



AMERICAN ACADEMY *of* ACTUARIES

Report of the American Academy of Actuaries' Annuity Reserve Work Group

Presented to the National Association of Insurance Commissioners' Life and Health Actuarial Task Force

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Deposit Fund Subgroup of the Annuity Reserve Work Group

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I. Background

In 2009, the Life Health and Actuarial Task Force (LHATF) of the National Association of Insurance Commissioners (NAIC) requested that the Annuity Reserve Working Group (ARWG) of the American Academy of Actuaries (Academy) recommend a valuation methodology for deposit fund contracts that addresses the risks underlying the contracts and the insurer's administration of them. The ARWG initially gathered current requirements for deposit fund contracts, learned about the types of products and their risk profile and decided to form a smaller group to develop the recommendation. In April 2010, a subgroup of the ARWG, the Deposit Fund Subgroup, was formed to develop a recommendation.

Examples of deposit fund contracts include:

- Guaranteed Interest Contracts (GIC)
- Synthetic GICs
- Premium Deposit Funds
- Guaranteed Separate Account Group Contracts
- Annuities Certain
- Dividend Accumulations
- Funding Agreements
- Supplemental Contracts
- Lottery Payouts
- Group Annuity purchased under a retirement plan

In forming the recommendation, the group primarily focused on GICs, funding agreements, guaranteed separate account group contracts, and synthetic GICs.

The purpose of this document is to provide LHATF with an overview of the direction the Deposit Fund Subgroup of the ARWG is taking regarding development of recommendations to LHATF for the statutory valuation of deposit fund contracts in a principle-based environment. The Subgroup is seeking feedback from LHATF on this direction. While the Subgroup is aware of the need to ultimately address the subject of a reserve that may serve as a tax reserve as well as a reserve to be used by the regulator to compare results on a consistent basis for deposit fund contracts, this report deals solely with suggestions for a high level direction for development of statutory reserves as noted above and may need to be modified once taxes are considered.

II. Overview of the Approach to Statutory Valuation of Deposit Fund Contracts

The Deposit Fund Subgroup of the ARWG has completed a preliminary analysis of valuation methodologies for deposit fund contracts. As a result of the analysis, the subgroup recommends a principle-based approach to the statutory valuation of deposit fund contracts where the company is responsible for the following:

- Determining the appropriate valuation methodology based on the risk profile of each deposit fund product;
- Utilizing “Guiding Considerations” (see section III) in determining the appropriate valuation methodology; and
- Preparing documentation to support the valuation methodology utilized for the product and of the resulting reserve determination.

Within the context of this report, it is assumed that the actuary of the company will be acting on behalf of the company and thus performing the functions and bearing the responsibility for making actuarial judgments. As such, this report addresses those responsibilities as if they were those of the actuary.

The valuation methodology selected by the actuary for a given product could be solely of a deterministic nature, a deterministic approach that also involves stress testing, or one involving stochastic simulations in some manner. In evaluating the risk profile of a deposit fund product, the actuary should consider the product’s features as well as how the company manages the risks associated with the product. This recommendation is based on a belief that no single methodology would be appropriate to impose on particular classes of business in scope due to the changing nature of the products offered in the GIC and Funding Agreement marketplace and the wide range of risks accepted by insurers, from very minimal to potentially significant. Because of this diversity, we think it is appropriate for LHATF to rely on application of the judgment of the actuary as applied to an analysis of the specific risks inherent in the company’s business.

This approach to the statutory valuation of deposit fund contracts is recommended to be applicable to policies issued on or after the operative date of the valuation manual. However, we suggest that LHATF consider possible modifications to the existing statutory requirements applicable to business in force as well. The Deposit Funds Subgroup stands ready to assist LHATF in investigating the need for, and nature of, any such modifications. Refer to section IV for suggested modifications.

III. Guiding Considerations

In determining the appropriate valuation methodology for a deposit fund product, the actuary should consider, at a minimum, each of the following:

- Product classification
 - Contract contains guaranteed elements – unable to fully pass unfavorable experience to policyholder
 - Contract contains non-guaranteed elements – ability to fully pass unfavorable experience to policyholder
 - Contract contains guaranteed elements and non-guaranteed elements
- Types of guarantees provided in the product
 - Guarantee of interest
 - Length of guarantee
 - Guarantee of benefits
 - Foreign-currency based guarantee
 - Annuity purchase rate guarantee
 - Any other guarantee
- Types of discretionary policyholder withdrawal provisions
 - Not available
 - Subject to market value adjustment
 - At book value subject to minimum notice period
 - At book value
 - At market value
- Types of non-policyholder (i.e., plan participant) withdrawal provisions
 - Not available
 - Subject to market value adjustment
 - At book value
 - At market value
- Responsibility for losses, if any, associated with book value withdrawals
 - Insurance Company
 - Policyholder
- Use of contractual provisions to reduce interest rate risk
 - Associated with cash flows into the product
 - Associated with cash flows out of the product
- Existence of investment policy statement or guidelines and periodic review of investment guideline compliance
- Asset Adequacy Analysis method utilized to demonstrate reserve adequacy
- Existence and efficacy of a clearly defined risk management plan to manage the interest rate risk, credit risk, mortality risk and foreign currency risk associated with the product and periodic reporting to company management to demonstrate the effectiveness of the risk management plan.

