



Reinsurance and Rating Agency Models

Susan Witcraft

Prepared for: Casualty Loss Reserve Seminar

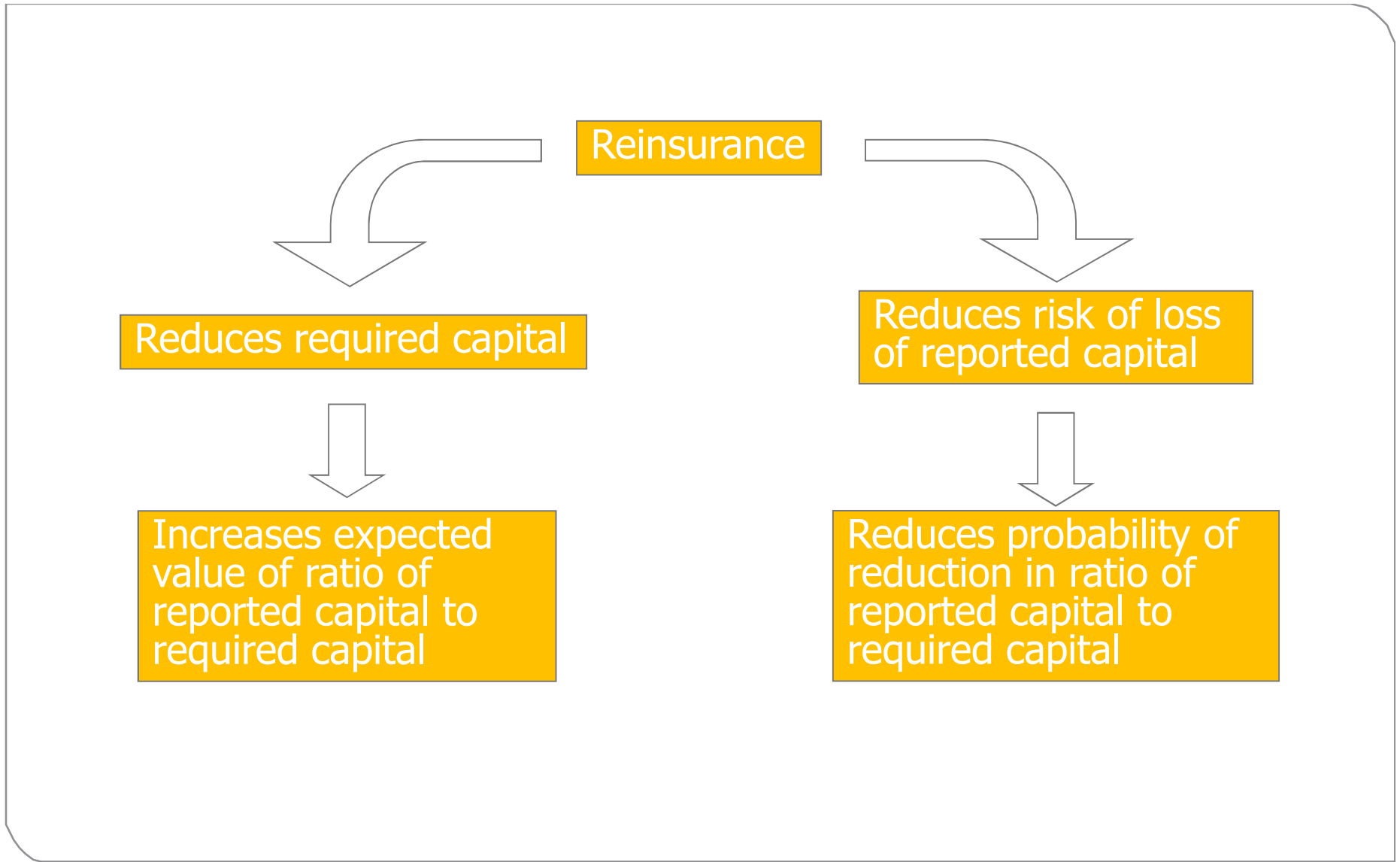
September 16, 2013

Capital Adequacy Models

Complexity & Risk Sensitivity

Agency		Ratio	Risk Based Capital Quantitative Analyst Judgment	Stress Testing Or Stochastic
Regulatory System	U.S.	IRIS Tests	RBC Calculation	
	Canada		MCT Calculation	DCAT
	Japan		SMR Calculation	
	Australia		MCR Calculation	Internal Model Option
	EU	Solvency 1 Rules	ECR	Internal Model Option
Rating Agency System	S&P	Basic Ratio And Peer Comparisons	S&P Capital Adequacy Ratio (SPCAR)	
	A.M. Best		A.M. Best Capital Adequacy Ratio (BCAR)	
	Moody's		Moody's MRAC	
	Fitch		Fitch PRISM	

