Idealised expected loss and default probability tables explained

This document provides insight into two reference elements that are instrumental to most of Scope's analytical frameworks for secured instruments:

1) **Scope's idealised expected loss table; and**
2) **Scope's idealised default probability table.**

Appendix I illustrates the tables with numerical values for risk horizons up to 10 years. Appendix II and Appendix III illustrate the graphical expected loss and default probability curves, respectively, for risk horizons up to 30 years.

A tool for consistent analysis

Scope's idealised expected loss table shows the maximum expected loss reference generally consistent with a given rating level over a given risk horizon. Scope's idealised default probability table shows the maximum default probability reference that is generally consistent with a given rating level over a given risk horizon.

Rating methodologies that use the idealised tables contain an explicit reference to them. The idealised tables result in improved rating comparability because the same quantitative scale is used by the different methodologies.

The most common examples of the application of these tables are:

- The calibration of analytical assumptions, for instance, quantifying the default risk or the expected loss associated with an asset exposure or a credit-risk presenter; or
- The interpretation of quantitative results, typically the expected loss or the default risk of an instrument over a given horizon.

Key characteristics and background

We constructed the idealised tables to support the consistent analysis of secured instruments, originally in the context of structured finance transactions. Our idealised tables and associated curves exhibit several fundamental properties including:

- Monotonicity per category over time;
- No intersection between categories;
- Investment grade categories (BBB- and above) with increasing marginal rates; and
- Non-investment grade categories (BB+ and below) with decreasing marginal rates.

We have primarily taken into account public information on fundamental ratings and their performance, as reported between 1970 and 2012 by the large credit rating agencies, in order to construct those tables. We applied regression, extrapolation and fitting techniques in order to reconcile observed historical data and to preserve the properties highlighted above. Historical default observations are rich for one-year and five-year observation periods and consequently constitute valuable data points. Longer-term horizons, in contrast, are poor in terms of available data. In addition, the high investment-grade levels AAA and AA have limited historical default observations; while A, BBB and BB benefit from robust calibration data. Observations of defaults available for the B and CCC segments exhibit volatility, potentially due to data quality limitations.

We applied a static and generic 50% loss given default to produce the idealised expected loss table by converting default probabilities into expected loss values.

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Idealised expected loss and default probability tables explained

Appendix I Scope's idealised expected loss and default probability tables

Figure 1. Idealised expected loss table

Scope	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
AAA	0.001%	0.003%	0.008%	0.015%	0.025%	0.038%	0.055%	0.076%	0.101%	0.130%
AA+	0.002%	0.005%	0.012%	0.023%	0.039%	0.059%	0.084%	0.115%	0.151%	0.193%
AA	0.004%	0.013%	0.028%	0.050%	0.079%	0.115%	0.158%	0.208%	0.265%	0.329%
AA-	0.007%	0.016%	0.037%	0.068%	0.108%	0.157%	0.215%	0.281%	0.356%	0.439%
A+	0.012%	0.028%	0.064%	0.114%	0.175%	0.248%	0.331%	0.422%	0.523%	0.632%
A	0.021%	0.054%	0.106%	0.172%	0.252%	0.344%	0.447%	0.560%	0.683%	0.815%
A-	0.035%	0.082%	0.160%	0.260%	0.377%	0.509%	0.653%	0.810%	0.978%	1.156%
BBB+	0.061%	0.170%	0.306%	0.462%	0.635%	0.823%	1.025%	1.240%	1.465%	1.702%
BBB	0.106%	0.287%	0.499%	0.733%	0.987%	1.258%	1.543%	1.842%	2.153%	2.475%
BBB-	0.182%	0.533%	0.923%	1.334%	1.758%	2.192%	2.634%	3.083%	3.538%	3.998%
BB+	0.571%	1.142%	1.713%	2.280%	2.841%	3.398%	3.950%	4.499%	5.044%	5.586%
BB	0.889%	1.778%	2.668%	3.526%	4.354%	5.154%	5.929%	6.683%	7.417%	8.133%
BB-	1.271%	2.541%	3.812%	5.014%	6.147%	7.220%	8.241%	9.217%	10.153%	11.055%
B+	2.302%	4.604%	6.280%	7.691%	8.952%	10.115%	11.209%	12.252%	13.253%	14.222%
B	2.971%	5.941%	8.032%	9.746%	11.245%	12.604%	13.863%	15.046%	16.170%	17.246%
B-	4.616%	8.971%	11.702%	13.777%	15.498%	16.999%	18.350%	19.593%	20.755%	21.855%
CCC	12.366%	19.533%	23.952%	27.264%	29.981%	32.328%	34.425%	36.344%	38.129%	39.812%
CC	23.538%	30.825%	35.785%	39.851%	43.465%	46.815%	50.000%	50.000%	50.000%	50.000%
C	41.960%	50.000%	50.000%	50.000%	50.000%	50.000%	50.000%	50.000%	50.000%	50.000%

