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Best's
Methodology and Criteria

Assessing the Tail Risk of Sidecars

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A. Market Overview

A sidecar is a limited-life, special-purpose reinsurance vehicle that generally provides property catastrophe quota-share reinsurance exclusively to its sponsor. A tightening of reinsurance capacity in the property and casualty market can make the use of sidecars an attractive alternative to traditional retrocession. Sidecars are also used to offer rated debt to investors seeking exposure to various layers of catastrophic risks.

Sponsors of sidecars generally take reinsurance credit for transferring risks to sidecars. While some sidecars may be capitalized to full aggregate limits, others may not be adequately capitalized to absorb losses that deviate from expectations. When capitalization is inadequate, some of the risk originally assumed to be fully hedged by a sidecar ultimately may be borne by the sponsor. This risk is referred to as "tail risk." This criteria procedure outlines how AM Best may estimate tail risk to ensure that appropriate reinsurance credit is reflected in the sidecar's sponsor's BCAR score. The criteria is most useful for a sidecar with a limited underwriting life. AM Best may consider completing a BCAR model for the sidecar as part of building the sidecar reinsurance into assessment of the sponsor.

B. Assessing Tail Risk

Base Assumptions for Estimating Tail Risk

To calculate the base level of tail risk, AM Best makes the following assumptions:

- Business ceded to the sidecar is the same quality as the business normally written by the sidecar's sponsor, and the sponsor bears no unforeseen operational, legal, tax, or regulatory risks.
- AM Best uses the one-year default rate from the *Best's Idealized Issuer Default Matrix*, found in *Best's Insurance-Linked Securities and Structures Methodology* (BILSM), to proxy the annual default probability for a sidecar with a given ICR. Specifically, for each ICR, the data in the matrix are assumed to represent the annual probability that the sidecar's capital (debt, equity and any retained cash) will be exhausted.

The base (unstressed) capitalization requirement for the sidecar will depend on the rating of its sponsor—the capitalization should be enough to ensure that the "shadow credit assessment" for the sidecar (solely for the purpose of assessing tail risk) is the same as that of the sponsoring company. For example, if the sponsoring company has an ICR of "a-", then the sidecar must be sufficiently capitalized to merit an "a-" rating and consequently will be assumed to have an annual default probability equivalent to the default rate of an "a-" insurance carrier over a one-year period as shown in *Best's Idealized Issuer Default Matrix*. If the sidecar's sponsor has a rating of "bbb+" or lower, the "shadow credit assessment" for the sidecar will be "a-".

Information Reviewed

AM Best's assessment of the tail risk of sidecars may include use of data and information from transaction sponsors, their representatives or experts, and independent peril modelers. AM Best accepts modeled losses from the peril modelers that reflect the most conservative trends in peril activities, and reviews business origination and profitability data modeled by the sidecar's representatives. Information reviewed, evaluated, or monitored may include the following:

- *Risk Transfer:* Structural, regulatory, legal, and all third-party related documents are reviewed for evidence of true risk transfer to the sidecar.
- *Operational Risks:* The monitoring and record-keeping needed to maintain the legal separation of the sidecar from the sponsoring insurance company to ensure the bankruptcy remote nature of the transaction and to properly allocate premiums and losses are important elements of the assessment.
- *Exceedance Curves:* AM Best reviews the aggregate and occurrence exceedance curves for the company benefiting from the sidecar before and after the effect of the sidecar. Stressed aggregate exceedance curves (based on peril activity rates and total insured values as described later in this document) are typically expected to be part of the review.
- *Data Quality:* The level of data quality (especially granularity of data) is critical to the evaluation of the sidecar, because it may affect the level of stress on the aggregate exceedance curve; if data quality is deemed to be in question, the stresses in the analysis may be more punitive.
- *Collateralization:* The level and form of the collateral, including investment guidelines, hedges on collateral value (if any), and the conditions surrounding the release of the collateral are critical to the determination of tail risk.
- *Degree of Peril Modeler Involvement:* The involvement of established peril modelers can range from simply making sure that the sidecar sponsors turn on the "right levers" (such as "storm surge," "loss amplification" and "fire following earthquake") on licensed software to actually modeling the peril and verifying data quality. AM Best has more confidence in transactions that are independently modeled (with data verification) than those that are all modeled in-house with little or no input from third-party peril modelers.

