

Date: 9/28/26

Virtual Meeting

RISK-BASED CAPITAL INVESTMENT RISK AND EVALUATION (E) WORKING GROUP

Monday, October 5, 2026

2:00 – 3:00 p.m. ET / 1:00 – 2:00 p.m. CT / 12:00 – 1:00 p.m. MT / 11:00 a.m. – 12:00 p.m. PT

ROLL CALL

Philip Barlow, Chair	District of Columbia	Tadd Wegner	Nebraska
Thomas Reedy, Vice Chair	California	Jennifer Li	New Hampshire
Wanchin Chou	Connecticut	Bob Kasinow/William B. Carmello	New York
Carolyn Morgan	Florida	Dale Bruggeman/Tom Botsko	Ohio
Matt Cheung	Illinois	Rachel Hemphill	Texas
Roy Eft	Indiana	Doug Stolte	Virginia
Carrie Mears/Kevin Clark	Iowa	Steve Drutz/Katy Bardsley	Washington
Fred Andersen	Minnesota	Amy Malm	Wisconsin
William Leung/Danielle Smith	Missouri		

NAIC Committee Support: Julie Gann/Maggie Chang

AGENDA

- Receive Comments on a Presentation by the American Academy of Actuaries (Academy) on the Collateralized Loan Obligations (CLO) Risk-Based Capital (RBC) Project, Focusing on Residual Tranches—*Philip Barlow (DC)* Attachment 1
 - American Council of Life Insurers (ACLI)—*Marc Altschull* Attachment 2
- Receive Comments on Exposure of the Academy's Excerpts from Dec. 15, 2025, C-1 Subcommittee Presentation—*Philip Barlow (DC)* Attachment 3
 - Alternative Credit Council (ACC) and Loan Syndications and Trading Association (LSTA) Joint Letter—*Joe Engelhard (ACC) and Andrew Berlin (LSTA)* Attachment 4A
 - ACLI—*Marc Altschull* Attachment 4B
 - Athene—*Mike Consedine and Kim Welsh* Attachment 4C
- Review Asset-Backed Securities (ABS) Reported in the 2025 Annual Statement Filings— *Philip Barlow (DC)* Attachment 5
- Consider Adoption of its Working Agenda—*Philip Barlow (DC)* Attachment 6
- Discuss Any Other Matters Brought Before the Working Group —*Philip Barlow (DC)*
- Adjournment

C-1 Subcommittee Update on CLO C-1 Factors Modeling— Residual Tranches and Portfolio Adjustment Factors

May 6, 2026

Stephen Smith, MAAA, FSA, CFA
Chairperson, C-1 Subcommittee

About the Academy

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**Mission:**

To serve the public and the U.S. actuarial profession

**Community:**

Serving over 20K MAAs & public stakeholders for 60 years

**Standards:**

Setting qualification, practice, and professionalism standards

**Impact:**

Delivering over 300 insight-driven publications & resources annually

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Glossary

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AEY: Allowable Earned Yield accounting methodology for residual tranches

PE: Practical Expedient accounting methodology for residual tranches

KDE: Kernel Density Estimation, an estimate of a random variable's probability density function

BV: Book Value, the value at which an asset is carried on a life insurer's statutory financials

FV: Face Value, representing par for CLO debt tranches and net asset value for residual tranches

Residual Tranches

Summary of Findings—Residual Tranches

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Since the April 10, 2026, meeting, the Academy implemented two model corrections to the calculated C-1 factors for residual tranches:

- 1) Accumulated deficiencies begin accruing interest at 12/31/24 projection start date, not at issuance date (*Increases C-1 factors under AEY*)
- 2) When book value = 0, any income earned accrues to statutory surplus on an after-tax basis (*Decreases C-1 factors under AEY and PE*)

The Academy's conclusions remain unchanged:

- Comparable attributes for residual tranche C-1 factors do not add significant precision; the Academy recommends using a simple average of C-1 factors
- **The Academy's analysis shows that the current post-tax factor of 35.55% is within the range of C-1 factors across residual tranche SAP accounting methods**

Estimating C-1 Under Practical Expedient Accounting

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$$C1 = \frac{PV(\text{Max Accumulated Deficiency})_{YE\ 2024}}{\text{Book Value}_{YE\ 2024}}$$

- Book Value (BV)_{t+1} = BV_t – Interest_t – Principal Distributions¹_t
- Accumulated Deficiency_t = min{0, (1+r_{accum}) × Accumulated Deficiency_{t-1} + Stat Net Income (NI)_t + (Realized BV Loss_t) - (Realized Balance Loss_t × Tax Rate) + Δ DTA_t}
 - NI_t = – Interest_t × Tax Rate
 - Deferred Tax Asset (DTA) = (Total Balance_t – BV_t) × Tax Rate
 - Since the change in (Balance – BV) equals paid Interest, then NI and ΔDTA perfectly offset
 - Assuming buy and hold, the only Realized Loss is at the end of the projection period, equal to remaining BV or Balance
 - Accumulated Deficiency₀ = 0
- When the loss is realized, the tax rate times the outstanding *balance* is counted as a tax recovery, which eliminates the DTA balance

¹ A Principal Contribution is a negative Principal Distribution

Estimating C-1 Under Allowable Earned Yield

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$$C1 = \frac{PV(\text{Max Accumulated Deficiency})_{YE\ 2024}}{\text{Book Value}_{YE\ 2024}}$$

- Allowable Earned Yield (AEY) = residual tranche IRR over run-off period
- $BV_{t+1} = BV_t - \max\{0, \text{Interest}_t - \text{Max AEY}_t + \text{Cumulative Shortfall}_t\} - \text{Principal Distributions}^1_t$
 - $\text{Max AEY}_t = \text{AEY}_t \times BV_{t-1}$
 - $\text{Cumulative Shortfall}_t = \min\{0, \text{Interest}_t - \text{Max AEY}_t + \text{Cumulative Shortfall}_{t-1}\}$
- $\text{Accumulated Deficiency}_t = \min\{0, (1+r_{\text{accum}}) \times \text{Accumulated Deficiency}_{t-1} + NI_t + (\text{Realized Book Value Loss}_t) - (\text{Realized Balance Loss}_t \times \text{Tax Rate}) + \Delta \text{DTA}_t\}$
 - $NI_t = \min(\text{Interest}_t, \text{Max AEY}_t) + \max(\Delta \text{Cumulative Shortfall}_t, 0) - \text{Interest}_t \times \text{Tax Rate}$
 - $\text{DTA}_t = (\text{Total Balance}_t^2 - BV_t) \times \text{Tax Rate}$
 - $\text{Accumulated Deficiency}_0 = 0$
- When the loss is realized, the tax rate times the outstanding *balance* is counted as a tax recovery, which eliminates the DTA balance

¹ A Principal Contribution is a negative Principal Distribution

² Total Balance = Original Balance + Principal Contributions and Distributions

Liability- vs. Surplus-Backing Assumption

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Liability-Backing

- Statutory income is used to fulfill liability cashflows
- When a loss occurs, the insurer uses its capital to absorb it
- Typically leads to higher C-1 factors

Surplus-Backing

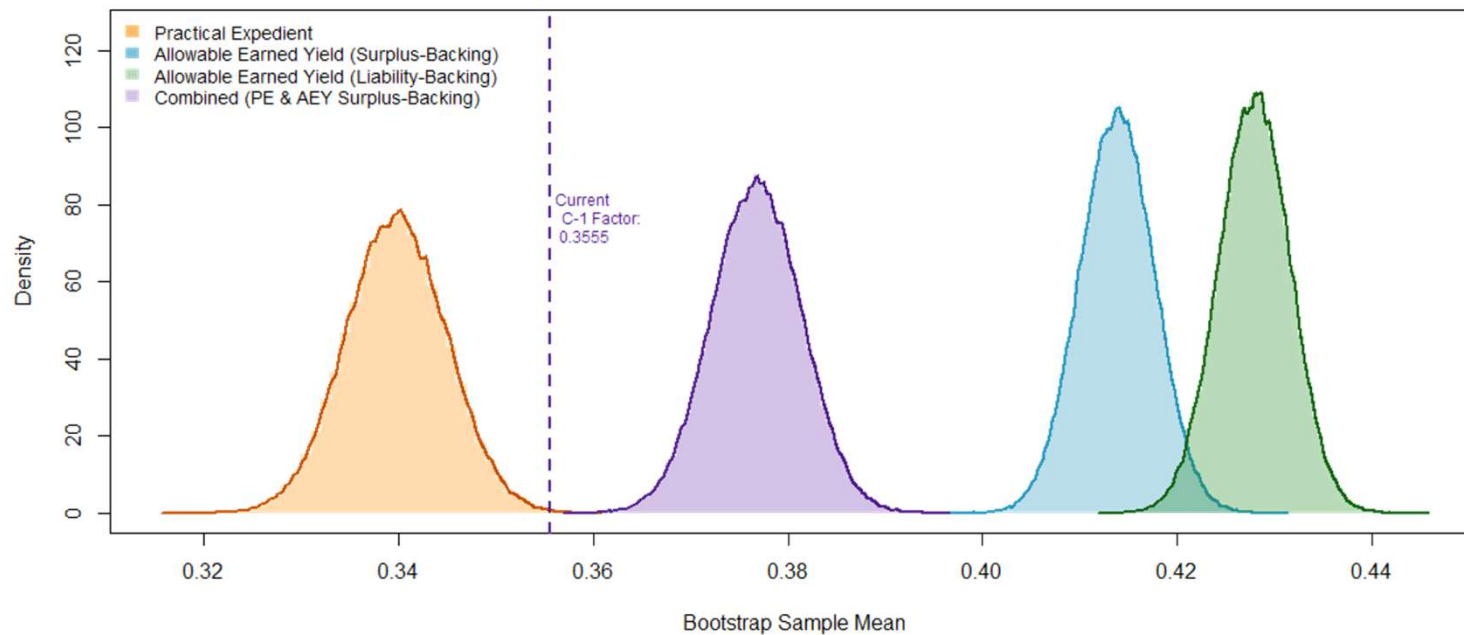
- Statutory income is retained in surplus and earns interest
- When a loss occurs, the insurer uses the accumulated statutory income first then its own capital to absorb it
- Typically leads to lower C-1 factors

- Accumulated deficiencies under AEY are sensitive to the assumption of whether the residual tranches are liability- or surplus-backing, but not under Practical Expedient (PE)
- The results presented assume residual tranches are surplus-backing

Sample Means of C-1 Factors

9

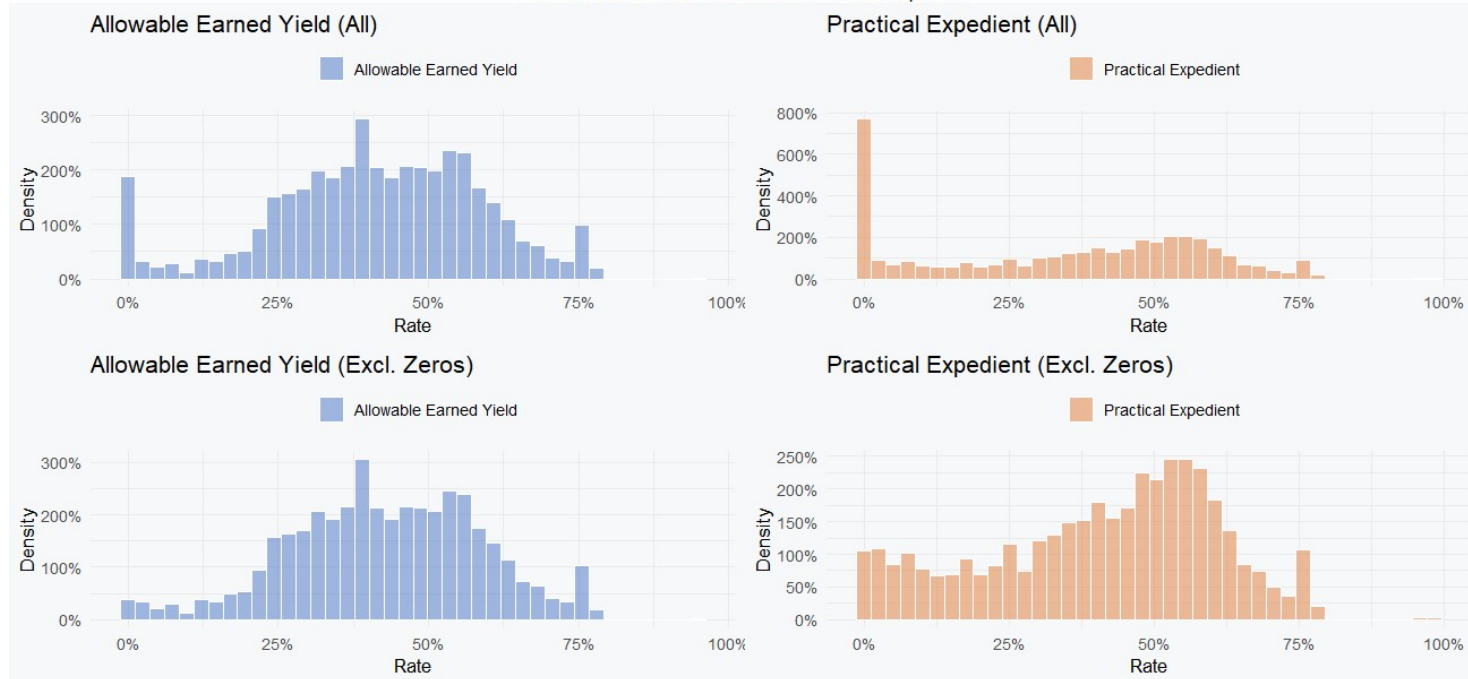
Distribution of Estimated Residual Tranche C-1 Means, by Accounting Method



Distribution of Raw C-1 Factors

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PMF: C-1 Allowable Earned Yield vs. Practical Expedient



*Modeled C-1 Factors shown under Practical Expedient method

Initial Comparable Attributes Results

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- The Academy regresses Raw C-1 against potential comparable attributes
- The std dev of C-1 is 23.5% while the std dev of model residuals is 16.4%

Regression Results

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.65564 -0.11078 -0.01858  0.09074  0.89382

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.569e-01  3.484e-02  10.245 < 2e-16 ***
int_prin_to_face -5.466e-01  1.180e-02 -46.320 < 2e-16 ***
WARF         7.511e-05  8.925e-06   8.415 < 2e-16 ***
TR_DP       -8.333e-01  1.191e-01  -7.000 3.46e-12 ***
max_rating_num  9.674e-03  2.058e-03   4.701 2.76e-06 ***
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

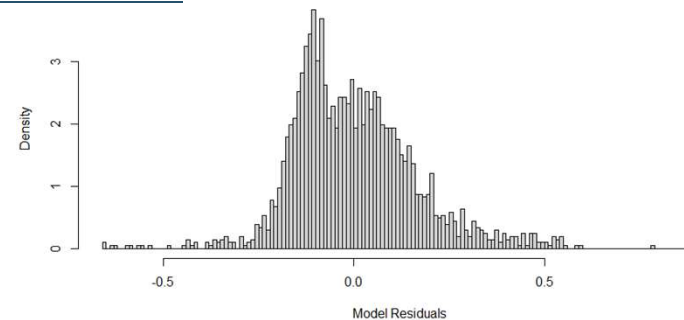
Residual standard error: 0.1639 on 2060 degrees of freedom
Multiple R-squared:  0.5148,    Adjusted R-squared:  0.5139
F-statistic: 546.5 on 4 and 2060 DF,  p-value: < 2.2e-16

```

Comparable Attributes Considered

- TR_DP: Tranche Detachment Point
- WARF: Weighted average rating factor
- max_rating_num: Deal's worst debt rating (where Aaa=1, Aa1=2, etc.)
- int_prin_to_face: Ratio of the sum of interest and net principal paid to model start-date, as a proportion of original face value (capped at 0 and 1)

Model Residuals

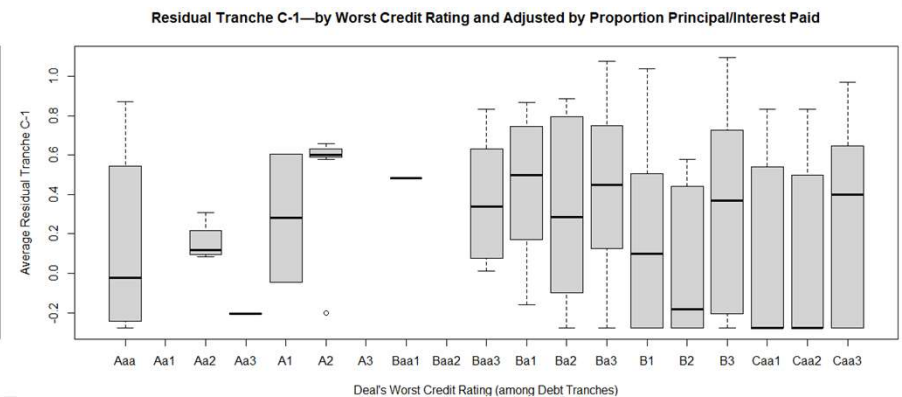
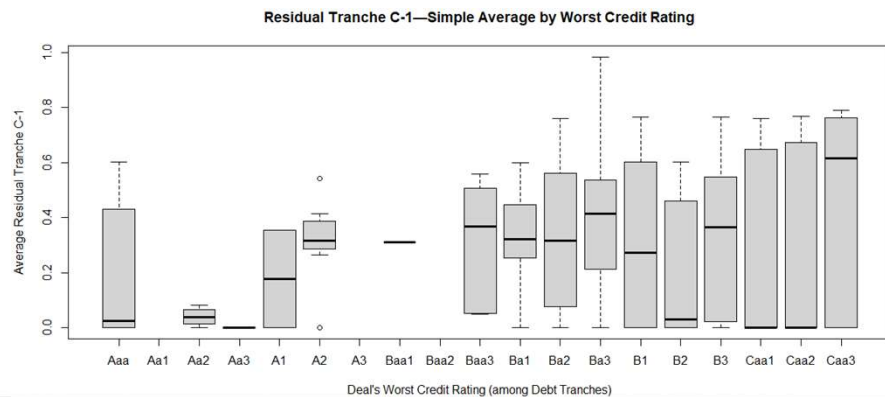


*Modeled C-1 Factors shown under Practical Expedient method

Limitations of Worst Credit Rating

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- While a lower worst credit rating does *on average* indicate a greater C-1, there is no monotonicity across ratings; Ba3 has the highest median C-1 (except Caa3)
- When adjusting for the proportion of principal and interest already paid (assuming the mean value), the same problem persists
- The wide inter-quartile ranges (IQRs) indicate potential credibility issues with the data



*Modeled C-1 Factors shown under Practical Expedient method

Alternative Comparable Attributes Results

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- To address the issue of credibility, the Academy considered the proportion of balance within “low quality” debt CLO tranches (defined by different cutoff points)
 - The different cutoff points considered are: Baa1, Ba1, B1 and Caa1
- When adding these variables, max_rating_number becomes less statistically significant
- Condensing the credit covariates to just Ba1 / below retains roughly the same level of explanatory power

Regression Results

Residuals:

Min	1Q	Median	3Q	Max
-0.65135	-0.10772	-0.01554	0.09166	0.89091

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.521259	0.028137	18.526	< 2e-16 ***
int_prin_to_face	-0.551976	0.011878	-46.472	< 2e-16 ***
max_rating_num	0.005093	0.002131	2.390	0.01692 *
prop_Baa1_or_worse	-0.011413	0.166946	-0.068	0.94550
prop_Ba1_or_worse	1.078025	0.250951	4.296	1.82e-05 ***
prop_B1_or_worse	0.538916	0.188661	2.857	0.00433 **
prop_Caa1_or_worse	-0.533315	0.190012	-2.807	0.00505 **

 signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1616 on 2058 degrees of freedom
 Multiple R-squared: 0.5288, Adjusted R-squared: 0.5274
 F-statistic: 384.9 on 6 and 2058 DF, p-value: < 2.2e-16

Regression Results

Residuals:

Min	1Q	Median	3Q	Max
-0.65121	-0.10922	-0.01788	0.09184	0.88010

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.578114	0.007294	79.26	<2e-16 ***
int_prin_to_face	-0.545435	0.011453	-47.62	<2e-16 ***
prop_Ba1_or_worse	1.335676	0.090402	14.78	<2e-16 ***

 signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1622 on 2062 degrees of freedom
 Multiple R-squared: 0.5242, Adjusted R-squared: 0.5238
 F-statistic: 1136 on 2 and 2062 DF, p-value: < 2.2e-16

*Modeled C-1 Factors shown under Practical Expedient method

Considering WARF and Detachment Point

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- WARF is not statistically significant when the proportion of Ba1/below balance is considered (collateral credit is captured by CLO credit)
- Detachment point is statistically significant, but removing it from the model only slightly reduces R^2 from 52.9% to 52.4%
- The ratio of total interest and principal paid to current face value is the most explanatory variable; removing all other covariates reduces the R^2 from 52.9% to only 47.4%

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.66481 -0.11001 -0.01731  0.09306  0.88431

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    5.932e-01  2.667e-02  22.241  < 2e-16 ***
int_prin_to_face -5.555e-01  1.166e-02 -47.624  < 2e-16 ***
WARF           1.483e-05  1.132e-05   1.310    0.19
TR_DP          -5.798e-01  1.187e-01  -4.885  1.11e-06 ***
prop_Ba1_or_worse 1.146e+00  1.215e-01   9.430  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1613 on 2060 degrees of freedom
Multiple R-squared:  0.5299,    Adjusted R-squared:  0.529
F-statistic: 580.6 on 4 and 2060 DF,  p-value: < 2.2e-16

```

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.65121 -0.10922 -0.01788  0.09184  0.88010

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    0.578114   0.007294   79.26  <2e-16 ***
int_prin_to_face -0.545435   0.011453  -47.62  <2e-16 ***
prop_Ba1_or_worse 1.335676   0.090402   14.78  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1622 on 2062 degrees of freedom
Multiple R-squared:  0.5242,    Adjusted R-squared:  0.5238
F-statistic: 1136 on 2 and 2062 DF,  p-value: < 2.2e-16

```

```

Residuals:
    Min       1Q   Median       3Q      Max
-0.61412 -0.12794 -0.02465  0.08551  0.85010

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    0.614118   0.007228   84.96  <2e-16 ***
int_prin_to_face -0.486175   0.011279  -43.10  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1705 on 2063 degrees of freedom
Multiple R-squared:  0.4739,    Adjusted R-squared:  0.4736
F-statistic: 1858 on 1 and 2063 DF,  p-value: < 2.2e-16