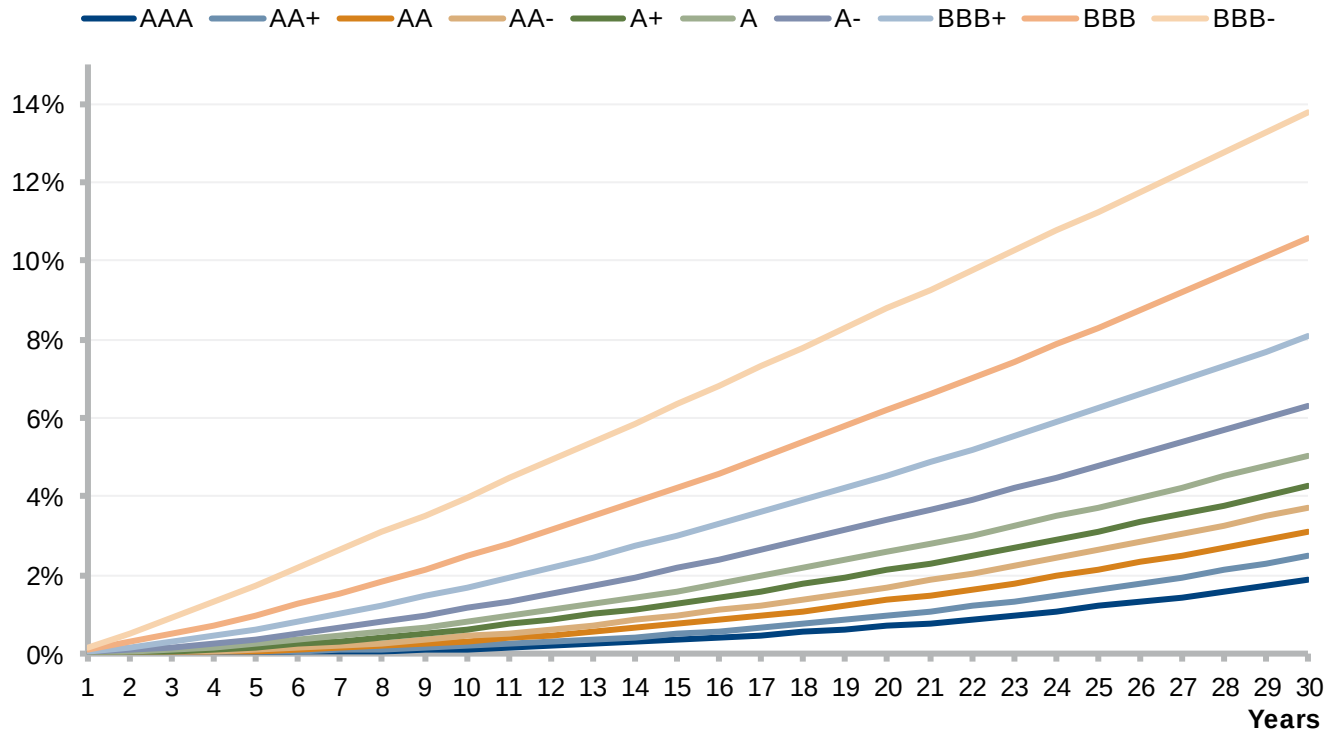
Figure 2. Idealised default probability table