- *Sidecar Sponsor:* The track record of the sponsor is of utmost importance in making a determination on the viability of the sidecar.
- *Management of Aggregate Risks:* How aggregate risks are managed, including how the risk layers are correlated, may factor into the evaluation.
- *Protected Cell Structure Mechanics:* If the sidecar has a protected cell structure, the structure and the limits of each cell may be evaluated, including whether each cell truly operates independently with its own capital to absorb losses up to predefined limits. Perils covered in individual cell structures are stressed more than those wholly contained in dedicated, special-purpose reinsurance vehicles.
- *Terms and Conditions:* Covenants in the reinsurance or underwriting agreement between the sidecar and its sponsor may be reviewed to help determine whether the interests of the sidecar's investors and sponsors are aligned.
- *Indemnifications and Carve-Outs:* The risks that the sponsoring company retains are expected to be described fully.
- *Business Origination:* The projected business origination and the processes for alerting AM Best to deviation from the plan may be discussed during the evaluation.
- *Ongoing Risk Monitoring:* The mechanism by which ongoing risk monitoring occurs may be examined to ensure that the tail risk of the sidecar can be re-evaluated periodically or as warranted by catastrophic events.
- *Reserves:* The procedures for the establishment and liquidation (run-off) of reserves may be reviewed to ensure that adverse loss developments can be covered by the sidecar's collateral, even when the sidecar's "risk period" has ended.
- *Key Assumptions on Business Profitability:* Specific assumptions used in modeling premiums and loss ratios earned/experienced by the sidecar are critical to the assessment, including assumed volatility of such premiums and loss ratios.
- *Profit Distribution:* Details on the circumstances under which profits can be withdrawn from the sidecar for distribution to investors (and the timing of such distributions) are expected to be well defined.
- *Cash Flow Model:* A review of the cash flow model to understand the critical assumptions used in determining the profitability of the sidecar is an important element in the tail risk analysis.
- *Advisers*: Tax, regulatory and legal advisers are of particular importance to the assessment because they ensure the validity of the documents.
- *Reporting Requirements:* Quarterly and annual financial statements, procedures for reporting material events, and exposure information should be provided for ongoing monitoring purposes.

Assessing the Tail Risk of Sidecars

Capital for Tail Risk

When assessing tail risk, AM Best seeks to understand the capital level needed such that the probability of exhausting that capital level is within a given tolerance. To determine this capital level for certain special-purpose reinsurance vehicles and their obligations, AM Best sets specific capital levels for each Issuer Credit Rating (ICR) based on the *Best's Idealized Issuer Default Matrix* found in BILSM.

For a reinsurance special-purpose vehicle to achieve a specific rating (absent any other considerations) it must hold enough capital to cover losses at a confidence level equivalent to one minus the one-year default rate of that rating target. The excess (if any) of calculated losses at the chosen confidence level over the amount of capital actually held by the special-purpose reinsurance vehicle (absent any other considerations) is the tail risk of the sidecar.

Tail risk is assessed at the time of the evaluation of the credit risk of the sidecar and its debt (if any). AM Best may assess tail risk at other times such as the following events or milestones: 1) annually after the latest tail risk assessment; 2) after any major catastrophic event; 3) after the business portfolio has been fully originated (if the initial portfolio was based on a projection of business origination); 4) after a fundamental change in the portfolio or business plans of the sidecar and 5) whenever the ICR of the cedant is being reassessed.

The following are the steps for estimating tail risk:

- **Step 1 -** Obtain the aggregate exceedance curve (including all perils and attritional losses, if any) for the business ceded to the sidecar. The storm surge, loss amplification and fire following earthquake levers should be switched on for the models.
- **Step 2 -** Obtain the shadow credit assessment of the sidecar based on the ICR of the cedant.
- **Step 3 -** Obtain the one-year default rate (from *Best's Idealized Issuer Default Matrix*) that is associated with the sidecar's shadow credit assessment (Step 2). If the sidecar's sponsor has a rating of "bbb+" or below, the annual default rate will be the one-year default rate associated with an "a-" ICR.
- **Step 4 -** Calculate the confidence interval as follows: 100% less the annual default rate from Step 3.
- **Step 5 -** Obtain the required collateral (the loss associated with the confidence interval from Step 4). The data should be from the appropriate confidence interval on the aggregate exceedance curve (see Step 1).
- **Step 6 -** Obtain the initial sidecar collateral (the initial debt and equity balance in the sidecar's trust, net of fees).
- **Step 7 -** Obtain the retained cash, which is the amount of cash from operations (net of operating expenses but before subtracting losses) that will be "trapped" in the sidecar. If, for example, distribution of net income is allowed on a quarterly basis, AM Best will assume that retained cash will be no more than one-fourth of the year's projected retained cash.

