

Earnings Emergence

Insurance Accounting Under Multiple Financial Reporting Bases





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Section 1: Background and Scope

1.1 Background and Objectives

In 2014, the Financial Reporting and Reinsurance sections of the Society of Actuaries (SOA) and the Committee for Life Insurance Research (CLIR) commissioned Ernst & Young LLP (EY US) to conduct research into the differences in measurement and presentation under various accounting and measurement bases. Interest in the topic had been building in the industry due to the disparity of approaches under various measurement bases and pending changes to all three major measurement bases applied in the U.S.: the U.S. Generally Accepted Accounting Principles (GAAP), U.S. statutory requirements and the International Financial Reporting Standards (IFRS). The results of this research were published in April 2015 in a report titled *Earnings Emergence: Insurance Accounting Under Multiple Financial Reporting Bases*¹. Since that time, interest in earnings emergence under various reporting frameworks has continued to grow as requirements under the various bases have become clearer. U.S. statutory requirements for life insurance under principle-based reserves (PBR) have become effective for life insurance products, IFRS 17 for life insurance has been adopted with an effective date of January 1, 2021, and targeted improvements to U.S. GAAP for long-duration insurance contracts are nearing adoption by the Financial Accounting Standards Board (FASB). These developments, along with an interest in assessing the differences in measurement for other products, led the Financial Reporting Section to commission further research on the topic. The results of this research are contained in this report.

Specifically, the current study considers two products, term life insurance and universal life insurance with secondary guarantees, under the following measurement bases:

- U.S. statutory requirements (Stat) adopted by the National Association of Insurance Commissioners (NAIC) for products issued before January 1, 2017 (for both the 2001 Commissioners Standard Ordinary (CSO) and 2017 CSO mortality tables)
- U.S. statutory requirements of PBR (Stat PBR) as codified under NAIC *Valuation Manual* minimum standard for life products, VM-20
- Current U.S. Generally Accepted Accounting Principles (U.S. GAAP)
- U.S. GAAP with targeted improvements proposed by the FASB on September 29, 2016
- International Financial Reporting Standards (IFRS), which take effect January 1, 2021, as presented in IFRS 17, Insurance Contracts

In addition, this study shows a Solvency II market-consistent balance sheet² for universal life insurance with secondary guarantees, as it was not a part of the April 2015 paper. For term life insurance, the detailed results and analysis for

¹ *Insurance Accounting Under Multiple Financial Reporting Bases*, Society of Actuaries, 2015

² This report presents a market-consistent balance sheet as one of the measurement bases being compared. Such a balance sheet is closely aligned with Solvency Capital Requirements under Solvency II. Consequently, we refer to the market-consistent balance sheet results as “Solvency II” throughout this report. This is not intended to imply precise consistency with Solvency II requirements within the analysis for this item, but is used for simplicity and ease of discussion.

the market-consistent balance sheet remain unchanged and can be found in the April 2015 paper. The objective of this report is to help insurance companies and users of financial statements to become better educated on the interpretation of results reported under various accounting regimes and to understand better the implications of some of the recent and proposed changes to financial reporting frameworks. It is not intended to endorse any particular interpretation of any requirements of any particular financial reporting basis, so readers should not infer any authoritative guidance. Different readers may arrive at different interpretations of financial reporting guidance and therefore may arrive at results different from those presented in this report.

1.2 Observations

The April 2015 report provided some initial observations as context to the reader. The current report repeats and modifies those observations to provide context again.

The different measurement bases are all essentially working toward the same goal—a measurement of the values of insurance contracts and a meaningful presentation of how those values change over time. However, this study observes that the bases themselves arose from different philosophical foundations and, consequently, exhibit differences in certain key areas, summarized in Table 1.

Table 1

DIFFERENCES IN MEASUREMENT BASES: DESCRIPTIONS AND IMPLICATIONS

Differences	Implications
<ul style="list-style-type: none"> U.S. statutory requirements are used for solvency purposes and are focused on the balance sheet. 	<ul style="list-style-type: none"> The U.S. statutory balance sheet is explicitly conservative, and earnings recognition may be heavily deferred.
<ul style="list-style-type: none"> U.S. GAAP is primarily focused on the income statement, whereas IFRS is largely defined in the context of the balance sheet. This results in different patterns of earnings emergence. 	<ul style="list-style-type: none"> U.S. GAAP earnings tend to emerge in proportion to revenue, whereas IFRS earnings align with the release from risk and the measurement of insurance in force.
<ul style="list-style-type: none"> Recently developed measurement bases (IFRS, PBR, U.S. GAAP with targeted improvements) tend to reflect changes in future expectations immediately in the liabilities. 	<ul style="list-style-type: none"> Liability values may exhibit greater volatility as assumptions change, though this does not always translate into volatility on the income statement.
<ul style="list-style-type: none"> U.S. GAAP and IFRS are promoting an enhanced ability to align asset and liability valuation, resulting in a greater, though incomplete, ability to eliminate income statement volatility arising from mismatches in asset and liability accounting. 	<ul style="list-style-type: none"> Care should be taken in electing accounting policies, where available, that result in alignment of asset and liability movements that are relegated to other comprehensive income.
<ul style="list-style-type: none"> The market-consistent balance sheet is used only as a balance sheet (although this study refers to changes in the balance sheet as “income emergence” for comparative purposes). 	<ul style="list-style-type: none"> Though Solvency II is entirely balance sheet focused, the careful observer will want to be able to make sense of the changes in the market value balance sheet over the reporting period.

The different measurement bases have a variety of mechanisms in place to achieve their philosophical goals, which inevitably create differences in income emergence.

This variation in design causes the differentiating features of the measurement bases to manifest themselves quite differently across various products. The U.S. statutory bases show the most extreme results, with large losses at issue due to conservative approaches designed to protect solvency. The other accounting bases (IFRS and U.S. GAAP) break even at issue from mechanisms designed to prevent gains from occurring at that time, or establish a loss component for onerous contracts under IFRS and under the proposed changes to U.S. GAAP. The market-consistent balance sheet shows “profits” at issue, as it is unconstrained by any need for conservatism in a market value world.

Market-consistent valuation also exhibits the most volatility in income, as it provides no mechanism for mitigating movements in value from the change in future assumptions. By contrast, current U.S. GAAP and pre-PBR statutory accounting show perhaps the least volatile income, due to their rules-based methods for valuation and their tying of earnings emergence to premium income, at least for term insurance. PBR and IFRS show greater volatility in earnings emergence because of the need to reassess assumptions at each reporting date and to revalue the contract liabilities accordingly, though both contain elements that mitigate large movements (the contractual service margin under IFRS and the formula-based net premium reserve under PBR).