Scope	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
AAA	0.003%	0.007%	0.015%	0.029%	0.049%	0.076%	0.110%	0.151%	0.201%	0.260%
AA+	0.003%	0.010%	0.025%	0.047%	0.078%	0.118%	0.169%	0.230%	0.302%	0.386%
AA	0.007%	0.025%	0.056%	0.101%	0.159%	0.231%	0.316%	0.416%	0.530%	0.657%
AA-	0.014%	0.032%	0.073%	0.135%	0.216%	0.314%	0.430%	0.563%	0.712%	0.878%
A+	0.024%	0.056%	0.128%	0.227%	0.351%	0.496%	0.661%	0.845%	1.046%	1.264%
A	0.041%	0.107%	0.211%	0.345%	0.505%	0.689%	0.894%	1.120%	1.366%	1.630%
A-	0.071%	0.164%	0.321%	0.520%	0.754%	1.018%	1.307%	1.620%	1.955%	2.311%
BBB+	0.122%	0.341%	0.612%	0.924%	1.270%	1.646%	2.050%	2.479%	2.931%	3.404%
BBB	0.211%	0.574%	0.998%	1.467%	1.975%	2.516%	3.087%	3.684%	4.306%	4.950%
BBB-	0.364%	1.066%	1.846%	2.667%	3.516%	4.384%	5.269%	6.167%	7.076%	7.996%
BB+	1.142%	2.284%	3.426%	4.559%	5.682%	6.795%	7.900%	8.998%	10.089%	11.173%
BB	1.778%	3.557%	5.335%	7.053%	8.709%	10.309%	11.859%	13.366%	14.833%	16.266%
BB-	2.541%	5.082%	7.624%	10.027%	12.294%	14.441%	16.483%	18.434%	20.307%	22.109%
B+	4.604%	9.208%	12.559%	15.381%	17.903%	20.230%	22.419%	24.504%	26.507%	28.445%
B	5.941%	11.882%	16.063%	19.491%	22.490%	25.208%	27.726%	30.092%	32.340%	34.491%
B-	9.232%	17.941%	23.403%	27.554%	30.997%	33.998%	36.700%	39.187%	41.511%	43.709%
CCC	24.731%	39.066%	47.904%	54.528%	59.961%	64.656%	68.850%	72.688%	76.259%	79.624%
CC	47.076%	61.650%	71.569%	79.703%	86.929%	93.629%	100.000%	100.000%	100.000%	100.000%
C	83.919%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%

Note: The idealised default probability values correspond to the idealised loss rate values when a severity of 50% is assumed.

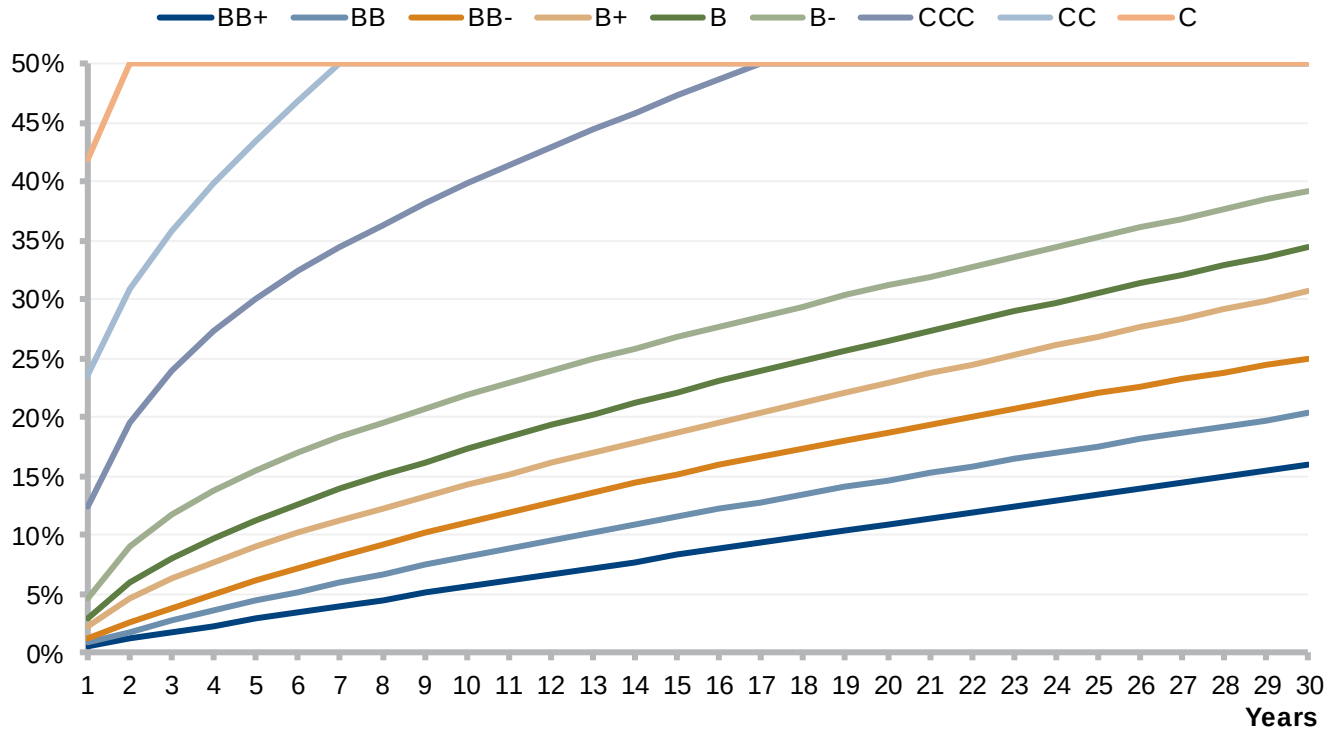
Appendix II Scope's idealised expected loss curves

