GAAP accounting for long-duration contracts: ramifications for the modeling actuary

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In August 2018, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update[1] (ASU) No. 2018-12 titled *Targeted Improvements to the Accounting for Long-Duration Contracts* with the objective to improve and simplify the financial reporting of long-duration contracts under generally accepted accounting principles (GAAP).

This accounting change impacts virtually every functional area within an insurance company, and the actuarial modeling process is not spared. During the short implementation period, life insurance actuaries will need to integrate new data sources into significantly revised actuarial models, while also working with other insurance functions to implement changes in IT infrastructure and model governance.

In this article, we examine some important implications of long-duration targeted improvements (LDTI) for the modeling actuary.

In the first section, we focus on what we have found to be the most critical area of LDTI for actuaries: modeling implications of new GAAP standards for market risk benefit (MRB). Under LDTI, insurers must identify MRBs within their product set, implement fair valuation in actuarial systems and retroactively determine at-issue valuation inputs for transition. This requires complex and computationally intensive calculations drawing upon market-calibrated risk-neutral scenario generation.

In the second section, we examine the modeling implications of the other aspects of the accounting change, including liability for future policy benefit (LFPB), deferred acquisition cost (DAC), and other transition and disclosure requirements. We cover some key considerations such as specific data requirements, impact on assumption management and disclosures.

This article is not meant to be exhaustive; we aim to provide a general overview of key considerations and potential pitfalls for the modeling actuary.

Modeling implications of MRBs

ASU No. 2018-12 introduces a product classification called MRBs that aims to bring consistency to the accounting of features associated with deposit products that include market-based guarantees.

Any product or product feature classified as an MRB must be accounted for at fair value under the new guidance. Previously, such features were inconsistently accounted for under one of two different accounting models: the insurance accrual model (formally known as SOP 03-1)[2] or as an embedded derivative under the fair value model. This is illustrated for common variable annuity (VA) and fixed indexed annuity (FIA) MRBs in the table below.

Common market risk benefits

Feature	Current GAAP	Post-LDTI
VA GMDB/GMIB	SOP 03-1	Fair value
VA GMWB	Fair value*	Fair value
VA GMAB	Fair value	Fair value
FIA GMDB/GMWB	SOP 03-1	Fair value

* Practice varies, as some reserve portions of the contract are under SOP 03-1.

GMDB = Guaranteed minimum death benefit
GMIB = Guaranteed minimum income benefit
GMAB = Guaranteed minimum accumulation benefit
GMWB = Guaranteed minimum withdrawal benefit

It is important to note that the FASB does not explicitly define what features constitute an MRB, but rather requires insurers to review any product or product feature against the criteria to determine the proper classification.[3]

Transition

The FASB requires insurers to perform a full retrospective exercise to support the calculation of the opening balance for all MRBs as part of transition. The exercise involves calculating at-issue values of projected MRB benefits and associated fees using fair value concepts. Depending on the accounting model chosen, these amounts are needed to derive the associated attributed fee ratio that causes the MRB to have a fair value of zero at contract issue (under a non-option valuation model) or the host contract adjustment needed to offset the fair value of the MRB at contract issue (under an option-based approach). These requirements align with Accounting Standards Codification Topic 820[4] guidance that effectively requires contracts with embedded derivatives to show no accounting gain or loss at issue.

Insurers will have to gather at-issue policyholder data and market information along with assumptions that were effective across the period when the business was sold. FASB allows the use of hindsight, as defined in the ASU, should insurers not have access to all applicable historical assumptions:

> "An insurance entity may use hindsight in instances in which assumptions in a prior period are unobservable or otherwise unavailable and cannot be independently substantiated.[5]

Disclosures

MRBs have specific disclosure requirements. For instance, detailed attribution of period-to-period change in fair value is required, with breakdown by components such as:

- Policy transactions, including new issuance, interest accrual, attributed fees collected and benefit payments
- Effect of changes in interest rates, equity market and index volatility
- Policyholder behavior
- Assumptions
- Instrument-specific credit risk

How will models support the requisite fair value calculations?

Modeling actuaries should be aware of key considerations involved with fair value given the increased reliance on this valuation methodology under LDTI. The objective of this framework is to calculate a value that would, in theory, reflect market conditions as if the MRB were to be actively traded on financial markets. We outline specific elements that warrant attention beyond having the fundamental cash flow projection mechanics in place.

Fair value of insurance liabilities, such as those provided in the overview above, is typically derived from the average of discounted cash flows under a risk-neutral measure. This valuation model estimates MRB cash flows across a range of stochastically generated risk-neutral scenarios created by a risk-neutral generator.