Dual Effect of Reinsurance on Capital Adequacy



Best Capital Adequacy Ratio (BCAR)

BCAR = Adjusted Surplus / Required Capital

Secure Ratings

A++	>175%
A+	>160%
A	>145%
A-	>130%
B++	>115%
B+	>100%

Vulnerable Ratings

B-/B	>80%
C+/C++	>60%
C-/C	>40%

BCAR: Base Formula

Adjusted statutory capital is reported surplus
adjusted for after-tax impact of:

- + equity in unearned premium reserves
- + equity (discount amount) in the loss reserves
- + or - redundancy or deficiency in loss reserves
- + or - market vs. book value of fixed income portfolio
- one net catastrophe PML

BCAR: Required Capital

- Invested asset risk
- Interest rate risk
- Credit risk
- Reserve risk
- Premium risk

BCAR: Invested Asset Risk

	Statement Value	Asset Risk Factor %	Required Capital		Statement Value	Asset Risk Factor %	Required Capital
Bonds							
U. S. Government	21,858	0.0%	-				
Class 1	52,406	1.0%	524	Mortgage & Collateralized Loans	-	5.0%	-
Class 2	8,743	2.0%	175	Real Estate - Owner Occupied	-	10.0%	-
Class 3	2,267	4.0%	91	Real Estate - Investment	-	20.0%	-
Class 4	-	4.5%	-	Contract Loans	-	5.0%	-
Class 5	-	10.0%	-	Cash	5,667	0.3%	17
Class 6	-	30.0%	-	Short Term Investments	-	1.0%	-
Affiliated	-	100.0%	-	Other Investments	-	20.0%	-
Total Bonds	85,274		790	Title Plants	-	10.0%	-
				EDP and Other Tangible Assets	-	20.0%	-
Preferred Stocks				Foreign Exchange Rate Asset	-	20.0%	-
Non-affiliated	-	15.0%	-	Aggregate Write-Ins	-	20.0%	-
Affiliated	-	100.0%	-				
Total Preferred Stocks	-		-				
Common Stocks				Sub Totals	99,036		2,021
Non-affiliated	8,096	15.0%	1,214				
Affiliated	-	100.0%	-	Multiply: Spread of Risk Factor			1.259
Total Common Stocks	8,096		1,214	Company Totals	99,036		2,544

BCAR: Credit Risk

	Statement Value	Increase for Reserve Deficiency	Adjusted Amount	Credit Risk Factor (%)	Required Capital for Credit Risk	Selected Reinsurance Dependence Factor (C)	Required Capital for Reins Dependence	Total Required Capital
Agents' Balances:								
In Course of Collection	6,186	-	6,186	5.0%	309	-	-	309
Deferred - Net Yet Due	-	-	-	5.0%	-	-	-	-
Accrued Retros	-	-	-	10.0%	-	-	-	-
Gross Agents' Bal.	6,186	-	6,186	5.0%	309	-	-	309
Reinsurance Recoverables (A):								
US Insurers	29,425	3,934	33,360	5.5%	1,841	1,282	519	2,361
Pools & Associations - Reinsurers	-	-	-	10.0%	-	1,282	-	-
Pools & Associations - State Run	-	-	-	3.0%	-	1,282	-	-
All Other Insurers	2,943	313	3,255	9.0%	293	1,282	83	376
Less: Schedule F Provision	-	-	-	10.0%	-	1,282	-	-
Less: Funds Held by Company	-	-	-	10.0%	-	1,211	-	-
Net Reinsurance Recoverables	32,368	4,247	36,615	5.8%	2,134	-	602	2,736
All Other Receivables:								
Federal Income Tax	1,500	-	1,500	5.0%	75	-	-	75
Accrued investment Income	700	-	700	2.5%	18	-	-	18
Receivable from Affiliates	1,200	-	1,200	5.0%	60	-	-	60
Write-Ins	100	-	100	5.0%	5	-	-	5
Total Other Receivables	3,500	-	3,500		158	-	-	158
Company Totals	42,054	4,247	46,301	6.2%	2,601		602	3,203