It is dangerous, however, to provide simple explanations and expectations for differences across reporting bases, as the characteristics are becoming blurred. Current GAAP, IFRS and PBR all contain elements that reflect changing assumptions that tend to accelerate liability and income movements, yet all contain mitigating elements as well. So while it may have been easy to apply broad generalizations to, for example, a “GAAP vs. stat” discussion in the past, the same expectations may no longer be true. The interactions of accounting basis and product design and current environment can combine in ways that may no longer be intuitively based foundational concepts alone.

This is merely a high-level summary of the observations made; the full report shows the projected income emergence on each basis for baseline runs and for a variety of sensitivity tests. Differences in earnings emergence can be subtle, and a thorough analysis of the modeled projections is needed to appreciate their sources. Even at that, this study can only hope to present in broad terms and for an admittedly small selection of products the differences in reporting that the various measurement bases may generate. Additional research into additional product types and wider scenario testing are necessary to help preparers and users alike better understand the messages being conveyed by the results under different financial-reporting bases.

1.3 Approach

The study provides an analysis of income emergence under a variety of financial measurement bases for two products: term life insurance and universal life insurance with secondary guarantees. The products were constructed to balance simplicity of design with a desire to have characteristics that would trigger the salient differences between the measurement bases. Consequently, some of the product features and elements of pricing may not be precisely reflective of products commonly seen in today’s market.

The study is constructed using spreadsheet-based models that project cash flows and deterministic outcomes. Many of the assumptions are simplified to better illustrate the financial reporting outcomes.

There are certain simplifications and limitations in the scope of the modeling. These are as follows:

- For the term product, the level of assets supporting the business equals U.S. pre-PBR statutory reserve with CSO 2001 mortality table plus 300% of the company action level risk-based capital (RBC) requirement. This implies that any income that would result in assets exceeding that amount is distributed to shareholders each year. This is similar to the modeling done for an appraisal or embedded value of the product. Also, the choice of U.S. standards to drive the asset portfolio implies that the entity is U.S. based, although this report illustrates accounting on various non-U.S. financial reporting bases.

- For the universal life product with a secondary guarantee (ULSG), the level of assets similarly follows statutory reserves plus 300% of company action level RBC. For the analysis of statutory reporting bases, the asset level follows the statutory reporting basis under consideration. For the GAAP, IFRS and Solvency II analyses, the asset level follows statutory reserves on a PBR basis.
- Individual asset cash flows are not explicitly modeled. Instead, we used a portfolio approach under which baseline investment income is projected based on best-estimate portfolio earned rates, using the assets held at each future point in time. RBC requirements are estimated at the product level, which would not normally be the case in a multiline company.
- Taxes are not modeled. All presentations are pretax.
- The analysis does not include any testing of the sufficiency of reserves, such as cash flow testing or loss recognition testing, under the various reporting bases.
- The report primarily focuses on earnings emergence, though balance sheet presentation is included for some bases to show the impact to accumulated other comprehensive income (AOCI). The appendix includes additional detail, including income statements and balance sheets under all bases. For clarity of comparison, the appendix shows the income statements under all bases for both products using a traditional presentation with premiums recorded in revenue as they are received.
- Risk adjustments or margins for IFRS and Solvency II liabilities, respectively, are calculated using a cost of capital method based on certain simplifying assumptions. The methodology was based on the technique applied in the SOA study titled *IASB Insurance Contracts Earnings Emergence Report*³, described in Appendix B of that report.

³ *IASB Insurance Contracts Earnings Emergence Report*, Society of Actuaries, 2014

Section 2: Term Life Insurance

2.1 Product Information

2.1.1 Features

The product illustrated is a 10-year level term life insurance policy. It features a level premium for the first 10 years of the policy (the level term period) and increasing annually renewable premiums thereafter (the post-level term period). The policy pays benefits upon death only and does not have a cash value option. The policy is renewable up to an attained age of 80 years. For this exercise, a portfolio of 100 identical policies with a face amount of \$150,000 each is illustrated. The policies are assumed to be issued to 40-year-old male nonsmokers. The product has policy fees and pays commissions during the level term period.

2.1.2 Pricing Targets

The term product is priced based on U.S. statutory income (pre-PBR, using the 2001 CSO mortality table). The premium pattern has three key components: (1) the level term premium, (2) the jump in premium after the level premium period and (3) the premium scale relative to expected mortality in the post-level term period. The next section provides additional details on the development of the assumptions.

The product generates an internal rate of return (IRR) of 12.1% on a consolidated U.S. statutory income basis (pre-PBR) under the baseline scenario.

2.1.3 Assumptions

For the baseline scenario, experience emerges as expected under the best-estimate assumptions used to price the product. Valuation assumptions under U.S. GAAP proposed targeted improvements are best estimate as well, while PBR assumptions include both prescribed assumptions and assumptions with margins. Following is a summary of the key best-estimate assumptions.

Demographic

The mortality and lapse assumptions were developed to be consistent with current industry experience studies. The best-estimate mortality assumption uses the 2014 valuation basic table (VBT) as a base table and a mortality improvement factor for the first 20 years of the projection. The assumption also incorporates mortality deterioration after the high lapses at the end of the level term period, to reflect anti-selection by policyholders. The mortality deterioration represents a 225% increase in year 11 above the base table with improvements for mortality, with the increase grading linearly to 0% over 10 years as the effect of anti-selection diminishes.

The best-estimate lapse assumption is 15% in the first year, and it grades down to 7% per year for the year prior to the end of the level term period. A shock lapse of 85% is modeled at the end of the level term period, with an ultimate long-term lapse rate of 10% per year thereafter. The high lapse rate after the level term period is consistent with a 2014 industry study⁴ for products with similar increases in premium upon renewal.

Expenses

The expenses include ongoing policy maintenance expenses, commissions and other acquisition costs. For simplicity, no other expense types are included. The best-estimate maintenance expense assumption consists of two

⁴ Report on the Lapse and Mortality Experience of Post-Level Premium Period Term Plans, Society of Actuaries, 2014

components: a per-policy expense and a per \$1,000 face amount expense. We assume inflation of 2% per year for maintenance expenses.

Asset Portfolio

Aside from U.S. statutory, accounting bases typically generate either very low positive or negative reserves for term insurance. This means there may be little or no “real” assets backing reserves, and any existing traditional assets are almost entirely backing surplus. Different companies use different strategies for assets backing surplus. For the purposes of this study and to simplify the analysis, we assumed that the asset portfolio has a target duration of five years.

