



AMERICAN ACADEMY *of* ACTUARIES

Principles-Based Reserving Reinsurance Examples

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Reinsurance Work Group**

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PBR Reinsurance Examples

This paper was prepared by the Academy's Reinsurance Work Group at the request of LHATF's Reinsurance Subgroup. The purpose of this report is to guide the consideration of the treatment of reinsurance within the principles-based reserve calculation (PBR) as proposed in the current exposure of VM-20. The report provides examples of reinsurance treaties that we believe make economic sense, but that may be considered counter to the current rules under the Life and Health Reinsurance Agreements Model Regulation (Model Regulation). The report describes the example treaties, provides possible business rationale for the treaties, and discusses how the treaties may be treated for reinsurance reserve credit under both the Model Regulation and under the proposed treatment of reinsurance in the current exposure of VM-20. Please note that this paper does not attempt to interpret the provisions in the Model Regulation, but rather acknowledges that it is possible for one to take the positions described in this report.

1. Reinsurance of a Universal Life (UL) secondary guarantee provision only, where there's no specified charge for the guarantee or the reinsurer charges more than the specified charge.

Business rationale for reinsuring this risk: The direct writer is comfortable with taking the mortality, lapse, interest rate, and policyholder behavior risks embedded in the underlying product, but desires reinsurance to cover the combination of these risks present in the secondary guarantee benefit, and also desires to have a reinsurance partner providing reserve and capital support for this benefit, which is fairly capital-intensive, even under a PBR.

Proposed reinsurance: In this example, the reinsurer charges a specified rate, expressed as a fixed level of basis points applied to reinsured account value. In return, the reinsurer reimburses the ceding company for any death benefits payable by virtue of the secondary guarantee being in place (i.e., deaths that occur when the account value has gone to 0, but the secondary guarantee is keeping the policy in-force).

Situation today: The direct writer may not be able to obtain any reserve credit for this reinsurance, for the reasons discussed below:

- a. Since the secondary guarantee is embedded in the UL contract, such reinsurance might be deemed not to reinsure all of the significant risks inherent in the product, as may be required by the Model Regulation.
- b. Even if (a) above were not the case, it might be argued that the reinsurer is charging more than the retail premium being collected for this benefit (e.g., since there is no specified premium being charged to the policyholder for this benefit), which could potentially violate the requirement in the Model Regulation that the reinsurance involves amounts other than income realized from the reinsurance policies.

Treatment under PBR: Under the current VM-20 proposal, the following could apply:

- a. The change in the calculated reserve due to the impact of this reinsurance treaty could accurately reflect the appropriate change in the liability of the ceding company, since the ceding company could be able to properly recognize both the reinsurance premiums being paid and the reinsurance benefits being provided, in the context of the whole policy.
- b. Specifically, for the Stochastic Reserve calculations, the reinsurance could be appropriately modeled, since the primary risk that this reinsurance structure covers is the risk of long-term low interest rates.
- c. Section D.1.6. in the current exposure of VM-20¹ may need to be applied for mortality to the extent the value of the reinsurance is sensitive to changes in mortality.
- d. It also important to note that under the current exposure of VM-20, the modeling of this and all reinsurance treaties require the use of the “knowledgeable counterparties” provision in section D.4.1. of the current exposure of VM-20² regarding the modeling of actions by counterparties. In this example, this provision could apply to the modeling of the credited interest rates and the COI charges applied to the underlying policies in the determination of the assuming company’s reserve.
- e. Both the reinsurance premiums and the reinsurance benefit payments would be reflected under the Deterministic Reserve, but because of the nature of the Deterministic Reserve, the calculation may not necessarily reflect the same level of

¹ Section D.1.6. of the current exposure of VM-20 states the following:

“There are certain provisions of reinsurance agreements where a single deterministic valuation assumption for the related risk factor or factors will not adequately capture the risk. Examples of such provisions include stop loss reinsurance and maximum limits on benefits receivable. For these features, the company shall make provision for these risk factors by either:

- a. Stochastically modeling the risk factor(s) directly in the cash flow model when calculating the stochastic reserve, or
- b. Performing a separate stochastic analysis outside the cash flow model to quantify the impact on reinsurance cash flows to and from the company. The results of this analysis shall be used to adjust prudent estimate assumptions or to determine an amount to adjust the stochastic reserve to adequately make provision for the risks of the reinsurance feature(s).”