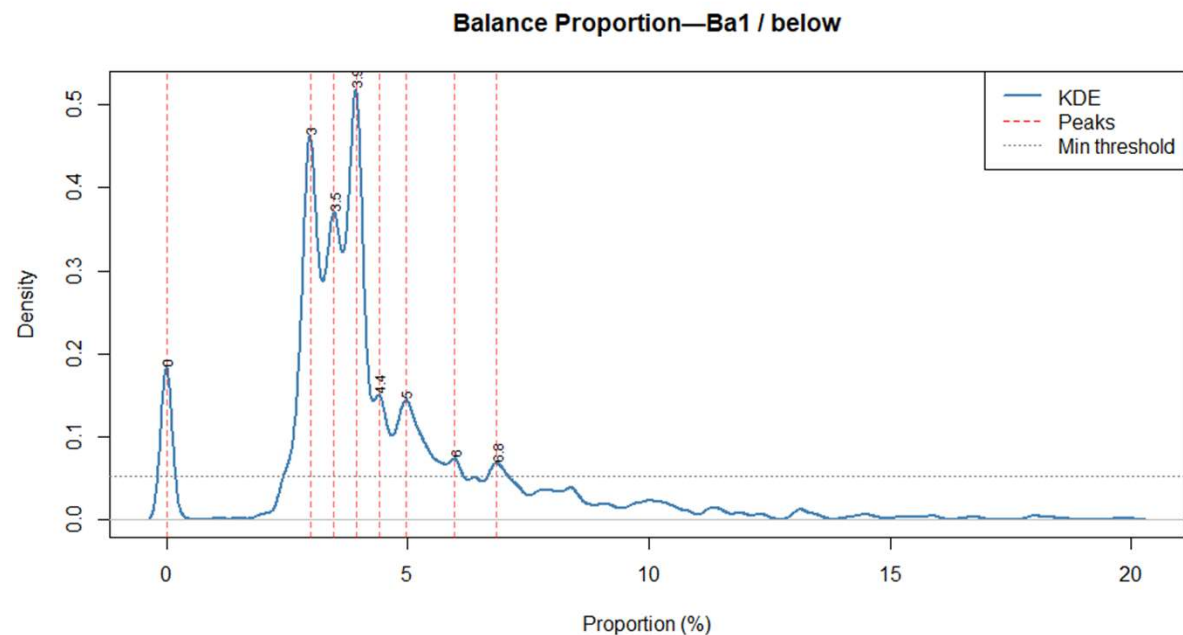
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*Modeled C-1 Factors shown under Practical Expedient method

Distribution of Ba1 / Below Credit

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- Balance in Ba1 or below credit averages 4.53% of total deal balance
- Proportions are clustered around 0%, 3% and 3.9%
- 87% of deals have less than 7% of balance in Ba1 or below credit



*Modeled C-1 Factors shown under Practical Expedient method

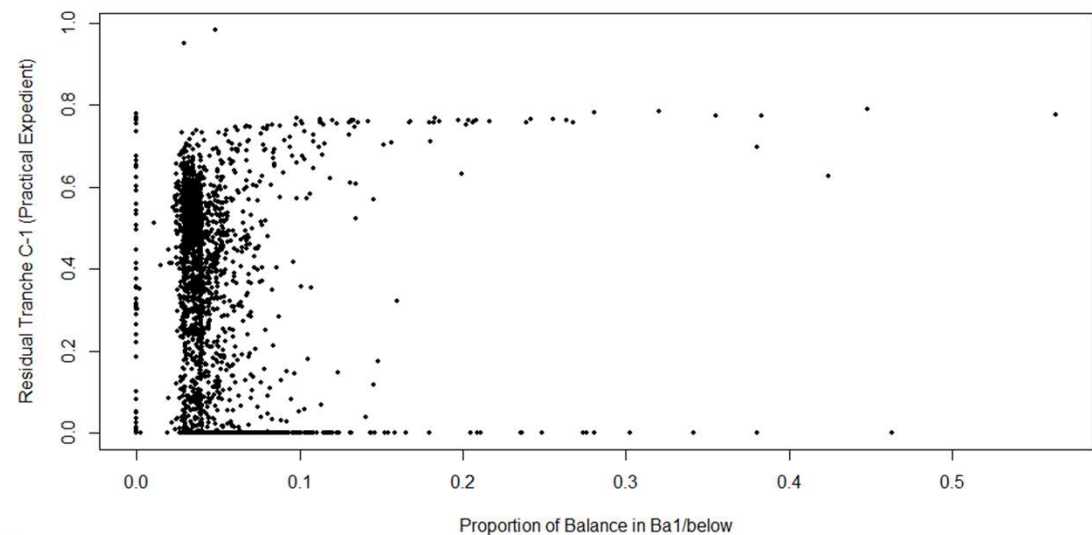
Considerations for Additional Comparable Attributes

16

- Assuming the range of 0% – 7% for the proportion of Ba1 / below (debt credit quality, by balance), the implied C-1 factors range from 27.12% to 36.47%
- Because
 - 1) This <10% range of modeled factors is small compared to the wide dispersion of residual tranche C-1
 - 2) The relationship between debt credit and C-1 is not visually apparent
 the Academy concludes that the explanatory power of debt credit quality does not warrant the operational complexity of adding a new attribute; a simple average factor is sufficient

Considered Formula:

$$27.12\% + 1.34 \times \text{Proportion of Ba1/below}$$



Portfolio Adjustment Factors

Summary of Findings—Portfolio Adjustment Factors

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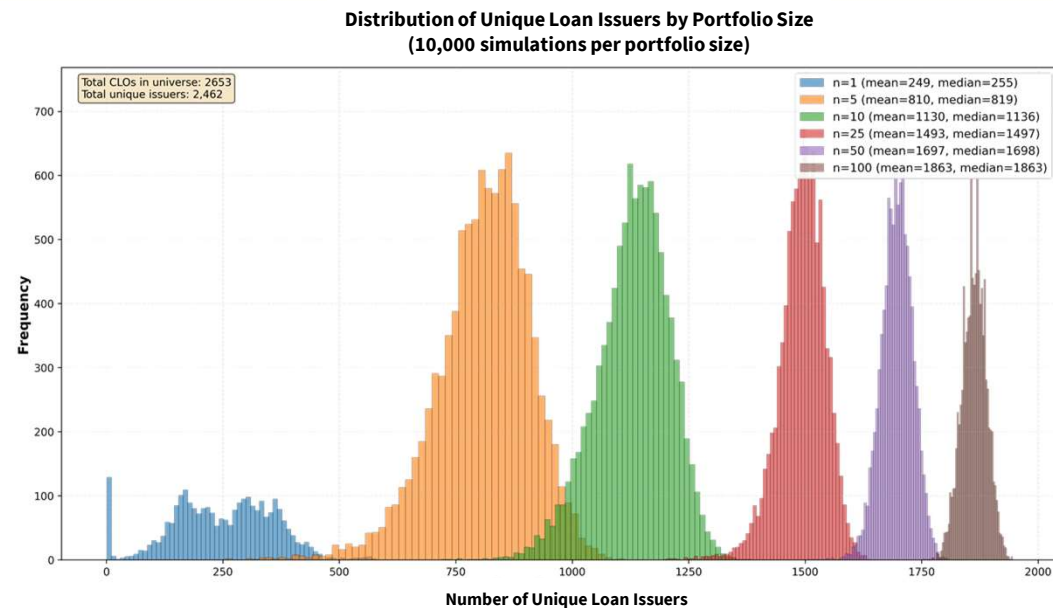
- The Academy models PAF consistent with the bond PAF methodology based on the number of unique loan *issuers* for a given portfolio of N CLO deals, deriving two metrics:
 - Absolute PAF = Portfolio of N CLO Deals PAF
 - Relative PAF = Absolute PAF $\div$ Collateral Loan Universe PAF, assumes full diversification when holding a loan for every one of the 2,462 issuers in the collateral universe
- The Academy proposes two options:

Option 1	Option 2			
CLO PAF of 1.00	N	CLO PAF	N	CLO PAF
	1	1.38	7	1.08
	2	1.22	8	1.07
	3	1.16	9	1.07
	4	1.12	10	1.06
	5	1.10	11+	1.00
	6	1.09		
Based on Absolute PAF		Based on Relative PAF		

Loan Issuer Diversification by CLO Portfolio Size

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- The average number of unique issuers in the collateral universe is 277 per CLO deal
- Here, CLO diversification is measured based on the number of unique loan issuers in the underlying collateral pool



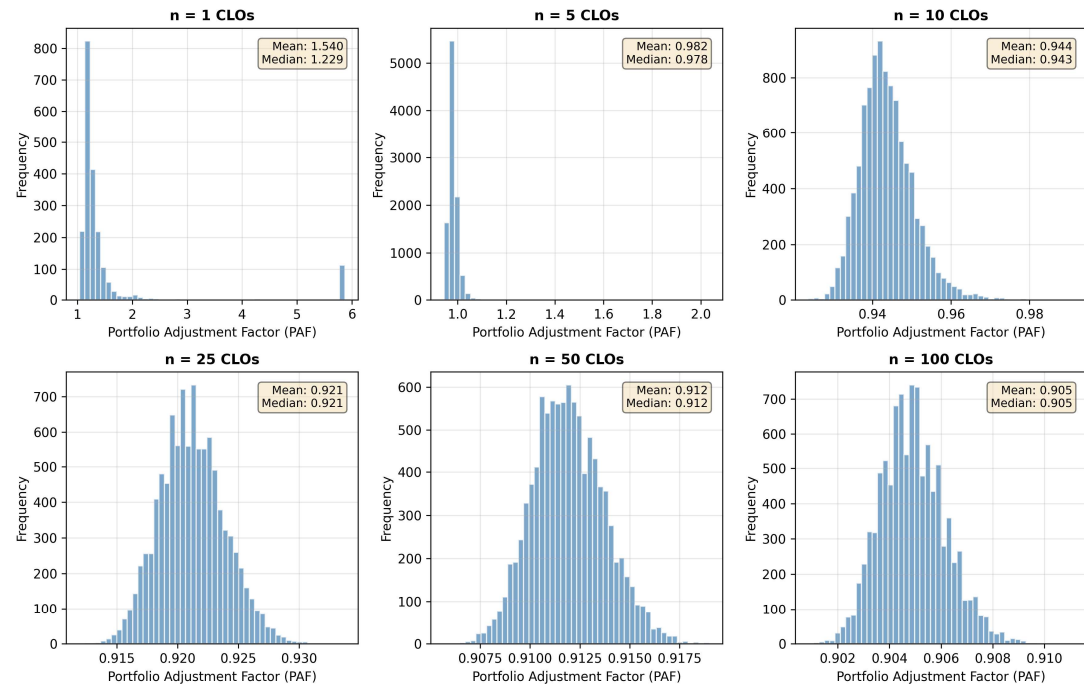
N	1	250	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500
Bond PAF	2.400	1.296	1.073	0.989	0.947	0.921	0.904	0.892	0.883	0.876	0.871

Absolute CLO Portfolio Adjustment Factor

20

- CLO Collateral and Bond Factor default risk is modeled at the issuer-level
- We apply the Bond PAF methodology to estimate *absolute* PAF for simulated portfolios of N randomly drawn CLO deals

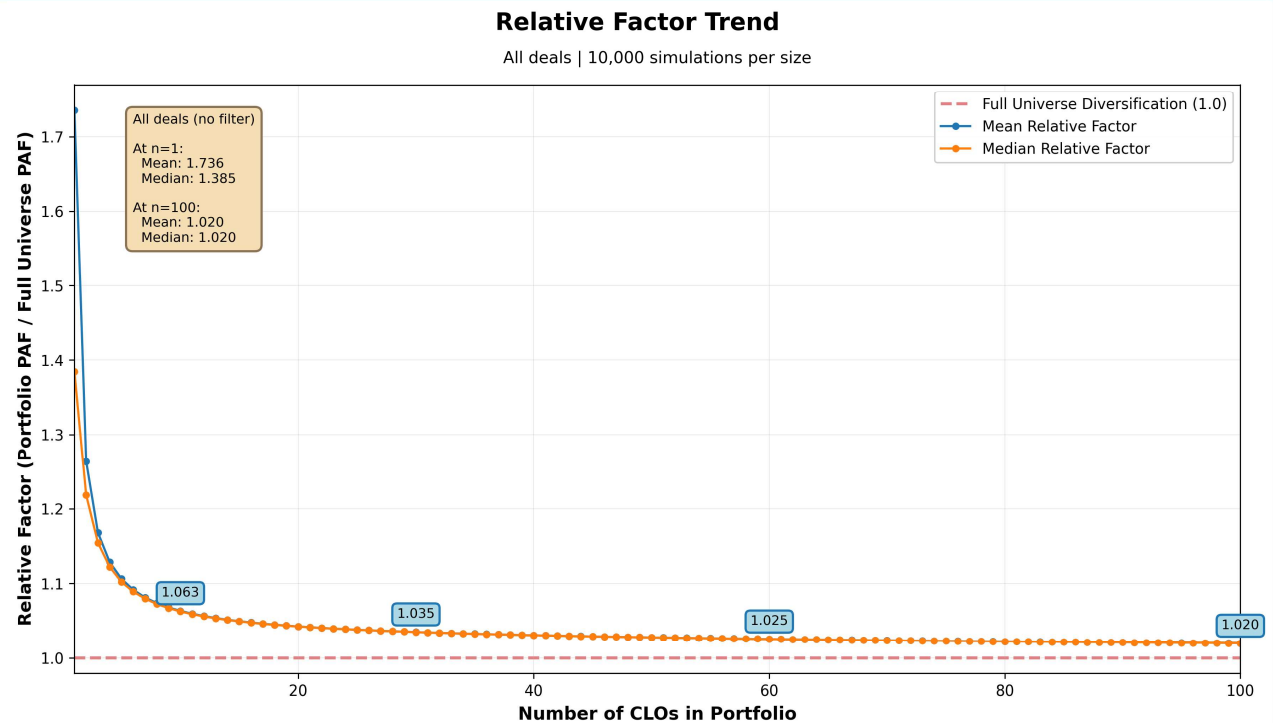
Distribution of Portfolio Adjustment Factors (PAF) by Portfolio Size



Relative CLO Portfolio Adjustment Factors

21

- PAF is calculated consistent with the bond PAF methodology assuming portfolios of N randomly drawn CLO deals
- We observe *relative* PAF quickly converges to 1.0 as the number of unique CLO deals in the portfolio increases



*Based on YE2024 U.S. Statutory Filings

Absolute vs. Relative PAF for < 10 CLO Holdings

22

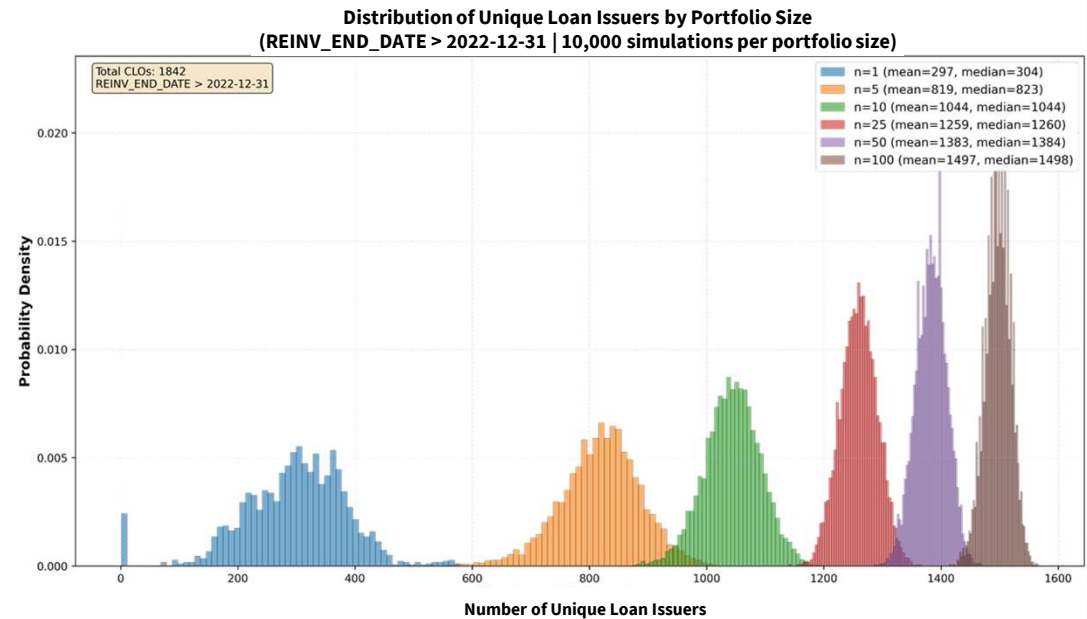
# Unique CLO Deals	Number of Companies*	Median Unique Loan Issuers	Median Absolute PAF	Median Relative PAF
1	18	294	1.2289	1.3848
2	2	482	1.0811	1.2182
3	6	618	1.0245	1.1545
4	6	719	0.9958	1.1221
5	6	800	0.9780	1.1020
6	6	863	0.9665	1.0890
7	3	914	0.9583	1.0798
8	3	959	0.9518	1.0725
9	5	995	0.9470	1.0671
10	0	1,028	0.9430	1.0625

Loan Issuer Diversification by CLO Portfolio Size

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The Academy does not observe meaningful differences in relative PAF or loan issuer diversification when limiting the universe to “newer” CLO deals (reinvestment end date > 2022-12-31)

Metric	All	Newer CLOs
Unique CLO Deals	2,053	1,842
Unique Loan Issuers	1,874	1,864
N=1 Mean Relative PAF	1.736	1.526
N=10 Mean Relative PAF	1.063	1.060
N=100 Mean Relative PAF	1.020	1.019



Based on YE2024 U.S. Statutory Filings

Life Insurance Industry CLO Holdings

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The life insurance industry holds concentrated CLO portfolios, with half of the companies holding fewer than 40 unique CLO deals

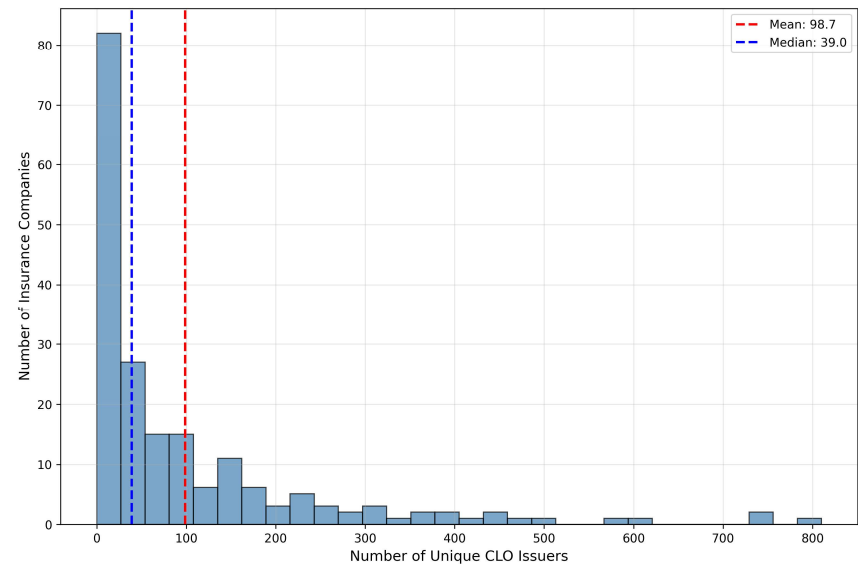
Key Statistics

Total CLO Holdings:	27,930
Unique CLO Deals:	3,307
Median CLO holdings per co.:	51
Median unique CLO deals per co.:	39
Standard deviation:	145.8
Range:	1 to 810 issuers
Q1 (25 th percentile):	7 unique CLO deals
Q3 (75 th percentile):	134 unique CLO deals

Distribution by Issuer Count

Unique CLO deals count range	# of Companies
1-10	57
11-25	24
26-50	27
51-100	27
101-200	28
201-500	25
501+	5

Distribution of CLO Deal Holdings Counts by Life Insurance Companies
(193 companies at group holdings level)



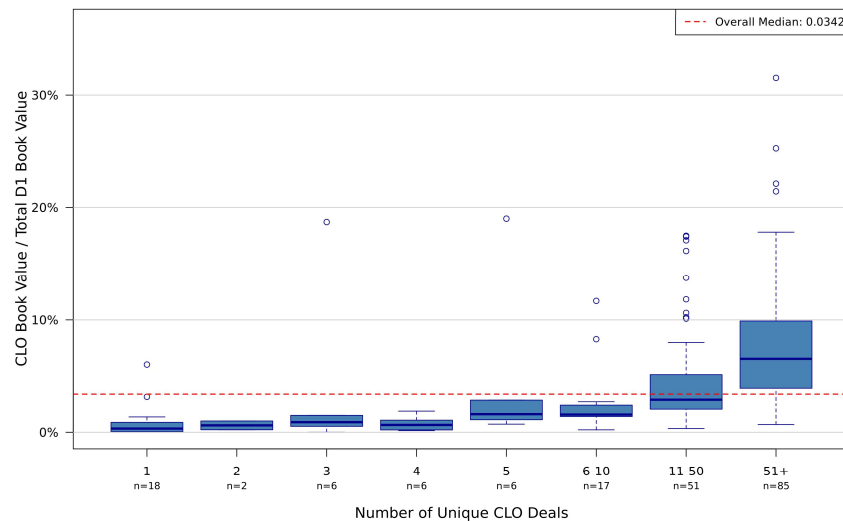
Based on YE2024 U.S. Statutory Filings

Life Insurance Industry CLO Holdings

25

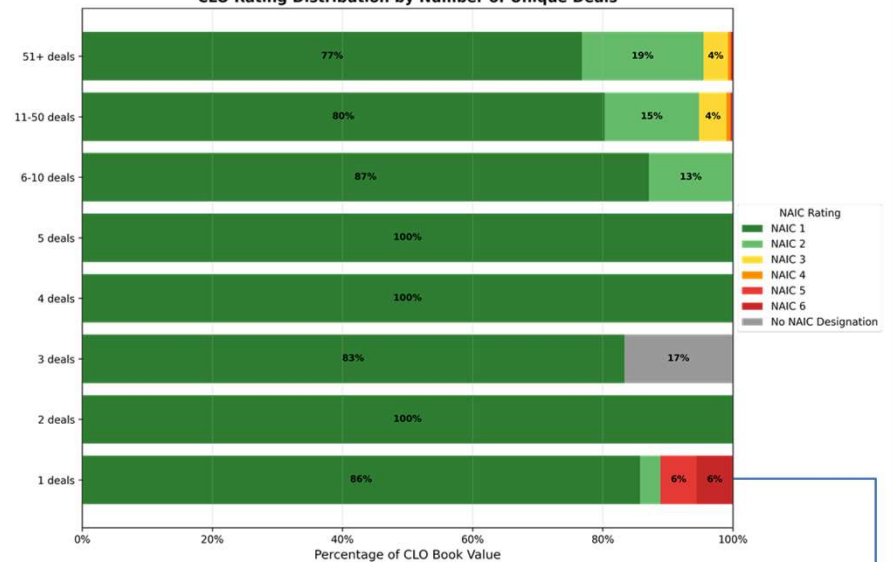
Life insurers with fewer unique CLO deals generally allocate to higher quality tranches and have a smaller proportion of D1 assets allocated to CLOs

CLO Book Value Ratio by Deal Diversification



There are only 2 companies that hold 1 CLO below-investment grade debt tranche. The total BV of these CLO debt holdings represent less than 0.1% of total general account invested assets.