Asset Yield

For the purpose of calculating investment income, the asset yield equals the risk-free rate (RFR) plus a credit spread minus a provision for expected defaults. For simplicity, the model uses a flat yield curve and level spread factors, such that the best-estimate asset yield is level over the product’s lifetime. For valuation purposes where discount rates depend on expected asset yields, the development of those assumptions is described in the corresponding methodology sections that follow.

2.2 Accounting Methodology

In the April 2015 paper on earnings emergence, we analyzed earnings emergence for term life insurance, describing results across five different financial reporting bases:

1. U.S. statutory requirements adopted by the NAIC under the Commissioners Reserve Valuation Method (CRVM)
2. Current U.S. Generally Accepted Accounting Principles (U.S. GAAP)
3. The Canadian Asset Liability Method (CALM)
4. Proposed International Financial Reporting Standards (IFRS) as contemplated under the exposure draft for insurance contract accounting released by the International Accounting Standards Board (IASB) in June 2013
5. Market-consistent balance sheet (Solvency II)

A lot has changed in the last three years. The NAIC has adopted the 2017 CSO mortality table as the statutory minimum table for life insurance, and VM-20 has been adopted as the governing U.S. statutory reserve basis for life insurance under PBR. The IASB has adopted IFRS 17 as the standard for valuing insurance contract liabilities under IFRS. In addition, we now have much more clarity around U.S. GAAP proposed targeted improvements, though at the time of the writing of this paper, the FASB had yet to issue final guidance and updates to codified U.S. GAAP.

In this report, we update the analysis from the April 2015 paper by considering the following financial reporting bases:

- U.S. statutory requirements adopted by the NAIC (CRVM pre-PBR), modified using 2017 CSO table
- U.S. statutory, principle-based reserves, using the 2017 CSO table
- U.S. GAAP, including proposed targeted improvements for long-duration contracts

The reader is encouraged to refer to the April 2015 paper for details on the prior analysis across the five previously considered reporting bases. While we do not repeat the results for all five bases in this report, we make reference to the results for CRVM pre-PBR, current U.S. GAAP and IFRS from the prior report to provide context and additional points of comparison with the bases detailed in this report. The CRVM analysis is updated in this report to include the impact of moving to the 2017 CSO, but we retain the prior report’s analysis under the 2001 CSO for comparison. The analysis related to IFRS was modified slightly (described further below in section 2.2.5) and repeated in this report.

The following sections describe the financial reporting bases covered in this study in relation to the modeling of the term life insurance product.

2.2.1 US Statutory

The valuation of U.S. statutory reserves uses CRVM, including the provisions in the *Valuation of Life Insurance Policies Model Regulation*, commonly known as Regulation XXX. The valuation assumptions for interest follow prescribed assumptions and are consistent with a policy issued in 2017, prior to the adoption of PBR. Mortality similarly follows prescribed assumptions, but the analysis from the April 2015 paper, which used the 2001 CSO, has been updated to include the 2017 CSO as well. The deficiency reserves under CRVM permit the use of X factors to reduce the prescribed valuation mortality to levels more reflective of a company's mortality experience. The X factors are formulated such that the final mortality rates used in the valuation of the deficiency reserves equal 200% of the best-estimate mortality assumption. The conservative X factors ensure that a deficiency reserve emerges to better illustrate the potential impact of deficiency reserves. The assumption still provides a significant reduction to the prescribed 2001 CSO mortality table.

2.2.2 US Statutory, Principle-Based Reserves

The valuation of U.S. statutory reserves under PBR is defined in the NAIC *Valuation Manual* minimum standard for life products, VM-20. The PBR reserve is the maximum of the net premium reserve (NPR), deterministic reserve (DR) and stochastic reserve (SR). The NPR is a formulaic reserve calculated using prescribed assumptions. The DR is a gross premium reserve using pretax cash flows from a single economic scenario using prudent estimate assumptions. The cash flows are discounted at a rate that is based on a modeled earned rate. Assumptions used for the DR are a mix of prescribed and best-estimate assumptions plus a margin. For the purposes of this study, the SR calculation was not performed, and we presumed that the term product passes the Stochastic Exclusion Test (SET) in Section 6 of VM-20. This is a commonly observed outcome of the SET when applied to this type of business.

Where applicable, the assumptions we used in the calculation of the DR are the best-estimate assumptions used to price the product plus a margin. For mortality, the analysis assumes 100% credibility. Mortality begins to grade to the industry table after 10 years and assumes a 25-year grading period. Mortality margins are set based on prescribed VM-20 margins, and zero mortality improvement is assumed. A 10% margin is assumed for lapses and expenses.

2.2.3 Current US GAAP

The U.S. GAAP benefit reserves use a net-level premium reserve valuation method consistent with the requirements in ASC 944-40 (previously FAS 60) for traditional long-duration contracts. The valuation assumptions are equal to the best-estimate assumptions plus the following provisions for adverse deviation (PADs):

- **Mortality:** Base mortality rates are multiplied by 110% for all durations.
- **Lapse:** Base lapses are multiplied by 90% for all durations except duration 10 and 11.
- **Expense:** Maintenance expenses are multiplied by 115% for all durations.
- **Discount rate:** The discount rate is reduced by 10 basis points to account for unexpected defaults.

The assumptions are locked in at issue and used throughout the projections.

Commissions and other deferrable acquisition costs (DAC) are capitalized, and the resulting DAC asset is amortized in proportion to premiums consistent with requirements in ASC 944-30 for traditional long-duration contracts.

2.2.4 US GAAP: Proposed Targeted Improvements

Reserves calculated pursuant to U.S. GAAP under the proposed targeted improvements follow the same net level premium formula as the current U.S. GAAP. However, we have made several significant changes with respect to the assumptions used in calculating the reserves and how they change over time:

- Assumptions are best estimate with no provisions for adverse deviation (PADs). Current U.S. GAAP assumptions include modest PADs.
- Expected future cash flows are discounted on the basis of upper-medium-grade fixed-income instrument yields, rather than management's best estimate of portfolio asset yields with a small PAD. This results in a lower discount than is modeled under current U.S. GAAP.
- Assumptions are not locked in at inception of the policies. Rather, each year, assumptions are updated to current best estimates.
- The net-to-gross ratio applied to premiums for the reserve calculation is adjusted each reporting period to reflect experience variances and assumption changes. This adjustment is retrospective to the beginning of the policy, such that the policy with the revised projection and revised net-to-gross ratio would have resulted in a zero reserve at inception. The net-to-gross ratio is not permitted to exceed 100%; in other words, a loss will be recognized if the updated projection results in claims and expenses that exceed the present value of premiums. The net-to-gross premium ratio is not updated for changes in the discount rate.
- Commissions and other deferrable acquisition costs are capitalized, and the resulting asset DAC is amortized in proportion to the undiscounted amount of insurance in force over the expected lifetime of the contracts. For the purposes of this study, DAC is amortized based on annual exposures of face amount in force. This is a proxy for amortizing DAC on a constant level basis over the expected term of the contracts. This is a valid approximation method, given the characteristics of the business being modeled, though it might not work for other types of business. For example, assume 75 of face amount is expected to be in force for 10 years and then lapse:
 - The total exposure is 75×10 years = 750 face-amount-years.
 - Each year, 75 face-amount-years are "incurred," for a decrement of $75/750 = 10\%$ of DAC.
 - Under this example, with no decrements during the projection, the DAC decreases linearly over 10 years.