Risk-neutral generators must be calibrated such that MRB valuation reflects market conditions. This is typically done using observable market information such as current yield curve and market value of actively traded instruments. Risk-neutral scenario sets produced by these generators must be tested with care, to confirm that market prices are reproduced and that arbitrage-free conditions are met (i.e., the "1=1 test").

Some MRB features are currently valued under the insurance accrual model, which uses real-world scenarios. Modeling actuaries should consider how these assumptions might now change under a risk-neutral framework.

Lastly, fair value often requires large scenario sets to reach a desired convergence threshold. This is particularly true for path-dependent MRB features such as ratchet death benefits. Modeling actuaries may explore variance reduction techniques to manage runtime and computing costs, but proper testing should be performed to confirm that the fair value has converged, with values stabilized and without the propensity for unexplained variances.

How will models address the demands of transition?

Insurers will need to perform a retrospective exercise to retroactively calculate the components of MRB cash flows using fair value concepts. While this exercise may appear to hinge on an insurer's ability to gather necessary data as of issue, the burden of the exercise may end up falling on the modeling actuary.

Actuarial modeling will first have to implement historical assumptions, which includes loading mortality rates, coding dynamic lapse formulas and implementing any other assumptions such as rider utilization. Actuaries may also find creative ways to streamline the MRB retrospective exercise by implementing automation within actuarial systems to reduce the need to produce at-issue source files.

Each aspect of the retrospective exercise needs to go through the proper testing and validation process. This is particularly important, as future reporting periods will reflect the fee ratios or host adjustment calculated as of issue under the retrospective exercise.

The modeling and testing effort would significantly increase should companies calculating fee ratios by cohort be required to reflect the actual new business at issue, including policies that have since lapsed.

Further, insurers will need to strike the right balance between fidelity and practicality for models, assumptions and data.

How will models handle the required MRB disclosures?

Actuarial models will have to be adapted to calculate the fair value for each attribution item required by the guidance, in addition to any other line items elected by the insurance company. Beyond the calculations themselves, accessing process orchestration or batching tools, along with access to the right granularity of data, will prove important.

Modeling actuaries should be cautious in managing the associated runtime. A single fair value calculation can be calculation-intensive, so performing such calculations multiple times for different scenarios may warrant additional distributed processing capabilities beyond current capacity.

What should be considered for FIA?

The implementation of fair value for MRBs on FIA requires working through some additional key methodology considerations. This is unlike variable annuities, where fair value has already been introduced for guaranteed minimum benefit features that are currently classified as embedded derivatives. Few FIAs have MRB features requiring fair valuation under the current accounting model. The crediting mechanism on such products is based not only on market performance but also on general account returns and cost of derivatives. This introduces complexity in fair value calculations not previously encountered.

Key methodology considerations affecting modeling of these guarantees mostly relate to the interaction of the MRB with the index crediting mechanism of the base contract, which is itself fair valued. These include the following questions:

- Should general account assets and interactions with liabilities be modeled under risk-neutral scenarios?
- Given the methodology used for general account assets, how should the index crediting reset mechanism be handled?
- Should a full-blown fair valuation framework be established, capturing stochastic interest, equity returns and equity volatility, or are simplifying assumptions justifiable?
- Are there any additional methodology considerations for MRB given the existing accounting for index credit embedded value for FIA?

These questions may have important implications for modelers implementing MRBs. For instance, fair value is typically performed on a policy basis, whereas general account assets are typically modeled in aggregate. Developing risk-neutral projections for a volatility surface is no small feat either.

Modeling actuaries may be called upon to test the financial impact of proposed methodologies, especially as the industry works through what risk-neutral valuation of such features really means. We caution modeling actuaries to monitor how these new features and methodologies affect core modeling in terms of model fidelity and runtime speed. It is advisable to keep track of any approximations or simplifications used.

How will models handle forecasting needs associated with MRBs?

Insurers that aspire to continue forecasting GAAP financial results will have to adapt their forecasting functionality accordingly. While certain core forecasting concepts such as inner and outer looping remain, calculating the fair value of MRBs has unique considerations relative to the insurance accrual model.

For instance, risk-neutral generators should always be calibrated to observable market prices, and this should remain true in a forecast setting. This is no small feat as it requires the risk-neutral generator to be embedded within the actuarial forecasting model and to be calibrated on the fly as the model transitions from forecasting to fair valuation.

Unfortunately, many actuarial systems may not be equipped to handle this level of sophistication, requiring insurers to rely on inaccurate projections for financial planning purposes.

Modeling implications of non-MRB components

Liability for future policyholder benefits

The mechanics of determining the LFPB have changed for long-duration contracts. These contracts include nonparticipating traditional life insurance and limited pay contracts.