BCAR: Reserve Risk

	Statement Reserves	Deficiency Factor	Discount Factor	Adjusted Reserves	Capital Factor	Adj' Req'd Capital
Homeowners/Farmowners Multi-Peril	0	1.00	0.95	0	0.37	0
Private Passenger Auto Liability	0	1.00	0.93	0	0.38	0
Commercial Auto Liability	0	1.00	0.89	0	0.38	0
Workers' Compensation	63,096	1.00	0.79	49,845	0.39	19,440
Commercial Multi-Peril	0	1.17	0.85	0	0.28	0
Medical Malpractice: Occurrence	0	1.00	0.85	0	0.50	0
Medical Malpractice: Claims-Made	0	1.00	0.89	0	0.44	0
Special Liability	0	1.00	0.92	0	0.45	0
Other Liability: Occurrence	0	1.00	0.82	0	0.45	0
Other Liability: Claims-Made	0	1.00	0.86	0	0.42	0
Products Liability: Occurrence	0	1.00	0.80	0	0.50	0
Products Liability: Claims-Made	0	1.00	0.84	0	0.43	0
Special Property	0	1.00	0.95	0	0.44	0
Auto Physical Damage	0	1.00	0.94	0	0.44	0
Fidelity/Surety/Fin Guar/Mtg Guar	0	1.00	0.95	0	0.44	0
Other (Credit, A&H, Agg Write-ins)	0	1.00	0.90	0	0.44	0
International	0	1.00	0.90	0	0.59	0
Reinsurance: Property	0	1.00	0.95	0	0.45	0
Reinsurance: Liability	0	1.00	0.87	0	0.51	0
Reinsurance: Financial	0	1.00	0.90	0	0.50	0
Total	63,096	1.00	0.79	49,845	0.39	19,440
					Growth Factor	1.00
					Diversification Factor	1.00
						19,440

BCAR: Premium Risk

	Net Written Premium	Capital Charge	Adj Req'd Capital
Homeowners/Farmowners Multi-Peril	0	0.53	-
Private Passenger Auto Liability	0	0.36	-
Commercial Auto Liability	0	0.39	-
Workers' Compensation	42,788	0.40	17,115
Commercial Multi-Peril	0	0.33	-
Medical Malpractice: Occurrence	0	0.41	-
Medical Malpractice: Claims-Made	0	0.35	-
Special Liability	0	0.41	-
Other Liability: Occurrence	0	0.44	-
Other Liability: Claims-Made	0	0.37	-
Products Liability: Occurrence	0	0.42	-
Products Liability: Claims-Made	0	0.36	-
Special Property	0	0.48	-
Auto Physical Damage	0	0.33	-
Fidelity/Surety/Fin Guar/Mtg Guar	0	0.33	-
Other (Credit, A&H, Agg Write-ins)	0	0.33	-
International	0	0.59	-
Reinsurance: Property	0	0.54	-
Reinsurance: Liability	0	0.45	-
Reinsurance: Financial	0	0.53	-
Total	42,788	0.40	17,115
		Growth Factor	1.00
		Diversification Factor	1.00
			17,115

BCAR: Required Capital & BCAR

Required Capital	
<u>Asset Risk</u>	
(B1) Fixed Income Securities	1,016
(B2) Equity Securities	1,529
Subtotal	<u>2,544</u>
(B3) Interest Rate	1,185
Total Investment Risk	<u>3,730</u>
(B4) Credit	3,203
Total Asset Risk	<u>6,932</u>
<u>Underwriting Risk</u>	
(B5) Loss and LAE Reserves	19,440
(B6) Net Premiums Written	17,115
Total Underwriting Risk	<u>36,555</u>
(B7) Business Risk	-
Gross Required Capital (GRC)	43,487
Less: Covariance Adjustment	<u>16,229</u>
Net Required Capital (NRC)	<u>27,258</u>
Adjusted Surplus (APHS)	39,639
BCAR % (APHS/NRC)	1.454

BCAR: Reinsurance Impact

- Excess of Loss
 - Reduces
 - Written premium risk
 - Reserve risk
 - Invested asset risk
 - Increases credit risk
 - Net impact is usually increase in BCAR
 - Often greater benefit over time as ceded reserves build

