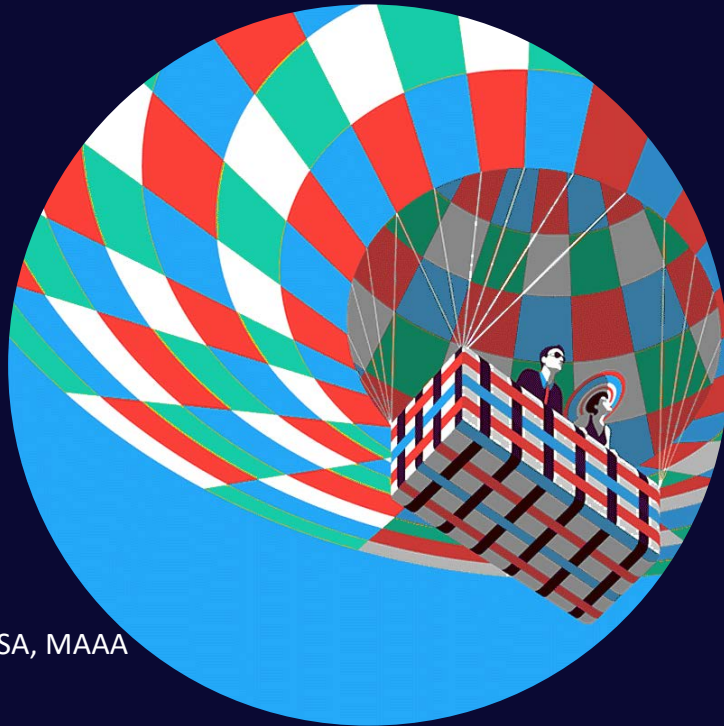


The Revised S&P Global Insurance Capital Model



Presented by
Spencer Ackerman, FSA, MAAA
May 21, 2024

About this Presentation

About Delaware Life

- Founded in 2013, Delaware Life Insurance Company is the flagship member of Group 1001 Insurance Businesses. Group 1001 is a collective that empowers its companies to create positive growth.
- Active seller of retirement products (MYGA, FIA and VA)
- Subsidiary Clear Spring Property & Casualty actively sells Workers Comp, General Liability, and Select Auto
- Rated by AM Best, S&P and Fitch

About my role at Delaware Life

- Responsible for internal capital modeling, forecasting, reporting and analysis for NAIC RBC, AM Best and S&P
- Part of Life & Annuity business unit, but also support the Property & Casualty business unit as well as other corporate capital initiatives
- Lead a cross departmental effort to fill out and submit the new capital model inputs
- Worked with our rating analysts to assist their review of our results under the new criteria

Focus of presentation

- Investments and Annuities
- Statutory NAIC perspective
- Cross capital perspective between NAIC RBC, AM Best and S&P
- Views are my own and do not reflect those of Group 1001 or Delaware Life