Figure 3. Idealised expected loss curves (investment grade ratings)



Source: Scope.

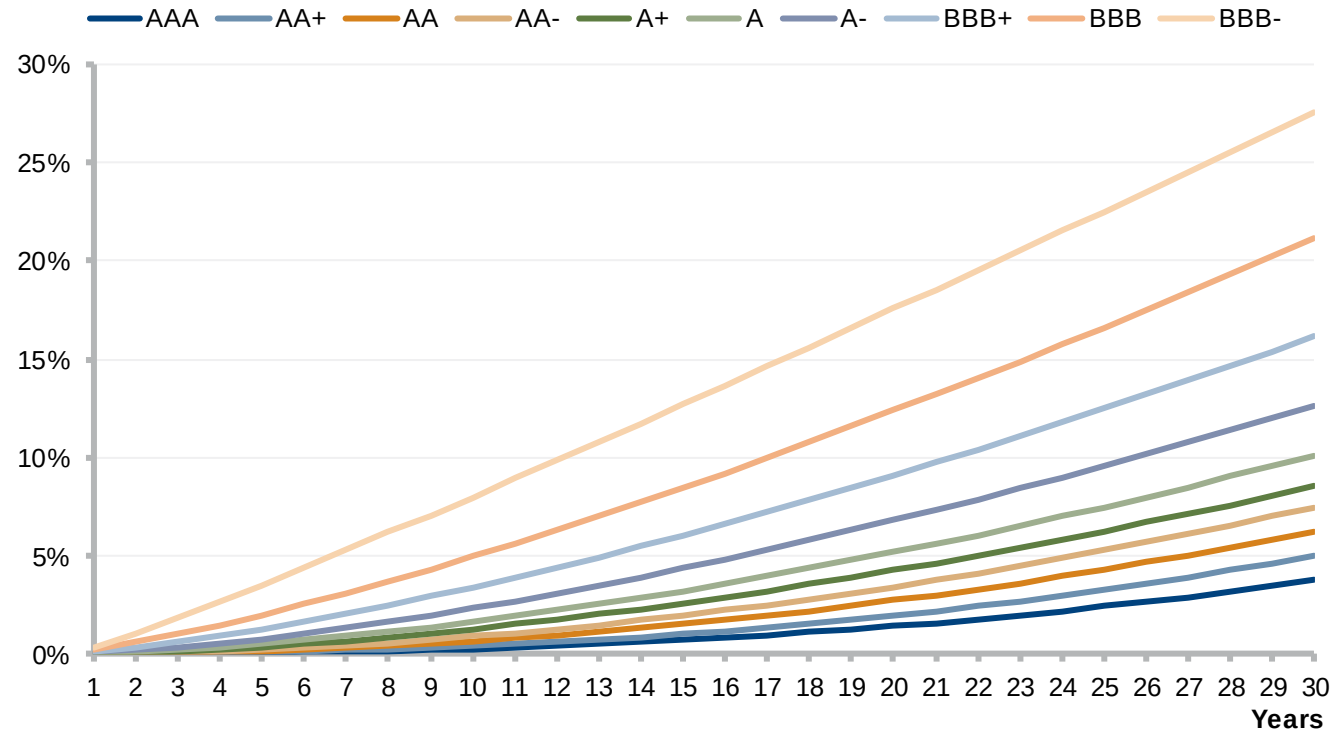
Figure 4. Idealised expected loss curves (non-investment grade ratings)