At the time of the writing of this report, the exact interpretation of the latest guidance is still being actively debated. This relates to DAC amortization, the treatment of maintenance expenses in reserves, and other items. The final guidance and/or interpretation of the guidance may well result in different earnings patterns than exhibited in this report.

2.2.5 IFRS 17

There are three components to the liabilities under IFRS 17 Insurance Contracts, the new IFRS accounting standard for insurance contracts effective January 1, 2021. For the purposes of this study, the calculation of each component is as follows:

The **fulfilment cash flows (PVCF)** are calculated as a present value of all gross liability cash flows, using best-estimate assumptions. The interest rate for discounting cash flows is developed using a top-down approach, where the rate is equal to $Y - SD - SR$, where:

Y = projected gross investment yield;

SD = spread for defaults; and

SR = spread for the risk surrounding the expected default losses.

For the purpose of this exercise, the fulfilment cash flows are calculated under a single deterministic scenario. This simplifying assumption is adopted to make the calculations more manageable and in recognition of the fact that the probability-weighted best estimate over the range of possible outcomes, as required by IFRS 17, is likely to yield a value close to that generated by the single scenario.

The **risk adjustment for nonfinancial risk** is calculated based on a cost-of-capital method. Under this approach, the risk adjustment is estimated based on the cost of holding a sufficient amount of capital in order to fulfill the insurance contract obligations at a 99.5% confidence level.

The **contractual service margin (CSM)** is set to ensure no gain at issue (i.e., the sum of the fulfilment cash flows and the risk adjustment, if less than zero). The CSM is amortized based on annual exposures of face amount in force. The method for CSM amortization has been revised since the April 2015 paper, based on the final published standard. The previous model assumed that CSM was released in direct proportion to the number of lives remaining.

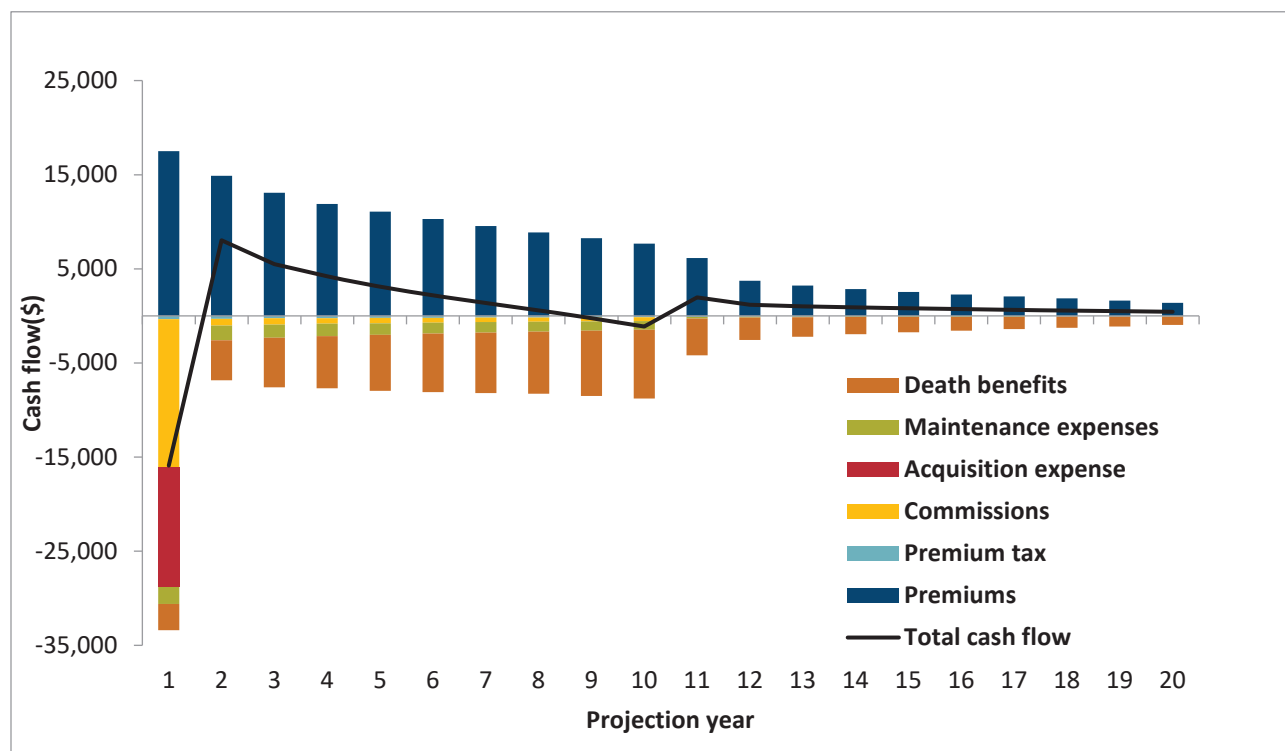
2.3 Baseline Results

Figures 1 through 6 provide graphical illustrations of the baseline results. The full income statements and balance sheets are provided in the appendix.

2.3.1 Cash Flow Projections

The cash flow projections (see Figure 1) are based on the product information described in Section 2.1 and are used consistently across all measurement bases.