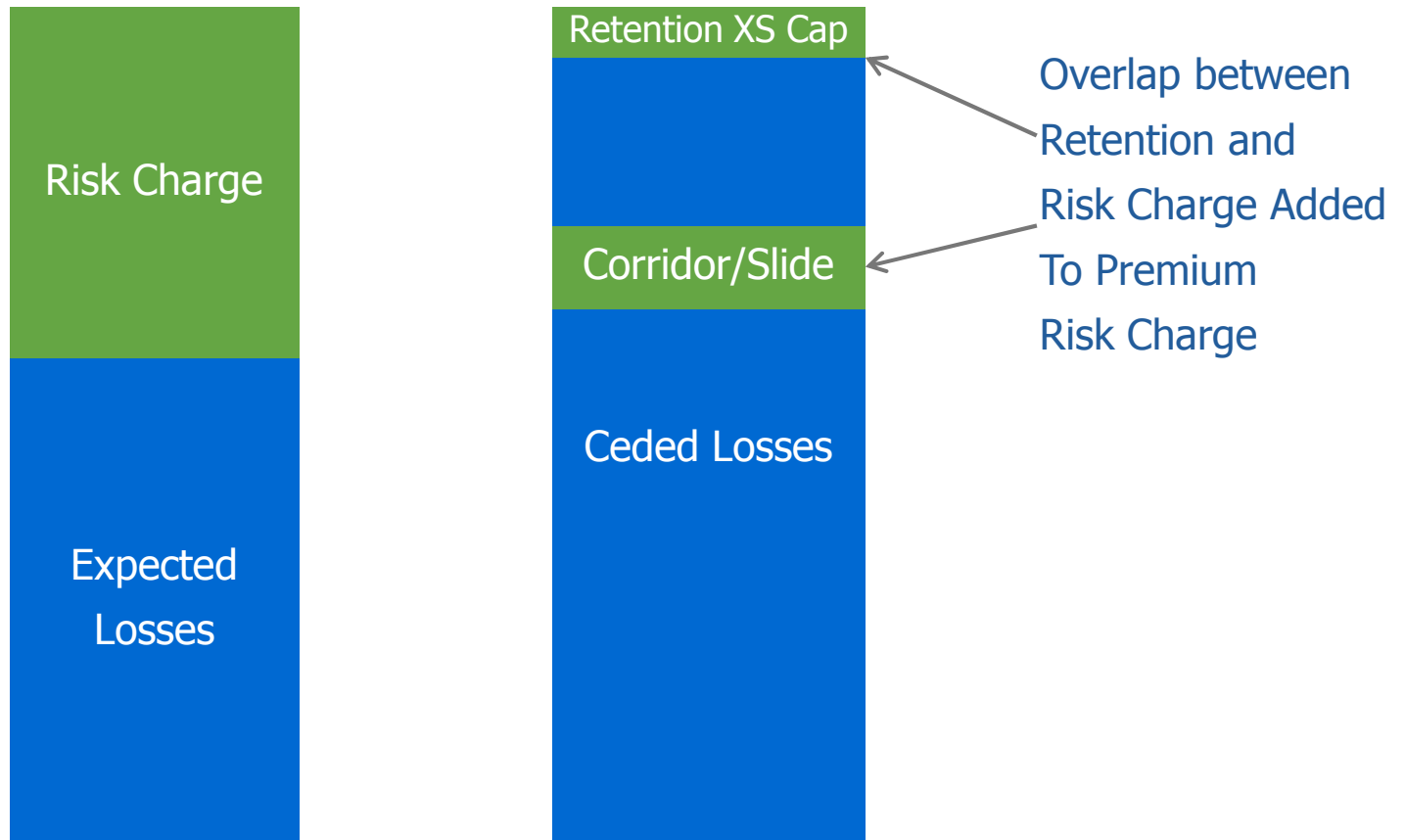
BCAR: Reinsurance Impact

- Quota share
 - Reduces
 - Written premium risk
 - Reserve risk
 - Invested asset risk
 - Increases credit risk
 - Little or no ceding commission impact due to adjustment for DAC asset
 - Adjustments made for risk retained due to caps, corridors and sliding scale commissions
 - Net impact is usually increase in BCAR
 - Impact often bigger than reduced excess retention due to greater premium cession