Agenda



General Background

Timeline of Capital Model Development
Structural Changes of Capital Model



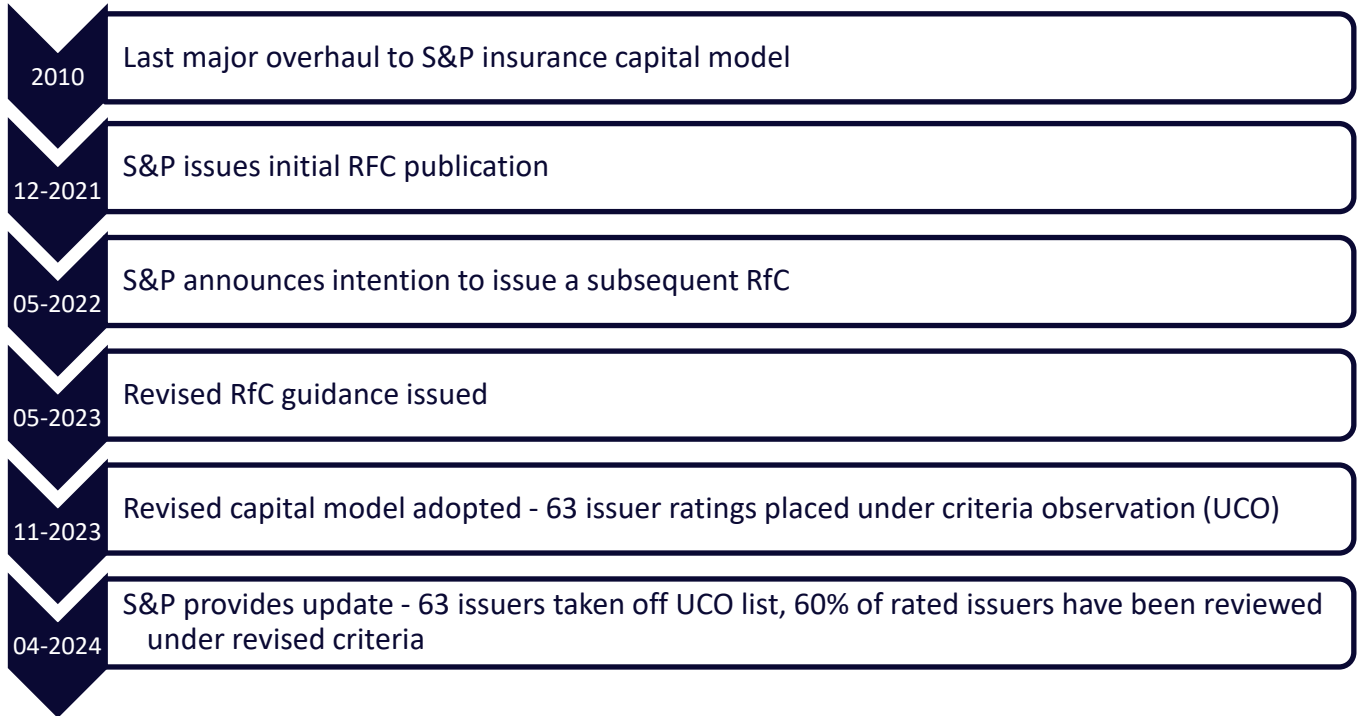
Deep Dive into Selected Topics

Investment Risks
Liability and Interest Rate Risks
Diversification



Q&A

S&P Global Insurance Capital Model Timeline



General Changes to Capital Model

“RBC requirements are the amounts of capital in excess of reserves that an insurance company may need to cover losses from different risks in stress scenarios.” – S&P Insurer Risk Based Capital Criteria

Changes from prior model

- New risk scenario levels that are no longer described with a specific rating
- New factors and inputs for everything
- Completely new diversification credit
- Goal of global consistency
 - Accounting agnostic inputs that require interpretation
 - Inputs are almost entirely provided from company records

Risk Scenario	New Model VaR Level	Prior Model Mapped Level
Moderate Stress	99.5%	BBB
Substantial Stress	99.8%	A
Severe Stress	99.95%	AA
Extreme Stress	99.99%	AAA

