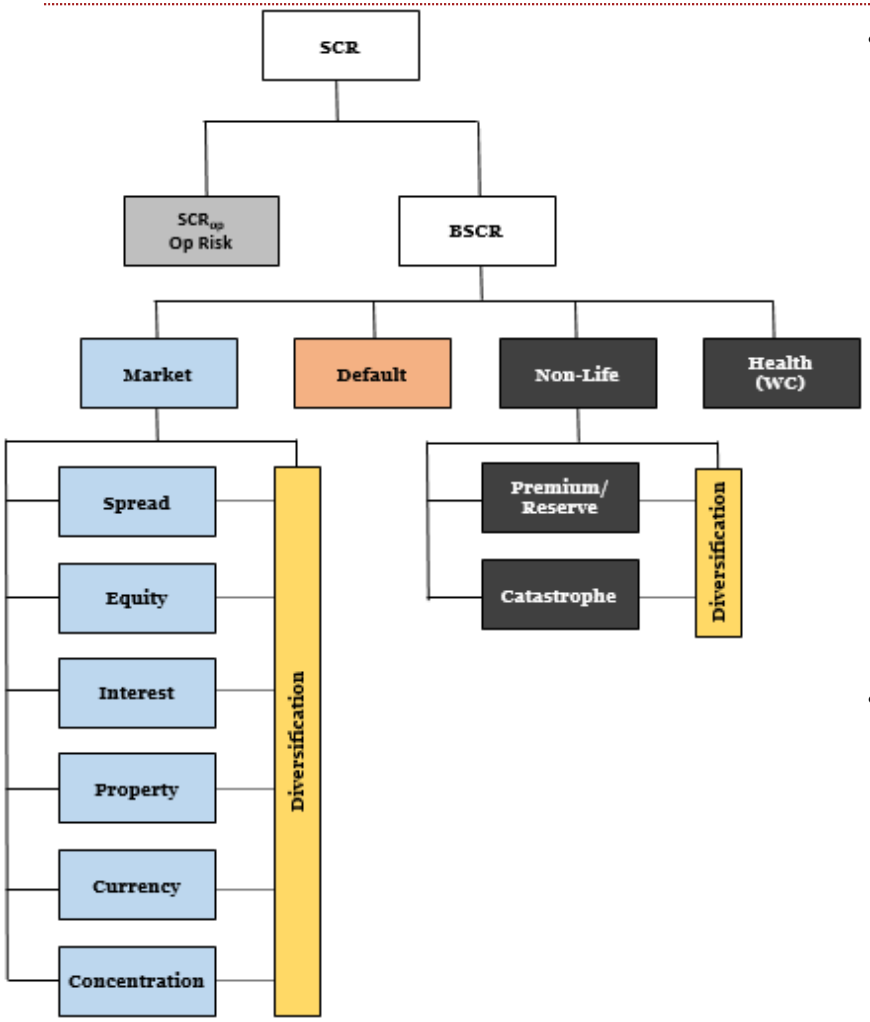
  C_{cred} = Credit risk

  C_{cat} = Catastrophe risk



- BMA may assess capital add-ons/reductions directly to the BSCR for items such as: provisions for reserve deficiencies or premium inadequacies, significant growth in premiums, and quality of risk management surrounding operational risk.

RBC risk categories – EEA SII Standard Formula



- $SCR = BSCR + Adj + SCR_{op}$

  where

  $$BSCR = \sqrt{\sum_{ij} Corr_{ij} \times SCR_i \times SCR_j} + SCR_{intangible}$$

  and

  $Adj =$ Adjustment for risk absorbing effect of TP and deferred taxes

  $SCR_{op} =$ Operational risk

  $Corr_{ij} =$ Correlation

  SCR_i and $SCR_j =$ Market risk, counterparty default risk, non-life underwriting risk, and health underwriting risk

  $SCR_{intangible} =$ Intangible asset risk

- Adj, $SCR_{intangible}$ and certain sub-modules (i.e. life underwriting) have been redacted from the graphic.