Figure 1
TERM LIFE PRODUCT CASH FLOW PROJECTION



2.3.2 Liability Projections

Figure 2 illustrates the net liability projections under the various measurement bases. The following naming conventions are used to identify results for the different reporting bases:

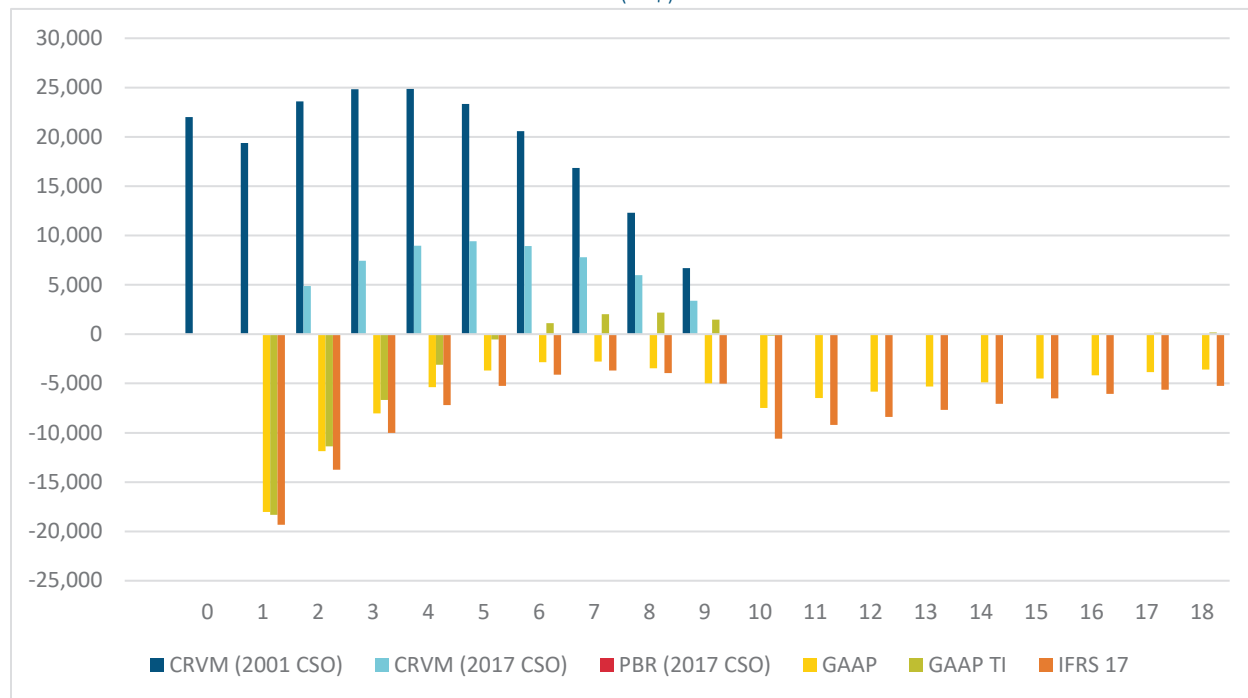
CRVM (2001 CSO): non-PBR statutory using the 2001 CSO table

CRVM (2017 CSO): non-PBR statutory using the 2017 CSO table

PBR (2017 CSO): statutory reserve per VM-20 using the 2017 CSO table
GAAP: net GAAP liability (reserves minus DAC) for current U.S. GAAP
GAAP TI: net GAAP liability for U.S. GAAP with proposed targeted improvements
IFRS 17: IFRS 17 liability

Figure 2

TERM LIFE PROJECTION: COMPARISON OF NET LIABILITY (in \$) BY PROJECTION YEAR



These results in Figure 2 are shown after application of the floor to statutory reserve bases. Under typical conditions where policies are sold on average halfway through the calendar year, this floor would be 1/2 the mortality cost (cx). In this instance, because all policies are assumed to be sold at the beginning of the calendar year, by December 31 of each fiscal year the unearned premium reaches zero rather than 1/2 cx.

Statutory results drop significantly through use of the 2017 CSO table and then again with the shift to PBR. The PBR reserves shown here are the greater of the NPR and the DR floored at zero; they are not visible on the graph in Figure 2 because NPR and DR remained negative throughout projection. Thus, the final PBR reserves are entirely zero. The unfloored components for PBR are shown in Figure 3. The results shown in Figure 2 represent the net GAAP liability, defined as the reserve minus DAC. Under GAAP-targeted improvements, the most visible difference is that the net liability increases during the latter half of the term period. These differences are examined further below in Figure 3.

Figure 3 provides a breakdown of the components of the PBR reserve. Both the NPR and the DR calculations result in reserves that are negative throughout the projection. Consequently, the recorded reserve is floored at zero. Some significant drivers affect the differences between these two calculations:

- The NPR has a prescribed expense allowance of \$2.50 per \$1,000 of face amount. This decreases the reserve by \$37,500 at time 0, with varying impacts during the level term period.
- This effect is partially offset by prescribed adjustments to premiums during the first five years of the projection.
- The DR reserve is higher because of inclusion of expenses and premium tax.
- In this example, the mortality with prescribed margins resulted in higher mortality than the 2017 CSO table, resulting in a slight increase to the DR relative to the NPR.