Further, the documentation prepared by the actuary to support the valuation methodology should address each Guiding Consideration and document the extent to which each either applies or does not apply and for those that apply, how the chosen methodology may address them.

IV. Methodology Considerations

While the actuary would have the responsibility to determine the appropriate reserve methodology based on the risk profile of the product, a possible starting point for constructing a reserve methodology of a deterministic nature could be derived from the following summary of existing regulations as applicable to deposit fund contracts:

<u>Product Type</u>	<u>Existing Regulation</u>
General Account Products	NAIC Standard Valuation Law
Synthetic GIC	NAIC Model Law Appendix A-695 of the APPM NY Regulation 128 CA Bulletin 95-10 NE Title 210 Chapter 80
Guaranteed Separate Account	NAIC Model Law Appendix A-200 of the APPM NY Regulation 128 CA Bulletin 95-8

With respect to general account products, the NAIC Standard Valuation Law provides a fundamental framework for the actuary to consider as the basis for constructing a deterministic reserve methodology.

With respect to Synthetic GICs and Guaranteed Separate Accounts, revisions to the existing statutory requirements may merit consideration under a principle-based approach to valuation and perhaps to business in force, as well. They include:

- Possible elimination of the asset “haircut” based on AVR factors resulting in a comparison of the market value of the assets to the value of the guaranteed contract liabilities. The asset “haircut” may be redundant when the market value of assets is used to determine asset maintenance requirements. Further, for products with interest rate reset formulas, the insurance company is able to pass unfavorable credit losses through to the policyholder and this should perhaps be taken into consideration.
- Consider changing the liability discount rate from a function of the U.S. Treasury rate to a rate that corresponds with the underlying asset portfolio or a benchmark index associated with the investment policy statement or guideline of the product/contract. The existing liability discount rate of 105% of the U.S. Treasury rate (or 104.5% of the U.S. Treasury rate in New York) may bear little relationship to the yield on the portfolio of assets or target portfolio of assets supporting the product and to credit spreads, especially during periods such as year-ends 2008 and 2009 when the Treasury yields were so very low.
- Reconsider fee-based reserves. A fee-based reserve does not bear a direct relationship to the underlying risk. The same amount is held regardless of asset quality, crediting rate strategy, liability cash flows, etc. The fee-based reserve grows in good economic environments and may not be adequate in moderately adverse environments.

Thus, with certain modifications as noted to the existing regulations for Synthetic GICs and Guaranteed Separate Accounts, we believe the actuary could have a good fundamental framework to consider in constructing a reserve methodology of a deterministic nature. However, more research into the above three

possible modifications should be performed if LHATF believes it would be proper to pursue these suggestions; the Deposit Funds Subgroup stands ready to assist LHATF in this endeavor.

V. Stochastic Simulation Considerations

Should the actuary conclude that stochastic simulations be used in developing the statutory reserve for a particular deposit fund contract (or groups of contracts), the following guiding considerations should be taken into account when developing and using the cash flow model and when developing the stochastic reserve component.

A general objective is to be consistent with VM-20, where applicable, and with VM-22 when completed.

Cash Flow Models

- The cash flow projection model should comply with applicable Actuarial Standards of Practice regarding the development of cash flow models and the projection of cash flows
- Projection models should reflect
 - All significant product risks
 - All material benefits, charges, and expenses
 - Nonguaranteed elements, if any
 - Interaction of assumptions (e.g., dynamic liability behavior)
- The Projection period should be sufficiently long that no materially greater reserve amount would result from a longer projection period. Certain types of deposit fund contracts are evergreen in nature, so the guidance in VM-20 to project cash flows for a period that extends far enough into the future so that no obligations remain is not appropriate.
- The justification for any liability model point or model cell groupings, as well as any significant approximations used in the model, should be given in the PBR Actuarial Report or in the supplemental reports required under VM-31.
- The model should be validated using back-testing or another appropriate method.
- Asset models
 - Although some deposit fund contracts have specified investment portfolios and many companies employ segmented or segregated portfolios, the actuary may need to segment assets for modeling purposes if neither exists. If so, guidance from sources such as VM-20, VM-22, and VM-30 should be followed.
 - Asset models should reflect characteristics of any asset segments that back the product (either specifically or notionally), including optionality such as put or call options and prepayment.
 - Asset models should reflect the investment account basis of the particular deposit fund contract being modeled. For example, it may be appropriate for some types of contracts to base the analysis on the market value of assets, which is somewhat of a departure from the treatment of a typical GA annuity contract subject to VM-22. Thus, if the statement value of the assets is book value, then projected book values should be modeled (and potentially market value as well). Likewise if market value is the statement value, then projected market values should be modeled.
- If derivatives are used as part of the investment or risk management strategy, they should be reflected in the model. Requirements will be similar to VM-20 and VM-22, including the concept of a Clearly Defined Hedging Strategy