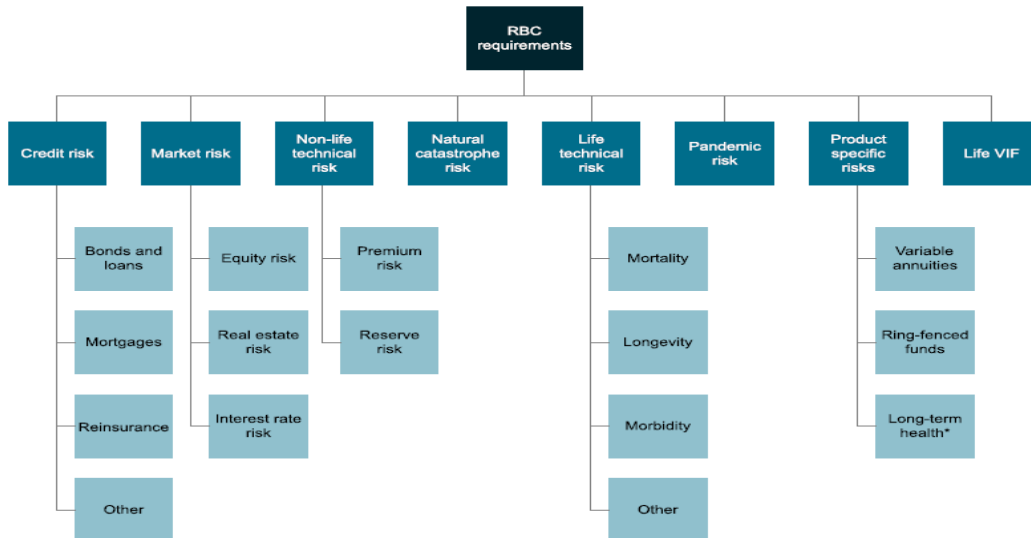
Similarities with prior model

- Transparent capital model provided to insurer
- Primary metric is redundancy in both absolute dollars and as a percent of required capital

General Changes to Capital Model

- New risk categories replacing C1, C2, C3 and C4 categories
- Risk categories get 2-3 levels of diversification, one level within risk categories, and between risk categories

Risk-based capital requirements



*Long-term health business with aging reserves. Source: S&P Global Ratings.
Copyright © 2023 by Standard & Poor's Financial Services LLC. All rights reserved.

Section 2

Investment Risk

Investment Risks

Changes against prior model

- Bond risk charges now vary by recovery category

Table 37

Credit Risk Recovery Categories

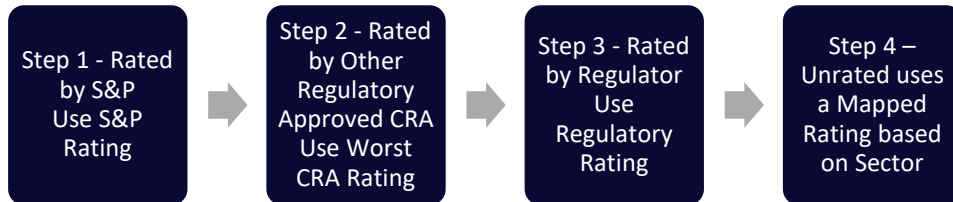
Category Typical assets

Category 1	Sovereign, local and regional governments (LRGs), and U.S. municipal debt (including multilateral lending institutions)
	Government-related entities (GREs) with an almost certain likelihood of extraordinary government support where we equalize the rating with the relevant sovereign
	Senior secured bonds and loans (corporates, financials, and non-LRG public-sector obligors)
	Infrastructure corporates and project finance (other than subordinated exposures)
	Covered bonds
Category 2	Senior unsecured bonds and loans (corporates, financials, and non-LRG public-sector obligors)
Category 3	Subordinated bonds and loans and preferred stock (corporates, financials, non-LRG public-sector obligors, and infrastructure)
Category 4	Structured finance, including non-agency RMBS, non-agency CMBS, CLO, CDO, ABS, agency RMBS, and agency CMBS

Investment Risks

Changes against prior model

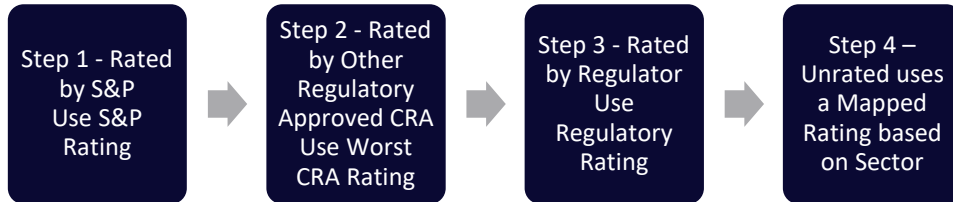
- Bond risk charges now vary by recovery category
- Credit Rating follows a waterfall selection process