CLO Rating Distribution by Number of Unique Deals



Appendix—Supplemental Analysis

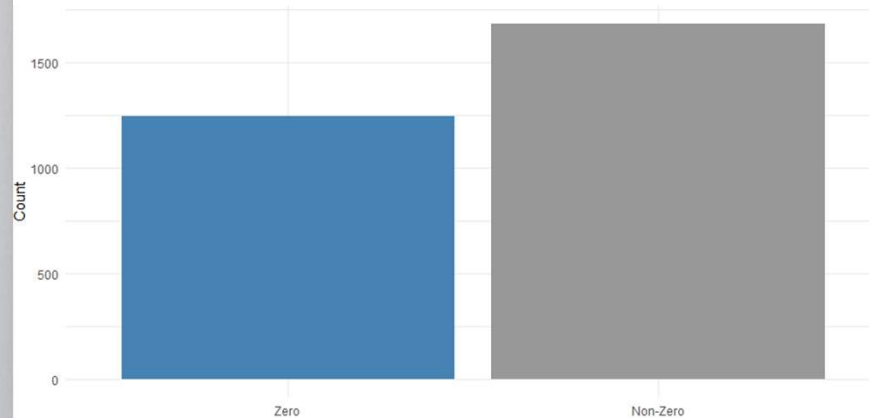
Embedded Model Conservatism

27

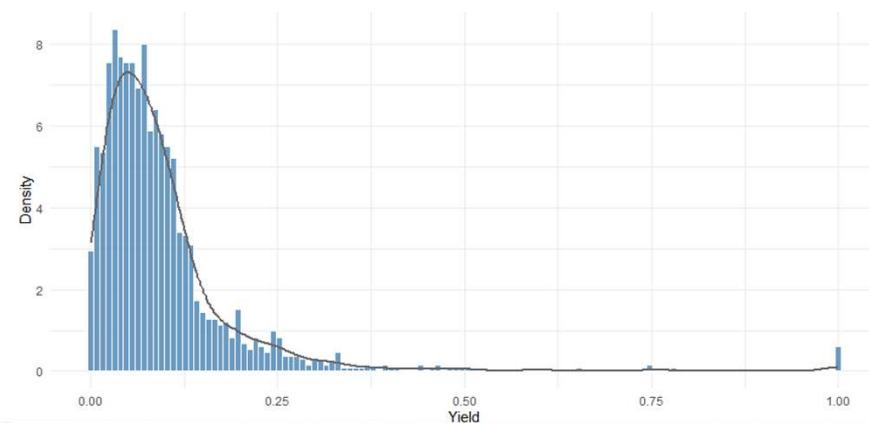
- CLO managers target >15% yields in the residual tranche
- The Academy's "Mean Loss Scenario" (assuming average levels of losses) produces an average yield of only 5.42%; a 15% yield is in the 92nd percentile
- This suggests that the collateral loss distribution assumptions are conservative and may overstate losses

Description	Value	Description	Value
Proportion of Yields = 0	42.55%	Mean Yield	5.42%
Mean Non-Zero Yield	9.43%	25 th percentile of Non-Zero Yields	3.79%
Std of Non-Zero Yields	10.37%	50 th percentile of Non-Zero Yields	7.06%
		75 th percentile of Non-Zero Yields	11.28%

Residual Tranche Yields under Mean Loss Scenario—Zero vs. Non-Zero



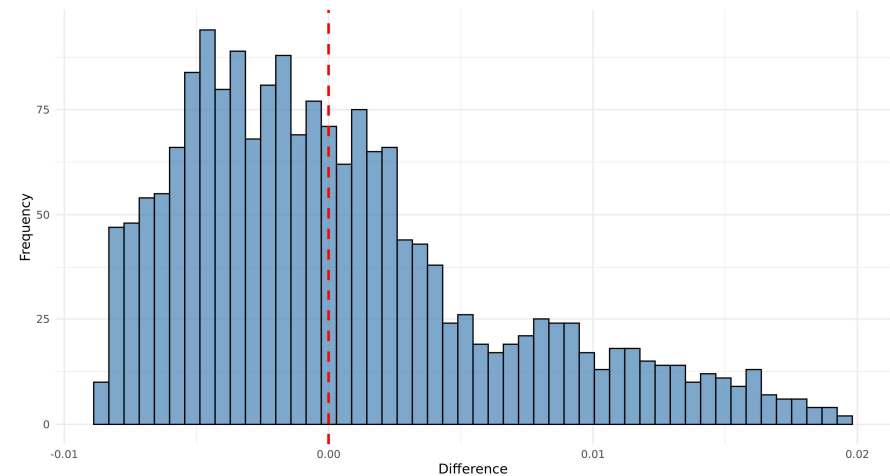
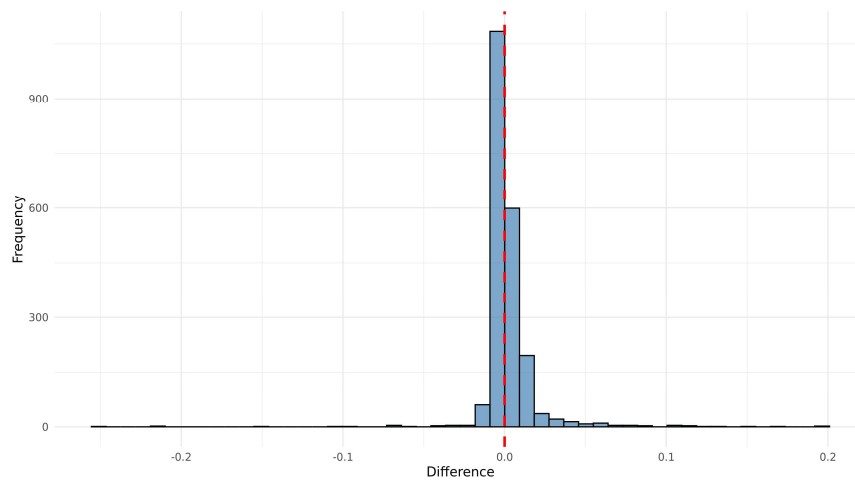
Distribution of Non-Zero Residual Tranche Yields under Mean Loss Scenario



Collateral Bond RBC vs. Collateral PV Loss CTE90

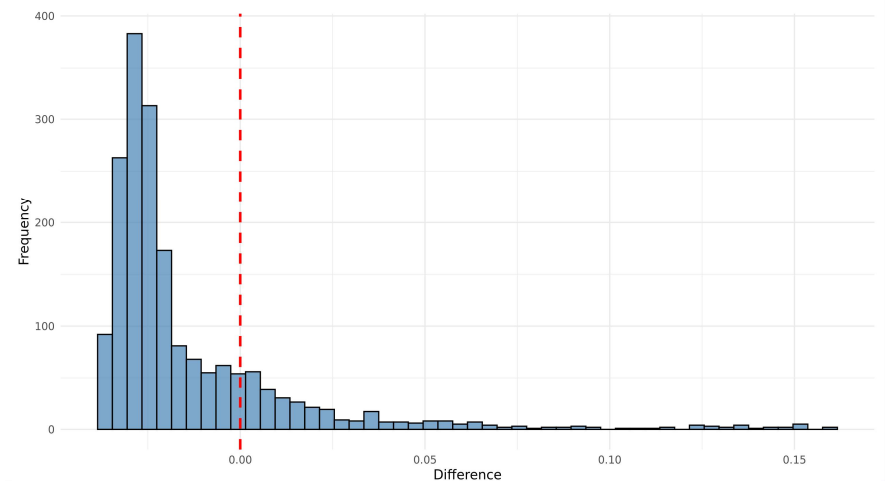
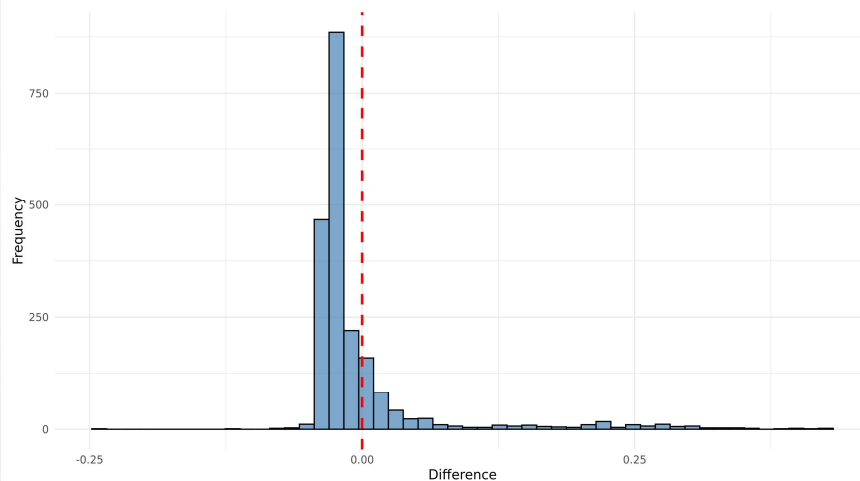
28

- The Academy calculates the bond RBC for each loan and averages by CLO deal
- The Academy also estimates CTE90 of the present value of collateral losses
- Collateral RBC minus PV Loss CTE90 (“Difference” below) averages 0.18% with a median of -0.09%



Collateral PV Loss CTE90 vs. Proposed CLO RBC Vertical Slide 29

- The Academy estimates the CLO RBC by applying proposed CLO tranche factors and averaging to the deal level; tranches are averaged by **face value** to neutralize the discrepancy introduced by residual tranche accounting
- Collateral PV Loss CTE90 minus Proposed CLO RBC (“Difference” below) averages -0.18% with a median of -2.44%



Example CLO Deal at Median Collateral Loss

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Statistics for Specific Deal at Median Loss

Collateral CTE90 Loss PV (% of FV)	7.47%
Collateral RBC (Current Bond Factors ¹)	7.72%
Post-Tax VaR96 Loss PV (% of FV)	7.13%
Post-Tax VaR96 BV Loss PV (% of BV)	2.23%
Vertical Slice CLO RBC (Proposed)	2.34%
Vertical Slice CLO RBC (Current Bond Factors ¹)	1.31%

- The median collateral post-tax loss² PV is 7.47% across all CLO deals
- On this specific median deal, the 7.47% CTE90 collateral loss equates to \$48mn (collateral RBC² is 7.72%), or \$66mn pre-tax without discounting
- Under practical expedient accounting, the residual tranche's \$52mn book value ("BV") has fallen to \$0 due to (a) \$38mn of prior payments received and (b) \$14mn projected payments
- Under the VaR 96 scenario, we observe a \$74mn undiscounted loss: (a) the **\$52mn** residual tranche face value ("FV") falls to \$0 and (b) an additional **\$22mn of loss** penetrates the Ba3 tranche
- Residual tranche accounting reduces losses by ~2/3, from **\$46mn to \$14mn**

Illustrative Numbers from VaR 96 for Specific Deal at Median Loss

Tranche Rating	DP (%)	Thickness (%)	FV (\$mn)	BV (\$mn)	Pre-Tax Loss Undisc. (\$)	Post-Tax Loss PV (\$)	Post-Tax Loss PV (% FV)	BV PV Loss (\$)	Post-Tax BV PV Loss (% BV)
			A	B	C	D	D ÷ A	E	E ÷ B
Aaa	100.0	63.8	410	410	0	0	0.00	0	0.00
Aa2	36.2	12.2	78	78	0	0	0.00	0	0.00
A2	24.0	7.1	46	46	0	0	0.00	0	0.00
Baa3	17.0	6.1	39	39	0	0	0.00	0	0.00
Ba3	10.9	3.8	24	24	22	14	56.87	14	56.87
NR	7.1	7.1	52	14	52	33	62.32	0	0.00
Total			649	610	74	46	7.13	14	2.23

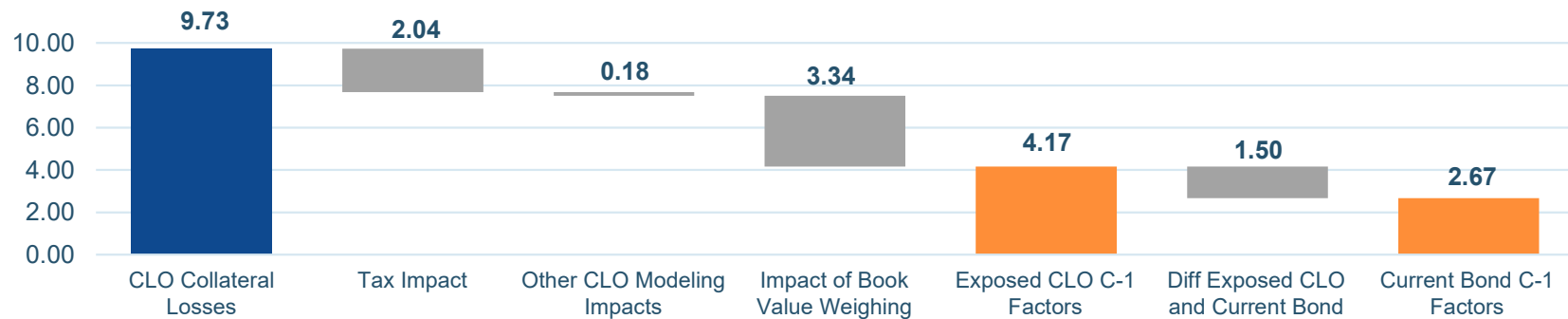
1. Bond factor model is calibrated to the VaR96 PV of losses

2. Collateral loss PV understates total loss because it does not include losses on reinvested assets; it underestimates RBC because RBC includes the risk premium provision

Collateral Losses vs. Exposed C-1 Factors

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Tax adjustments and residual tranche BV accounting explain the difference between Exposed CLO C-1 factors and the collateral losses modeled



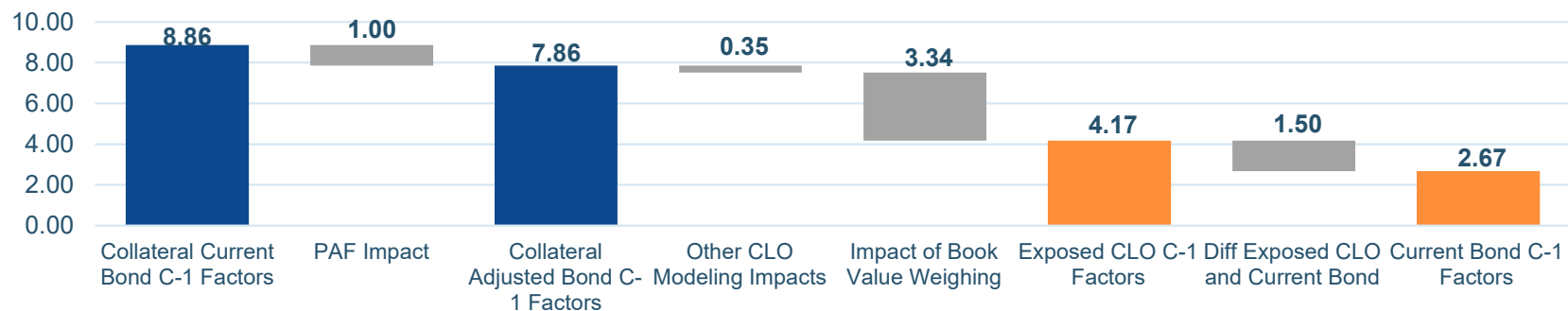
Equal-weighted averages across the CLO deal universe are shown for:

- a) CLO Collateral Losses = PV of Pre-Tax Losses / Loan Balance as of 12/31/24 for CTE90 scenario
- b) Exposed CLO C-1 Factors = BV-weighted Exposed CLO C-1 Factors for a vertical slice
- c) Current C-1 Bond Factors = BV-weighted Current Bond C-1 Factors for a vertical slice

Collateral Bond C-1 Factors vs. Exposed CLO C-1 Factors

32

Diversification (via PAF) and residual tranche BV accounting explain the difference between Exposed CLO C-1 factors and the collateral Current Bond C-1 Factors



Equal-weighted averages across the CLO deal universe are shown for:

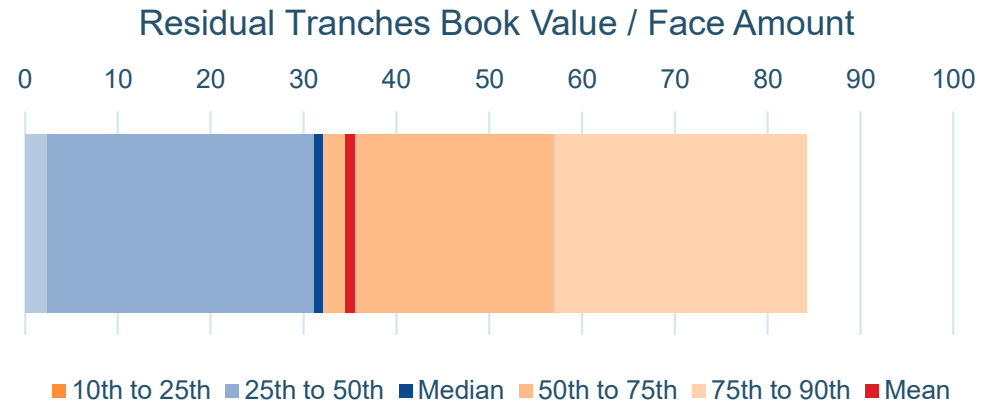
- a) Collateral Base RBC = The base RBC ratio for a CLO's underlying loan collateral, using Current Bond C-1 Factors
- b) Collateral Adjusted RBC = The collateral RBC ratio after applying full universe portfolio adjustment factor (PAF)
- c) Exposed CLO C-1 Factors = BV-weighted Exposed CLO C-1 Factors for a vertical slice
- d) Current C-1 Bond Factors = BV-weighted Current Bond C-1 Factors for a vertical slice

Residual Tranches Book Value vs. Face Amount

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Residual tranche book values diverge from the underlying loan balance after issuance date.

Under Practical Expedient, the CLO deal universe has an average ratio of 35.02% and a median of 31.65%.



Questions?

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For more information, please contact
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July 6, 2026

Mr. Philip Barlow, Chair

Risk-Based Capital Investment Risk and Evaluation (E) Working Group
National Association of Insurance Commissioners
1100 Walnut Street, Suite 1000
Kansas City, MO 64106-2197

Re: American Academy of Actuaries' Presentation on C-1 for CLO Residual Tranches

Submitted Electronically

Dear Chair Barlow:

The American Council of Life Insurers (ACLI) appreciates the opportunity to comment on the exposure regarding the calibration of C-1 factors for collateralized loan obligation (CLO) residual tranches, as reflected in the American Academy of Actuaries' ("Academy") presentation on May 6, 2026 titled *C-1 Subcommittee Update on CLO C-1 Factors Modeling—Residual Tranches and Portfolio Adjustment Factors*.

ACLI continues to support the Academy's broader effort to develop a transparent, analytically grounded framework for calibrating C-1 factors for CLOs. As noted in ACLI's prior submission on April 16, 2026, a robust and credible framework should incorporate appropriate model enhancements, sensitivity testing, and validation before it is relied upon for regulatory capital purposes.

ACLI appreciates the Academy's continued analytical work in this area, including refinements to the modeling framework and evaluation across both Practical Expedient and Allowable Earned Yield accounting approaches. We recognize that the risk profile of CLO residual tranches may vary meaningfully based on portfolio characteristics and accounting outcomes. Continued model development, sensitivity testing, and validation could further strengthen the framework and support confidence in any final calibration decisions if regulators decided to make any changes to the current RBC treatment for the residual tranches. And, we note that the conclusions on pages 31 and 32 are not an indication that the Academy's CLO C-1 modeling work is complete.

ACLI respectfully encourages the Working Group to continue advancing the model enhancements for all CLO tranches, as identified in ACLI's April 16, 2026 comment letter (details copied in the Appendix to this letter), including the following:

- Incorporating and expanding sensitivity testing for key assumptions shown to materially affect modeled tail risk, including systemic risk correlation, recovery assumptions, collateral reinvestment prices, and prepayment assumptions;

American Council of Life Insurers | 300 New Jersey Avenue, NW, 10th Floor | Washington, DC 20001

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- Developing separate modeled C-1 factors for middle-market CLOs based on dedicated analysis of MM collateral performance, structural features, and available data;
- Enhancing grading between adjacent tranche ratings to reduce cliff effects and improve alignment with economic risk; and
- Considering tranche thickness as a comparable attribute for both BSL and MM CLOs, particularly for below-investment-grade tranches.

This would support transparency, analytical rigor, and supervisory confidence, while reducing the risk of embedding unintended outcomes into the capital framework.

ACLI appreciates the Academy's continued progress in advancing the CLO C-1 modeling framework and the Working Group's engagement on these issues. We believe that incorporating the recommended model enhancements and revisiting the residual tranche analysis would further strengthen the analytical foundation for final factor calibration and related conclusions.

We look forward to continued engagement with the Working Group and the Academy as this important work progresses.

Respectfully submitted,



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APPENDIX: ACLI RECOMMENDED MODEL ENHANCEMENTS FOR YEAR-END 2027 ADOPTION

Copied from ACLI Comment Letter Dated April 16, 2026

ACLI recommends the following enhancements to be considered as part of the 2027 implementation:

1. Incorporation of Sensitivity Test Results

ACLI supports incorporating insights from the Academy's sensitivity testing as presented on December 15, particularly where results identify assumptions that materially influence modeled tail risk. These results can help inform appropriate calibration choices and strengthen confidence in the selected C-1 factors.

Specifically, ACLI recommends the sensitivity testing be expanded where possible to include the universe of CLOs as well as targeted additional analysis, focused on three assumption areas that the Academy's sensitivities showed to be material:

- Systemic risk correlation (Academy sensitivities #1 and #2)
- Recovery average (Academy sensitivity #5)
- Collateral repurchase price and prepayment (Academy sensitivities #6 and #7)

Systemic Risk (Sensitivities #1 and #2)

The Academy's presentation demonstrates that small changes in correlation assumptions can drive material changes in modeled C-1 factors. The Academy pointed to a set of studies providing academic ballast to the observed behavior that default correlations increase during stress, especially for non-investment grade issuers. In other words, correlations are state-dependent and not static properties of ratings. Accordingly, ACLI contends that not fully conducting this sensitivity analysis risks misaligning the factor with the underlying risks.