Balance sheet valuation differences

	US Statutory	Bermuda Statutory	Bermuda EBS	EEA SII BS
Assets	• Bonds at amortized cost • Equities at market value	• Bonds at market value or amortized cost • Equities at market value	• GAAP or IFRS, if at fair value	• SII (or IFRS if SII not economic)
Liabilities	• LLAE Reserves: Undiscounted MBE • Unearned Premium Reserves (UPR)	• LLAE Reserves: Undiscounted MBE • UPR	• Technical Provisions - Loss and Premium	• Technical Provisions - Loss and Premium
				

Sample company

Company profile

- Multiline property & casualty insurer
- Net written premium: $13.3 billion
- Assets: $28.4 billion
- Surplus: $9.3 billion

Simplifications

- No deferred tax assets or liabilities
- No affiliates

Sample balance sheets under different regimes

($ Billions)	US Statutory	BDA Statutory	BDA EBS	EEA SII BS
Bonds	18.2	18.6	18.6	18.6
Equities	2.7	2.7	2.7	2.7
Cash and Other Invested Assets	3.3	3.3	3.3	3.3
Other Assets	4.2	4.2	4.2	4.2
Total Assets	**28.4**	**28.9**	**28.9**	**28.9**
LLAE Reserves / Provisions	11.7	11.7	10.8	10.8
UPR / Provisions	5.2	5.2	3.7	3.7
Risk Margins	--	--	2.2	2.2
Other Liabilities	2.2	2.2	2.2	2.2
Total Liabilities	**19.1**	**19.1**	**18.8**	**18.8**
Surplus / Available Capital	**9.3**	**9.8**	**10.1**	**10.1**

Comparison of regulatory required capital

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII SCR
Market	1.0	1.1	2.1	3.3
Credit	0.1	0.2	0.2	0.6
Insurance	5.2	12.3	10.1	4.0
Total	**6.3**	**13.5**	**12.3**	**7.9**
Diversification ($)	(3.4)	(5.9)	(6.1)	(1.7)
Diversification (%)	54%	44%	50%	22%
Pre-Op Risk	**2.9**	**7.6**	**6.2**	**6.1**
Op Risk	0.1	0.8	0.6	0.4
RBC / BSCR / SCR	**3.0**	**8.3**	**6.8**	**6.6**
Surplus / Available Capital	9.3	9.8	10.1	10.1
Solvency Ratio	**312%**	**117%**	**148%**	**154%**

- EEA SII utilizes separate correlation matrices to determine diversification benefit within market and insurance sub-modules

Required capital by risk category - market

Risk	US RBC	Bermuda BSCR (Stat)	Bermuda BSCR (EBS)	EEA SII SCR
Fixed Income	• Factor based charges • Bond size adj. factor	• Factor based charges	• Factor based charges	
Spread				• Shock on non-government bonds
Equity	• Factor based charges	• Factor based charges, affiliates < SII	• Factor based charges	• Shock on equities, affiliates > BSCR
Interest		• Shock on bonds not held to maturity	• Shock on all bonds	• Shock on net (interest sensitive) assets
Property	• Factor based charges, included in Equity	• Factor based charges, included in Equity	• Factor based charges, included in Equity	• Factor based charges, relatively high
Currency			• Shock by currency if net assets < proxy	• Shock on net assets by currency
Concentration	• Factor based on largest 10 exposures, included in FI/Equity		• Factor based on largest 10 exposures	• Variable shock of assets > proportion threshold

Required capital by risk category – market (cont'd)