Source: Scope.

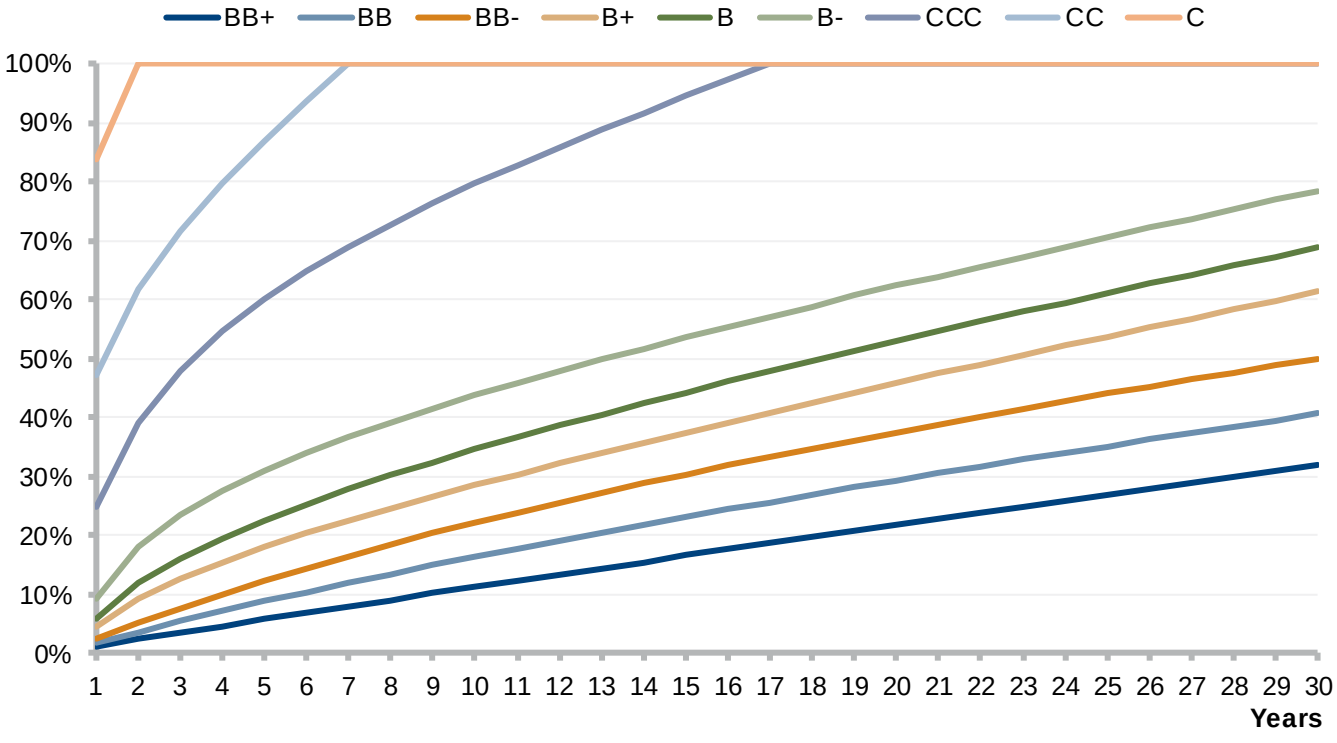
Appendix III Scope's idealised default probability curves

Figure 5. Idealised cumulative default curves (investment grade ratings)



Source: Scope.