Investment Risks

Changes against prior model

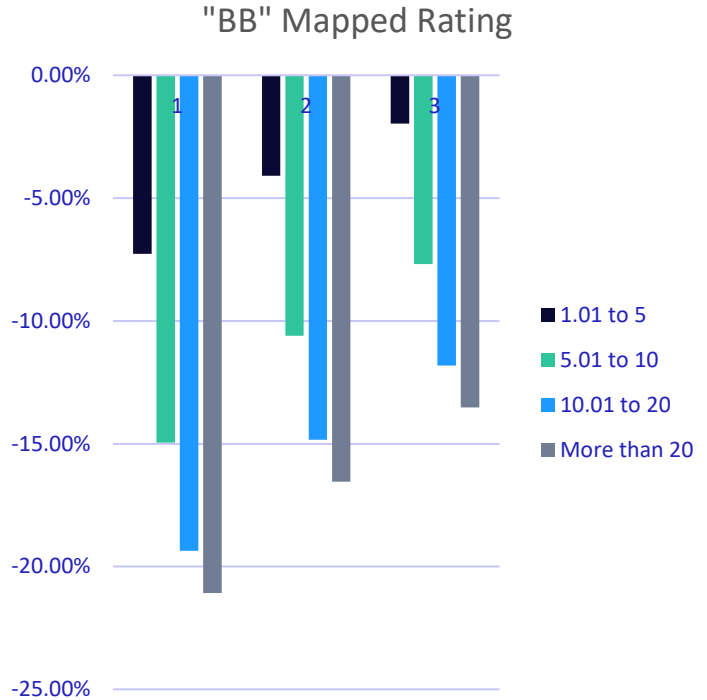
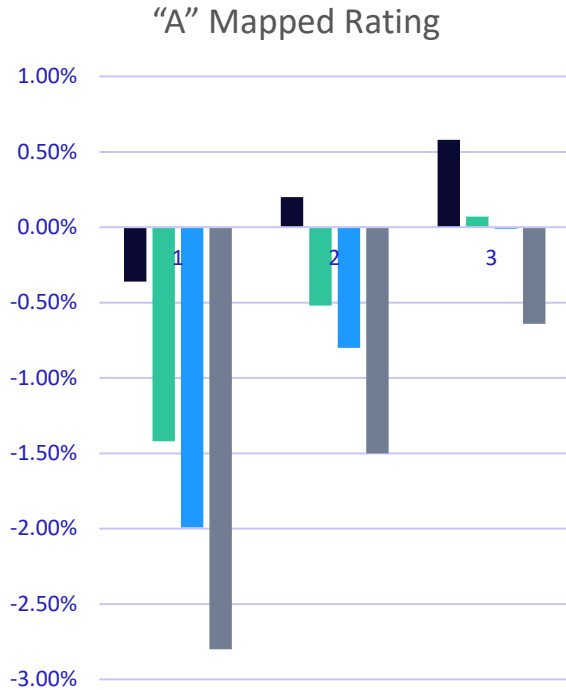
- Bond risk charges now vary by recovery category
- Credit Rating follows a waterfall selection process



- Designed to be agnostic to the accounting regime
- **Requires a significant effort in pulling the relevant data from your investment management and accounting system**

Investment Risks

S&P VaR 99.95% less Current AA Factor Differences – excluding Recovery Category 4



Investment Risks

Changes against prior model

Illustrative Portfolio Example composed of 90% Bonds (70% IG, 20% BIG), 6% Equity, 4% Cash

Category	YTM	Rating	%	S&P VaR		Model Impact
				99.95%	S&P AA	
Bond - IG Structured	5 Yrs	A	10%	1.7%	1.2%	0.5%
Bond - BIG Structured	5 Yrs	BB	5%	12.3%	20.0%	-7.7%
Bond - IG Unsecured	5 Yrs	BBB	30%	2.5%	2.5%	0.0%
Bond - IG Secured	5 Yrs	BBB	30%	1.4%	2.5%	-1.2%
Bond - BIG Secured	5 Yrs	BB	15%	3.7%	11.0%	-7.3%
Structured finance - junior	5 Yrs		1%	100.0%	42.0%	58.0%
Unlisted Equities			5%	60.0%	42.0%	18.0%
Cash			4%	0.2%	0.1%	0.1%
Total			100%	6.5%	6.8%	-0.3%

Investment Risks

Cross Model Comparison

Example compared to AM Best (BCAR) and NAIC RBC (at 400% Target)

- No diversification credit reflected
- BCAR model does not reflect ESG or High Risk CMO adjustments
- RBC does not reflect Bond Size Factor adjustments