² Section D.4.1. of the current exposure of VM-20 states the following:

“a. Knowledgeable counterparties. Assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and thus likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. Items that should be considered when setting assumptions for the non-guaranteed elements in reinsurance cash flows shall include but not be limited to:

- i. The usual and customary practices associated with such agreements,
- ii. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected,
- iii. Any limits placed upon either party’s ability to exercise contractual options in the reinsurance agreement,
- iv. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms, and
- v. Actions that might be taken by a party if the counterparty is in financial difficulty.”

reinsurance benefit payments as the Stochastic Reserve. For a treaty similar to one discussed in this example, the change in the Deterministic Reserve may be more conservative than the change in the Stochastic Reserve, as the calculation will reflect the same level of reinsurance premiums but a lower level of reinsurance benefit payments. Similarly, the impact on the Deterministic Reserve could be less conservative than the impact on the Stochastic Reserve for the assuming company. It is important to note that this effect is not a result of the requirements for determining risk transfer (i.e., a similar effect would be obtained for a 100% coinsurance treaty covering a block of UL contracts with a secondary guarantee if the current risk transfer rules were to be applied under proposed VM-20). It is rather the result of the nature of the Deterministic Reserve, which doesn't pick up the same level of tail risk as the Stochastic Reserve.

- f. Similarly, it is not clear how well the mortality risk arising from the secondary guarantee would be reflected in the Deterministic Reserve in this example. It may make sense to consider whether the language in section D.1.6. of the current exposure of VM-20 also applies to the assumptions used in the Deterministic Reserve and to modify the language in that section to clarify.

2. Reinsurance of a VA guarantee rider (e.g., Guaranteed Minimum Death Benefit and/or a Guaranteed Minimum Withdrawal Benefit), where the reinsurer charges more than the specified rider fee.

Business rationale for reinsuring this risk: The direct writer is comfortable with taking the risks associated with the underlying VA product (e.g., fund performance and lapse), but desires reinsurance to cover the risks present in the VA guarantee benefits.

Proposed reinsurance: In this example, the reinsurer charges a specified rate, expressed as a fixed level of basis points applied to reinsured account value, which is greater than the specific rider fee (e.g., the reinsurer charges 60 bps for the GMWB rider while the direct writer charges only 50 bps). In return, the reinsurer reimburses the ceding company for any guaranteed benefits paid in excess of the amounts that would be paid if the VA guarantee was not in place.

Among the reasons why the reinsurer may charge a specified rate that is higher than the rider fee charged by the direct writer:

- a. Both the reinsurer and the direct writer value the VA guarantee risk consistently, but the direct writer sets the rider fee at a lower level because they expect to collect more revenue from the underlying VA contract by virtue of having the rider in place (e.g., they believe the GMDB rider will improve persistency and allow them to collect more mortality and expense (M&E) fees because contractholders keep their contracts longer). Since the reinsurer does not have access to the revenue from the underlying VA contract, they may have to charge more for the reinsurance.

- b. The direct writer is reinsuring an in-force block of business that is in-the-money and wishes to “cut its losses”, so may be willing to pay more than the rider charge for the reinsurance.

Situation today: The direct writer may not be able to obtain any reserve credit for this reinsurance, even though it is transferring significant risk to the reinsurer, because it could be argued that the reinsurer charging more than the rider fee contradicts certain provisions in the current risk transfer rules in the Model Regulation (i.e., the reinsurance cannot involve amounts other than income realized from the reinsurance policies).