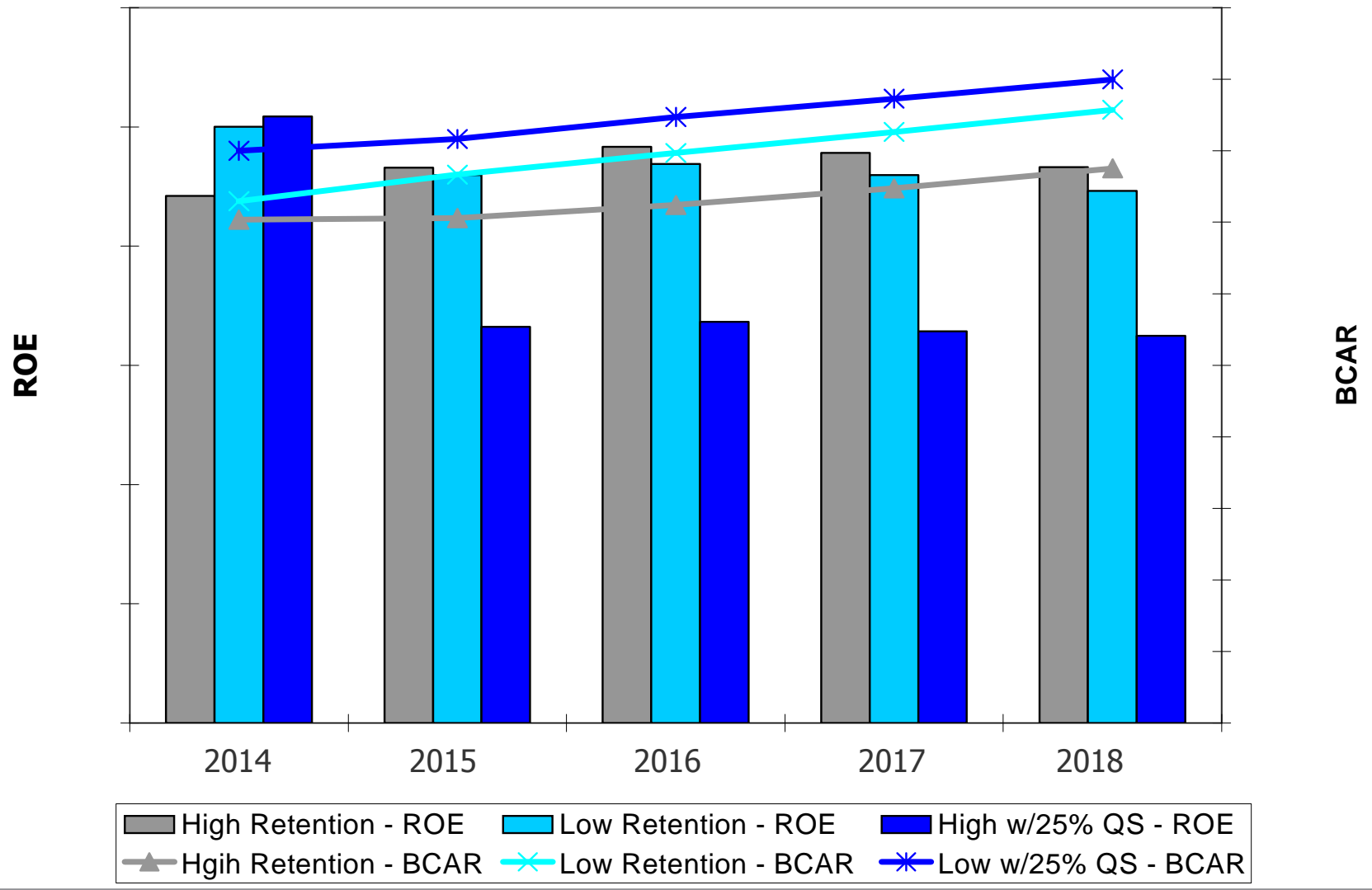
BCAR: Reinsurance Impact

Required Capital	High Retention	Low Retention	High w/ QS
<u>Asset Risk</u>			
(B1) Fixed Income Securities	1,016	996	900
(B2) Equity Securities	1,529	4,304	3,890
Subtotal	2,544	5,299	4,790
(B3) Interest Rate	1,185	947	856
Total Investment Risk	3,730	6,246	5,645
(B4) Credit	3,203	3,742	4,539
Total Asset Risk	6,932	9,988	10,184
<u>Underwriting Risk</u>			
(B5) Loss and LAE Reserves	19,440	18,141	16,439
(B6) Net Premiums Written	17,115	13,091	10,654
Total Underwriting Risk	36,555	31,232	27,093
(B7) Business Risk	-	-	-
Gross Required Capital (GRC)	43,487	41,220	37,277
Less: Covariance Adjustment	16,229	16,812	15,247
Net Required Capital (NRC)	27,258	24,408	22,030
Adjusted Surplus (APHS)	39,639	37,339	37,390
BCAR % (APHS/NRC)	1.454	1.530	1.697