Category	YTM	Rating	%	S&P VaR	BCAR VaR	Diff BCAR	RBC 400% CAL	Diff RBC
				99.95%	99.6%			
Bond - IG Structured	5 Yrs	A	10%	1.7%	2.4%	-0.7%	2.7%	-1.0%
Bond - BIG Structured	5 Yrs	BB	5%	12.3%	10.7%	1.7%	15.1%	-2.8%
Bond - IG Unsecured	5 Yrs	BBB	30%	2.5%	5.1%	-2.6%	2.7%	-0.2%
Bond - IG Secured	5 Yrs	BBB	30%	1.4%	5.1%	-3.8%	2.7%	-1.4%
Bond - BIG Secured	5 Yrs	BB	15%	3.7%	10.7%	-6.9%	15.1%	-11.4%
Structured finance - junior	5 Yrs		1%	100.0%	48.4%	51.6%	142.2%	-42.2%
Unlisted Equity			5%	60.0%	55.0%	5.0%	94.8%	-34.8%
Cash			4%	0.2%	0%	-0.1%	1.3%	-1.1%
Total			100%	6.5%	8.7%	-2.2%	11.1%	-4.6%

Liability and Interest Rate Risks

Life Risks – Other Life Technical

Original C3 and C4 risk charges broken into targeted risk charges on interest rate, longevity, and 'other life technical risk' (lapse risk)

Other Life Technical Risk varies by three risk categories

1. Lapse risk without mitigants – 2.0%
2. Lapse risk with mitigants – 1.0%
3. No lapse risk of 0.6%

Category 3 – 'No Lapse Risk' has a risk charge meant to cover operating expense risk

Other Life Technical Risks				
Product	Reported life net reserves	Lapse Risk Mitigants (%)	Not exposed to lapse risk (%)	Risk Category
<i>General account</i>				
Non-linked savings* (eg Fixed indexed annuity / RILA)				1
Immediate payout annuities				3
<i>Separate account</i>				
Linked business without guarantees (e.g. Variable universal life)				3

Life Risks - Longevity

Longevity Risk varies by three categories

1. High risk Products with no or limited lump-sum optionality for policyholders (e.g. SPIA)
2. Medium Risk
Products with economically attractive annuitization options that may or may not be utilized by the policyholder, assumes 30% of policyholders annuitize (e.g. Deferred Annuities with rich annuitization options)
3. Low Risk (no risk charge)
Immaterial longevity risk due to economically unattractive annuitization options

Risk charge is scaled down when reserves for products exposed to longevity risk are held significantly above 'best estimate' levels

Longevity Risk		
Longevity risk category	NPV Future Claim Payments	Risk Category
Category 1- immediate payout annuities		1
Category 1- other		1
Category 2		2
Category 3		3
Reserve confidence level	Default	

Longevity risk charges	Reserve confidence level	
	Reserve Confidence Level	Reduction in Charge
Risk Category	99.95%	
Category 1	7.00%	0%
Category 2	2.10%	25%
Category 3	0.00%	35%
	90% or above	45%

Life Risks – Illustrative Example

Below are the prior S&P capital model C3 and C4 risk charges for select products. How will the new model impact liability risk charges on select product types?

Product Type	C3	C4	Total Old Model	VaR 99.95%	Impact
Full MVAs with surrender charge	3.90%	0.20%	4.10%	?	?
No MVAs without surrender charge	4.10%	0.20%	4.30%	?	?
Retail SPIAs with life contingencies	3.50%	0.20%	3.70%	?	?
Retail SPIAs without life contingencies	2.80%	0.20%	3.00%	?	?
Linked business without guarantees (e.g. Variable universal life)	0.00%	0.00%	0.00%	?	?