Finally, it should be noted that the Academy points out in their presentation that it is important to test their chosen systemic risk correlation assumption because "leveraged loans may carry more systemic risk than bonds."

ACLI recommends:

- Finalizing the systemic risk correlation of tranches under stressed economic and financial market scenarios (e.g., correlation of price movements across issuances by ratings) that may amplify tail outcomes. The literature indicates this much for bonds and the Academy suggests that loans may have more systemic risks.
- Documenting the rationale for the chosen systemic risk correlation given its outsized influence on tranche tails and on "equal capital for equal risk."

Recoveries (Sensitivity #5)

The Academy's presentation demonstrates that lower recovery rate assumptions materially increase modeled C-1 for Baa and below tranches. We understand the baseline uses S&P recovery deciles by seniority (capturing tail shape), while Sensitivity #5 tests higher average loss given default (LGD) rates derived through statistical fitting. ACLI recommends:

- Refreshing recovery assumptions against the most current, seniority-aware empirical sources and ensuring that tail behavior remains realistically represented, particularly for first-lien/senior secured loans predominating CLO collateral.
- Assessing independence of structures (e.g., correlation of recoveries across issuers and with default intensity) that may amplify tail outcomes, as the Academy's correlation-in-severities sensitivity (Sensitivity #4) also shows meaningful impacts for mezzanine tranches.
- Evaluating whether a weighting technique may be appropriate when using historical data to derive recovery assumptions given the consistently lower loan recoveries observed in the last decade as a consequence of the material changes to standard loan structures and terms in the market versus the prior historical norm.
- Documenting the rationale for the chosen recovery distribution (level and shape), given its outsized influence on tranche tails and on "equal capital for equal risk" across otherwise similar CLOs.
- Using loan probability of default (PD) assumptions rather than broader all-issuer defaults across exposure types, as the broader dataset includes issuers and instruments that are not representative of predominantly senior-secured CLO collateral and therefore can overstate default incidence¹.
- Pairing any higher CLO collateral LGD assumption with a corresponding enhancement to loan PD, as expected loss reflects both default frequency and loss severity. A framework that increases severity without also calibrating behavior of the same collateral assumptions can overstate the overall loss profile of CLO collateral and therefore assign a capital charge that exceeds the collateral's actual risk profile.

Collateral Reinvestment Price and Prepayment (Sensitivities #6 and #7)

ACLI appreciates that the baseline assumes no prepayment and par reinvestment, consistent with rating-agency cash-flow setups. However, the Academy's stressed-market sensitivities, introducing below-par reinvestment prices and non-zero prepayments, show material dispersion across CLOs and material reductions in C-1 factors for junior tranches in certain structures. We recommend:

- Joint calibration of price-at-reinvestment and prepayment to historically consistent, stress-period relationships (e.g., linking loan prices and prepayment rates to observed default-rate

¹ Loan default rates (that generally include senior secured borrowing) are expected to be lower than all-issuer default rates (that include unsecured, bond-only issuers) when applying Moody's Default and Recovery Database data.

regimes). This would avoid overstating or understating risk when these drivers move together in real markets.

- Bounding or stratifying assumptions by collateral quality mix and reinvestment horizon (e.g., within the CLO reinvestment period versus after), to reflect realistic manager behavior and market liquidity conditions.
- Explicitly testing stability across a broader deal set (beyond the initial six deals) to confirm that the approach is robust – recognizing the Academy’s finding of widely varying results across deals under these sensitivities.

ACLI agrees with the Academy’s observation and recognizes these sensitivities move in opposite directions and may not fully offset each other. Treating the assumptions jointly will better align the C-1 factors with underlying risk. Given their interaction, we recommend an integrated sensitivity suite (like the Academy’s combined tests #8 and #9 but incorporating the three sensitivities mentioned above) be used to select final calibration points, so that RBC factors reflect the net portfolio-tail effect rather than canceling assumptions in isolation. Additionally, an enhancement to replace the application of all-issuer default rates with loan default rates would produce lower PD assumptions that are expected to offset the higher LGD sensitivity in the bond C-1 framework even before any prepayment or reinvestment enhancements.

2. Development of Separate Factors for MM CLOs

Although currently a smaller subset of the overall CLO universe, MM CLO issuance has grown rapidly, with new issue volumes reaching record levels in recent years. As exposure increases, the proportion of insurer-held CLOs backed by middle market collateral will rise. Therefore, ACLI recommends development of separate modeled C-1 factors for MM CLOs, based on dedicated analysis of MM collateral performance, structural features, and available data. Separate calibration would improve risk alignment while remaining consistent with the Academy’s overall framework. Developing separate modeled C1 factors now proactively addresses the trajectory of insurer-held MM CLOs, adapting to innovation in financial markets while protecting policyholders and preventing future capital distortions or the need for ad hoc adjustments.

Some analyses suggest MM CLOs may carry different risks than BSL CLOs due to less liquid collateral, higher weighted average spreads compensating for credit profiles, greater industry/issuer concentration profile, and limited secondary market pricing transparency. At the same time, MM structures often incorporate compensating features such as stronger credit enhancements and manager alignment through risk retention and origination. A dedicated MM analysis would empirically evaluate those factors, ensuring C-1 factors reflect “equal capital for equal risk” and avoid BSL-centric assumptions that may not capture MM nuances. Extending BSL logic to MM CLOs is a natural and feasible extension of the Academy’s work given the data now available from rating agencies and managers.

3. Enhancement of Grading Between Tranche Ratings

ACLI encourages continued enhancement of grading between adjacent tranche ratings, particularly where model outputs imply discontinuities that may not reflect commensurate differences in economic risk. Reducing cliff effects would help promote smoother transitions, strengthen alignment with the broader C-1 bond framework, and improve interpretability across market environments. In periods of market stress, investment-grade CLO tranches, while generally expected to remain performing, may nonetheless experience meaningful rating migration potentially by multiple letter grades rather than single-notch moves. More gradual capital transitions can help limit the potential for procyclical dynamics

by reducing incentives for forced selling at inopportune points in the cycle (as illustrated by subprime RMBS during the financial crisis, where rapid rating migration contributed to the NAIC's subsequent adoption of a break-point methodology).

4. Consideration of Tranche Thickness for BSL and MM CLOs

ACLI supports further consideration of tranche thickness as a comparable attribute for both BSL and MM CLOs, particularly for below-investment-grade tranches, where the Academy's analysis shows it provides incremental information about tail risk.

Excerpts from Dec. 15, 2025, C-1 Subcommittee Presentation to RBC Investment Risk Evaluation Working Group

August 2026

Stephen Smith, MAAA, FSA, CFA
Chairperson, Academy C-1 Subcommittee

About the Academy

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**Mission:**

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Introduction and Purpose

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- During the Risk-Based Capital Investment Risk and Evaluation (E) Working Group (RBCIREWG) Dec. 15, 2025, meeting, the Academy presented sensitivity tests for several key modeling assumptions within its *C-1 Subcommittee Update on CLO C-1 Factors Modeling* presentation.
- Based on stakeholders' feedback received so far, the RBCIREWG would like to solicit feedback on:
 1. Support for the continued refinement of the following assumptions:
 - Systemic Risk Correlation
 - Recovery Average
 - Collateral Repurchase Price and Prepayment
 2. If supportive, recommendations for refinements with empirical support

Introduction and Purpose

(continued)

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- Further effort to refine these assumptions would likely lead to sensitivity tests on a larger portion of the CLO universe beyond the 6 sample CLOs that were used in the sensitivity analysis for the Dec. 15, 2025, presentation.
- To facilitate the RBCIREWG request for feedback, excerpts from the Academy's presentation at the Dec. 15, 2025, meeting are provided for reference.

Acknowledgments

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- ACLI—use of C-1 corporate bond model developed by Moody's for ACLI
- Moody's—access to CLO deal data, collateral data, historical default rate data, and CDOnet
- S&P—historical recovery data and frequent discussions with structured finance analytical professionals
- Bridgeway Analytics—frequent discussions on credit modeling, structured finance, and help in understanding the ACLI & Moody's corporate bond model
- SSG—modeling advice and running CDOnet
- NAIC accounting staff—guidance on CLO statutory accounting

Modeling Assumptions

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Model Assumption	Description	Sensitivity # <i>Per Dec. 15, 2025 meeting</i>	Baseline Assumption	Previously -Stated Reason to Retain Baseline Assumption
Systemic Risk Correlation	Pairwise correlation amongst loans in the collateral pool	1, 2	10%	Consistency with C-1 bond factors
Recovery Average	Recovery average upon default for loans in the collateral pool	5	S&P average loss given default (LGD): 27% for senior secured, 60% for senior unsecured	Baseline is derived using actual data, whereas alternative approach is sensitive to statistical fitting methodology
Collateral Repurchase Price & Prepayment	Repurchase price upon default and prepayment speed for loans in the collateral pool	6, 7	No prepayments and no repurchase discounts	Alternative approaches were unrealistically credit-supportive by allowing deep discount purchases during the entire investment period and produced widely variable results across deals
Combination of Recovery Average and Collateral Repurchase Price & Repayment*	(Same as above)	8, 9 (combining 5 with each of 6 and 7)	(Same as above)	(Same as above)

*Shown for informational purposes.

Sensitivity —Systemic Risk Correlation

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After-Tax C-1 / Tranche Rtg	Baseline Dec '25	1	2
		5% Corr	20% Corr
Aaa	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.05%
A2	0.04%	0.01%	1.24%
Baa2	0.89%	0.04%	8.17%
Baa3	2.34%	0.80%	12.58%
Ba3	30.72%	20.18%	52.93%

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included. Baa2 tranche is from only one deal and is therefore potentially especially unrepresentative due to its small sample size.

Systemic risk is modeled with pairwise correlation between loans.

Baseline correlation is 10%.

Li and Chen (2018) reference 2%, 35% and 51% in 1-yr, 5-yr and 10-yr correlations for B-rated issuers.

Qi et al (2019) reference 2%, 10% and 9% in 1-yr, 5-yr and 10-yr correlations for B-rated issuers.

Sensitivity —Recovery Average

8

		5
After-Tax C-1 / Tranche Rtg	Baseline Dec '25	Lower Recovery
Aaa	0.00%	0.00%
Aa2	0.00%	0.00%
A2	0.04%	1.77%
Baa2	0.89%	21.73%
Baa3	2.34%	19.62%
Ba3	30.72%	59.09%

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included. Baa2 tranche is from only one deal and is therefore potentially especially unrepresentative due to its small sample size.

Baseline assumption S&P average loss given default (LGD): 27% for senior secured, 60% for senior unsecured.

A higher LGD is tested: 36% for senior secured, 54% for senior unsecured (despite being lower for senior unsecured, this is higher overall because most loans in CLOs are senior secured).

However, in both cases simple averages are not the input to the model. Decile data published by S&P was used so that the tail could be captured. The averages for the sensitivity are fitted to the shape of the S&P deciles by least-squares optimization.

Sensitivity —Collateral Repurchase Price & Prepayment

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		6	7
After-Tax C-1 / Tranche Rtg	Baseline Dec '25	Prepay & Discount A	Prepay & Discount B
Aaa	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.00%
A2	0.04%	0.07%	0.07%
Baa2	0.89%	0.00%	0.00%
Baa3	2.34%	0.55%	0.37%
Ba3	30.72%	10.15%	6.67%

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included. Baa2 tranche is from only one deal and is therefore potentially especially unrepresentative due to its small sample size.

Baseline scenario models no prepayments and no repurchase discounts. Sensitivities model historically low prepayment speeds and purchase prices, consistent with stressed credit environments.

Sensitivity A = prepay and purchase price equal to CTE(10) of historical data: 11.8% prepayment rate, 82.5 price.

Sensitivity B = prepay and repurchase price equal to VaR(0.5) of historical data: 8.7% prepayment rate, 72.0 price.

Sensitivity #6 —Widely Varying Results Across Deals

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After-Tax C-1 / Tranche Rtg	Prepay & Discount A						
	Average	Carlyle 2021-1	Strata II	Ares 52	Magnetite 27	OHA 3	Anchorage 17
Aaa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A2	0.07%	0.00%	0.00%	0.00%	0.00%	0.41%	0.00%
Baa2	0.00%	0.00%	n/a	n/a	n/a	n/a	n/a
Baa3	0.55%	0.00%	1.89%	0.83%	0.00%	0.60%	0.00%
Ba3	10.15%	0.00%	15.43%	31.11%	5.45%	1.22%	7.66%

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included.

Baa2 tranche is from only one deal and is therefore potentially especially unrepresentative due to its small sample size.

Sensitivity #7 —Widely Varying Results Across Deals

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After-Tax C-1 / Tranche Rtg	Prepay & Discount B						
	Average	Carlyle 2021-1	Strata II	Ares 52	Magnetite 27	OHA 3	Anchorage 17
Aaa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A2	0.07%	0.00%	0.00%	0.00%	0.00%	0.41%	0.00%
Baa2	0.00%	0.00%	n/a	n/a	n/a	n/a	n/a
Baa3	0.37%	0.00%	0.81%	0.79%	0.00%	0.60%	0.00%
Ba3	6.67%	0.00%	10.00%	28.68%	0.01%	1.22%	0.13%

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included.

Combined Sensitivity —Recovery Average & Collateral Repurchase Price & Prepayment

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After-Tax C-1 / Tranche Rtg	Baseline Dec '25	8	9
		5 & 6	5 & 7
Aaa	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.00%
A2	0.04%	0.20%	0.11%
Baa2	0.89%	0.00%	0.00%
Baa3	2.34%	5.51%	3.43%
Ba3	30.72%	31.12%	23.27%

Combination of lower recovery averages along with prepayment and repurchase discounts.

*Results are preliminary and subject to change. This is only 6 deals—results may change when all CLOs held by life insurers are included. Baa2 tranche is from only one deal and is therefore potentially especially unrepresentative due to its small sample size.

Questions?

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For more information, please contact
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September 4, 2026

VIA EMAIL

Risk-Based Capital Investment Risk and Evaluation (E) Working Group
National Association of Insurance Commissioners
1100 Walnut Street, Suite 1500
Kansas City, MO 64106

Re: Comments on the American Academy of Actuaries' August 2026 C-1 Subcommittee Update on CLO Modeling Assumptions, Systemic Risk Correlation, Recovery Average, and Collateral Repurchase Price and Prepayment

Dear Chairman Barlow and Members of the Working Group:

The Alternative Credit Council ("ACC")¹ and LSTA, Inc. ("LSTA")² submit these comments in response to the Working Group's request for stakeholder feedback on the modeling assumptions underlying the C-1 factors for collateralized loan obligations ("CLOs"), as set out in the American Academy of Actuaries C-1 Subcommittee's August 2026 update circulating excerpts from its December 15, 2025, presentation to the Working Group (the "August Update").³

The August Update asks stakeholders two questions: whether we support continued refinement of the systemic risk correlation, recovery average, and collateral repurchase price and prepayment assumptions, and, if so, what refinements we recommend with empirical support. The ACC and LSTA support continued refinement, and this letter sets out specific, empirically grounded recommendations on the recovery average and on the collateral repurchase price and prepayment assumptions.

We begin by thanking Chairman Barlow, the Working Group, and the Academy for their openness to potential revisions to some CLO C1 factor modeling assumptions and for disclosing sensitivity results in enough detail to

¹ The Alternative Credit Council (ACC) is a global body that represents asset management firms in the private credit and direct lending space. It currently represents 250 members that manage over US\$2 trillion of private credit assets. The ACC is an affiliate of AIMA and is governed by its own board, which ultimately reports to the AIMA Council. ACC members provide an important source of funding to the economy. They provide finance to mid-market corporates, SMEs, commercial and residential real estate developments, infrastructure, and the trade and receivables business. The ACC's core objectives are to provide guidance on policy and regulatory matters, support wider advocacy and educational efforts and generate industry research to strengthen the sector's sustainability and wider economic and financial benefits.

² LSTA, Inc. is a not-for-profit trade association that has been the leading advocate for the U.S. corporate lending market since 1995. LSTA's mission is to promote a fair, orderly, efficient and growing corporate loan market while advancing and balancing the interests of all market participants. Our 600+ member institutions include commercial banks (ranging in size from GSIBs to community banks), investment banks, broker-dealers, asset managers, and institutional lenders, as well as law firms and market service providers. For more information, visit www.lsta.org.

³ American Academy of Actuaries, Excerpts from Dec. 15, 2025, C-1 Subcommittee Presentation to RBC Investment Risk Evaluation Working Group (August 2026) (the "August Update"). All sensitivity results cited in this letter are the after-tax C-1 figures set out in the August Update and are labelled by the Academy as draft and preliminary.

support meaningful stakeholder analysis. The ACC and LSTA supported exactly this course in our April 16 and June 5, 2026, joint comment letters, in which we urged that key modeling assumptions continue to be refined through the Academy's governance process after the year-end 2026 implementation milestone, and that any such refinements be addressed through the model itself rather than through administrative floors or other non-modeled adjustments.⁴ The August Update reflects that commitment, and we appreciate it. We also welcome the Academy's forthcoming publication of comprehensive model documentation, which will allow stakeholders to engage with the calibration in far greater depth than the sensitivity excerpts alone permit.

Our comments reflect the analytical reality that the new CLO capital charges depend heavily on several key assumptions. The assumptions the Academy has identified for further review exert substantial leverage over the resulting C-1 factors, in several cases changing a factor by an order of magnitude. Where an assumption of that consequence rests on a value that lies outside the entire observed empirical distribution, or is imported from a universe materially different from the one being modeled, we believe that refinement is essential to protect the data-driven integrity of the results and that the NAIC's RBC Model Governance principles require. Where, by contrast, the empirical record is not yet sufficient to support a specific alternative, we say so rather than proposing a number the data cannot support. For instance, we are not in a position to propose a refinement regarding systemic risk correlation within the short comment period available, for the multiple reasons set out in section I of the first appendix.

Summary of recommendations

The ACC and LSTA respectfully urge the Working Group to:

- (i) Confirm that the Academy should continue to refine the recovery average and the collateral repurchase price and prepayment assumptions, and that no refreshed factors be adopted until that work is complete and exposed for comment.
- (ii) Conduct separate loss given default (LGD) analyses for broadly syndicated loan collateral and for middle-market collateral, rather than applying a single recovery assumption across both. An LGD derived from observed market prices presupposes a liquid secondary market that middle-market collateral does not have, and the Academy's calibration was built on broadly syndicated loan data alone. The 36% single-source assumption tested in Sensitivity 5 is not supportable as a standalone input for either segment.
- (iii) Recalibrate the probability of default (PD) assumption to loan-issuer experience alongside any change to loss severity. The current assumption is carried over from a corporate bond model calibrated to all issuers, and loan issuers default at materially lower rates over precisely the horizon in which CLO tranches pay down. The associations are providing the historical default experience for loan issuers and all issuers and the implied ratio of their cumulative default rates that could be applied to the Academy's CLO model to address this issue.
- (iv) Replace the zero-prepayment and no-repurchase-discount baseline with the fitted, state-contingent specification set out in section III, under which reinvestment price and prepayment rate are functions of the modeled default rate in each period rather than constants held across the full projection. The underlying analysis and the fitted parameters are set out in Appendix II.

⁴ Joint Comment Letter of the Alternative Credit Council and LSTA, Inc. to the Risk-Based Capital Investment Risk and Evaluation (E) Working Group, Re: Comments on the American Academy of Actuaries' March 2, 2026, Presentation, C-1 Subcommittee Update on CLO C-1 Factors Modeling (April 16, 2026) (the "April Letter"); Joint Comment Letter of the Alternative Credit Council and LSTA, Inc., Re: Comments on NAIC RBC Proposal 2026-12-IRE, CLO Factor (June 5, 2026) (the "June Letter").

- (v) Expose the full assumption documentation, the composition of the deal sample used, and the resulting sensitivity output for a public comment period of not less than 45 days before the Working Group votes on any refreshed factors for year-end 2027.

Appendix I to this letter sets out our reasoning and the supporting data for these recommendations, and Appendix II contains the reinvestment price analysis described in section III. We would welcome the opportunity to discuss these comments with the Working Group and the Academy in greater detail, and we are prepared to work with the Academy on the data underlying each of these assumptions.

If you have any questions, please reach out to Joe Engelhard, Head of Private Credit and Asset Management Policy, Americas, at ACC, at jengelhard@aima.org, or to Andrew Berlin, Director of Policy Research at LSTA, at aberlin@lsta.org.

Sincerely,

LSTA, INC.



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Appendix I

The table below summarizes the three assumptions on which the Working Group has requested feedback, the sensitivity range the Academy tested, and the position the ACC and LSTA take in each case. Each is developed in the sections that follow.

Assumption	Academy baseline	Sensitivity range tested	ACC and LSTA position
Systemic risk correlation	10% flat pairwise correlation, carried over from the C-1 corporate bond factors	5% and 20%. Baa2 moves from 0.89% to 0.04% and 8.17%; Ba3 from 30.72% to 20.18% and 52.93%	No refinement proposed at this time. The parameter is not CLO-specific, so any revision carries implications for the corporate bond factors as well and should be evaluated on that basis. We are reviewing the derivation and will revert with empirical support.
Recovery average, and the PD assumption paired with it	S&P LGD of 27% senior secured and 60% senior unsecured, fitted to S&P deciles. PD carried over from the corporate bond model, calibrated to all issuers	36% and 54% LGD. Baa2 moves from 0.89% to 21.73%; Baa3 from 2.34% to 19.62%. No PD sensitivity was run	Conduct separate LGD analyses for BSL and middle-market collateral, because the liquidity premise embedded in a market-price-derived input differs between them. The 36% single-source figure is not supportable for either segment. Recalibrate PD to loan-issuer experience alongside any change to loss severity.
Collateral repurchase price and prepayment	No prepayments and no repurchase discounts	11.8% prepayment at a price of 82.5, and 8.7% at 72.0, each held constant across the projection. Ba3 moves from 30.72% to 10.15% and 6.67%	Replace both constants with the fitted exponential relationships set out in section III, under which price and prepayment are functions of the modeled default rate, with the price series leading realized defaults by approximately 12 months. Applied across the modeled scenarios these are in several respects more conservative than the tested constants.

I. Systemic risk correlation

The Academy baselines pairwise correlation among the loans in the collateral pool at 10% and has retained that value for consistency with the C-1 bond factors. Sensitivities 1 and 2 test 5% and 20%. The results make correlation the most consequential assumption in the entire sensitivity set. At 5% correlation,

the after-tax Baa2 factor falls from 0.89% to 0.04% and the Baa3 factor from 2.34% to 0.80%. At 20% those same factors rise to 8.17% and 12.58%, and the Ba3 factor rises from 30.72% to 52.93%.

