Understanding the Aircraft NPI Methodology
An application study

Scope Ratings' Aircraft Non-Payment Insurance (NPI) methodology was published as call for comments on 17 January 2020. This document illustrates how the analytical approach in the proposed methodology can be applied to a hypothetical transaction. The NPI methodology is used in conjunction with Scope's Aviation Finance Rating Methodology.

Example underlying transaction to be insured

Transaction elements	
Airline credit quality	B
Aircraft characteristics	New widebody, mature phase
Debt characteristics	Senior secured loan with 85% loan-to-value (LTV)

Source: Scope.

Insurance consortium (i.e. the portfolio of insurers)

Insurer	Scope probability of default strength[1]	Share of total exposure
Insurer 1	aa	50%
Insurer 2	a+	25%
Insurer 3	a+	25%

[1] Scope PD strength represents an assumption about the time structure of defaults of an issuer or instrument.
Source: Scope.

Assumption about loss given insurer default

The methodology assumes that the severity of an insurer's default is 100% (i.e. no partial payments from the insurer are available in case of default—the most severe possible assumption).

We encourage market participants and insurance industry representatives to provide feedback and data that they have available to contradict this assumption during the call-for-comments period. We are aware that some recovery from a defaulted insurer is likely because insurers are regulated, have minimum levels of capital and their exposures are collateralised. However, data on recovery from defaulted insurers in the market are limited.

Analysis of the example underlying transaction before NPI

We will assume that the result of analysing the underlying transaction with our Aviation Finance Rating Methodology (AF methodology) would have a quantitative outcome of BBB- before the NPI protection. The corresponding expected loss is 1.71%. The expected loss in the AF methodology is calculated by adding all products obtained by multiplying the probability of default of the contract with the loss given default of the contract for each of the months in the life of the transaction.

Analysis of the protection provided by non-payment insurance

The NPI methodology calculates the severity reduction that results from the protection provided by insurers. We assume no protection is available from an insurer if it has defaulted in the time elapsed from the moment of the analysis to the time of default.

For this, the NPI methodology uses a stressed assumption about the share of the exposure covered by insurers that would not be protected.

Analysts

Helene Spro
+49 69 66 77 389 90
h.spro@scoperatings.com

Team Leader
Carlos Terré
+49 30 27891 242
c.terre@scoperatings.com

Related Research

Aircraft Non-payment Insurance Methodology (Call for Comments)
January 2020

Aircraft non-payment insurance – Credit risk under an expected loss perspective
April 2019

Aviation Finance Rating Methodology
July 2019

Aviation Finance Outlook 2019: Lack of discrimination hints at hard landing to come
December 2018

Scope Ratings GmbH

Neue Mainzer Straße 66-68
D-60311 Frankfurt am Main

Phone +49 69 66 77 389 0

Headquarters

Lennéstraße 5
10785 Berlin

Phone +49 30 27891 0
Fax +49 30 27891 100

info@scoperatings.com
www.scoperatings.com

Bloomberg: SCOP

This stressed assumption is a function of rating level. For testing a 'B' category rating, we use the cumulative mean default rate (DR) of the portfolio of insurers making up the consortium.

The default rate we consider is rating conditional because the scenarios that would result in the highest aircraft-value losses will also have the highest probability of insurers defaulting. In other words, both aircraft values and insurer defaults are expected to worsen simultaneously during periods of stress.

The expected loss calculated with the AF methodology is further reduced with the application of the NPI protection. The methodology document shows the following relationships:

$$\boldsymbol{EL_{rating}} = \sum_{i=1}^{n}\left[\boldsymbol{PD(i)} \times \boldsymbol{LGD_{rating}^{AF}(i)}\right] \times \boldsymbol{LGD_{rating}^{NPI}(i)}$$

$$\boldsymbol{LGD_{rating}^{NPI}(i)} = \boldsymbol{DR_{rating}^{NPI}(i)}$$

After applying the NPI methodology to the example transaction the quantitative outcome increases to A+ from the initial value of BBB- before the NPI protection was considered. The NPI protection therefore contributes with a 5-notch uplift to the transaction. The expected loss of the transaction decreases to 0.06% from 1.71%.

Sensitivity to airline credit quality

The credit risk of an NPI transaction depends on the credit quality of the airline in the transaction. Of course, the higher the credit quality of the airline the higher the credit quality of the NPI transaction because the expected loss would be lower via lower probability of default on the months of the transaction.

The table below shows how the analysis result after NPI protection. For example, an airline with a credit quality of BB- in the example transaction, would result in AA a quantitative result considering the protection from the example consortium of insurers.

Airline credit quality	Quantitative outcome after NPI
CCC	A
B-	A+
B	A+
B+	AA-
BB-	AA

Source: Scope.

Sensitivity to the credit quality and number of insurers

The credit quality of the insurers in the consortium has the highest impact on credit quality the transaction after NPI protection. Weak insurers are more likely to default during the transaction life, which will reduce the effective protection available because NPI protection is usually structured without the joint liability of the insurers. The transaction will then experience a loss even when the other insurers may be performing.

The expected loss approach takes into consideration the severity-mitigation of an increased number of insurers. The more insurers in the transaction, the higher the probability that anyone of them may default. However, the loss of protection after an insurer default is lower the more insurers are in the consortium.

An NPI transaction reflects the benefit of a diversified consortium over one with a concentrated portfolio. The table below shows the sensitivity to the number and quality of insurers considering the case of either 10 or 2 insurers in the consortium, and all of them either with a PD strength of a- or aa+. The bigger uplift is of course for the case of 10 insurers, all assumed to have a PD strength of aa+.

Number of insurers	Scope's PD strength of the insurer	Insurer share	Quantitative outcome
10	all a-	10% each	**AA-**
2	all a-	50% each	**A+**
10	all aa+	10% each	**AA+**
2	all aa+	50% each	**AA**

Source: Scope.

Scope Ratings GmbH

Headquarters Berlin
Lennéstraße 5
D-10785 Berlin

Phone +49 30 27891 0

Frankfurt am Main
Neue Mainzer Straße 66-68
D-60311 Frankfurt am Main

Phone +49 69 66 77 389 0

Paris
1 Cour du Havre
F-75008 Paris

Phone +33 1 8288 5557

London
Suite 301
2 Angel Square
London EC1V 1NY

Phone +44 203-457 0 4444

Madrid
Paseo de la Castellana 95
Edificio Torre Europa
E-28046 Madrid

Phone +34 914 186 973

Milan
Via Paleocapa 7
IT-20121 Milan

Phone +39 02 30315 814

Oslo
Haakon VII's gate 6
N-0161 Oslo

Phone +47 21 62 31 42

info@scoperatings.com
www.scoperatings.com

Disclaimer