Figure 3
TERM LIFE PROJECTION: COMPARISON OF PBR RESERVE COMPONENTS (in \$) BY PROJECTION YEAR

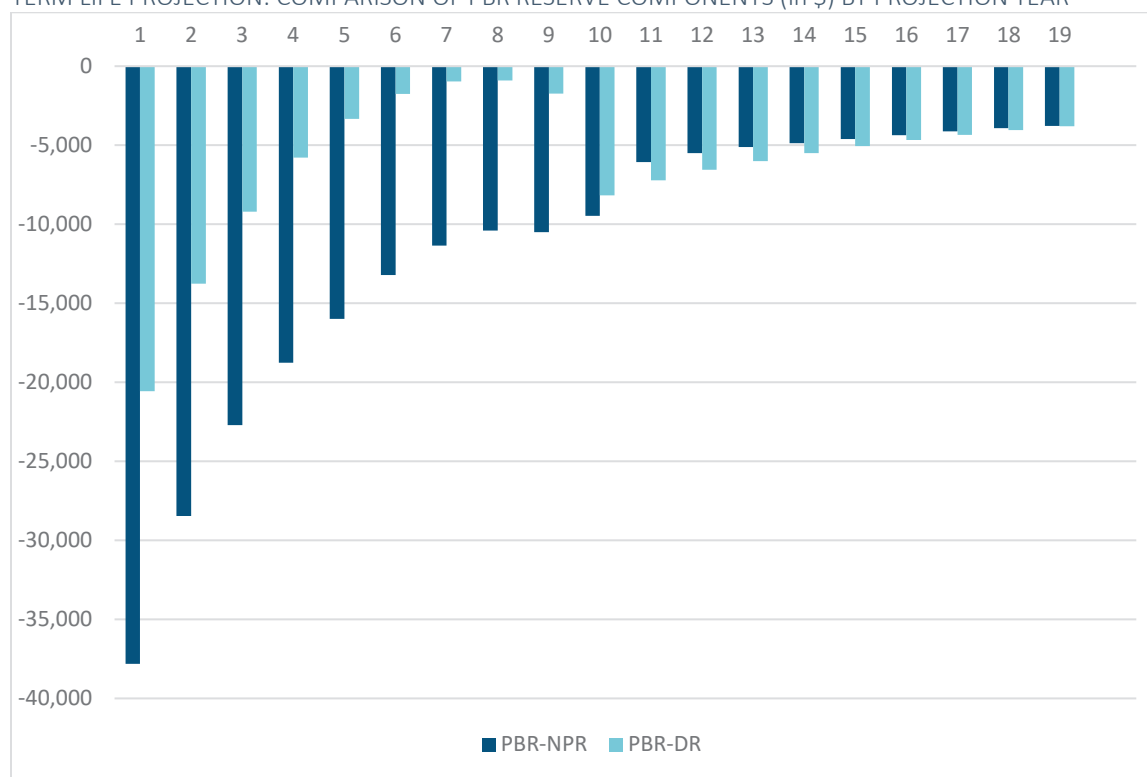
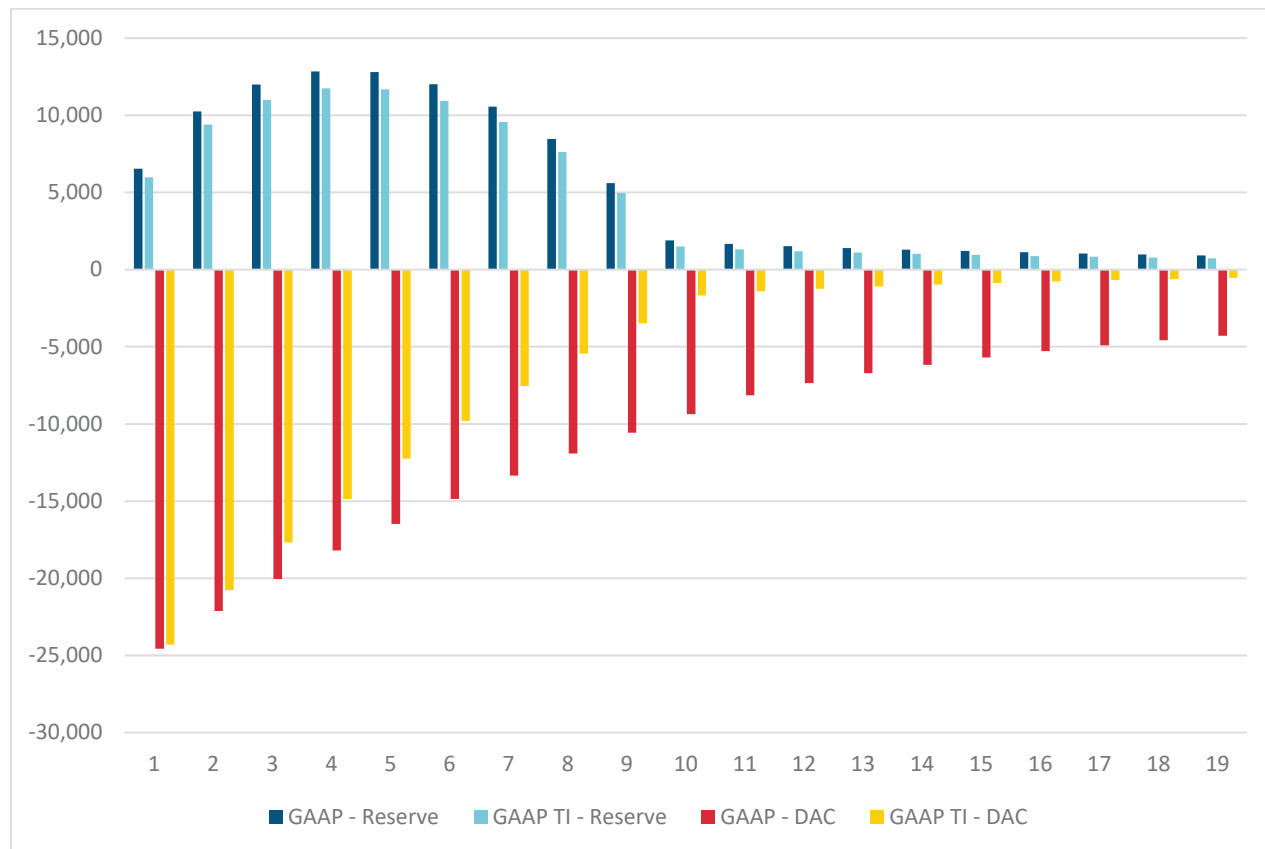


Figure 3 shows that the PBR reserve, which is the greater of the NPR and the DR floored at zero, is significantly lower than the CRVM reserve. While there are many differences between the PBR and CRVM calculations, there are two significant differences. First is the new approach to calculating an expense allowance, which tends to be relatively large on shorter-term policies. The second is allowing a reduction to the PBR reserve during the level term period for anticipating profit in the post-level term period.

Figure 4 provides a breakdown of the components of the U.S. GAAP net liability (reserves minus DAC), before and after proposed targeted improvements. The reserve begins at zero under both current GAAP and proposed targeted improvements. It is a net level premium calculation that rises and falls during the level term period and is floored at zero in both the level term and post-level term periods. This contrasts with DR under PBR (shown in Figure 3), which

is a significantly lower reserve where the zero floor was never reached, primarily because the DR allows for the full premium to be projected.