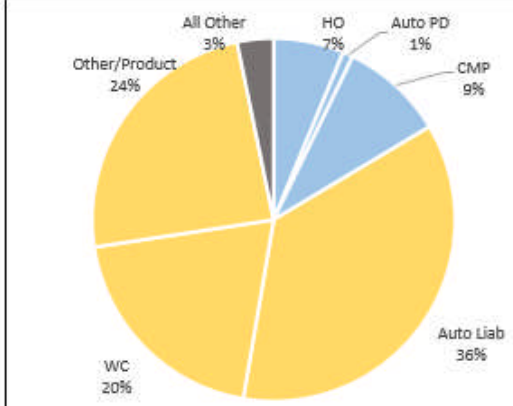
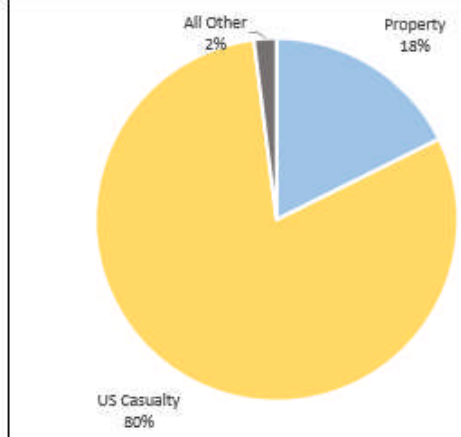
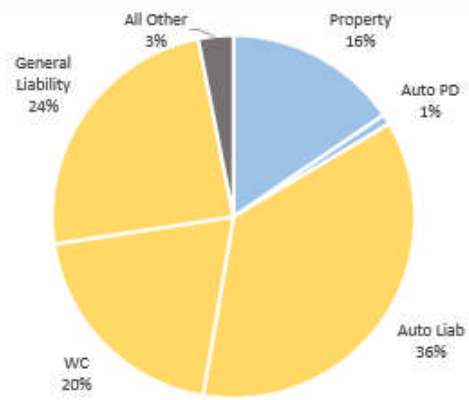
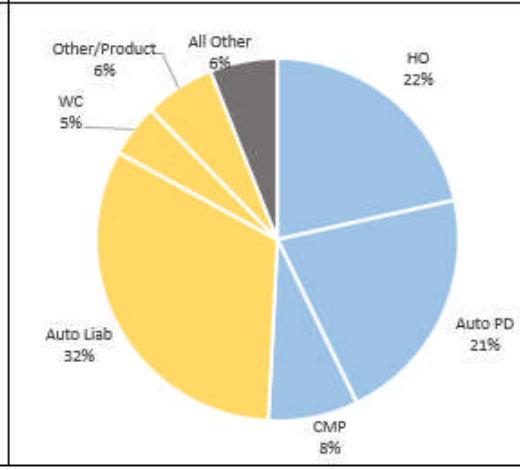
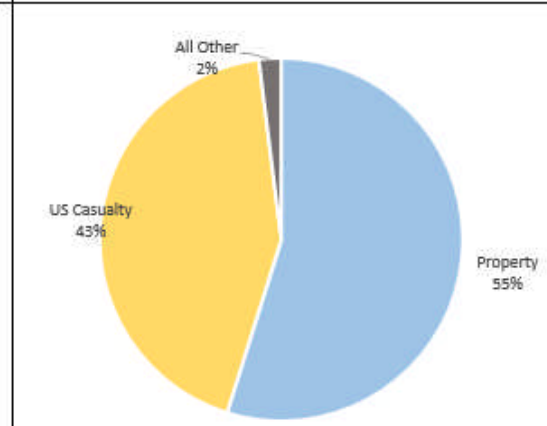
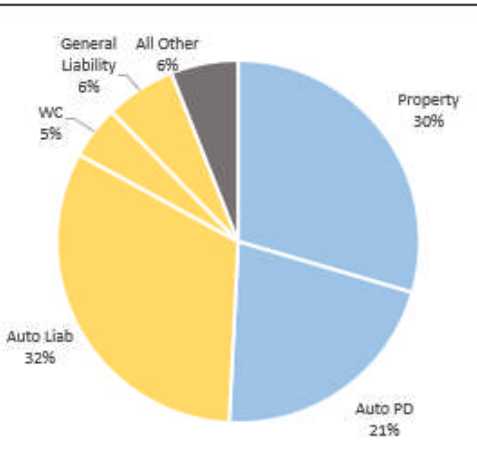
($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
Fixed Income	0.2	0.1	0.1	--
Spread	--	--	--	0.9
Equity	0.9	0.9	0.9	2.4
Interest	--	0.0	0.4	0.0
Property	--	--	--	0.1
Currency	--	--	0.6	0.4
Concentration	--	--	0.0	0.2
Total	**1.0**	**1.1**	**2.1**	**3.9**
Diversification ($)	--	--	--	(0.7)
Diversification (%)	--	--	--	17%
Market Risk	**--**	**--**	**--**	**3.3**