Treatment under PBR: If the reinsurance treatment in the current VM-20 proposal were to be applied to the PBR approach in proposed Actuarial Guideline VACARVM (AG VACARVM) – currently it is not – the following would apply:

- a. The change in the calculated reserve due to this reinsurance treaty may accurately reflect the appropriate change in the liability of the ceding company, since the ceding company would be able to properly recognize both the reinsurance premiums being paid and the reinsurance benefits being provided, in the context of the whole VA contract (i.e., to the extent the reinsurance charge is greater than the rider fee there would be less revenue available to fund the benefits available under the underlying VA contract).
- b. Specifically, for the Stochastic Reserve calculations, the reinsurance may be appropriately modeled, as both fund performance and contractholder behavior risk is included in the calculation.
- c. The reserve credit taken by the ceding company would be less (i.e., the reserve net of reinsurance would be greater) than that taken if reinsurance premium was equal to the rider charge. In this way, the reserve net of reinsurance would reflect the amount of risk that is actually transferred to the reinsurer through the treaty.
- d. Both the reinsurance premiums and the reinsurance benefit payments could be reflected under the Standard Scenario, but similar to discussion in the first example, the calculation may not necessarily reflect the same level of benefit payments as the Stochastic Reserve. It is important to note that this effect is not a result of the requirements for determining risk transfer (i.e., a similar effect would be obtained for a 100% coinsurance treaty covering a block of VA contracts with a minimum guaranteed benefit rider under proposed AG VACARVM with the current risk transfer rules).

3. Coinsurance level term policies only during the level-premium period

Business rationale for reinsuring this risk: The direct writer desires reinsurance covering just the initial 20-year period, as the direct writer and the reinsurer may not come to agreement on

the appropriate price for anti-selective lapses and ultimate mortality levels after the level-premium period.

Proposed reinsurance: In this example, the reinsurer receives the level premiums during the initial 20-year period, less an initial ceding commission and coverage of ongoing expenses, and pays death benefits occurring during the same 20-year period. After a policy reaches its 20th policy anniversary, the reinsurance terminates with respect to that policy.

Situation today: The direct writer may not be able to obtain any reserve credit for this reinsurance, for the following reasons:

- a. Since the reinsurance is not unlimited in duration, it could be argued that the treaty may not meet the risk transfer rules in the Model Regulation.
- b. Since the reinsurance does not cover all of the material risks inherent in the product (specifically, anti-selective lapses and mortality after the level-term period), it could be argued that the treaty may not meet the risk transfer rules in the Model Regulation.

Treatment under PBR: Under the current VM-20 proposal, the following may apply:

- a. The change in the calculated reserve due to the impact of this reinsurance treaty would accurately reflect the appropriate change in the liability of the ceding company, since the PBR calculations would reflect the impact of the reinsurance while it is in effect, but will leave the risk of anti-selective lapse and ultimate mortality levels after the level premium period, and the reserves appropriate for that risk, with the ceding company, consistent with what the modeling would have been absent any reinsurance.
- b. As the policy nears the end of the 20-year period, the reinsurance reserve credit calculated under PBR could be reduced and ultimately become zero at the end of the period. Therefore, the reserve held by the ceding company net of reinsurance would not suddenly increase when the treaty ends.
- c. The treatment under the Deterministic Reserve would be similar to the treatment under the Stochastic Reserve.

4. Reinsurance of surrender benefit only (for the life of the business or for a limited duration)

Business rationale for reinsuring this risk: The direct writer desires to retain only the mortality risk.

Proposed reinsurance: In this example, the ceding company pays the reinsurer the policyholder premium on a block of universal life policies less COI charges and the reinsurer reimburses the ceding company an amount equal to the cash surrender value paid to the

underlying policyholder for actual lapses during the term of the treaty. As noted above, the term could be for the life of the business or for an agreed upon limited duration.

Situation today: The direct writer may not be able to obtain any reserve credit for this reinsurance, for the following reasons:

- a. To the extent the reinsurance is for a limited duration, the limited duration may potentially not comply with current risk transfer rules.
- b. The reinsurance may not cover all of the material risks inherent in the product (it does not cover the mortality risk).