Figure 4
 TERM LIFE PROJECTION: COMPARISON OF US GAAP RESERVE COMPONENTS (in \$) BY PROJECTION YEAR



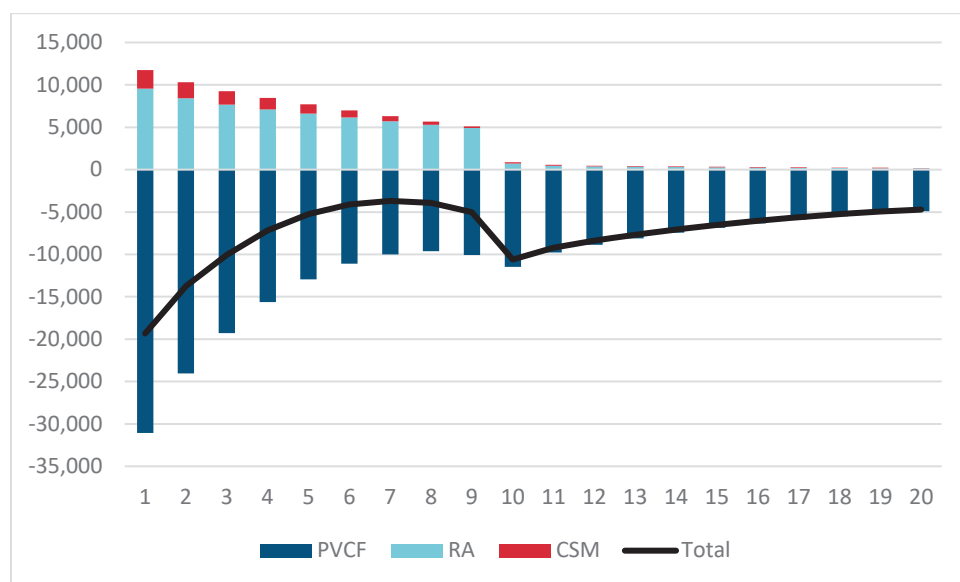
The reserve under proposed targeted improvements is lower than the reserve using current U.S. GAAP methodology. This is a result of the lack of PADs, partially offset by the increase resulting from lower discount rates.

The projected DAC balance under proposed targeted improvements (amortized straight-line over the expected term of the policies) is amortized more quickly than the current U.S. GAAP methodology (amortized in proportion to premiums). This is because the approach taken under current U.S. GAAP methodology was to anticipate significantly higher premiums in the post-level term period, with less than 100% lapse. We have observed that some companies currently assume a 100% shock lapse and amortize the DAC fully during the level term period. Under the approach taken for this case study, the high premiums in the post-level term period result in a significant amount of DAC

persisting into the post-level term period and being amortized during that time, whereas under proposed targeted improvements, there are very few residual exposures beyond the level term period.

Figure 5 provides a breakdown of the components of the IFRS 17 liability. This product is priced to be profitable. Therefore, a positive CSM is required to force the contracts to break even at issue. The CSM is a modest component of this product and amortizes primarily during the level term period, when there is the most insurance in force. The risk adjustment (RA) is approximated as being proportional to the death benefit in force. Consequently, it declines dramatically at the end of the level term period, when much of the in-force business lapses. The fulfilment cash flows are highly negative at the contract inception and gradually increase as the gap between premiums charged and expected deaths narrows as the contract ages. They become more negative again toward the end of the level term period, when the years with low margins between premiums and expected deaths begin to pass and the present value of cash flows past the end of the level term period become dominant.

Figure 5
TERM LIFE IFRS 17 LIABILITY PROJECTIONS (in \$) BY PROJECTION YEAR

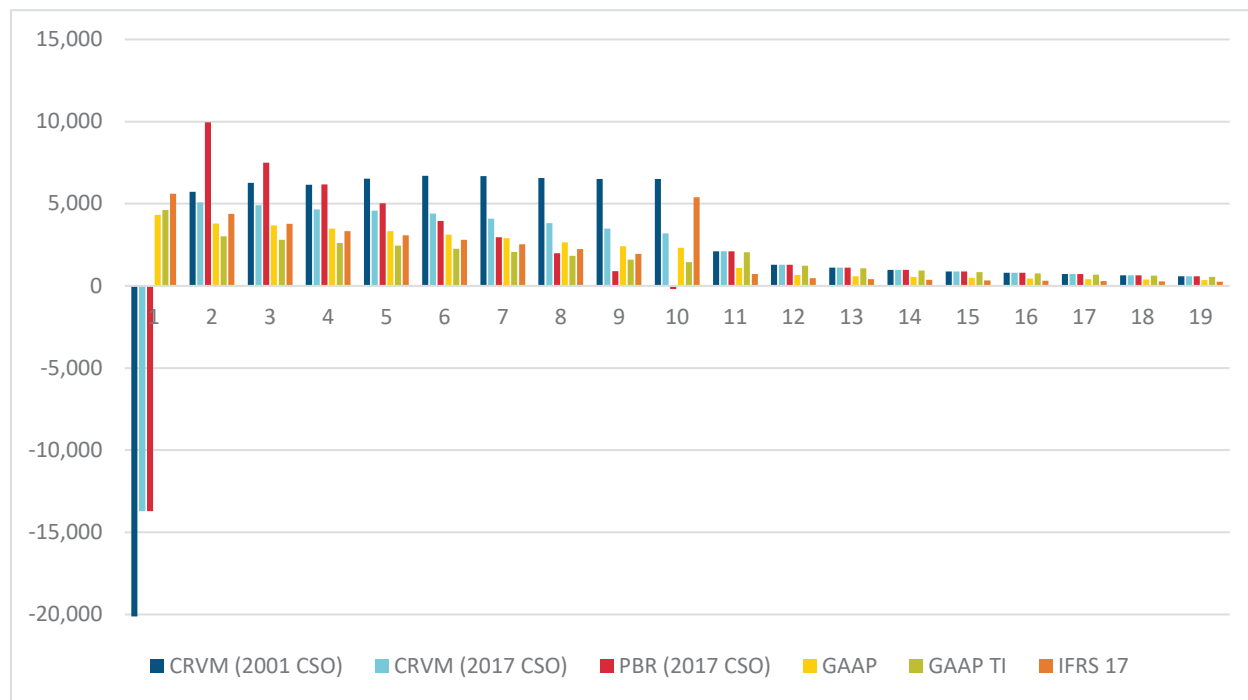


2.3.3 Earnings Emergence

The earnings emergence in *Figure 6* compares pretax income across bases. Readers should take this result with caution, as the relationship between bases could change depending on product features and assumptions.

Figure 6

TERM LIFE PRETAX INCOME (in \$) BY PROJECTION YEAR : ALL BASES

*US Statutory: CRVM (2001 CSO), CRVM (2017 CSO), PBR*

U.S. statutory reporting is a measurement basis that targets solvency with an objective of producing a conservative balance sheet. It has little focus on earnings and therefore less concern with matching revenues and expenses and no explicit effort to eliminate gains or losses at contract inception. Any deferral of acquisition costs occurs through means implicit to the reserving, so deferral may be minimal. Conservatism in the measurement basis for this product is reflected in the use of prescribed valuation assumptions for CRVM and the NPR with VM-20, and margins on assumptions for the DR in VM-20.

Statutory income for non-PBR reserves exhibit the familiar pattern of up-front losses followed by gains in future years as the margin in the reserve is released. The difference in income between the 2001 CSO and the 2017 CSO under pre-PBR statutory methods is driven by differences in the level of mortality between the two mortality tables.

Under PBR, the pretax income is driven by cash inflows directly with no reserve release, since the reserve was held constant at zero throughout the projection. This observation will vary based on the exact product features and assumptions used.