Life Risks – Illustrative Example

Illustrative Example Assumptions

- Longevity reserves at highest confidence level (45% reduction in risk charge)
- No ALM credit reflected in interest rate risk charge (can be reduced up to 50%)
- Deferred Annuities have economically attractive annuitization options

Product Type	Risk Category			Risk Charge Pre Divers.			
	Interest Rate Risk	Longev. Risk	Lapse Risk	Interest Rate Risk	Longev. Risk	Lapse Risk	Total
Full MVAs with surrender charge	Applies	2	2	3.30%	0.45%	1.00%	4.75%
No MVAs without surrender charge	Applies	2	1	3.30%	0.45%	2.00%	5.75%
Retail SPIAs with life contingencies	Applies	1	3	3.30%	0.90%	0.60%	4.80%
Retail SPIAs without life contingencies	Applies	3	3	3.30%	0.00%	0.60%	3.90%
Linked business without guarantees (e.g. Variable universal life)	NA	3	3	0.00%	0.00%	0.60%	0.60%

Life Risks - Illustrative Example

Illustrative Example Assumptions continued

- Include diversification credit in the analysis

Diversification Factor	91%	40%	50%		
Product Type	Interest Rate Risk	Longev. Risk	Lapse Risk	Divers Credit	Total
Full MVAs with surrender charge	3.30%	0.45%	1.00%	-1.08%	3.67%
No MVAs without surrender charge	3.30%	0.45%	2.00%	-1.58%	4.17%
Retail SPIAs with life contingencies	3.30%	0.90%	0.60%	-1.15%	3.65%
Retail SPIAs without life contingencies	3.30%	0.13%	0.60%	-0.69%	3.34%
Linked business without guarantees (e.g. Variable universal life)	0.00%	0.00%	0.60%	-0.30%	0.30%

Life Risks - Illustrative Example

Illustrative Example compared to prior S&P model

- Reduced capital charges in most product types
- Further reductions possible based on ALM credit

Product Type	AA	VaR 99.95%	Impact
Full MVAs with surrender charge	4.10%	3.67%	-0.43%
No MVAs without surrender charge	4.30%	4.17%	-0.13%
Retail SPIAs with life contingencies	3.70%	3.65%	-0.05%
Retail SPIAs without life contingencies	3.00%	3.29%	0.29%
Linked business without guarantees (e.g. Variable universal life)	0.00%	0.30%	0.30%

Life Risks – Illustrative Example

Illustrative Example compared to AM Best and NAIC RBC equivalent C3 + C4 charges

Assumptions

- RBC assumes a 50% diversification credit for longevity risk and a 50% credit for C3P1 testing
- BCAR assumes a well ALM matched portfolio

Product Type	S&P VaR 99.95%	BCAR VaR 99.6%	RBC 400% CAL	Diff BCAR	Diff RBC
Full MVAs with surrender charge expiring in 2-3 yrs	3.67%	5.12%	2.99%	-1.45%	0.68%
No MVAs without surrender charge	4.17%	6.56%	6.00%	-2.39%	-1.83%
Retail SPIAs with life contingencies	3.65%	2.43%	2.40%	1.22%	1.25%
Retail SPIAs without life contingencies	3.29%	2.43%	1.00%	0.86%	2.29%
Linked business without guarantees (e.g. Variable universal life)	0.30%	0.20%	0.19%	0.10%	0.11%

Interest Rate Risk

Baseline risk charges can be instead used as modeled interest rate scenarios for calculating the “Net Change in Market Value of Surplus” (NCMV)

NCMV uses company specific modeling of a market value of assets and liabilities in baseline and shocked interest rate scenarios

NCMV risk charge is floored at 50% of baseline charges, but no cap

- Volatile and unlikely to have consistent application across industry
- Will need to document the modeling methodology and assumptions used

Interest Rate Risk Baseline Charges		
Confidence Level	Rate Shock	
	Up	Down
99.99%	365	-330
99.95%	330	-290
99.80%	295	-250
99.50%	270	-225

Variable Annuities

- Substantial changes to VA risk charges
 - Increased CTE levels
 - No longer reduced for after-tax effect
 - Increased maximum hedging credit from 50% to 80%
- Risk charges continue to differ from AM Best and RBC
 - No diversification credit against other risk categories
 - Maximum hedging credit still much lower than NAIC 95%
 - Removal of tax effect adds to capital volatility
 - S&P VA risk charges continue to be higher and more volatile

Confidence Level	Prior	New
AAA / VaR 99.99%	CTE 99.5%	CTE 99.75%
AA / VaR 99.95%	CTE 98.0%	CTE 98.75%
A / VaR 99.8%	CTE 95.0%	CTE 96.5%
BBB / VaR 99.5%	CTE 90.0%	CTE 92.0%
Tax Rate Used	21%	0%
Hedging Credit	50%	80%