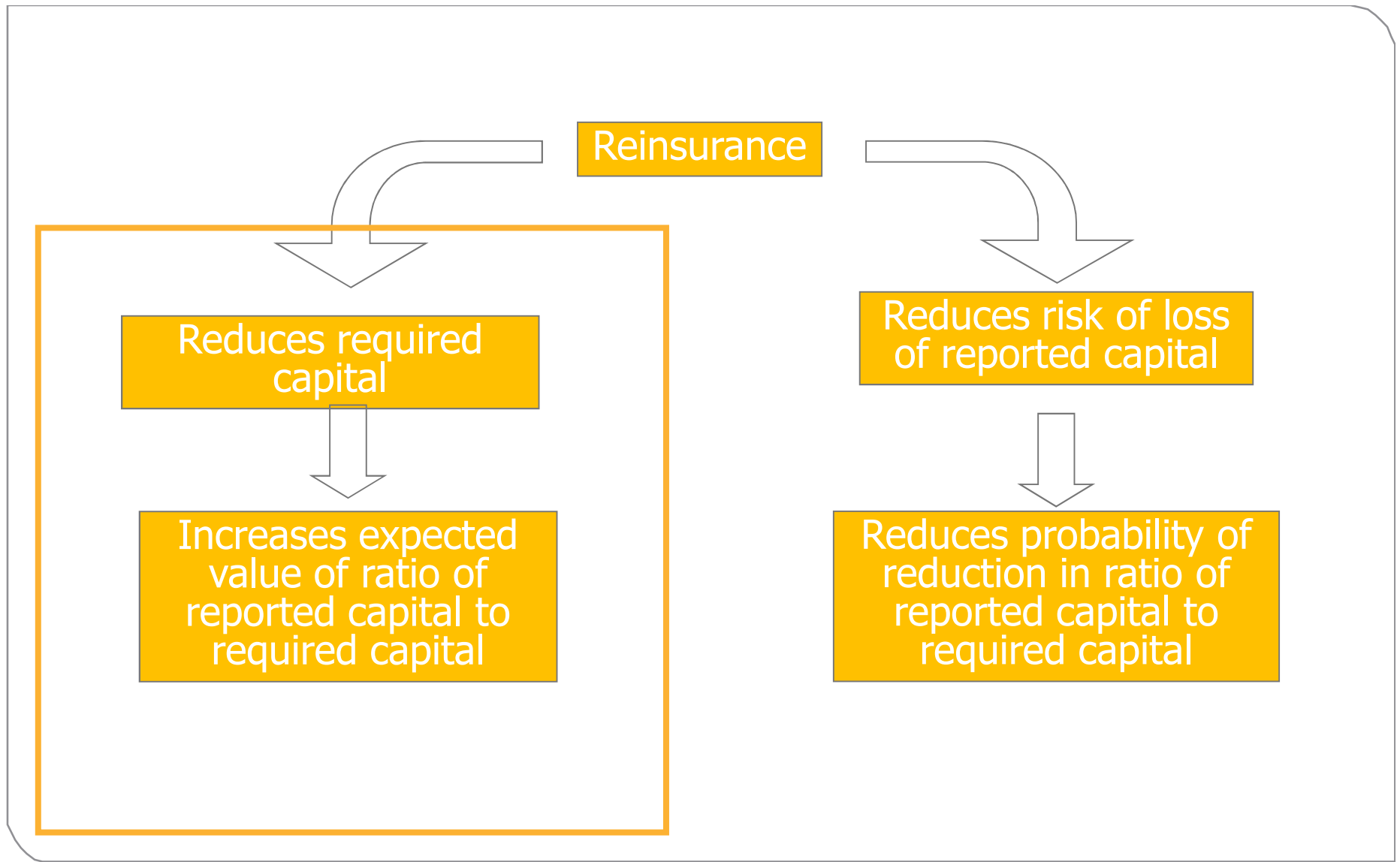
BCAR Impact: Risk Limiting Features



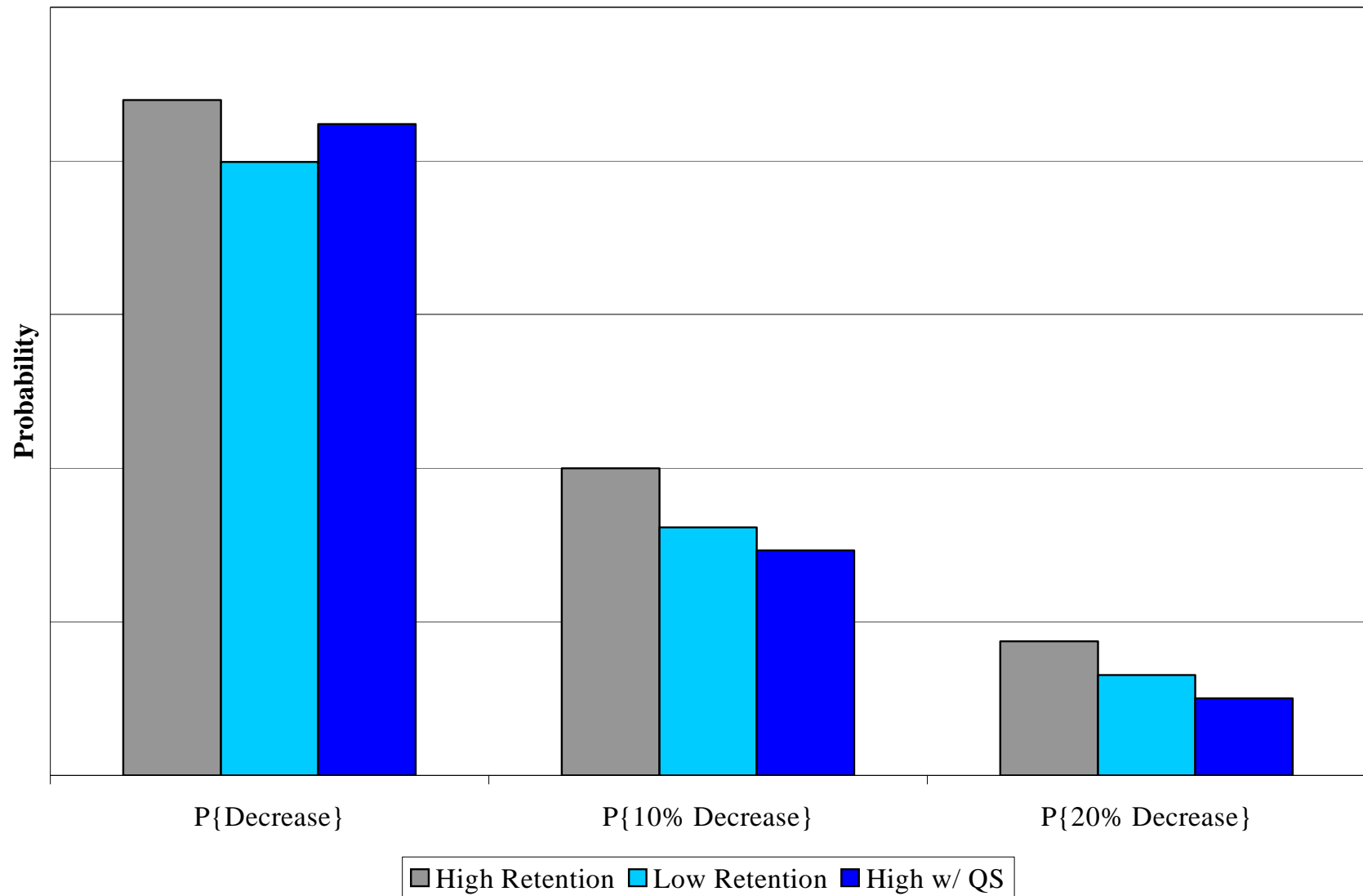
BCAR: Long Term Reinsurance Impact