Required capital by risk category - credit

Risk	US RBC	Bermuda BSCR (Stat)	Bermuda BSCR (EBS)	EEA SII SCR
Credit	• Factor based charges	• Factor based charges	• Factor based charges	• Factor based charges • Reinsurance recoverables offset by collateral, mitigants

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
Credit Risk	0.1	0.2	0.2	0.6

Insurance risk – mapping lines of business

	NAIC RBC	BMA BSCR	Solvency II
By Reserves			
By Premium			

Required capital by risk category – insurance risk

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
Reserve	1.7	4.7	3.5	1.7
Premium	1.5	5.4	4.4	1.7
Catastrophe	2.1	2.2	2.2	2.0
Total	**5.2**	**12.3**	**10.1**	**5.4**
Diversification ($)	--	--	--	(1.5)
Diversification (%)	--	--	--	27%
Insurance Risk	**--**	**--**	**--**	**4.0**

Required capital by risk category – reserve risk

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
Nominal reserves	11.7	11.7	11.7	11.7
Implied discount	88.4%	--	92.0%	92.0%
Discounted reserves	10.4	--	10.8	10.8
Implied geo-div factor	--	--	81.3%	81.3%
Total post geo-diversification	--	--	8.8	8.8
Implied capital charge	20.1%	43.2%	43.2%	30.7%
Pre-covariance amount	2.1	5.1	3.8	2.7
LoB diversification factor	78.9%	92.1%	92.1%	62.9%
Total required capital	1.7	4.7	3.5	1.7
'% of nominal reserves	14.0%	39.8%	29.7%	14.4%
% of discounted reserves	15.8%	--	32.3%	15.7%

Required capital by risk category – premium risk

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
2016 NWP (estimated)	13.3	13.3	13.3	13.1
Implied geo-div factor	--	--	81.3%	81.3%
Total post geo-diversification	--	--	10.8	10.6
Implied capital charge	14.6%	49.8%	49.8%	24.3%
Pre-covariance amount	1.9	6.6	5.4	2.6
LoB diversification factor	78.4%	81.8%	81.8%	67.2%
Total required capital	1.5	5.4	4.4	1.7
% of NWP	11.5%	40.8%	33.1%	13.3%

Required capital by risk category – cat risk

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII
Hurricane – net	1.5			1.5
Earthquake – net	0.5			0.5
Net PML/natural catastrophe		2.0	2.0	1.6
Credit charge	0.1	0.2	0.2	
Man made catastrophe				1.2
Other catastrophe				0.2
Total required capital	2.1	2.2	2.2	2.0

- EEA SII utilizes separate correlation matrices to determine diversification benefit within natural catastrophes and man made catastrophes. in addition to an overall correlation between natural, man made, and other catastrophes

Sensitivity to insurance exposure

Sample company: multi-line example

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII SCR
Insurance	5.2	12.3	10.1	4.0
Total	6.3	13.5	12.3	7.9
RBC / BSCR / SCR	3.0	8.3	6.8	6.6
Solvency Ratio	312%	117%	148%	154%

Sample company: mono-line example (general liability)

($ Billions)	US RBC	BDA BSCR (Stat)	BDA BSCR (EBS)	EEA SII SCR
Insurance	5.2	11.7	9.2	5.6
Total	6.3	13.0	11.5	9.5
RBC / BSCR / SCR	4.1	9.3	7.4	7.9
Solvency Ratio	228%	105%	136%	128%

Conclusions

- While rating agency required capital is often the binding capital constraint for US insurers, growth in non-US territories can have a significant impact on an insurer's ability to strategically deploy capital within a global group.
- Regulatory capital standards continue to evolve, with enhancements to US RBC well underway, NAIC development of a US capital standard for US insurance groups, Fed development of a capital standard for regulated insurance groups, and the IAIS' development of ICS. Understanding the nuances of local regulatory capital requirements is essential for informed contributions to the discussions surrounding these evolving standards.

Useful references

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