- **Step 8 -** Calculate the total collateral as follows: initial sidecar collateral (Step 6) + retained cash (Step 7).
- **Step 9 -** Calculate the tail risk as follows: maximum (0, required collateral [Step 5] – total collateral [Step 8]).

Stresses on Activity Rate, Insured Value and Retained Cash

The procedures above use the base aggregate exceedance probability curve to determine tail risk. However, AM Best will repeat those procedures using additional aggregate exceedance curves based on the following stress scenarios:

- Increased peril activity rates—5% increase, 10% increase, 15% increase
- Increased total insured value (TIV)—5% increase, 10% increase, 15% increase
- Combination of increased peril activity rate and TIV—10% increase in peril activity rate and 10% increase in TIV

If the sponsor of the sidecar and its representatives are unable to provide new aggregate exceedance curves based on the stress scenarios listed above, AM Best will stress the losses on the base aggregate exceedance curve at its discretion for each return period.

Another category of stress test is on the retained cash in **Step 7** of the steps for estimating tail risk. The retained cash will be reduced by up to 50%.

Applying Stresses

Depending on the specific circumstances surrounding the sidecar and its sponsor, AM Best may use the stressed exceedance curves to determine the appropriate level of tail risk. The following items maybe considered when deciding to use the stressed exceedance curves:

- *Business and Reinsurance Type*: AM Best believes that the following risks related to lines of business, reinsurance types and combinations thereof can be difficult to model: terrorism, retrocession, marine/offshore energy, excess and surplus lines, commercial, workers' compensation and "nonpeak" perils. The severity of the stress scenarios will depend partially on whether the business ceded to the sidecar derives a substantial amount of premium from these lines of businesses or reinsurance types.
- *Data Quality:* The quality of the data loaded into the peril model matters greatly. AM Best expects the extent to which the latitude and longitude of property locations are supplied to the peril model to be an indication of the level of data quality. Other indicators of data quality could be the extent to which the model has been supplied information related to construction type, roof type, occupancy type, contents, square footage, etc. Excessive use of default values in the models for primary and secondary characteristics of property is a clear indication of poor data quality. The choice of the level of stress to impose on the parameters

used in deriving the exceedance curve will depend on AM Best's view of the quality of data supplied to the peril model.

- *Book of Business*: AM Best will apply higher stress factors to those sidecars whose sponsors have not finalized the book of business anticipated to be ceded to their sidecars at the time of the evaluation of the sidecars. If a sidecar's portfolio will be constructed on a "policy attaching" basis, AM Best will consider the cedant's historical book of business and its business renewal history. If the ceding company has a record of high renewal rates, AM Best would be more comfortable with the sidecar's projection of business origination.
- *Deviation from Historical Book of Business*: AM Best expects that the sponsors of sidecars will not originate business outside of their areas of expertise. Originations in completely new lines of business will merit higher stresses unless the sponsors demonstrate that they have the staff and risk management processes to properly price and monitor the risks.
- *Stresses Already Applied by the Sidecar Sponso*r: AM Best is aware that there are sidecar sponsors that are adept at modeling catastrophic risks and already make adjustments to data supplied to the peril models to produce more conservative results. The extent to which AM Best agrees with these adjustments may cause a reduction of the level of stresses applied in the evaluation of tail risk.

C. Tail Risk and Best's Capital Adequacy Ratio (BCAR)

The BCAR is a valuable tool in AM Best's assessment of balance sheet strength. When calculating the BCAR of the sponsor, AM Best incorporates the tail risk from a sidecar transaction in its assessment of the sponsor's available capital. In addition, the required capital components in the sponsor's BCAR will be adjusted to reflect other impacts resulting from the sidecar transaction. These adjustments will differ between the sponsor's standard BCAR and its stress BCAR.

Standard BCAR

When calculating the standard BCAR of a sidecar's sponsor, AM Best reduces the sponsor's reported capital (surplus) by the sidecar's tail risk. **Exhibit C.2** demonstrates how tail risk (shown for hypothetical Sidecar ZZZ in **Exhibit C.1**) would be incorporated into the standard BCAR of Sponsor ABC.

Exhibit C.1: Calculating the Tail Risk of Sidecar ZZZ*

Required Collateral	Total Collateral	Tail Risk
150	140	10

*Amounts shown are in millions USD.

Exhibit C.2: Calculating Sponsor ABC's Adjusted Capital for Standard BCAR*

ABC's Reported Capital (Surplus)	Tail Risk of Sidecar ZZZ	ABC's Capital Reduced for Tail Risk
1000	10	990

*Amounts shown are in millions USD.