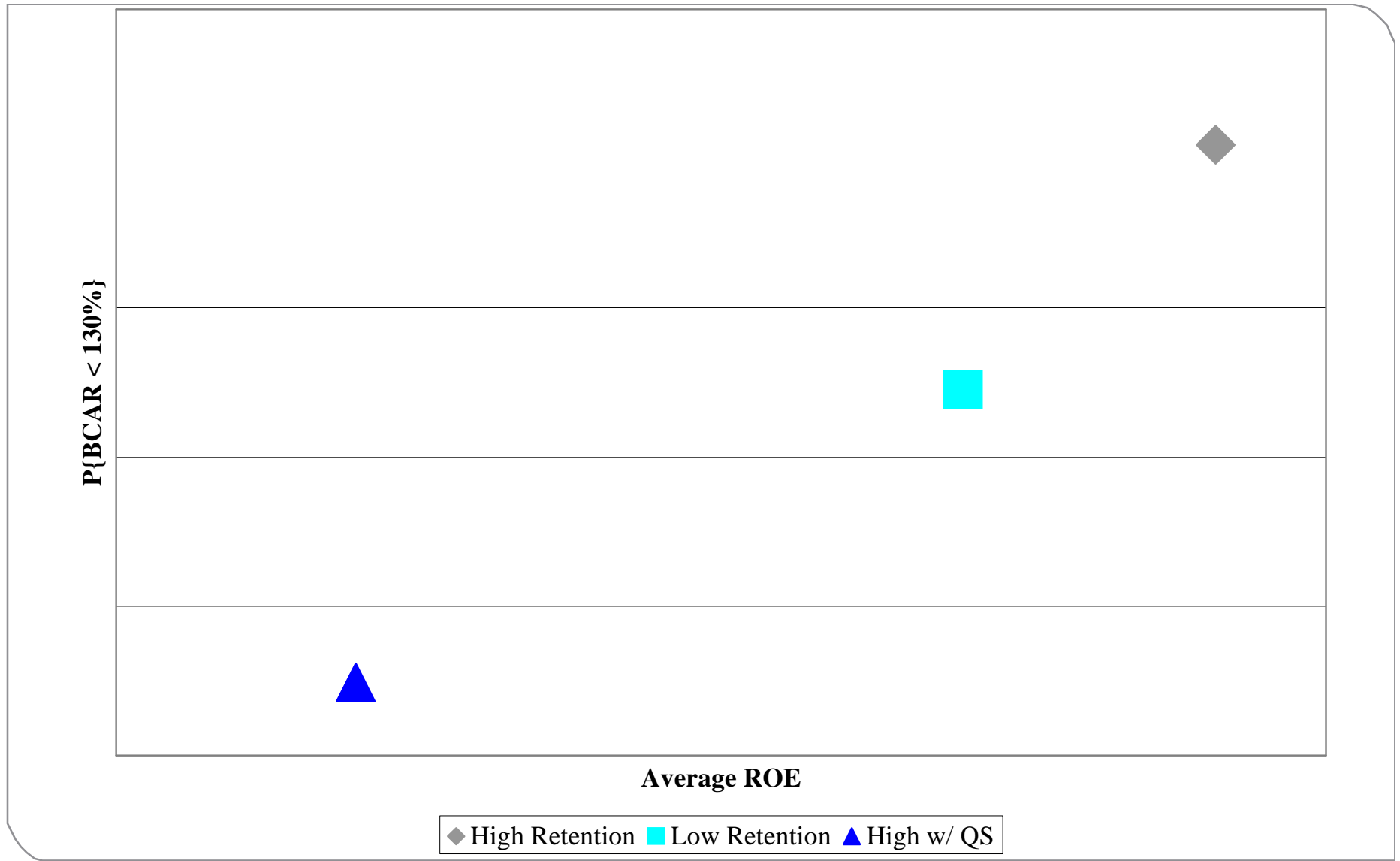
Dual Effect of Reinsurance on Capital Adequacy



Reinsurance Protects Against Surplus Reduction



Reinsurance Protects Against BCAR Decline





Reinsurance and Rating Agency Models

Susan Witcraft

Prepared for: Casualty Loss Reserve Seminar

September 16, 2013