The ACC and LSTA are not in a position to propose a specific refinement to this assumption within the comment period available. The 10% parameter did not originate in the CLO workstream. It was derived in the documentation supporting the C-1 corporate bond factors and carried forward into the CLO modeling because no basis was identified for changing it.⁵ Evaluating whether it should change requires working through that original derivation and assembling loan-level default correlation data, which is materially harder to obtain than the total return series more commonly available. We are undertaking that review and will revert to the Working Group and the Academy with empirical support if the analysis warrants a change.

Two observations bear on how the Working Group should treat the assumption in the meantime.

- The current parameter is not CLO-specific, so any revision has implications beyond CLOs. Because the 10% figure is shared with the corporate bond C-1 factors, a conclusion that it is miscalibrated would apply to those factors as well. Revising it for CLO collateral alone, in either direction, would introduce precisely the inconsistency that the equal capital for equal risk principle is meant to prevent. Any change should be evaluated for both asset classes together and through the same governance process.
- The academic literature on this point is not yet settled enough to make any changes. The studies cited in the August Update report correlations that vary widely by horizon and by rating, and in several cases do not cleanly separate default correlation from return correlation. Return correlations are systematically higher than default correlations, so estimates that blend the two are not a sound basis for setting a default correlation parameter in either direction. Where the correlation assumption is refined, the underlying studies should be assessed for that distinction before their estimates are relied upon.

We note that if the Working Group were to consider differentiating correlation by rating, consistency would require considering the other drivers of default correlation as well, including obligor and facility size. Facility sizes in the broadly syndicated loan market have grown substantially, and the size distribution of the collateral pool bears on realized correlation in the same way that rating does. Differentiating on one dimension while holding the others fixed would not produce a better calibrated parameter.

II. Recovery average, and the default frequency assumption paired with it

The Academy baselines recovery on the S&P average LGD of 27% for senior secured loans and 60% for senior unsecured loans, fitted to the shape of the S&P decile data by least-squares optimization so that the tail rather than the mean drives the result. Sensitivity 5 tests a higher assumption of 36% and 54%. The effect is severe and concentrated at the ratings where insurers hold significant exposure. The after-tax A2 factor moves from 0.04% to 1.77%, the Baa2 factor from 0.89% to 21.73%, a twenty-fourfold increase, the Baa3 factor from 2.34% to 19.62%, and the Ba3 factor from 30.72% to 59.09%.

⁵ Moody's Analytics, documentation supporting the C-1 corporate bond factors developed for the ACLI (2021), at the discussion of the systemic risk correlation parameter.

The 36% single-source assumption is not supportable, and a headline average is the wrong instrument

The ACC and LSTA do not support adopting the 36% assumption tested in Sensitivity 5. Two problems attend it, and both would attend any recalibration that proceeds by moving a headline average.

- A single agency's figure imports that agency's methodology wholesale. S&P's recovery study measures nominal ultimate recovery realized on emergence from the restructuring process. Moody's recovery measures differ in the discounting convention applied to recoveries received over time, in whether recovery is measured at the instrument or the corporate family level, and in the treatment of post-default trading prices. A meaningful portion of the nine percentage point gap between the two headline figures reflects these methodological differences rather than a genuine disagreement about loss severity. Adopting the higher figure would treat a difference in measurement convention as though it were an empirical finding about how much is recovered.
- Any revision must be constructed at the decile level, not by moving a central estimate. The Academy fits to the S&P deciles precisely because CTE-90 is a tail measure and the shape of the recovery distribution, not its mean, drives the result. Substituting a different headline average and re-fitting it to the existing decile shape would shift the central tendency while leaving the dispersion untouched, which is not a coherent recalibration of a tail-driven model. A defensible revision has to be built from the underlying distribution.
- The recovery assumption interacts materially with the repurchase price and prepayment assumptions, and should not be refined in isolation. Combined Sensitivities 8 and 9 apply the lower recovery assumption together with the prepayment and repurchase discount specifications. Under those combinations, the Baa3 factor is 5.51% and 3.43%, against 19.62% when the recovery change is applied alone, and the Ba3 factor is 31.12% and 23.27%, against 59.09%. The severity of Sensitivity 5 is therefore substantially an artifact of holding the zero-prepayment and no-discount baseline fixed while the recovery assumption moves. The Working Group should not treat any single-assumption sensitivity as an estimate of the factor that a full recalibration would produce.

The recovery assumption should be analyzed separately for broadly syndicated and middle-market collateral

The most consequential refinement available on the recovery assumption is not a change in its level but a change in its scope. A recovery assumption derived from observed market prices and market-value-based recovery measures carries an embedded premise: that a liquid secondary market exists in which the collateral can be marked and sold. That premise holds for broadly syndicated loans. It does not hold for middle-market collateral, which is originated bilaterally or through club processes, lacks broadly available market pricing, and does not trade in any comparable sense. The Academy's calibration was built on broadly syndicated loan data, and the resulting recovery input is nonetheless applied to middle-market collateral without any analysis specific to that segment.

- Recovery in the middle-market segment is determined by different mechanics. Outcomes are driven by lender control within a concentrated group, covenant structure, and access to collateral through a negotiated workout, rather than by a post-default trading price. Those mechanics have historically supported higher recoveries than a market-price-based measure would imply, because the holder is positioned to manage the credit rather than to sell it into a distressed bid.

- The direction of the error is not neutral. Applying an LGD derived from liquid secondary market behavior to illiquid, directly originated collateral systematically understates recovery for that segment, and therefore overstates the capital charge. A single parameter applied across both segments cannot satisfy the principle of equal capital for equal risk, because the two segments do not carry equal risk on the dimension the parameter measures.
- The problem is compounded, not cured, by any revision to the level. If the recovery assumption is moved on the strength of broadly syndicated loan data, the revised figure is applied to middle-market collateral with even less support than the current one, because the evidentiary basis for the change is drawn entirely from the segment to which it properly applies. Separating the analysis is therefore a precondition to revising the level, not an alternative to it.

The ACC and LSTA accordingly ask that the Academy conduct separate LGD analyses for the two segments, and that any revised recovery input be derived from and applied to the segment whose experience supports it. The data required to do so are available. Credit rating agencies with substantial middle-market CLO coverage have indicated a willingness to provide the necessary recovery data, and S&P alone rates approximately two-thirds of the middle-market CLO market on a dollar basis. We understand that the Working Group expects to consider middle-market CLOs within its broader asset-backed securities workstream, and that the comparable attributes framework may ultimately be retained for that segment. Our request here is narrower and does not depend on that outcome. It concerns the recovery input itself, and the fact that the liquidity premise embedded in that input differs fundamentally between the two segments.

If loss severity is made loan-specific, default frequency must be as well

The recovery assumption and the PD assumption are the two inputs to expected loss. The Academy is considering whether loss severity should be calibrated to loan-specific experience. The default frequency assumption sitting alongside it has not been, and the two cannot be treated differently without producing an internally inconsistent expected loss. The Academy's PD assumptions are carried over from the Moody's corporate bond model, which is calibrated to all issuers rather than to the loan issuer universe that constitutes CLO collateral.

The associations have quantified the difference. Using the Moody's Default and Recovery Database cumulative default rate series for all issuers and for loan-only issuers, across 29 annual cohorts from January 1, 1996 through December 31, 2024, we regressed loan-only issuer cumulative default rates on all-issuer cumulative default rates through the origin across the Baa1 to Caa3 notches, at one, three, five and seven year horizons.⁶ The resulting multipliers are 0.63 at one year, 0.73 at three years, 0.81 at five years and 0.85 at seven years. The loan-only issuer advantage therefore erodes at approximately 0.037 per additional year and converges on parity by roughly year ten.

That pattern is decisive for CLOs, because the advantage is concentrated in exactly the years in which CLO tranches pay down. Tranches typically amortize over roughly five to six years, so the portion of the curve that drives tranche outcomes is the portion in which loan issuers default at between 0.63 and 0.81

⁶ Loan vs All Issuer Cumulative Default Rate Ratios, analysis prepared by ACC and LSTA members and provided to the Academy with this letter. Source data: Moody's Default and Recovery Database cumulative default rate timeseries for all issuers and loan-only issuers, 29 annual cohorts from January 1, 1996 through December 31, 2024, all countries and industries, ratings Aaa through C. Multipliers are the slope of a zero-intercept regression of loan-issuer on all-issuer cumulative default rates across the Baa1 to Caa3 notches.

times the all-issuer rate. A calibration built on the all-issuer curve does not produce a conservative result so much as a mismatched one, and the mismatch is largest precisely where it matters most. We would add that the benefit is concentrated in speculative grade, where the loan-only to all-issuer ratio across the B1 to Caa3 notches runs between roughly 0.4 and 0.9, consistent with the covenant protection and senior secured position that distinguish loan obligations from the broader rated universe.

We recognize that the PD assumption was not among the three items on which the August Update solicited comment. We raise it because it is not a separable question. A revision to loss severity that is not accompanied by a corresponding revision to default frequency would move one input of expected loss toward loan-specific experience while leaving the other calibrated to a broader universe, and the resulting factor would be less accurate than either a fully loan-specific or a fully general calibration. The ACC and LSTA will provide the supporting default rate data to the Academy, and we understand that the same analysis is being shared with the ACLI.

III. Collateral repurchase price and prepayment

The Academy baselines the model on no prepayments and no repurchase discounts. This is the assumption most clearly at odds with the empirical record, and it is the assumption on which the ACC and LSTA urge the most substantial refinement. It is also the assumption that appears to drive the results of the December 2025 sensitivity test, rather than market data. This section sets out a specific alternative specification, including the benchmark and the filter the Academy would need to construct it.

The baseline lies outside the observed distribution, and the tested alternative was applied in a way the data does not support

Prepayments have never ceased in the broadly syndicated loan market. The associations have assembled the monthly history of the Morningstar LSTA US Leveraged Loan Index from November 1998 through September 2025, measuring the trailing 12-month default rate by principal, the weighted average bid price, the trailing 12-month average price, and the trailing 12-month repayment rate.⁷ Over that period the trailing 12-month repayment rate averaged 30.99%. Its maximum was 62.59%. Its minimum, across 27 years including two systemic credit crises, was 8.69%, recorded in March 2009. Prepayment has never approached zero. Across the COVID period, approximately 14% of CLO collateral paid off at par on an annualized basis through amortization and scheduled payments, and the index repayment rate did not fall below 17.66%.

That figure locates the Academy's own parameters precisely. Sensitivity B applies a prepayment rate of 8.7%, drawn as the VaR(0.5) of the historical data. The lowest trailing 12-month repayment rate ever recorded in the index is 8.69%. Sensitivity A's 11.8%, drawn as the CTE(10), sits just above it. Neither is an implausible point estimate; each is close to the worst outcome the market has produced. The difficulty is that a value observed in the single worst month of the worst credit environment on record was then assumed to persist for a 10-year projection. The zero baseline lies below even that. The baseline is not a conservative point within the observed distribution but a value the distribution does not contain.

⁷ US Leveraged Loan Index: Defaults vs Price and Prepayments, analysis prepared by ACC and LSTA members and provided to the Academy with this letter. Source data: Morningstar LSTA US Leveraged Loan Index, monthly, November 1998 through September 2025. Default rates are trailing twelve month by principal; repayment rates are trailing twelve month repayments as a percentage of total loan outstandings. The price relationship is fitted to the trailing twelve month average price.

The difficulty with the tested alternative is not the level of the parameters but the way they were applied. Each was drawn from the tail of its own historical distribution and then held constant across the entire projection.⁸ The remedy is not to return to a zero assumption, which is equally unsupported by the data and errs in the opposite direction. The remedy is to make the parameters vary with the credit environment, which is what the record shows they do.

A fitted specification the Academy can implement

We understand the constraint the Academy is working under, which is that any specification must be simple enough to implement systematically within the cash flow projection while being realistic enough to withstand scrutiny. Rather than describe an approach in the abstract, the associations have fitted the relationships directly and set out the underlying analysis in Appendix II. The specification below uses only variables the model already produces.

We fitted reinvestment price and prepayment rate to the trailing 12-month default rate in exponential form, $y = a \times \exp(b \times d)$, where d is the trailing 12-month default rate. The fitted relationships are:

- Reinvestment price = $99.443 \times \exp(-2.236 \times d)$, fitted against the trailing 12-month average price, with a correlation to the default rate of -0.74 .
- Prepayment rate = $0.3657 \times \exp(-12.36 \times d)$, with a correlation to the default rate of -0.40 .

The exponential form is a deliberate choice, and it resolves the problem that led the Academy to constants in the first place. Fitting a linear relationship to the observed range and then extrapolating into the tail produces negative prices and negative prepayment rates at the default levels the model generates for the lowest rating categories in the most severe scenarios. These default levels are far in excess of anything in the historical record. The exponential form is bounded below by zero and asymptotes as defaults rise, so it can be applied across the full range of modeled default rates without producing impossible values and without requiring an arbitrary floor. It moderates the predicted values in extreme scenarios by construction rather than by adjustment.

- Replace each constant with a vector, constructed separately for each scenario. Rather than a single prepayment speed and a single price applied uniformly, each scenario carried through the cash flow model should receive its own time-varying vector of prepayment speeds and reinvestment prices. Scenarios with elevated simulated defaults would carry slower prepayment and deeper discounts in the affected periods, while benign scenarios would carry speeds and prices near their long-run averages.
- Apply the fitted relationships period by period to the modeled default rate. In each projection period, the simulated marginal default rate is the input, and the two equations return a reinvestment price and a prepayment rate. This ties both variables to a single state variable the model already generates, requires no additional stochastic process, and is fully transparent and reproducible from the parameters set out above. The associations have applied the relationships across nine Moody's rating categories from Ba1 to Caa3, 10 loss years and 17 stress percentiles from the 90th to the 99.99th, and that output is set out in Appendix II.

⁸ August Update, slide 6 (previously stated reasons to retain the baseline assumptions).

- Lead the price vector ahead of realized defaults by approximately 12 months. Market prices dislocate on expectation while defaults follow on realization, so a specification that applies the discount contemporaneously with defaults understates the reinvestment opportunity. The observed lag between the onset of price dislocation and the associated default wave has ranged from roughly nine to 18 months, and 12 months is a reasonable central assumption. The COVID episode illustrates the mechanism: prices dislocated sharply in March 2020, while the associated defaults did not materialize in volume until 2021 and 2022. Through that interval CLOs reinvested at discounts in collateral that was still performing.
- Recognize that the two channels do not respond alike. The fitted slope on prepayment, -12.36 , is more than five times the slope on price, -2.236 , so in proportional terms prepayment is by some margin the more responsive of the two. At Ba1 in the first loss year at the 99.99th percentile, the modeled default rate of 7.2% produces a reinvestment price of 84.7, roughly 15% below its benign level, while the prepayment rate falls from about 31% to 15.1%, a decline of more than half. Price, by contrast, is bounded in practice by the behavior of the market: the weighted average bid price has never closed a month below 61.74, recorded in December 2008. Drawing both parameters from the tail and holding them constant misstates both channels at once, understating how sharply prepayment collapses in severe scenarios and overstating how long a deep price discount persists.

The fitted specification is not a device for lowering charges

The associations recognize that the Working Group will want to know whether a state-contingent specification simply produces lower capital charges by another route. It does not. Applied across the modeled default rates, the fitted relationships is more conservative on average than the constants the Academy tested.

- Across all ratings, percentiles, and loss years, the weighted average fitted reinvestment price is 86.1. That is above the 82.5 applied in Sensitivity A and well above the 72.0 applied in Sensitivity B. As such, on average across all tail scenarios, ratings and time, a lower reinvestment benefit is assumed under the proposed specification than the sensitivities considered by the Academy.

A qualification on the price relationship, and a commitment to refresh it

One qualification attaches to the price relationship, and the associations raise it now rather than leave it to be discovered. The relationship is fitted to the full index, which includes distressed names that CLO managers do not purchase. As set out below, managers migrate up in credit quality during dislocation, so a price series drawn from the whole index understates the price a CLO actually pays and therefore overstates the reinvestment discount the model would credit.

The associations are obtaining the index constituent data that most closely represents the CLO investing universe, and we expect that refit to raise the predicted reinvestment price at every default rate. Accordingly, that would reduce the modeled benefit relative to the parameters set out above. We will provide the refreshed analysis to the Academy within the coming weeks. We flag the point in advance because the direction of the correction runs against the most beneficial outcome for our members, but we want to be consistent in following an appropriate data-driven analysis. As a result, we recommend that the Academy should not adopt the price relationship in its present form without it first receiving and incorporating this additional data. The prepayment relationship is not affected.

The specification should also reflect contractual reinvestment spread and interest rate floors

Price is not the only reinvestment variable that responds to the credit environment. Contractual reinvestment spreads widen materially in and after periods of stress, and the widening persists well beyond the dislocation itself. The weighted average contractual spread in the loan market was approximately 350 basis points at the end of 2019 and remained elevated at approximately 379 basis points at the end of 2021, notwithstanding that 2021 was a notably loose credit environment. Interest rate floors also become more prevalent as base rates fall, which is the environment in which credit stress typically occurs. Both effects increase excess spread, and excess spread is materially more protective once an overcollateralization test has been tripped and cash is being diverted to senior tranches. A specification that captures the reinvestment discount while omitting the associated spread and floor effects would model only part of the reinvestment economics.

Cross-deal variability is a property of the sample, not evidence against the assumption

The Academy also cited widely varying results across deals under Sensitivities 6 and 7. Under Sensitivity A the Ba3 results range from 0.00% for Carlyle 2021-1 to 31.11% for Ares 52, and under Sensitivity B they range from 0.00% to 28.68%. Dispersion of that magnitude reflects deal-specific structural features rather than a defect in the assumption being tested. The baseline results carry the same underlying sensitivity to deal selection; the alternative specifications simply make it visible. Selecting the assumption that produces the least dispersion would optimize for the appearance of stability rather than for accuracy. We understand that the Academy's testing now extends well beyond the deals used for the December 2025 sensitivities, which should address the dispersion concern directly and on its own terms.

IV. Transparency and exposure before any year-end 2027 factor update

The ACC and LSTA have consistently supported addressing assumption questions through the model and its documented governance process rather than through floors, caps or other non-modeled adjustments applied after the fact, and the Working Group has consistently done so. Principle 9 of the Principles for RBC Requirements adopted on December 10, 2025, requires clear, complete and transparent communication and documentation of proposed and adopted updates, methodologies and supporting rationale, and Principle 10 requires adherence to model risk management standards relying on data-driven methodologies.⁹ Applying those principles to the workstream the August Update describes, we ask the Working Group to commit to the following before any refreshed factors are adopted for year-end 2027.

- Publish the full assumption documentation in advance of adoption, including the derivation of the systemic risk correlation parameter and its relationship to the corporate bond calibration, the recovery fitting methodology together with the decile inputs used and any reconciliation between the S&P and Moody's datasets, the basis for the PD assumption, and the complete specification of any prepayment and repurchase price vectors.
- Disclose the composition of the deal sample used, including the number of deals, the vintage distribution, the rating distribution across tranches, the manager distribution, and the criteria applied

⁹ Principles for RBC Requirements adopted by the Risk-Based Capital Model Governance (EX) Task Force on December 10, 2025. Principle 9 (Transparency) requires clear, complete and transparent communication and documentation of proposed and adopted updates, methodologies, and supporting rationale. Principle 10 (Process) requires adherence to model risk management standards relying on data-driven methodologies.

for inclusion, so that stakeholders can assess whether the sample is representative of insurer-held BSL CLO exposure.

- Expose any refreshed factors for a public comment period of not less than 45 days before the Working Group votes, and provide the underlying sensitivity results at the same level of detail as the December 15, 2025, excerpts contained in the August Update. That level of disclosure is what has made this comment letter possible, and it should be the standard for the refinement workstream rather than the exception. We note that the Working Group and the Capital Adequacy (E) Task Force applied a 45-day comment period to the exposure of the RBC Preamble itself, and that the technical complexity of the CLO calibration warrants no less.
- Implement any assumption changes through the model itself. Where a refined assumption produces a factor materially different from the year-end 2026 factor, whether higher or lower, that difference reflects the model's improved assessment of actual risk and should flow through to the factor. A one-sided adjustment that permits increases but not decreases would be inconsistent with Principle 4 of the Principles for RBC Requirements adopted by the Risk-Based Capital Model Governance (EX) Task Force on December 10, 2025, which provides that RBC requirements should be guided by the principle of equal capital for equal risk, consistent in their statistical safety levels and time horizons, appropriate for the underlying risk.

V. Conclusion

The ACC and LSTA support the continued refinement of the assumptions identified in the August Update, and we have set out the specific recommendations the empirical record will carry. The recovery input should be analyzed separately for broadly syndicated and middle-market collateral, because the liquidity premise embedded in a market-price-derived assumption does not hold across both, and no revision to its level should be applied to a segment whose experience did not support the revision. The 36% single-source figure tested in Sensitivity 5 is not supportable for either segment. Any move toward loan-specific loss severity must also be accompanied by a corresponding move toward loan-specific default frequency. The zero-prepayment and no-discount baseline, which lies below anything the index has recorded in 27 years, should be replaced with the fitted exponential relationships set out in section III, applied period by period to the modeled default rate and led ahead of realized defaults by approximately twelve months. Applied across the modeled scenarios, that specification is more conservative on average than the constants tested in December 2025, and we will provide the underlying analysis to the Academy so that it can be tested directly.

On systemic risk correlation, we have declined to propose a figure the available evidence cannot yet support. We are reviewing the derivation and will revert if our analysis warrants a change. We note only that the parameter is shared with the corporate bond C-1 factors and that any revision should be evaluated for both asset classes through the same process.

All of this work should be exposed for public comment before any factor is updated. We appreciate the Working Group's and the Academy's continued engagement and are prepared to provide the underlying data on each of these points. We would also welcome the opportunity to discuss these comments in greater detail with the Working Group and its staff.

Appendix II

Predicted reinvestment price under the proposed specification, compared with the Academy's tested constants

This appendix reproduces the two worksheets of the reinvestment price analysis described in section III. Part A sets out the reference inputs, being the weights applied across the 17 stress percentiles, the sample CLO rating weights and the average trailing twelve month default rate associated with each rating, together with the resulting weighted average reinvestment price and the two constants the Academy tested. Part B sets out the full grid of predicted reinvestment prices by rating, loss year and stress percentile, from which the weighted average is derived.