Figure 6. Idealised cumulative default curves (non-investment grade ratings)



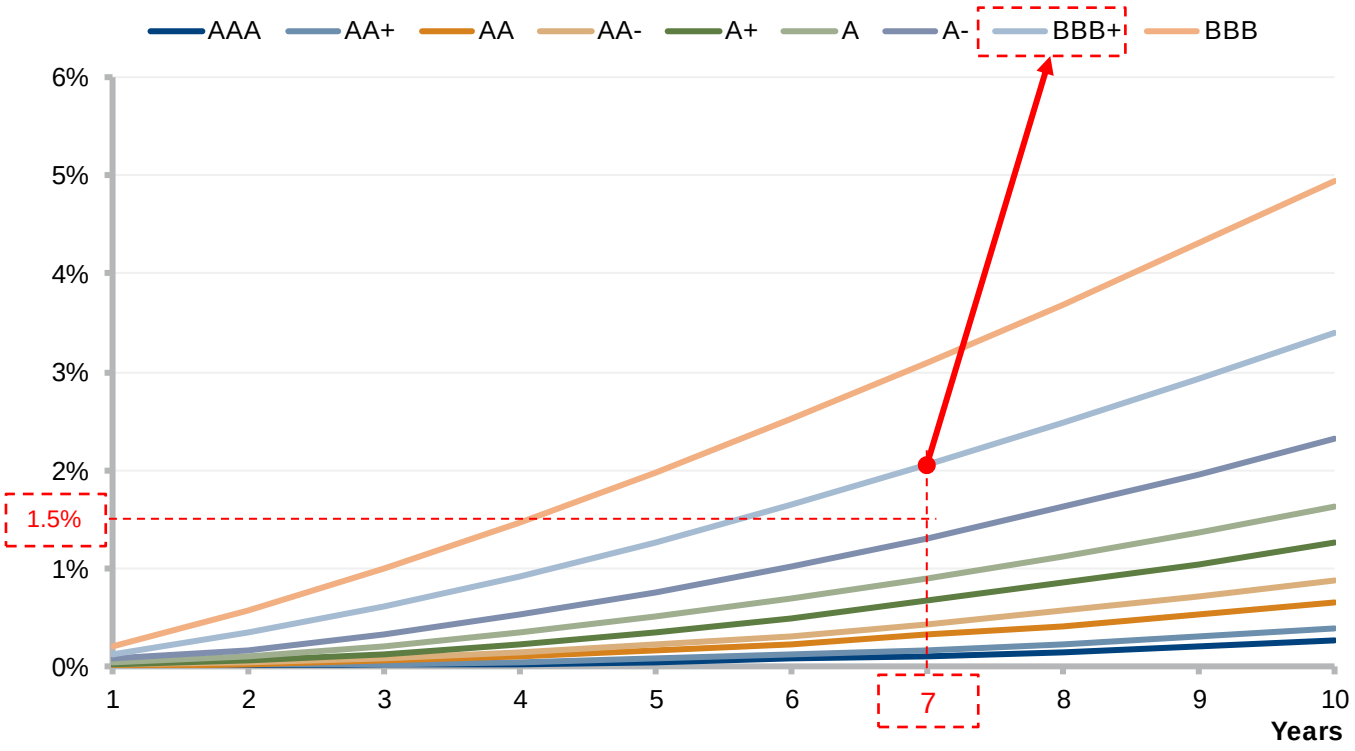
Source: Scope.

Appendix IV Example of determination of rating symbol given expected loss and risk horizon

We typically rely on the idealised expected loss tables to interpret quantitative results of an analysis. The following example illustrates how the tables can be read.

Figure 7 shows that the rating symbol that would correspond to an instrument with a lifetime expected loss of 1.5% over a risk horizon of seven years is a BBB+. This is because the instrument has an expected loss that is higher than the typical loss for the A- rating level for a risk horizon of seven years (i.e. the A- level is not passed); and has an expected loss that is lower than the typical loss for the BBB+ rating level (i.e. the BBB+ level is passed).

Figure 7. Example of interpreting the idealised loss curves



Source: Scope.

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