Treatment under PBR: Under the current exposure of VM-20, the following could apply:

- a. The change in the calculated reserve due to the impact of this reinsurance treaty could accurately reflect the appropriate change in the liability of the ceding company, since the PBR calculations would will reflect the impact of reinsurance while it is in effect, and would reflect the risks retained by the ceding company after the treaty has terminated (assuming the treaty has a limited duration), consistent with what the modeling would have been absent any reinsurance.
- b. As the policy nears the end of the treaty duration, the reinsurance reserve credit calculated under PBR would be reduced and may ultimately become zero at the termination of the treaty. Therefore, the reserve held by the ceding company net of reinsurance would not suddenly increase when the treaty ends.
- c. The treatment under the Deterministic Reserve would be similar to the treatment under the Stochastic Reserve. It is important to note that the cash surrender value floor under VM-20 would reflect the impact of the reinsurance being in place on the valuation date, but it would not reflect the reinsurance terminating if the treaty is limited in duration. See the “Additional Comment” below.
- d. Section D.1.6. in the current exposure of VM-20³ may need to be applied for lapse or other assumptions, to the extent the value of the reinsurance is sensitive to changes in those assumptions.

³ Section D.1.6. of the current exposure of VM-20 states the following:

“There are certain provisions of reinsurance agreements where a single deterministic valuation assumption for the related risk factor or factors will not adequately capture the risk. Examples of such provisions include stop loss reinsurance and maximum limits on benefits receivable. For these features, the company shall make provision for these risk factors by either:

- c. Stochastically modeling the risk factor(s) directly in the cash flow model when calculating the stochastic reserve, or
- d. Performing a separate stochastic analysis outside the cash flow model to quantify the impact on reinsurance cash flows to and from the company. The results of this analysis shall be used to adjust prudent estimate assumptions or to determine an amount to adjust the stochastic reserve to adequately make provision for the risks of the reinsurance feature(s).”

- e. The Margin the ceding company includes in the lapse and mortality assumptions used in the determination of the Stochastic Reserve may have a different magnitude and direction than the Margin the assuming company uses. In addition, the ceding company may need to consider whether Margin included in the lapse assumption used in the determination of a Stochastic Reserve that includes this reinsurance treaty may have a different magnitude and direction than the Margin used in a reserve calculation that excludes this reinsurance treaty.

Additional comment: Some have expressed a belief that it may be possible that results could be manipulated under the proposed treatment of reinsurance under a PBR by entering into a treaty that cedes only the surrender benefit, similar to the example discussed here, where the treaty is in effect for only one day (i.e., the valuation date). While such a treaty would likely have little, if any, impact on the Stochastic Reserve, it could serve to reduce the cash surrender value floor associated with the Deterministic Reserve under the current exposure of VM-20.

There are several provisions, however, that could be used to reduce or eliminate the impact of such potential manipulation. First, section 11G of the 1/7/08 version of the proposed Standard Valuation Law (SVL)⁴ may be applied in such a situation. Second, it may also be possible to apply the “foreknowledge” provision, which is in the current exposure of AG VACARVM⁵ and was part of the ‘guiding principles’ in the prior versions of VM-20.

While these provisions may be enough to address any concerns, it may be possible to further address by adding an additional provision, for example: a provision that requires the cash surrender value floor to also consider the present value of the cash surrender value upon the assumed termination of a treaty that affects the cash surrender value floor on the valuation date could be considered.

⁴ Section 11G of the current exposure of the SVL states:

“The commissioner may require a company to change any assumption or method that the commissioner determines is necessary in order to comply with the requirements of the valuation manual or this Act; and the company shall adjust the reserves as required by the commissioner.”

⁵ The “foreknowledge” provision in the current exposure of AG VACARVM states:

“The use of assumptions and risk management strategies should be appropriate to the business and not merely constructed to exploit 'foreknowledge' of the components of the required methodology.”