Part A. Reference inputs

Weighted average reinvestment price against the Academy's tested constants

Measure	Price
Wtd Avg Reinvestment Price Across 9 ratings, 10Y and 17 Scenarios	86.11
Academy's Sensitivity A Reinvestment Price	82.50
Academy's Sensitivity B Reinvestment Price	72.00

Scenario weights applied across the 17 stress percentiles

Percentile	Optimistic	Conservative	Average
0.9999	0.50%	0.00%	0.25%
0.9995	0.50%	0.50%	0.50%
0.999	1.50%	0.50%	1.00%
0.9975	2.50%	1.50%	2.00%
0.995	2.50%	2.50%	2.50%
0.9925	2.50%	2.50%	2.50%
0.99	5.00%	2.50%	3.75%
0.985	5.00%	5.00%	5.00%
0.98	10.00%	5.00%	7.50%
0.97	10.00%	10.00%	10.00%
0.96	10.00%	10.00%	10.00%
0.95	10.00%	10.00%	10.00%
0.94	10.00%	10.00%	10.00%
0.93	10.00%	10.00%	10.00%
0.92	10.00%	10.00%	10.00%
0.91	10.00%	10.00%	10.00%
0.9	0.00%	10.00%	5.00%

Sample CLO rating weights and average default rate across the 17 tail scenarios

Rating	Sample CLO weight	Average LTM default rate
Ba1	2.73%	95.06

Rating	Sample CLO weight	Average LTM default rate
Ba2	3.62%	92.72
Ba3	10.07%	90.91
B1	18.11%	88.63
B2	37.57%	85.53
B3	26.03%	82.27
Caa1	1.28%	77.98
Caa2	0.42%	72.35
Caa3	0.18%	63.06

The weighted average reinvestment price of 86.11 is calculated across all nine rating categories, ten loss years and seventeen stress percentiles, using the average scenario weights and the sample CLO rating weights set out above. It exceeds the 82.5 applied in the Academy's Sensitivity A and the 72.0 applied in Sensitivity B, so the proposed specification assumes a smaller reinvestment benefit, on average across ratings, scenarios and time, than either constant the Academy tested.

Part B. Predicted reinvestment price by rating, loss year and stress percentile

Each table reports the reinvestment price returned by the fitted relationship, $\text{price} = 99.443 \times \exp(-2.236 \times d)$, where d is the modeled default rate for that rating, loss year and stress percentile. Columns are loss years 1 through 10; rows are the 17 stress percentiles.

Ba1

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	84.71	88.99	92.90	88.68	96.74	95.40	92.87	90.34	95.93	94.70
0.9995	87.97	86.57	95.61	89.59	95.92	92.54	97.44	95.71	94.50	90.46
0.999	88.42	88.98	93.73	91.45	93.25	94.57	96.19	96.63	94.67	91.26
0.9975	89.65	91.75	92.00	92.36	93.42	94.08	97.10	95.68	95.13	94.72
0.995	91.05	92.49	92.48	92.65	93.85	94.54	95.72	95.61	95.89	95.25
0.9925	91.92	92.54	92.90	93.18	94.10	94.74	95.69	95.27	95.58	96.12
0.99	92.47	92.76	93.18	93.52	94.03	94.44	96.06	95.51	95.06	96.08
0.985	93.26	93.18	93.44	93.54	94.89	94.41	95.95	95.53	95.30	95.47
0.98	93.75	93.44	93.48	94.02	94.85	94.56	95.86	95.68	95.73	95.42
0.97	94.48	93.84	93.86	94.31	95.01	94.62	95.82	95.85	95.96	95.45
0.96	94.93	94.13	94.17	94.48	94.99	94.98	95.86	95.63	96.21	95.60
0.95	95.35	94.45	94.35	94.61	95.21	95.04	95.67	95.93	95.95	95.82
0.94	95.69	94.63	94.42	94.77	95.19	95.42	95.65	95.84	96.01	95.82
0.93	95.94	94.86	94.50	94.87	95.32	95.56	95.66	95.77	95.98	95.99
0.92	96.13	95.07	94.63	94.88	95.52	95.51	95.77	95.79	96.01	95.90
0.91	96.38	95.17	94.77	94.93	95.51	95.59	95.72	95.93	96.00	95.95
0.9	96.51	95.30	94.98	94.97	95.53	95.61	95.94	95.95	95.83	95.99

Ba2

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	78.77	81.59	85.70	95.44	90.60	86.32	94.77	90.55	98.12	86.96
0.9995	81.79	84.15	89.39	88.73	90.54	89.57	91.93	97.64	88.96	93.07
0.999	83.76	85.10	87.93	89.88	90.17	90.06	95.54	93.48	91.80	92.26
0.9975	85.38	87.89	87.70	90.16	89.93	91.33	94.57	94.67	92.29	94.69
0.995	87.04	88.72	88.62	89.79	90.83	92.13	93.19	94.06	95.23	92.03
0.9925	88.28	89.10	88.87	90.04	91.15	92.56	92.89	94.20	94.08	93.17
0.99	89.06	89.09	89.34	90.64	90.87	93.50	92.82	92.85	94.78	93.22
0.985	89.99	89.93	90.07	90.58	91.67	92.48	92.88	93.64	94.15	94.26
0.98	90.78	90.07	90.38	91.16	91.28	93.03	93.68	93.56	93.90	94.11
0.97	91.88	90.56	91.05	90.63	92.42	92.81	93.98	94.00	93.97	93.73
0.96	92.69	90.97	91.09	91.14	92.96	92.50	93.76	94.53	93.92	93.82
0.95	93.18	91.35	91.37	91.60	92.95	92.53	93.95	94.25	94.12	94.25
0.94	93.62	91.67	91.67	91.69	93.03	92.71	94.09	94.14	94.31	94.20
0.93	94.01	91.87	91.84	91.88	93.04	93.15	93.82	94.37	93.98	94.30
0.92	94.28	92.19	91.87	91.98	93.21	93.28	93.80	94.30	94.26	94.39
0.91	94.51	92.44	92.00	92.05	93.39	93.29	93.93	94.31	94.36	94.43
0.9	94.73	92.64	92.10	92.17	93.51	93.30	94.06	94.26	94.49	94.45

Ba3

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	74.34	77.04	91.54	88.55	86.53	83.66	95.53	85.15	98.39	83.78
0.9995	76.65	83.80	84.76	86.75	89.41	82.95	94.95	95.12	91.16	88.22
0.999	77.49	84.33	85.50	87.66	88.42	86.13	94.58	90.78	91.47	95.01
0.9975	80.40	85.73	85.57	86.86	88.36	89.72	91.18	94.65	90.78	93.15
0.995	83.11	85.72	86.63	86.91	89.70	89.36	90.77	93.98	93.76	91.56
0.9925	84.84	85.54	87.40	87.67	89.49	89.45	91.39	93.15	93.38	92.02
0.99	85.85	86.14	87.55	87.82	89.27	90.13	91.72	92.78	92.87	93.08
0.985	87.02	86.72	87.99	88.40	89.64	90.24	91.72	93.16	92.22	92.76
0.98	87.94	87.09	88.12	88.77	90.37	90.07	92.19	92.22	93.14	92.74
0.97	89.03	87.69	88.86	89.07	90.91	90.68	92.14	92.24	92.49	93.11
0.96	89.99	88.09	89.11	89.50	91.00	90.98	92.13	92.66	92.61	93.09
0.95	90.62	88.68	89.24	89.52	91.08	91.41	92.45	92.54	92.89	92.92
0.94	91.09	89.16	89.55	89.36	91.38	91.68	92.18	92.74	93.37	93.21
0.93	91.54	89.48	89.62	89.77	91.23	91.82	92.46	92.96	93.12	93.42
0.92	91.95	89.75	89.67	90.17	91.23	91.94	92.52	93.08	93.23	93.27
0.91	92.30	89.96	89.86	90.20	91.50	91.92	92.65	93.06	93.32	93.39
0.9	92.59	90.19	89.96	90.55	91.29	92.16	92.58	93.12	93.43	93.53

B1

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	65.76	72.11	87.58	83.25	94.98	80.01	91.76	84.92	93.42	86.78
0.9995	68.51	79.35	81.56	85.91	89.65	82.06	90.85	88.76	88.61	86.07
0.999	70.35	82.49	80.08	84.92	88.87	84.51	91.30	86.67	90.54	87.55
0.9975	75.39	78.75	83.69	85.66	87.91	87.13	88.93	89.73	89.00	92.76
0.995	77.33	80.96	84.87	84.26	87.77	87.63	90.16	89.48	91.05	90.27
0.9925	79.57	81.27	84.34	86.09	86.90	88.17	89.99	90.20	90.97	91.60
0.99	80.68	82.16	84.14	85.58	87.77	88.72	89.22	91.48	91.49	91.54
0.985	82.31	83.12	84.51	85.29	88.17	89.23	89.56	90.57	91.13	92.60
0.98	83.45	83.55	84.65	85.81	88.38	89.79	88.74	91.04	91.52	92.31
0.97	84.91	84.72	85.09	86.40	88.55	89.61	89.33	91.42	91.62	91.58
0.96	85.94	85.23	85.83	86.60	88.58	89.54	89.99	91.28	91.35	92.10
0.95	86.82	85.66	86.35	86.75	88.59	89.52	90.91	90.93	91.46	92.35
0.94	87.51	85.96	86.41	87.48	88.45	89.46	91.03	90.71	92.47	92.07
0.93	88.19	86.16	86.56	87.95	88.71	89.24	91.11	91.07	92.36	92.10
0.92	88.70	86.63	86.80	87.99	88.80	89.57	90.80	91.52	91.87	92.39
0.91	89.23	86.87	87.12	87.90	89.03	89.55	90.80	91.66	92.23	92.27
0.9	89.58	87.23	87.30	88.03	89.26	89.43	90.87	91.88	91.93	92.77

B2

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	59.67	68.88	83.96	82.32	77.24	86.53	79.88	98.05	77.73	96.99
0.9995	63.34	70.99	79.22	82.67	80.34	82.58	91.18	87.77	90.57	87.01
0.999	66.16	70.41	79.35	82.40	82.19	82.49	92.38	87.70	87.37	89.35
0.9975	69.43	75.93	75.11	83.96	83.17	84.13	88.13	87.51	89.48	90.46
0.995	71.60	77.29	78.04	82.50	83.64	84.43	88.81	87.49	87.46	89.16
0.9925	73.56	78.17	78.35	82.99	83.32	85.28	87.78	87.48	87.87	89.55
0.99	74.37	79.26	79.52	82.89	82.82	85.41	88.23	87.05	88.33	88.97
0.985	75.95	79.88	81.25	82.75	83.75	85.20	87.62	88.17	88.63	89.02
0.98	77.15	80.36	81.50	82.54	84.99	85.86	86.35	88.96	89.11	88.85
0.97	79.56	80.22	82.56	83.45	84.09	87.29	86.43	89.11	89.35	89.05
0.96	80.91	81.00	82.83	83.62	84.80	87.05	87.25	88.30	89.48	90.61
0.95	81.90	81.51	82.89	83.97	85.51	86.49	87.63	88.74	89.52	91.07
0.94	82.78	81.95	83.10	84.11	85.56	86.53	88.24	88.75	89.96	91.07
0.93	83.52	82.36	83.33	84.25	85.90	86.76	88.19	88.75	90.00	90.76
0.92	84.23	82.68	83.44	84.25	86.19	86.66	88.79	88.68	90.04	90.34
0.91	84.80	83.18	83.53	84.31	86.38	86.87	88.46	88.83	90.05	90.68
0.9	85.33	83.45	83.77	84.34	86.45	87.13	88.24	89.12	89.95	91.19

B3

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	44.87	71.47	73.54	75.03	91.79	81.74	87.13	78.95	89.27	84.99
0.9995	49.11	71.53	72.72	81.48	79.90	81.19	87.86	83.02	89.45	84.50
0.999	51.94	73.33	72.04	82.21	77.03	81.81	87.37	82.97	90.63	87.59
0.9975	56.62	73.50	74.77	78.19	78.44	80.10	86.40	87.62	86.19	89.43
0.995	60.00	73.64	74.33	79.13	79.69	81.76	85.24	87.90	88.98	87.73
0.9925	61.96	74.20	74.36	78.02	82.37	82.56	83.87	88.40	88.01	87.20
0.99	63.45	73.84	75.29	78.17	82.39	82.44	86.98	85.73	88.36	87.41
0.985	64.99	75.54	76.05	78.34	82.32	84.14	84.56	87.70	87.49	88.58
0.98	66.77	75.59	76.20	79.52	81.74	85.65	85.21	86.78	87.09	88.99
0.97	69.39	75.64	77.36	80.06	82.47	85.04	86.08	85.96	88.21	88.13
0.96	71.11	76.40	77.43	81.04	82.27	84.77	86.52	86.33	87.84	88.95
0.95	72.49	76.69	77.97	81.37	82.58	84.18	86.91	86.83	87.96	88.76
0.94	73.55	77.13	78.68	80.85	83.16	84.43	86.98	86.40	88.14	89.32
0.93	74.50	77.36	79.16	80.98	83.22	84.77	86.69	86.75	88.30	89.44
0.92	75.37	77.72	79.40	80.80	83.76	84.69	86.73	87.03	88.33	90.01
0.91	76.18	78.14	79.36	81.17	83.92	84.87	86.21	87.50	88.34	89.88
0.9	76.86	78.44	79.85	81.09	83.95	85.02	85.94	87.65	88.59	90.09

Caa1

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	33.97	62.27	71.66	71.65	83.63	67.64	85.74	80.92	84.21	84.07
0.9995	37.03	66.08	71.24	71.83	77.53	77.40	81.05	76.56	86.05	91.76
0.999	38.50	71.31	69.08	72.36	76.94	76.01	82.13	87.77	77.23	85.77
0.9975	43.40	67.66	71.36	69.38	76.54	80.10	81.16	85.35	86.24	80.48
0.995	46.22	69.56	69.75	71.76	77.10	80.81	84.63	83.60	83.90	87.84
0.9925	48.73	67.86	69.94	73.22	77.59	80.97	83.59	82.81	86.63	87.23
0.99	50.04	68.35	69.87	73.73	78.17	79.40	84.95	84.69	85.81	87.74
0.985	52.04	68.78	71.09	74.36	77.77	81.08	83.53	85.61	86.89	85.62
0.98	53.82	68.47	72.23	74.41	78.54	81.44	84.40	84.97	85.83	85.68
0.97	56.46	68.99	73.07	74.84	78.36	81.47	85.25	85.35	85.86	86.28
0.96	58.20	69.70	73.43	75.07	79.00	82.37	83.67	85.54	86.24	87.17
0.95	59.61	70.21	73.92	75.48	79.41	82.65	82.99	85.91	86.08	87.05
0.94	60.78	70.62	73.82	76.49	79.02	82.75	83.72	85.40	86.19	87.61
0.93	61.95	71.41	73.72	76.29	79.70	83.05	82.76	86.05	86.17	87.30
0.92	62.87	71.99	73.82	76.57	79.78	82.71	83.47	86.28	86.10	87.17
0.91	63.69	72.25	74.06	76.72	79.87	82.72	83.85	85.88	86.43	87.33
0.9	64.52	72.60	73.96	77.11	79.87	82.68	84.08	86.09	86.43	87.88

Caa2

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	24.06	53.57	66.25	60.76	89.40	64.30	66.75	85.98	90.60	92.32
0.9995	26.09	59.49	58.49	72.98	74.26	75.64	72.71	84.11	76.68	78.40
0.999	26.96	62.12	65.03	60.86	84.38	73.38	79.47	77.27	83.17	76.89
0.9975	30.27	63.33	59.75	68.62	72.29	80.11	75.02	84.58	77.50	84.14
0.995	32.68	61.36	64.59	65.44	73.58	76.62	79.99	84.58	80.50	84.49
0.9925	34.45	60.55	65.54	65.81	72.69	77.61	80.11	84.34	82.03	82.33
0.99	35.57	60.79	65.45	65.77	74.68	75.64	81.03	83.48	83.27	84.20
0.985	37.45	61.23	64.97	68.15	72.49	77.63	80.55	82.23	85.11	81.84
0.98	38.63	61.62	66.19	68.33	72.79	79.24	79.24	82.48	83.59	82.44
0.97	40.83	62.07	66.76	68.01	74.26	80.11	80.25	81.45	83.41	82.43
0.96	42.36	62.65	66.73	69.33	73.30	81.17	80.38	82.51	81.33	83.41
0.95	43.87	62.77	67.16	69.04	74.16	80.39	80.73	82.41	82.03	83.57
0.94	45.10	63.11	67.24	69.23	74.81	79.47	81.10	82.42	82.41	83.55
0.93	46.19	63.78	67.05	69.38	75.08	80.13	80.70	82.89	82.46	82.95
0.92	46.94	64.22	67.56	69.61	75.12	79.94	81.32	82.56	82.63	83.38
0.91	47.83	64.29	68.00	69.32	75.53	79.86	81.38	82.97	83.14	83.42
0.9	48.43	64.73	68.17	69.48	75.71	80.27	81.27	82.83	83.47	83.26

Caa3

Percentile	1	2	3	4	5	6	7	8	9	10
0.9999	15.37	50.40	58.95	50.69	69.65	73.67	58.42	72.42	50.81	85.14
0.9995	17.20	47.28	53.91	57.25	54.91	68.07	64.06	68.77	62.51	81.83
0.999	17.92	56.21	45.76	56.55	57.17	79.52	59.96	71.44	61.12	86.21
0.9975	20.12	50.50	49.25	50.68	66.88	67.44	73.71	65.42	79.69	68.31
0.995	21.41	51.33	50.61	53.57	64.19	71.73	74.87	75.18	70.72	64.83
0.9925	22.12	53.52	52.93	52.84	62.25	72.14	75.32	73.41	75.15	68.44
0.99	22.63	52.57	54.34	54.21	62.30	73.23	73.14	75.24	73.52	73.25
0.985	23.68	53.63	54.51	53.38	62.67	76.02	72.96	73.85	73.71	74.69
0.98	24.68	52.47	55.93	53.03	64.20	74.09	74.45	73.63	74.34	75.85
0.97	26.08	52.74	55.64	54.98	64.06	71.77	77.86	74.50	73.59	75.41
0.96	27.09	53.11	56.17	56.06	64.67	73.15	74.60	75.87	74.57	76.65
0.95	28.07	53.40	55.69	57.02	65.34	73.06	75.35	76.00	74.69	75.58
0.94	28.92	53.67	56.03	57.58	64.77	73.75	76.28	75.53	74.67	75.03
0.93	29.65	53.84	56.93	56.99	65.66	73.07	77.03	74.99	75.33	75.73
0.92	30.28	54.04	57.54	57.39	65.87	73.68	76.05	75.44	75.07	76.50
0.91	30.88	54.11	57.60	58.02	65.49	74.25	76.13	75.68	75.06	76.77
0.9	31.44	54.41	57.30	58.54	66.35	74.28	75.43	76.11	74.39	76.88



September 4, 2026

Mr. Philip Barlow, Chair

Risk-Based Capital Investment Risk and Evaluation (E) Working Group
National Association of Insurance Commissioners
1100 Walnut Street, Suite 1000
Kansas City, MO 64106-2197

Re: Exposure Request Regarding Refinement of CLO Modeling Assumptions

Submitted Electronically

Dear Chair Barlow:

The American Council of Life Insurers (ACLI) appreciates the opportunity to provide feedback on the Working Group's request for continued refinement of key assumptions within the American Academy of Actuaries' (Academy) CLO C-1 modeling framework, as outlined in Slide 3 of the August 2026 exposure.

ACLI supports continued evaluation of the assumptions identified in the exposure. As demonstrated by the Academy's sensitivity analysis, these assumptions can materially influence modeled tail losses and resulting C-1 factors. Continued analysis would therefore help strengthen confidence that the final calibration appropriately reflects the risks that the framework is intended to capture.

In conducting this analysis, ACLI recommends that the assumptions be evaluated both individually and collectively. Because these assumptions address different aspects of CLO performance and model behavior, they may require different empirical sources and calibration approaches. Changes to correlation, recovery, collateral repurchase price, or prepayment assumptions may have offsetting or compounding effects. Evaluating the assumptions together would help ensure that the final calibration reflects their combined impact and does not rely on selective adjustments that could distort modeled results.

ACLI also supports expanding sensitivity testing beyond the six sample transactions included in the December 2025 analysis. Testing across a substantially larger and more representative portion of the CLO universe would provide a stronger basis for evaluating the stability and appropriateness of the resulting factors. As part of this refined and expanded analysis, ACLI strongly encourages the Academy to consider the recent CLO methodology updates by certain rating agencies which broadly yield higher ratings for certain tranches of CLOs, to ensure that the factors derived using the new rating as a comparable attribute continues to comport to the risk of these tranches.

Need for Additional Analysis and Empirical Review

Several assumptions identified by the Working Group involve complex interactions among loan-level credit performance, CLO structural features, market conditions, and manager behavior. ACLI believes the

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The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 275 member companies represent 94 percent of industry assets in the United States.

Academy should use the data available to it, together with relevant information provided by stakeholders, to evaluate alternative assumptions and explain how its recommended calibrations reflect market experience and the tail-risk purpose of RBC.

ACLI also recommends that the Working Group provide stakeholders sufficient time to review the data, methodology, and proposed calibrations before final decisions are made. In particular, stakeholders should have a meaningful opportunity to evaluate how the Academy selects among relevant datasets, translates empirical observations into model inputs, and considers the combined effect of the assumptions.

Recommended Areas for Refinement

Consistent with ACLI's previous comments, ACLI recommends continued evaluation of four distinct, but interrelated, assumptions: systemic risk correlation, recovery rates, collateral repurchase price, and prepayment rates. These assumptions may require different empirical sources and calibration approaches, but their combined effects should also be evaluated within the modeling framework.

1. Systemic Risk Correlation

ACLI supports continued evaluation of the systemic risk correlation assumption, including how the selected asset-correlation input reflects the tail-risk objective of RBC and the characteristics of leveraged loan portfolios.

The Academy has cited empirical studies producing different correlation estimates. ACLI recommends that the Academy explain how it evaluated those studies, why the selected assumption is appropriate for the model's purpose, and how the asset-correlation input translates into modeled default correlations over a horizon comparable to the effective life of CLO collateral. The analysis should also consider whether correlations may change materially during periods of financial stress and whether the narrower set of assets that comprise the universe of CLO collateral shares the same correlation levels of broader corporate-credit data.

ACLI and its members may provide additional relevant information as it becomes available and is appropriately reviewed.

2. Recovery and Probability of Default Assumptions

ACLI supports continued evaluation of the recovery assumptions used in the model. The Academy should consider whether a long-term historical average remains representative of the current leveraged loan market, particularly in light of the changes in the loan market of the last 10 to 15 years related to creditor protections, loan structure, and the composition of market participants, all of which may potentially point to secular market changes.

ACLI recommends that the Academy evaluate whether changes in observed recovery experience are primarily cyclical or structural and explain the period and datasets used to calibrate the recovery assumption. Because the framework is intended to address tail risk, the analysis should also consider recovery behavior during stressed conditions and the interaction between probability-of-default and loss-given-default assumptions.