Assumptions

- Certain types of deposit fund contracts involve multiple parties, some contractual and some not, the behavior of which can affect cash flows. The rights of the various parties (e.g., plan participants) should be considered when setting assumptions and developing the model.
- Reserves based on stochastic simulations should use Prudent Estimate Assumptions for non-modeled risk factors.
- Investment assumptions relating to reinvestment and disinvestment should reflect:
 - Any contractual investment policy guidelines
 - Any company investment policy guidelines for the contract or segment
 - The company's A/L strategy for the segment
- Dynamic assumptions should be used where appropriate.

Aggregation

Decisions regarding the level of aggregation may be required in three different contexts: aggregation of GA and SA cash flows for a product within a model, aggregation of products and contracts within a model, and aggregation for the purpose of calculating the resulting reserve.

- Within the projection model, GA and SA cash flows may need to be aggregated in order to develop the correct GA reserve. For instance, this can arise for a deposit fund contract that provides a guarantee of SA performance through the GA. This would be highly similar to the modeling of a variable annuity with a guaranteed minimum benefit under AG43. Ultimately, the actuary will need to make certain decisions based on the nature of the liabilities and any future rules and regulations regarding blue/green book accounting and reporting.
- Aggregation with other deposit fund contracts would be at the actuary's discretion, depending on the facts and circumstances. Existing practice regarding aggregation in asset adequacy analysis and/or C-3 Phase I RBC could be considered, as well as how the company manages and measures the profitability of the products.
- Aggregation of deposit fund contracts with other GA liabilities (perhaps those subject to VM-22) would be at the actuary's discretion, depending on the facts and circumstances. Existing practice regarding aggregation in asset adequacy analysis and/or C-3 Phase I RBC could be considered, as well as how the company manages and measures the profitability of the products.

Reporting Guidance

We recognize that some guidance may be needed in terms of allocating any stochastically derived reserve amounts. We are unsure whether this will be covered elsewhere in the Valuation Manual, but provide some preliminary thoughts here.

- Allocation of the reserve between GA and SA
 - This may depend on whether the deposit fund contract is an insulated or non-insulated product.
 - For most deposit fund contracts involving both the GA and SA, we envisage following a practice similar to AG43/VM-21. For example, the fund balance would normally be held in the SA, with any reserve in excess of this amount held in the GA.
- Allocation of reserve amounts between different sections of the (GA) blue book (e.g., Exhibits 5 and 7)
 - The need for allocation within and among the various blue book exhibits will largely depend on the actuary's chosen approach to aggregation for modeling and reserve calculation purposes. This will be at the discretion of the actuary, with possible guidance found in VM-20 and VM-22.

Stochastic Scenarios and Economic Assumptions

- Looking across the universe of deposit fund contracts, some may only require Treasury interest rate scenarios, whereas some may require LIBOR/swap rates, and some may require equity scenarios as well.
 - Treasury rates would be based on Academy scenarios, or, if ultimately allowed under PBR, company-developed scenarios that meet calibration criteria.
 - Equity growth would also be based on Academy scenarios, or, if allowed, company-developed scenarios that meet calibration criteria.
 - The actuary may need to consider developing LIBOR rates consistent with existing scenarios (e.g., as a function of Treasury rates) or using company-developed scenarios.
- Assumptions regarding asset credit spreads and defaults should be based on Prudent Estimate Assumptions.

Reserves Based on Stochastic Simulations

- Due to the varying nature of deposit fund contracts, one cannot provide singular or absolute guidance in regard to the choice of starting assets for a stochastic model. For some deposit fund contracts (or groups of contracts), such as an immediate annuity certain, the actuary should select starting assets such that the aggregate value of the assets at the projection start date equals the estimated value of the reserve for the contract (or contracts). For other deposit fund contracts, such as a synthetic GIC, the actuary may need to project starting assets supporting both the estimated value of the reserve and starting assets associated with the off balance sheet funds.
- Similar to VM-20 and VM-22, reserves would be based on the GPVAD measure, Scenario Amounts, and CTE 70.

- The actuary may add an additional amount to CTE 70 to capture any material risk included in the scope of these requirements but not already reflected in the cash flow models using an appropriate and supportable method and supporting rationale.
- Reserves are determined on a pretax basis, so cash flows and discount rates would be pretax (consistent with VM-20, AG43/VM-21, and VM-22).
- Use of prior period data should be acceptable (e.g., September 30th), with adjustment to reporting date.

Documentation

- The actuary should develop a report (memorandum) documenting results, methodologies, processes, and assumptions.