Diversification

Diversification

Correlation Matrices

- Significant diversification benefits available between investment and liability risks
- Different correlations than AM Best & NAIC RBC
 - Larger benefit to Life and Interest Rate risks (“C3int”)
 - Smaller benefit to equity risk (“C1cs”)
 - No credit to VA (“C3Mkt”)
 - Credit for Life & Non-Life
- Haircut to diversification credit applied at each VaR level

Level 3: Between risk categories: Diversification across risks					
	Market risk	Credit/default risk	Nat Cat risk	Non-life technical risk	Life technical risk
Market risk	100%	75%	25%	25%	25%
Credit/default risk	75%	100%	25%	25%	25%
Nat Cat risk	25%	25%	100%	0%	0%
Non-life technical risk	25%	25%	0%	100%	0%
Life technical risk	25%	25%	0%	0%	100%
Pandemic Risk	75%	75%	0%	25%	25.0%

Level 2: Within risk categories: Life technical risk diversification					
	Mortality	Morbidity	Longevity	Other life	Pandemic
Mortality	100%	50%	-25%	25%	25%
Morbidity	50%	100%	25%	25%	50%
Longevity	-25%	25%	100%	25%	0%
Other life	25%	25%	25%	100%	25%
Pandemic	25%	50%	0%	25%	100%

Diversification Allocation

Diversification needs to be allocated for management decision making exercises such as product pricing and portfolio management

I recommend a 'dollar diversification factor allocation' methodology, akin to hedging greeks

For each risk factor calculate $(A - B) / C$ where

- C = Amount of pre-diversification required capital added
- $(A - B)$ = Impact on after-diversification required capital

Useful for internal incremental analysis, less useful for large scale restructures or M&A

Diversification Allocation

Illustrative example

Assumed rating group has annuity, life insurance and P&C exposures

Category	Risk Capital	Pct of Total
Credit risk	46,946	47%
Equity	8,732	9%
Interest Rate	30,369	30%
Asset Risks Subtotal	86,047	86%
Other life	10,292	10%
Mortality	4,539	5%
Longevity	7,709	8%
Non-life technical risk	7,261	7%
VA	9,365	9%
Liability Risk Subtotal	39,166	39%
Diversification	-25,213	-25%
Total	100,000	100%

Diversification Allocation

Illustrative example

Develop diversification factors by adding an amount to each risk category and calculating the percentage increase in the diversified required capital

Div Category	Undiversified Impact	Diversified Risk Charge	Diversified Impact	Diversification Factor
Baseline	0	100,000	0	100%
Credit risk	1,000	100,950	950	95%
Equity	1,000	100,686	686	69%
Interest Rate	1,000	100,906	906	91%
Other life	1,000	100,498	498	50%
Mortality	1,000	100,316	316	32%
Longevity	1,000	100,405	405	40%
Non-life technical risk	1,000	100,439	439	44%
VA	1,000	101,000	1,000	100%

Diversification Allocation

Illustrative example

Allocate the diversification benefit up to underlying risk drivers

Category	Risk Capital	Pct of Total	Div Allocation Factor	Div Allocated Risk Capital	Div Allocated Pct of Total
Credit risk	46,946	47%	95%	44,585	45%
Equity	8,732	9%	69%	5,994	6%
Interest Rate	30,369	30%	91%	27,518	28%
Asset Risks Subtotal	86,047	86%		78,096	78%
Other life	10,292	10%	50%	5,125	5%
Mortality	4,539	5%	32%	1,432	1%
Longevity	7,709	8%	40%	3,118	3%
Non-life technical risk	7,261	7%	44%	3,190	3%
VA	9,365	9%	100%	9,365	9%
Liability Risk Subtotal	39,166	39%		15,674	16%
Diversification	-25,213	-25%	1%	-327	0%
Total	100,000	100%		100,000	100%

Concluding Thoughts

Pros

- Risk charges better aligned with underlying risk drivers
- Limited guidance allows for model to adapt over time
- Recognizes Life & Non-Life diversification
- Completely transparent

Cons

- Not enough guidance on implementation
- Volatility of capital results

Questions?