However, recovery assumptions should not be changed in isolation and should be coupled with appropriate changes to Probability of Default. In particular, probability-of-default (PD) assumptions should be calibrated to the same collateral universe used for loss-given-default (LGD) assumptions for the senior-secured bank loans that make up CLO collateral. The Academy model appears to rely on PD assumptions drawn from a broader set of all corporate issuer defaults rather than from the US broadly syndicated loan (BSL) market, to which US BSL CLOs are limited. Importantly, any different data used to derive separate PD assumptions for broadly syndicated loans should account for the impact that borrower-friendly liability management exercises that have become prevalent over the last 10 to 15 years may have on masking distress and the loss of economic value for investors.

Also, the bond C1 model used conservative assumptions on probabilities of default for below investment grade (sub-IG) ratings especially CCC ratings. Since CLOs comprise only sub-IG collateral, the Academy should revisit the appropriateness of conservativeness embedded in the probability of defaults in the bond C1 model.

To sum, making both the PD and LGD assumptions in the Academy's model specific to CLO loan collateral, in the context of the current market structure and practices, would make the derived capital charges more suitable for CLOs.

3. Collateral Repurchase Price and Prepayment Assumptions

ACLI supports continued evaluation of reinvestment price and prepayment assumptions. These assumptions should reflect the extent to which prepayment behavior and available loan purchase prices vary across economic and market scenarios.

ACLI recommends that the Academy consider calibrations under which prepayment rates and collateral repurchase prices respond consistently to the severity of each scenario, based on available historical evidence. For example, benign scenarios may warrant different prepayment and purchase-price assumptions than adverse scenarios. These assumptions should be evaluated jointly, as well as in combination with correlation and recovery assumptions, because changes may produce offsetting or compounding effects on modeled losses.

Conclusion

ACLI appreciates the Working Group's and Academy's continued evaluation of these important modeling assumptions. ACLI recommends further analysis of systemic risk correlation, recovery rates, and collateral repurchase price and prepayment rates, both individually and in combination, using data and methodologies appropriate to the tail-risk purpose of RBC.

ACLI respectfully requests that stakeholders be provided sufficient time to review the Academy's supporting data, methodology, and proposed calibrations before final decisions are made. ACLI looks forward to continuing to work constructively with the Working Group and the Academy as this analysis progresses.

Respectfully submitted,

A handwritten signature in blue ink, reading "Marc Altschull". The signature is fluid and cursive, with the first name "Marc" and last name "Altschull" clearly distinguishable.

Marc Altschull, CFA, FSA, MAAA
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A handwritten signature in blue ink, reading "Brian Bayerle". The signature is fluid and cursive, with the first name "Brian" and last name "Bayerle" clearly distinguishable.

Brian Bayerle, FSA, MAAA
Chief Life Actuary
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202-624-2169

September 4, 2026

Philip Barlow

Associate Commissioner of Insurance, District of Columbia
Chair, Risk-Based Capital Investment Risk & Evaluation (E) Working Group
1050 First Street, NE, Suite 801
Washington, DC 20002

Re: IRE Exposure - Excerpts from Dec. 15, 2025 C-1 Subcommittee Presentation

Dear Mr. Barlow:

Athene Holding Ltd. (Athene) appreciates the opportunity to provide feedback on the continued refinement of the American Academy of Actuaries C-1 Subcommittees' (Academy) CLO modeling assumptions. We support refinement of the three assumptions discussed in the current exposure: systemic risk correlation, recovery average, and collateral repurchase price and prepayment. Our April 16, 2026 letter to the working group also identified a related refinement: aligning the probability of default (PD) input to the same collateral population that supports the loss given default (LGD) input.

The life and annuity sector is helping to close a growing retirement gap for American savers. We support regulatory frameworks that keep pace with industry innovation while protecting and benefiting policyholders, and disciplined capital rules that reflect the NAIC RBC principles, including Equal Capital for Equal Risk and Accuracy, serve that purpose. Accordingly, we support capital charges calibrated to measure loss experience rather than simple asset category and applying those charges to like exposures consistently across structures, insurers, and domiciles.

I. Athene supports reevaluation of all three assumptions identified in the exposure

The three assumptions flagged in the Academy presentation warrant further evaluation or refinement:

1. **Systemic Risk Correlation:** The Academy model retains the systematic risk correlation of 10% from the C-1 bond factor framework. The Academy should complete work on the correlation assumption, document the data and period supporting it, and state whether the assumption is held constant across scenarios.
2. **Recovery Average:** The baseline assumption in the Academy model uses 27% LGD for senior secured collateral.¹ Athene supports having the Academy reevaluate this assumption against appropriate recovery data for first-lien senior secured loans, but such a reevaluation should only be done in conjunction with calibration of PD inputs to appropriate default data for first-lien USD senior secured loans. Section II below discusses our recommendation to align PD and LGD inputs.

¹ Academy Presentation, December 2025, slide 16. <https://actuary.org/wp-content/uploads/2025/12/Life-Presentation-CLOUpdate.pdf>.

3. **Collateral Reinvestment Price & Prepayment:** The Academy model assumes no purchase discounts and keeps reinvestment price at par², which is inconsistent with Academy Principle #5 (“C-1 requirements on ABS should treat the collateral as a dynamic pool of assets”). It does not reflect that CLO managers have broad latitude to invest through cycles and at discounted prices while being bounded by the portfolio's current weighted average rating. An actively managed collateral pool turns over through prepayments, refinancings, sales, and amortization, and collateral is often acquired below par during times of market stress in a way that increases credit enhancement and excess spread. These baseline assumptions also reinvest prepayments, maturing assets, and default recoveries over a 2.5-year horizon, which is shorter than the reinvestment period in a typical BSL CLO.

Baseline model specifications are conservative relative to empirical experience:

Empirical data demonstrate that these baseline assumptions do not reflect market reality and are overly conservative. Specifically, the table below compares the baseline prepayment and reinvestment price assumptions against the historical prepayment rate and bid prices of U.S. BSL index between November 1998 to September 2025³. During this period, the empirical prepayments averaged 31% a year as compared to the baseline prepayments of 0%. The empirical average bid was 94.5 against the baseline reinvestment price of 100. During the two severe stress periods (GFC and COVID), the prepayment rate fell to 10% and 18% respectively and the Bid price fell to 65.4 and 82.8 respectively.

Specification	Prepayment	Bid price	Discount to par	Where the pair sits in the empirical data
Baseline adopted)	0.0%	100.0	0.0	Prepayment sits <i>below</i> the entire record (the lowest twelve-month rate observed is 8.7%). Price sits above the record average bid of 94.5.
US BSL Index Averages	31%	94.5	5.5	The index average blends performing loans priced near par with a small sample of distressed loans that pulls the average down. CLO managers typically buy at a discount when volatility creates an opportunity, but they reinvest in the performing cohort. In other words, the 94.5 average embeds distressed prices that a reinvesting CLO manager would not choose to access in normal conditions. Ideally, the index should be stripped of the distressed names each period to inform the reinvestment prices that a CLO manager would have accessed during this period.
US BSL Index Stress Periods	GFC 10% COVID 18%	GFC 65.4 COVID 82.8	GFC 34.6 Covid 17.2	Both stress periods produced the opposite of what the baseline assumes: (1) prepayment averaged 10% through the GFC and 18% through COVID, against the baseline's 0.0%, and (2) loans were available at discounts of 34.6 and 17.2 points in the same windows, against the baseline's reinvestment at par. Neither crisis produced anything close to the baseline. As in the previous row, ideally, the bid prices should be recalculated after stripping the index of distressed names to better reflect the reinvestment prices that a CLO manager would have accessed during these stress periods.

² Academy Presentation, December 2025, slide 35.

³ Source data: *Morningstar LSTA US Leveraged Loan Index*.

Given this data, the Academy should be given the opportunity to calibrate prepayment and reinvestment price to empirical data and replace the zero-prepayment and no-reinvestment-discount baseline with a specification in which both vary with the modeled default rate in each period rather than being held constant across the full projection. Specifically, Athene recommends using empirical data from the U.S. BSL index to estimate statistical relationships explaining bid prices and prepayment rates as a function of default rates and apply those relationships to estimate the prepayment rates and reinvestment prices in each tail scenario across ratings and time in the Academy's model.

II. Calibrate probability of default and loss severity on a consistent basis

Modeled CLO collateral loss depends on both default probability and loss severity. These inputs should be calibrated consistently to avoid asymmetric risk measurement. The Academy appropriately adjusted the recovery assumption (LGD) away from the C-1 bond factor framework to reflect that CLO collateral consists of senior secured bank loans, which have different recovery characteristics than corporate bonds. However, the default probability (PD) assumptions were retained from the C-1 bond factor framework, which were drawn from a broader universe of all corporate issuers. These default more frequently than loan issuers at the same rating and therefore overstate modeled loss. The PD assumptions should be calibrated to the U.S. BSL market and to the same senior secured bank loan collateral that supports the LGD assumptions.

This consistency is fundamental to credit risk: the same borrower behaviors that influence observed default frequency also influence ultimate loss severity. Loan issuers generally have access to amendment, extension, and restructuring mechanics that can defer a formal default event, and those same mechanics may reduce recovery if default eventually occurs. As such, the same borrower behavior moves observed default frequency and loss severity in opposite directions.

Appendices A & B contain empirical evidence which indicates that PDs of loan issuers are significantly lower than PDs of all issuers for periods relevant for CLO collateral:

- **Empirical evidence.** Using more than thirty years of Moody's Default and Recovery Database (DRD) history, we compared cumulative default rates for loan issuers with those for all issuers across the sub-investment-grade rating scale at one, three, five, and seven-year cumulation periods. Rates are measured at the issuer level on annual cohorts, using effective denominators that adjust for issuers whose ratings were withdrawn during the period. Loan issuer default rates are significantly lower on average, at 0.627 times the all-issuer rates at one year period and at 0.848 times at seven year period.
- **Relevance to CLO tranches.** CLO debt tranches typically carry principal weighted average lives of approximately three to five years for senior tranches and six years for junior tranches. Across that range the mean multiplier is well below one, suggesting that the current PDs in the Academy model are 18-60% higher⁴ than that indicated by empirical data.

⁴ Derived as $1/0.627 - 1 = 59.5\%$ at one year and $1/0.848 - 1 = 17.9\%$ at seven years.

III. Conclusion

Athene encourages the working group to allow the Academy to complete this important work to refine the systemic risk correlation, recovery average, and collateral repurchase price and prepayment assumption, and to also appropriately calibrate default frequency and loss severity on a consistent basis. The interaction of these assumptions matters as the refinements do not all move in the same direction or to the same degree. For example, adopting a higher severity assumption without the PD, prepayment and reinvestment price refinements that reduce modeled loss would leave the model carrying only the changes that raise capital. The result would not be a margin of prudence but a capital charge unnecessarily higher than the underlying risk of collateral CLOs, which would be a departure from the NAIC RBC principles of Equal Capital for Equal Risk and Accuracy. Athene asks that the assumptions above be tested jointly and the combined result reported for year-end 2027.

We offer our continued technical support to the Academy and the working group in constructing and testing this assumption set. Athene appreciates the working group and Academy's work on this important initiative and the transparency throughout the project.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael Consedine". The signature is fluid and cursive, with the first name "Michael" written in a larger, more prominent script than the last name "Consedine".

Michael Consedine
Executive Vice President
Global Head of Government and Regulatory Affairs
Athene Holding Ltd.

Aligning probability of default with loss severity on a consistent basis. Expected loss is the product of default frequency and loss severity. The Academy's recovery sensitivity tested raising LGD on senior secured loans from 27% to 36% to reflect loan collateral. The corresponding default probability input continues to draw on all rated issuers, a population that includes borrowers who issue only bonds (never issue loans), and those issuers default more often at the same credit rating. As noted in the analysis below, applying the severity change on its own raises modeled expected loss by a third. Applying a corresponding PD adjustment at the same time returns modeled expected loss to approximately the Academy's current calibration and therefore indicates that neither input should be changed without the

Purpose

The capital charge produced for a CLO tranche depends on the expected loss on the loans in the collateral pool. Expected loss is the product of two inputs: how often a borrower defaults (expressed as PD), and how much is lost when a default occurs (expressed as LGD). Both inputs must describe the same borrowers.

The Academy's CLO model takes its LGD from loan collateral, testing an increase on senior secured collateral from 27% to 36%. It takes its PD from the C-1 bond factor framework, which draws on all rated corporate issuers, including issuers that borrow *only* through bonds and never through loans. This analysis measures the difference between the two populations and quantifies what follows from adjusting one input and not the other.

Why it matters

Two issuers can hold the same Moody's rating and default at different rates. Over Yr 1, B2 rated issuers that borrow through loans defaulted at 1.3%. B2 rated issuers taken from the whole rated universe defaulted at 2.4%, close to double. CLO collateral consists of the first group and is charged as though it were the second, which produces a capital charge above the risk the collateral carries.

Data source

Moody's Default and Recovery Database (DRD), a subscription database of rated corporate default history. Twenty-nine annual cohorts formed on January 1 of each year from 1996 through 2024. Coverage includes all countries and all rated corporate industries.

Data scope

- 1. Cohort period:** Jan 01, 1996 – Dec 31, 2024 (29 yearly cohorts)
- 2. Coverage:** All countries, all industries, ratings Aaa through C
- 3. Horizons analyzed:** 1, 3, 5, and 7-year cumulative default rates
- 4. Regression sample:** Baa1–Caa3 notches (rated cohort rows with meaningful default observations)

Procedures

- 1. Obtained the one, three, five, and seven-year cumulative default probabilities of loan issuers as well as all issuers from Moody's DRD.
- 2. Ran regressions of loan against all issuer default rates across the sub-investment grade space for the one, three, five, and seven-year cumulation periods.
- 3. Loan issuer default rates are lower than all issuer rates across these cumulation periods.
- 4. Table A.2 reports the estimated ratio of loan PDs to all issuer PDs at each of the four periods. At the one-year period the loan PDs are 0.627x of all issuer PDs; at the seven-year period, 0.848x.
- 5. Used those four estimated ratios to predict how much lower loan PDs will be than all issuer PDs for every period from one to ten years.
- 6. Table A.3 reports the resulting multipliers, which would be applied to the one through ten-year cumulative default rates for all issuer PDs in the bond C-1 model to estimate the loan PDs.

Expected effect

If the Academy were to apply these multipliers to the one through ten-year cumulative default rates, translating the current all issuer PDs to loan PDs, this change alone would be expected to offset the effect of the higher LGD, without any change to the prepayment or reinvestment assumptions.

Terms used in this Appendix:

All issuers. Every corporate issuer that Moody's rates, whether it borrows through bonds, loans, or both. This is the population that the bond C-1 model draws PD from.

Loan issuer. An issuer that had at least one rated loan outstanding when measurement began. At speculative grade ratings such loans are almost always senior secured, which is what CLOs hold. Loan issuers are a subset of all issuers.

Cohort. A group of issuers holding the same rating on a single date, then tracked forward to see how many default. This analysis uses 29 cohorts, one formed on January 1 of each year from 1996 through 2024.

Cumulation period. The number of years over which defaults are counted after the cohort is formed. A three-year cumulative default rate counts every default in the three years following.

Effective denominator. The number of issuers in the cohort, adjusted downward for issuers whose ratings were withdrawn part way through the period. Without the adjustment, issuers that stopped being tracked would understate the rate.

Multiplier. A single factor by which an all issuer default rate would be scaled to give the loan issuer rate. A multiplier of 0.717 means the loan issuer rate is 71.7% of the all issuer rate at that horizon.

APPENDIX A: HOW OFTEN LOAN ISSUERS DEFAULT COMPARED TO ALL ISSUERS

The frequency input applied to CLO collateral reflects a wider population of borrowers than CLO collateral contains. At B2, Yr 1 default rates were 2.4% across all rated issuers and 1.3% among loan issuers. Over Yr 3, default rates were 11.2% across all rated issuers against 8.0% among loan issuers. The gap is not limited to B2—loan issuers defaulted less often at every rating from Ba1 through Caa2. Table A.1 compares the two groups with the same rating over the same years and from the same database, differing only in whether the issuer borrows through loans. The Academy's model inherits that PD from the C-bond factor framework, so modeled loss on CLO collateral reflects borrowers that the collateral does not contain while the LGD input has been tested against the collateral itself.

Table A.1. Cumulative default rates by rating. Read across a row to compare the two groups at the same rating. Shaded rows are the twelve ratings used to draw the summary line in Table A.2. Green figures mark ratings where loan issuers defaulted less often than all issuers.

Issuer rating	Yr 1 All issuers	Yr 1 Loan issuers	Yr 3 All issuers	Yr 3 Loan issuers	Yr 5 All issuers	Yr 5 Loan issuers	Yr 7 All issuers	Yr 7 Loan issuers
Aaa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Aa1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Aa2	0.0%	0.0%	0.1%	0.0%	0.3%	0.0%	0.5%	0.0%
Aa3	0.1%	0.0%	0.1%	0.0%	0.4%	3.3%	0.7%	5.0%
A1	0.1%	0.0%	0.2%	0.0%	0.6%	1.0%	1.1%	1.4%
A2	0.0%	0.2%	0.3%	1.1%	0.6%	1.6%	1.3%	2.0%
A3	0.1%	0.1%	0.3%	1.1%	0.7%	2.0%	1.3%	2.7%
Baa1	0.1%	0.2%	0.4%	0.7%	0.7%	1.7%	1.2%	2.6%
Baa2	0.2%	0.3%	0.6%	1.1%	1.1%	2.3%	1.6%	3.9%
Baa3	0.3%	0.4%	1.2%	2.1%	2.3%	3.3%	3.1%	4.9%
Ba1	0.4%	0.0%	2.2%	1.4%	3.9%	2.8%	5.8%	6.4%
Ba2	0.6%	0.6%	3.2%	3.1%	6.0%	7.4%	8.4%	11.4%
Ba3	0.9%	0.5%	4.4%	3.6%	8.8%	7.8%	12.7%	12.9%
B1	1.1%	0.6%	6.3%	5.8%	12.3%	12.5%	17.9%	20.6%
B2	2.4%	1.3%	11.2%	8.0%	19.6%	15.7%	26.1%	24.2%
B3	3.4%	1.5%	14.1%	8.6%	23.5%	15.8%	31.9%	22.4%
Caa1	4.1%	2.0%	15.6%	9.0%	26.8%	18.2%	35.2%	27.9%
Caa2	6.5%	3.3%	19.4%	12.5%	32.9%	24.3%	44.0%	35.1%
Caa3	16.3%	10.9%	38.4%	30.3%	51.8%	45.5%	60.5%	52.7%
Ca	33.1%	29.1%	57.2%	55.1%	67.3%	68.1%	69.8%	70.2%
C	46.1%	51.4%	67.2%	73.0%	75.8%	85.6%	77.4%	84.9%

Table A.2. Twelve ratings reduced to one ratio. The loan issuer rates are plotted against the all issuer rates and a straight summary line is drawn through them (see **Appendix B**). The slope of that line is the ratio between the two groups: 0.627 at one year means loan issuer rates averaged 62.7% of all issuer rates. R² reports how closely the twelve ratings sit along the line, where 1.0000 would be exact. The line is drawn with its intercept fixed at zero (see the note below).

Cumulation period (years)	Slope (loan ÷ all multiplier) ¹	Intercept, fixed at zero	R ²
1	0.627	0	0.9852
3	0.732	0	0.9849
5	0.808	0	0.9840
7	0.848	0	0.9844

¹ The loan/all multiplier is the fitted slope of the loan-issuer cumulative default rate on the all-issuer cumulative default rate across the Baa1–Caa3 cohorts (zero intercept). For example, Yr 1 slope of 0.627 reads as loan issuers defaulting at 62.7% of the full-universe rate at the same rating and horizon, or that loan issuers default at 37.3% *lower rate* than the full universe. By Yr 7, this number climbs to 0.848, or that loan issuers default at 15.2% *lower rate* than the full universe.

Notable takeaways

- 1. Loan issuers default less than the broad rated universe at every horizon studied — the regression multiplier runs from 0.63x at 1 year to 0.85x at 7 years.
- 2. The advantage decays with time: the multiplier rises about 0.037 per additional year, converging on parity (0.98x) by roughly year 10.
- 3. The benefit is concentrated in speculative grade. Across B1–Caa3 the loan/all ratio sits at roughly 0.4x–0.9x, consistent with covenant protection and senior-secured structure.
- 4. Practical application: apply the predicted multiplier in the table above to an all-issuer cumulative default curve to approximate an expected loan-issuer curve for the maturing holding period.

Notes on how these figures were produced

How the rates are measured. Default is recorded at the issuer level rather than at the level of an individual bond or loan, so the comparison does not turn on whether a particular obligation is secured. Each of the 29 cohorts is formed on January 1 of each year from 1996 through 2024 and tracked forward for the stated number of years, and the effective denominator adjusts the opening count for issuers whose ratings were withdrawn during the period.

Table A.3. One multiplier for each year the model projects. The Academy's CLO model applies default rates out to ten years, but the slopes above were estimated at one, three, five and seven only. A line fitted through those four slopes fills in the rest (see **Appendix B**). Applying 0.717 to a three year all issuer rate gives the loan issuer rate. The multipliers rise toward 1.000, meaning the gap narrows as the horizon lengthens.

Year	Multiplier	Year	Multiplier
1	0.643	6	0.828
2	0.680	7	0.865
3	0.717	8	0.902
4	0.754	9	0.939
5	0.791	10	0.976

Why Ca and C are left out of the summary line. Moody's assigns Ca and C to issuers already in default or expected to default imminently, so these are not ordinary credits. More than 45% of them defaulted within a single year and the issuer counts at those ratings are small. They are also the only two ratings at which loan issuers defaulted more often than all issuers, and including them would move the one year ratio from 0.627 to approximately 0.96. Both ratings are printed in Table B.1 so the effect of leaving them out can be checked directly.

Where individual ratings depart from the line. The summary line is a central tendency. At Ba2 and B1, loan issuer rates exceed all issuer rates at the five and seven year periods. The gap is widest and most consistent at the single-B and Caa ratings that predominate in broadly syndicated loan collateral pools.