Exhibit C.3 highlights how ABC's Standard BCAR (B8) Risk Component reflects the reinsurance benefit from the hypothetical sidecar.

Exhibit C.3: Sponsor ABC's Standard BCAR (B8) Risk Component Calculation*

VaR Level	Gross PML** Gross of all reinsurance	Net PML** Prior to cession to sidecar	Losses Ceded to Sidecar	Net PML*** After cession to sidecar	Reinstatement Costs	ABC's (B8) Risk Component PML net of all reinsurance and including reinstatement costs[1]
95	400	300	60	240	30	270
99	500	400	80	320	30	350
99.5	700	600	120	480	30	510
99.6	800	700	140	560	30	590

*Amounts shown are in millions USD.

**Probable Maximum Loss (PML) amounts are on a pre-tax basis from the all perils combined per-occurrence exceedance probability curve.

***Calculation based on assumption that Sponsor ABC cedes 20% of net losses on a quota share basis to Sidecar ZZZ.

[1]PML Net of All Reinsurance and including Reinstatement Costs = Net PML Prior to Cession to Sidecar – Losses Ceded to Sidecar + Reinstatement Costs.

Stress BCAR Calculation

As part of its assessment of balance sheet strength, AM Best may stress test a company's capitalization. The stress test is intended to be a reasonable reflection of a stressed risk profile shortly after a catastrophic event and to capture the company's exposure to further events. For catastrophe exposed insurers with sidecars, the stress test includes the following calculations:

1. The sponsor's reported capital is reduced by the 1-in-100-year net post-tax PML (including reinstatement premiums) from the per-occurrence all perils combined information. The PML is net of any applicable quota-share reinsurance from the sidecar.
2. Reinsurance recoverables are increased a minimum of 40% of the difference in the 1-in-100-year gross and net pre-tax per-occurrence all perils combined PMLs (after cession to sidecar and excluding reinstatement premiums). This adjustment can also increase the reinsurance dependence factor. In determining the appropriate risk charge for these recoverables, AM Best assumes the ratings on the reinsurers will remain unchanged as a result of the event.
3. An amount equal to 40% of the 1-in-100-year net pre-tax per-occurrence all-perils combined PML (after cession to sidecar and excluding reinstatement premiums) is added to the loss reserves. This amount may be adjusted based upon the reinsurance structure (i.e., caps, co-participation, etc.).
4. The tail risk of the sidecar is recalculated to reflect the collateral that was used to meet the quota share needs of the initial catastrophic event. The sponsor's remaining reported capital

is then reduced for the sidecar's recalculated tail risk, thus capturing the risk that the sponsor of the sidecar will have to bear if the sidecar is not sufficiently capitalized to support the quota-share reinsurance.

Note: The reduction to surplus in **Step 1** is on a post-tax basis only if the analyst believes that the company will be able to use the tax benefit. Otherwise, the calculation is on a pre-tax basis.

Exhibit C.4 outlines the stress BCAR steps for Sponsor ABC.

Exhibit C.4: Sponsor ABC's Stress BCAR Steps[1]*

	Reported Capital	Net Pre-tax 1-in-100 Year PML	Maximum Tax Rate for Jurisdiction	Net Post-tax PML =350*(100%-21%)	Reduced Reported Capital =1000 – 276.5
Step 1	**1000**	**350**	**21%**	**276.5**	**723.5**

	Gross Pre-tax 1-in-100 Year PML	Net Pre-tax 1-in-100 Year PML Prior to cession to sidecar	Net Pre-tax 1-in-100 Year PML After cession to sidecar, =80%*400	Total Ceded Pre-tax PML Recoverable =500 - 320	Minimum Increase to Reinsurance Recoverables in ABC's BCAR Credit Risk =40%*180
Step 2	**500**	**400**	**320**	**180**	**72**

	Net Pre-tax 1-in-100 Year PML After cession to sidecar (excluding reinstatement costs), =80%*400	Percentage of Net Pre-tax PML Used to Increase Reserves	Increase to Reserves in ABC's BCAR Reserve Risk =40%*320
Step 3	**320**	**40%**	**128**

	Collateral Used in the Initial Event =20% of VaR 99 net pre-tax PML prior to cession to sidecar	ZZZ's Remaining Collateral =140 initial actual collateral - 80 used	Recalculated Tail Risk of ZZZ =150 required collateral – 60 remaining actual collateral	Sponsor ABC's Remaining Reported Capital =723.5 from step 1 – 90 tail risk
Step 4	**80**	**60**	**90**	**633.5**

[1]PML amounts are from the all-perils combined per-occurrence exceedance probability curve.

*Amounts shown are in millions USD.

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