We highlight important changes introduced for LFPB below:

Changes to liability for future policyholder benefits

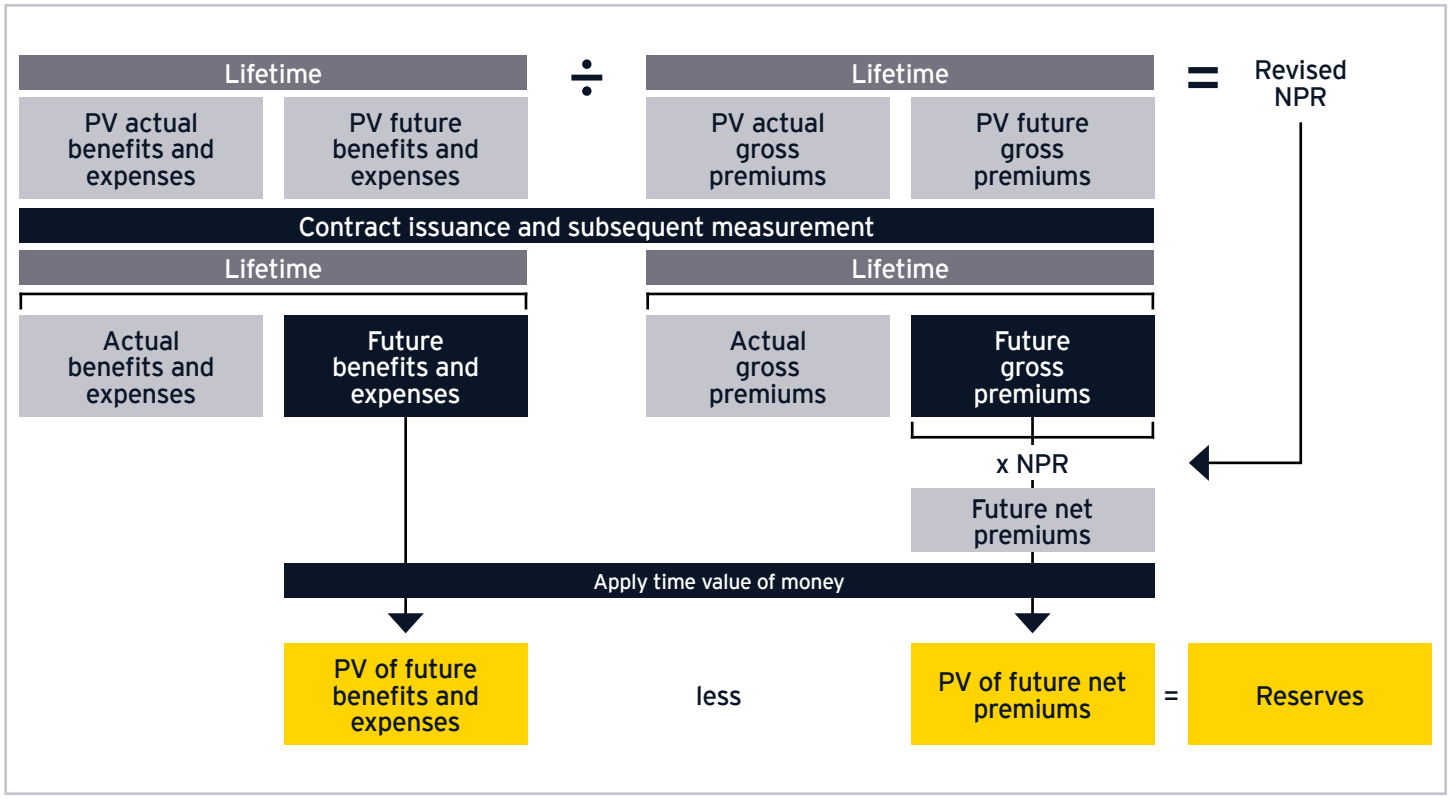
Key components	Current GAAP	LDTI
Assumptions	Locked in at issue	Reviewed annually
Margin for adverse deviation (MfAD)	Yes	No
Loss recognition testing	Yes	No
Net premium ratio (NPR) cap	None	100% cap
Discount rates	Expected investment yield at the contract issue, minus a pad	Upper-medium-grade fixed-income instrument yields

Previously, FAS 60[6] provisions covered setting and management of assumptions, and the specific reporting requirements were virtually nonexistent. Under LDTI, LPFB reflects actual historical experience, to be reviewed annually, instead of locked-in assumptions.

Although the new guidance keeps the fundamental net level premium approach, it requires insurers to review and update assumptions on an annual basis, or more frequently, if evidence suggests the need. The revised NPR is calculated using actual historical experience.