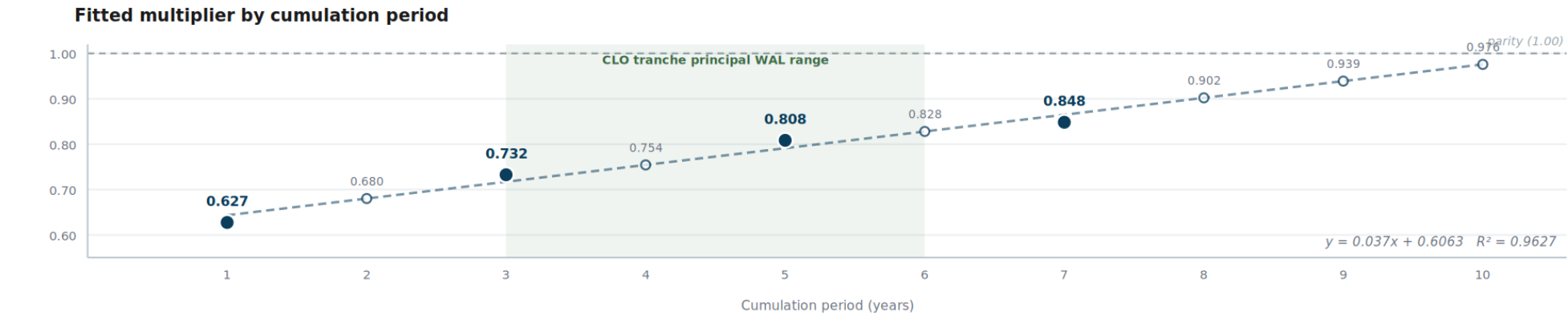
How the yearly multipliers were derived. The Table B.3 multipliers come from a line drawn through the four ratios in Table B.2, $y = 0.037x + 0.6063$, where x is the number of years, with $R^2 = 0.9627$. The R² values above 0.98 in Table B.2 indicate the ratio holds across the whole rating scale rather than being driven by one or two ratings.

"Intercept fixed at zero." The intercept is where a fitted line crosses the vertical axis. Left free, it would allow the line to predict some level of loan issuer defaults at a rating where all issuers had none, which cannot happen, because loan issuers are a subset of all issuers. Fixing the intercept at zero forces the line through the origin, and that is what reduces the relationship to a single ratio which can be applied as one multiplier.

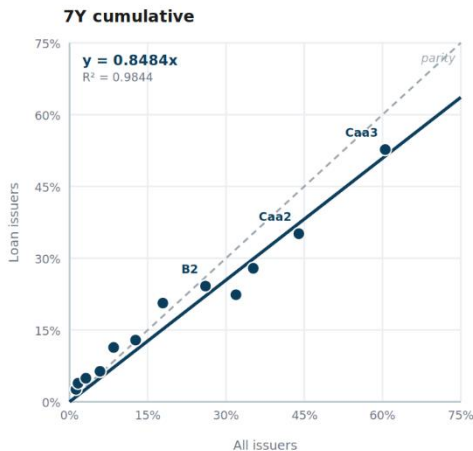
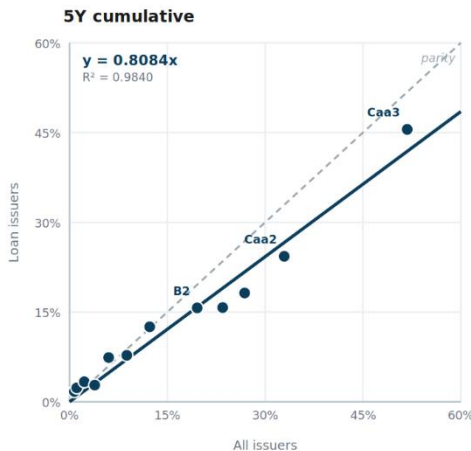
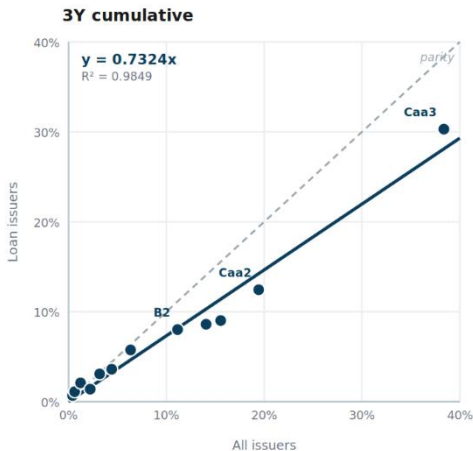
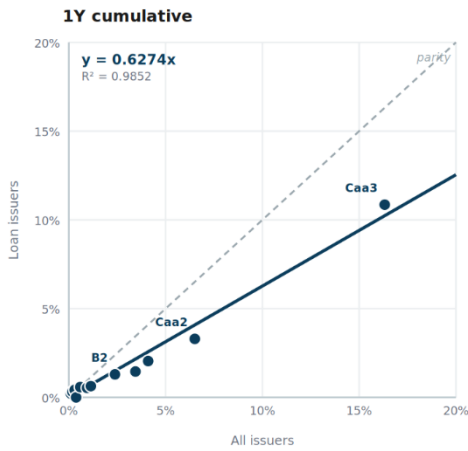
APPENDIX B: THE SAME COMPARISON SHOWN GRAPHICALLY

Each of the four lower charts plots one rating as one point, with the all issuer default rate on the horizontal axis and the loan issuer rate on the vertical axis. The dashed diagonal marks parity, meaning a rating at which both groups defaulted at the same rate—for example, a rating with a 20% all issuer rate would sit on the diagonal if loan issuers at that rating also defaulted at 20%. Points *below* the diagonal are ratings at which loan issuers defaulted less often. Accordingly, if the all issuer population were an appropriate source of PD for CLO collateral, the ratings would scatter evenly on both sides of the diagonal. However, the data demonstrates that the points do not. The summary line sits *below* parity at all four periods tested, which means the PD input applied to CLO collateral overstates default frequency at every horizon the model projects.

CLO tranche principal is repaid across Yrs 3-6, which is where the PD overstatement is largest. A CLO tranche is repaid out of cash flows on the underlying loans, and most of that principal returns within about three years for senior tranches and about six for junior tranches. Defaults occurring after a tranche has been repaid do not affect whether it was repaid, so the three to six year window (shaded below) is where the frequency input carries the most weight. The Academy's CLO model nonetheless projects defaults out to ten years, by which point the two groups are nearly equal. An adjustment measured at ten years would therefore understate the correction that years three through six require. Solid points are the four periods actually measured in the data. Hollow points are the years in between, estimated by drawing a straight line through those four measurements.



Each point below represents one rating with all issuer default rate across the bottom and loan issuer rate on the side. The equation printed on each chart reflects the summary line from Table A.2. The dashed diagonal reflects the parity line, or the line along which the two groups would default at exactly the same rate. A rating with a 20% all issuer default rate would sit on it if loan issuers at that rating also defaulted at 20%. It is drawn for reference and is not result of the analysis. A point below it is a rating where loan issuers defaulted less often; a point above it, more often. If the all issuer population were a suitable source of default rates for CLO collateral, the ratings would scatter evenly on both sides of this line. At all four periods they sit predominantly below it.



Asset-Backed Securities Reported in 2025 Statutory Filings - Schedule D, Part 1, Section 2 - For all Types of Businesses

Total Cash and Invested Assets (2025) 9,580,585,000,000 <https://content.naic.org/sites/default/files/capital-markets-special-reports-asset-mix-ye2025.pdf>

ABS_LINE_NO	Schedule D, Part 1, Section 2 Line No.	SCD_COLL_TYPE_DESC	BACV	PRIMARY ABS TYPES (SSG Observation)	As a % of Total ABS	As a % of Total Cash and Invested Assets	2026 RBC Methodology
Agency CMBS - Guaranteed	1029999999		38,007,299,685	MBS - U.S. Full Faith; ABS - SBA (Guaranteed)	2.4%	0.4%	Bond C-1 Factors
Agency CMBS - Not Fully-Guaranteed	1049999999		54,464,026,732	MBS - Agency	3.4%	0.6%	Bond C-1 Factors
Agency RMBS - Guaranteed	1019999999		58,531,659,951	MBS - U.S. Full Faith	3.6%	0.6%	Bond C-1 Factors
Agency RMBS - Not Fully-Guaranteed	1039999999		287,305,152,051	MBS - Agency	17.9%	3.0%	Bond C-1 Factors
CLO/CBO/CDO (Affiliated)	1109999999		28,841,535,217	CLO - MM; CLO - BSL; Fund Financing/Rated Note Feeder; ABS - Project Finance	1.8%	0.3%	CLO C-1 Factors
CLO/CBO/CDO (Unaffiliated)	1099999999		286,917,662,212	CLO - BSL; CLO - MM; CDO - TruPS; CBO; Investment Fund Debt/Fund Financing/Rated Note Feeder	17.8%	3.0%	CLO C-1 Factors
Equity Backed Securities (Affiliated)	1329999999		17,249,668,922	Need Addl. Review	1.1%	0.2%	Bond C-1 Factors
Equity Backed Securities (Unaffiliated)	1319999999		36,783,648,909	Need Addl. Review	2.3%	0.4%	Bond C-1 Factors
Non-Agency CMBS (Affiliated)	1089999999		2,202,204,407	CMBS; CRE CLO	0.1%	0.0%	Bond C-1 Factors
Non-Agency CMBS (Unaffiliated)	1079999999		204,431,331,480	CMBS; CRE CLO	12.7%	2.1%	Bond C-1 Factors
Non-Agency RMBS (Affiliated)	1069999999		1,559,890,493	RMBS	0.1%	0.0%	Bond C-1 Factors
Non-Agency RMBS (Unaffiliated)	1059999999		187,450,498,894	RMBS; Muni - Housing Bonds	11.7%	2.0%	Bond C-1 Factors
Non-Financial ABS - Full Analysis - Lease-Backed Securities (Affiliated)		No Collateral Type	-				
		Other	13,189,900	ABS - Leases/CTLs/Ground Leases			
Non-Financial ABS - Full Analysis - Lease-Backed Securities (Affiliated) Total	1729999999		13,189,900		0.0%	0.0%	Bond C-1 Factors
Non-Financial ABS - Full Analysis - Lease-Backed Securities (Unaffiliated)		Cash Flow Rights	34,464,326	ABS - Various Leases (Commercial Equipment & Business Assets, etc.)			
		Corporate/Industrial Obligations	1,572,867,743	ABS - Various Leases (e.g. Container, Railcar, etc.)			
		Individual Obligations	1,196,103,019	ABS - Various Leases (e.g. Automobile, Automobile - Fleet, etc.)			
		Non-Standard Home Loan Equity	19,937,008	Single Family Rental Securitization			
		Other	11,378,492,889	ABS - Various Leases (e.g. Data Center, Real Estate Leases, etc.)			
		Other Leases	14,873,655,345	ABS - Various Leases (e.g. Aircraft, Container, Railcar, Business Assets, etc.)			
		Real Estate Leases	10,527,124,262	ABS - Various Leases (e.g. Data Center, Real Estate Leases, etc.)			
Non-Financial ABS - Full Analysis - Lease-Backed Securities (Unaffiliated) Total	1719999999		39,602,644,592		2.5%	0.4%	Bond C-1 Factors
Non-Financial ABS - Full Analysis - Other (Affiliated)		Cash Flow Rights	203,370,182	ABS - Commercial Receivables (e.g. Royalties)			
		Corporate/Industrial Obligations	897,357,491	CMBS/CRE Securitization			
		Other	279,471,225	ABS - Commercial Receivables (e.g. Royalties)			
Non-Financial ABS - Full Analysis - Other (Affiliated) Total	1749999999		1,380,198,898		0.1%	0.0%	Bond C-1 Factors
Non-Financial ABS - Full Analysis - Other (Unaffiliated)		Cash Flow Rights	21,746,171,316	Whole Business Securitization			
		Corporate/Industrial Obligations	2,940,851,455	Whole Business Securitization; Lease Backed and Busiess Assets			
		Individual Obligations	1,758,398,842	ABS - Consumer Credit/Financing			
		No Collateral Type	10,000,000	ABS - Other (e.g. Corporate Asset Backed)			
		Non-Standard Home Loan Equity	361,664,799	Single Family Rental Securitization			
		Other	21,243,196,488	ABS - Commercial Leases/Financing and Corporate Credit (e.g. Whole Business Securitization and Various Leases and Corporate Asset Backed); ABS - Leases/CTLs/Ground Leases			
		Other Leases	2,204,737,808	Various Leases			
		Real Estate Leases	193,908,947	Various Leases			
Non-Financial ABS - Full Analysis - Other (Unaffiliated) Total	1739999999		50,458,929,655		3.1%	0.5%	Bond C-1 Factors
Non-Financial ABS - Practical Expedient - Lease-Backed Securities (Affiliated)		Corporate/Industrial Obligations	155,846,943	ABS - Commercial Leases/Financing and Corporate Credit			
		Other	2,775,308,086	ABS - Commercial Leases/Financing and Corporate Credit			
		Other Leases	50,570,208	ABS - Commercial Leases/Financing and Corporate Credit			
Non-Financial ABS - Practical Expedient - Lease-Backed Securities (Affiliated) Total	1529999999		2,981,725,237		0.2%	0.0%	Bond C-1 Factors
Non-Financial ABS - Practical Expedient - Lease-Backed Securities (Unaffiliated)		Cash Flow Rights	110,295,681	ABS - Commercial Leases/Financing and Corporate Credit			
		Corporate/Industrial Obligations	768,865,130	ABS - Commercial Leases/Financing and Corporate Credit; ABS - Leases/CTLs/Ground Leases			
		Individual Obligations	1,618,692,158	ABS - Commercial Leases/Financing and Corporate Credit; ABS - Consumer Credit/Financing			
		Other	6,111,100,381	Various Leases			
		Other Leases	20,801,812,976	Various Commercial Leases (e.g. Aircraft, Automobile, Container, Railcar, Business Assets, etc.)			
		Real Estate Leases	6,903,038,991	Various Real Estate Leases			
Non-Financial ABS - Practical Expedient - Lease-Backed Securities (Unaffiliated) Total	1519999999		36,313,805,317		2.3%	0.4%	Bond C-1 Factors
Non-Financial ABS - Practical Expedient - Other (Affiliated)		Cash Flow Rights	557,241,512	ABS - PACE/CPACE			
		Corporate/Industrial Obligations	300,834,391	Corporate Credit			
		No Collateral Type	-				
		Other	202,170,259	Various			
Non-Financial ABS - Practical Expedient - Other (Affiliated) Total	1549999999		1,060,246,162		0.1%	0.0%	Bond C-1 Factors
Non-Financial ABS - Practical Expedient - Other (Unaffiliated)		Cash Flow Rights	11,071,558,883	ABS - Commercial Leases/Financing and Corporate Credit; ABS - Commercial Receivables			
		Corporate/Industrial Obligations	9,529,683,607	ABS - Commercial Leases/Financing and Corporate Credit; ABS - Commercial Receivables			
		Individual Obligations	1,847,604,619	ABS - Student Loans; ABS - Commercial Leases/Financing and Corporate Credit			
		No Collateral Type	-				
		Non-Standard Home Loan Equity	764,534,869	Various MBS/ABS (e.g. Reverse Mortgage, Manufacturing Housing)			
		Other	24,142,715,735	ABS - Stranded Utilities; CRE CLO; CLO MM			
		Other Leases	1,246,509,655	ABS - Commercial Leases/Financing and Corporate Credit			
Non-Financial ABS - Practical Expedient - Other (Unaffiliated) Total	1539999999		48,645,803,108	ABS - Leases/CTLs/Ground Leases	3.0%	0.5%	Bond C-1 Factors
Other Financial ABS - Not Self-Liquidating (Affiliated)		Other	270,088,667	CRE CLO			
Other Financial ABS - Not Self-Liquidating (Affiliated) Total	1349999999		270,088,667		0.0%	0.0%	Bond C-1 Factors
Other Financial ABS - Not Self-Liquidating (Unaffiliated)		Cash Flow Rights	676,776,033	CMBS; CRE CLO			
		Corporate/Industrial Obligations	1,310,258,677	ABS - Commercial Leases/Financing and Corporate Credit			
		Individual Obligations	323,761,705	ABS - Consumer Credit/Financing			
		Non-Standard Home Loan Equity	160,160,071	RMBS - HELOC/CES; ABS - HEA			
		Other	4,548,812,778	Investment Fund Debt/Fund Financing/Rated Note Feeder; Muni - Housing Bonds			
		Other Leases	85,883,543	Various			
		Real Estate Leases	31,425,424	ABS - Leases/CTLs/Ground Leases			
Other Financial ABS - Not Self-Liquidating (Unaffiliated) Total	1339999999		7,137,078,231		0.4%	0.1%	Bond C-1 Factors
Other Financial ABS - Self-Liquidating (Affiliated)		Cash Flow Rights	98,680,255	ABS - Consumer Credit/Financing			
		Corporate/Industrial Obligations	3,442,449,685	CLO; ABS - Consumer Credit/Financing			
		Individual Obligations	2,213,266,926	ABS - Consumer Credit/Financing			
		No Collateral Type	-				
		Non-Standard Home Loan Equity	401,570,727	ABS - Consumer Credit/Financing (e.g. Residential Solar, Home Improvement Equipment, etc.)			
		Other	14,726,774,578	Investment Fund Debt/Fund Financing/Rated Note Feeder; ABS - Consumer Credit/Financing; ABS - Commercial Leases/Financing and Corporate Credit			
Other Financial ABS - Self-Liquidating (Affiliated) Total	1129999999		20,936,616,136	ABS - Commercial Leases	1.3%	0.2%	Bond C-1 Factors
Other Financial ABS - Self-Liquidating (Unaffiliated)		Cash Flow Rights	6,343,286,392	ABS - Commercial Leases/Financing and Corporate Credit; Investment Fund Debt/Fund Financing/Rated Note Feeder; ABS - Structured Settlements			
		Corporate/Industrial Obligations	17,616,681,403	ABS - Commercial Leases/Financing; ABS - Business Credit/Financing; Investment Fund Debt/Fund Financing/Rated Note Feeder			
		Individual Obligations	83,013,800,187	ABS - Consumer Credit/Financing (e.g. Automobiles, Consumer Loan, Credit Card, Student Loan, etc.)			
		No Collateral Type	1,569,058	ABS - Consumer Credit/Financing			
		Non-Standard Home Loan Equity	9,813,717,044	RMBS - Subprime; RMBS - HELOC/CES; Consumer Loans (Home Improvement)			
		Other	75,786,961,119	Investment Fund Debt/Fund Financing/Rated Note Feeder; ABS - PACE/CPACE; ABS - Consumer Credit/Financing			
		Other Leases	1,762,628,628	ABS - Commercial Leases/Financing; ABS - Consumer Credit/Financing			
		Real Estate Leases	1,570,173,363	Single Family Rental Securitization			
Other Financial ABS - Self-Liquidating (Unaffiliated) Total	1119999999		195,908,817,194		12.2%	2.0%	Bond C-1 Factors
Grand Total			1,608,453,722,050		100.0%	16.8%	

Priority 1 – High Priority
 Priority 2 – Medium Priority
 Priority 3 – Low Priority

CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2027~~6~~

2027 6 #	Owner	2027 6 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
Ongoing Items – RBC IR & E							
Carryover Items Currently being Addressed – RBC IR & E							
IR1	RBC IRE	2	2027 6 or later	Supplemental Investment Risks Interrogatories (SIRI)	Referred from CADTF Referral from Blackrock and IL DOI	The Task Force received the referral on Oct. 27. This referral will be tabled until the bond factors have been adopted and the TF will conduct a holistic review all investment referrals. Proposal 2025-12-IRE SVO Funds Alignment was withdrawn. The Working Group can consider reviewing the edits made in Asset Concentration Page to seek alignment with SIRI.	1/12/2022 11/19/2020
IR2	RBC IRE	2	2026 or later (Completed)	NAIC Designation for Schedule D, Part 2 Section 2 - Common Stocks Equity investments that have an underlying bond characteristic should have a lower RBC charge. Similar to existing guidance for SVO-identified ETFs reported on Schedule D-1, are treated as bonds.	Referred from CADTF Referral from SAPWG 8/13/2018	10/8/19 - Exposed for a 30-day Comment period ending 11/8/2019 3-22-20 - Tabled discussion pending adoption of the bond structure and factors. Proposal 2025-12-IRE SVO Funds Alignment was withdrawn.	1/12/2022 10/11/2018

IR3	RBC IRE	2	2026 or later <u>(Completed)</u>	Comprehensive Fund Review for investments reported on Schedule D Pt 2 Sn2	Referred from CADTF Referral from VOSTF 9/21/2018	Discussed during Spring Mtg. NAIC staff to do analysis. 10/8/19 - Exposed for a 30-day comment period ending 11/8/19 3-22-20 - Tabled discussion pending adoption of the bond structure and factors. <u>Proposal 2025-12-IRE SVO Funds Alignment was withdrawn.</u>	1/12/2022 11/16/2018
IR4	RBCIRE	1	2026 or later <u>Ongoing</u>	Evaluate the appropriate RBC treatment of Asset-Backed Securities (ABS), including Collateralized Loan Obligations (CLO), collateralized fund obligations (CFOs), or other similar securities carrying similar types of tail risk (Complex Assets). Address the tail risk concerns not captured by reserves for these privately structured securities.	Request from E Committee, SAPWG, VOSTF Referral from the Macropudentia I (E) Working Group	Per the request of E Committee comments were solicited asking if these types of assets should be considered a part of the RBC framework. <u>Proposal 2026-12-IRE (CLO Factors) was adopted on 6/23/26.</u> <u>The Working Group is considering refinement of modeling assumptions for CLO C-1 Model, as well as looking to proceed with evaluation of RBC treatment for other ABS asset types.</u>	1/12/2022 8/13/2022
IR5	RBC IRE	1	2026 or later <u>Ongoing</u>	Evaluate the appropriate RBC treatment of Residual Tranches.	Request from E Committee, SAPWG, VOSTF	Per the request of E Committee comments were solicited asking if these types of assets should be considered a part of the RBC framework.	1/12/2022

						Proposal 2023-09-IRE was adopted in 2023 to effect a 45% factor for residual tranches/interest for life insurers, with effect from YE 2024 reporting. This was deemed an interim solution, subject to positive or negative adjustments based on American Academy of Actuaries' study. (IR4) <u>Proposal 2026-12-IRE (CLO Factors) was adopted on 6/23/26. It was concluded that RBC factors for CLO residuals should be retained at 45%.</u> <u>The Academy is looking into further refinement to CLO modeling assumptions which may impact residual tranche factors.</u>	
IR6	RBC IRE	1	202 7 ⁶ or later	Phase 2 Bond analysis - evaluate and develop an approach to map other ABS to current bond factors following the established principles from Phase I where the collateral has an assigned RBC. This project will likely require an outside consultant, and the timeline could exceed 2-3 years.	Request from E Committee	Per the request of E Committee comments were solicited requesting the need for outside review. <u>Academy has developed principles to guide/ inform the mapping. The Working Group endorsed the principles during 12/2/2023 Fall National Meeting.</u>	1/12/2022

IR7	RBC IRE	2	202 7 ⁶ or later	Evaluate asset concentration related issues and the potential changes to the risk-based capital formulas to address the risk.	Referral from CADTF	<u>See IR4 for milestones.</u> 4/30/24 – Task Force referred to the Working Group.	10/22/2024
New Items – RBC IR & E							