Current assumptions for future cash flows are illustrated below:

Contract issuance and annual review of assumptions



Deferred acquisition costs

Perhaps the biggest reprieve for modeling actuaries comes in the form of changes to DAC. LDTI eliminates complex amortization bases such as estimated gross profits or estimated gross margins under current GAAP with a simplified, straight-line basis over the life of the contract for DAC. LDTI also eliminates the need for impairment testing and shadow DAC.

Under the new guidance, DAC can be amortized by individual contracts under a straight-line basis or by grouped contracts under a constant-level basis that approximates the seriatim straight-line.

Transition

The FASB provides insurers two options in implementing the amendments for LFPB and DAC. The default option is the modified retrospective approach, but the insurer has the option to apply the amendment on a full retrospective basis if the insurer can provide the appropriate support.

Under the modified retrospective approach, the transition values are set equal to the existing carrying amounts.

Under the retrospective approach, insurers apply the new accounting standard going back to contract inception and then record to retained earnings the difference in values as a cumulative catch-up adjustment as of the transition date. This approach, if elected, must be used consistently to all products entity-wide and requires the availability of actual, historical data at the level of granularity necessary to perform the required calculations. Estimates of such data are not acceptable.

Disclosures

Insurers are required to provide enhanced disclosures designed to increase transparency for users of the financial statements. The additional requirements of LDTI impact both annual and interim financial statements. An insurer needs to evaluate its current process, systems and controls in preparation for these disclosures.

How will my models consider the new data requirements of LDTI?

Now that NPRs need to reflect actual historical experience for nonparticipating traditional life and limited pay contracts, insurers are required to update the front-end processes for their actuarial models, including sourcing and receiving of new data. This is not a new concept for insurers that already amortize DAC under a retrospective unlocking method and have a process in place to update estimated gross profits with actual experience for such business. Nevertheless, it may prove challenging to source the data, particularly for older vintages of FAS 60 business.

Under LDTI, insurers need to capture actual historical cash flows at the cohort level for nonparticipating traditional life and limited pay products. The actuarial models need to be updated with the revised NPR calculation, using actual historical experience and current assumptions for future cash flows.

Insurers should assess the current state of their data for availability, accuracy and level of granularity. Systems and data flow process need to be identified to feed the actuarial models. Insurers should perform a gap analysis on data, systems and processes under the new standard to understand the enhancements required.

How will assumption management practices change?

Prior to the new guidance, assumptions were "locked-in" unless a premium deficiency existed when calculating the LFPB. The new guidance requires assumptions to be best-estimate assumptions, which will encourage insurers to assess their current assumption-setting and management processes. Most insurers should be able to leverage aspects of current processes and models currently using best-estimate assumptions.

For LDTI, insurers need to increase the robustness of controls, warehousing and documentation of assumption data. The increased demand for experience analysis puts a greater focus on automating the process and increasing the integrity of the underlying data. Finally, with best-estimate assumption sets becoming more prominent, insurers will want to create synergies by unifying these assumption sets to promote a "single source of truth" for their assumption data.

This increased focus on the best-estimate assumptions used in actuarial models provides a great incentive for insurers to evaluate their assumption-setting and management processes. The evaluation should consider how the insurer will be positioned when LDTI becomes effective.

How will actuarial models support the new disclosure requirements?

Insurers will be required to make additional disaggregated disclosures, including rollforwards and quantitative and qualitative information, about significant inputs, judgments and assumptions used in the measurement of liabilities.

The new guidance not only requires that the actuarial models produce additional granularity in their reports, but also requires that additional projections be performed by the actuarial models to produce the rollforwards. Insurers will want to perform a gap analysis to identify the additional output data elements required for GAAP reporting and the associated level of granularity. Based on that gap analysis, modelers will be better able to evaluate the actuarial modeling process for reporting.

Insurers will want to develop an automated production process to produce the new disclosure requirements and provide sufficient analysis to meet business needs.

These additional requirements being placed on the actuarial modeling process will put pressure on the financial close process. Insurers should evaluate their current process and assess where enhancements will be required to fulfill the new requirements.

Putting it all together

The US GAAP targeted improvements bring interesting challenges, with considerations to actuarial modeling going far beyond simply updating the calculation methodology.

In addition to the implementation considerations, modeling actuaries should take an active role in helping to plan their company's transition by developing a near-term action plan to orchestrate elements of this transition. Modeling actuaries should also keep refining financial impact assessments as models are adapted for the new framework while effectively communicating results to management.

Moving into the post-implementation phase, there will be heightened focus on the actuarial modeling process, increasing pressure on an insurer's ability to effectively manage the modeling environment. This includes data quality and management, assumption and model governance, and general modeling oversight.

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Endpoints

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