US GAAP

U.S. GAAP measurement is focused primarily on the income statement. Under current GAAP, DAC is used to effect a matching of acquisition costs with premiums over the life of the policy. This relationship is altered under GAAP with proposed targeted improvements because DAC is amortized straight-line, with reference to the expected lifetime of the insurance in force. For a level term product, this difference can be significant because of the small number of policies remaining in the post-level term with relatively high premiums.

Under current GAAP, income emerges over the lifetime of the business in proportion to premiums adjusted by the pattern of PAD release. The mortality and lapse PADs are released in proportion to the pattern of reduction in in-force.

Under the proposed targeted improvements, income emerges differently as a result of several differences:

1. There is no release of PADs in the reserve, so there is lower income during the level term period.
2. An increase in reserves as a result of a lower discount rate increases income during the level term period.
3. The revised DAC amortization pattern—DAC is amortized more quickly, straight-line over the terms of the contracts, rather than in proportion to premiums—reduces income during the level term period but increases income thereafter.

IFRS 17

IFRS 17 considers risk assumption to be the fundamental service provided by the contract and thus has an explicit risk adjustment incorporated in the measurement model. Earnings emergence follows the release from risk, consistent with this conceptual underpinning, as well as release of the CSM. Conservatism is provided through a CSM, which eliminates any gain at inception of a contract.

Similar to PBR and U.S. GAAP with proposed targeted improvements, IFRS 17 exhibits a relatively large spike in earnings in year 10. This spike is due to a risk adjustment release, which is driven by the large reduction in the face amount from the shock lapse. Our modeling approach is somewhat simplified and assumes that the risk adjustment is retained in proportion to face amount. While a variety of other approaches could plausibly generate significantly different patterns of risk adjustments, we nonetheless find that the release of risk adjustment in the year of the shock lapse is consistent with the concept that much of the uncertainty in the contract is released when the shock lapse occurs. Of course, other approaches to developing risk adjustments are possible, with consequent effects on earnings emergence.

2.4 Sensitivity Analysis

Additional sensitivities demonstrate the impact of emerging experience and assumption changes on earnings emergence under PBR and U.S. GAAP with proposed targeted improvements. Table 2 summarizes the sensitivities tested. Similar sensitivities were performed in the 2015 study for other reporting bases.

Table 2

SENSITIVITIES TESTED: TERM LIFE

Sensitivity	Description
1	10% increase to mortality experience (assumptions are unchanged)
2	In addition to mortality experience in sensitivity 1, 10% increase in best-estimate mortality assumption in year 5
3	100 bps increase to risk-free rates in year 6 (not a cumulative sensitivity)

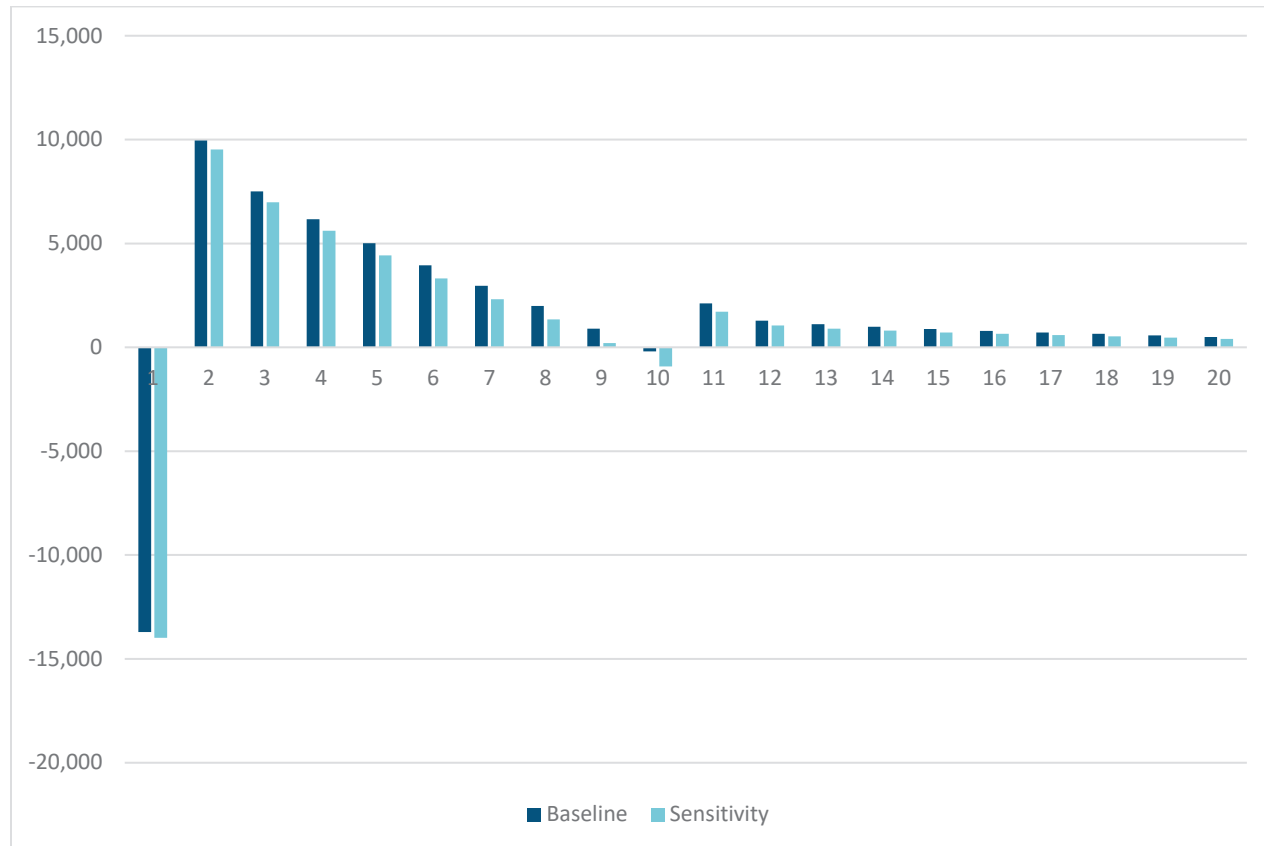
2.4.1 Sensitivity 1: Mortality Experience

Mortality experience is assumed to be 10% higher than anticipated, immediately and throughout the projection. The mortality assumptions used within the liability calculations are not revised.

Cash Flow Projections

Figure 7 illustrates the change to net cash flows under the mortality experience sensitivity. Higher claims throughout the project result in a decrease to net cash flows in every period.

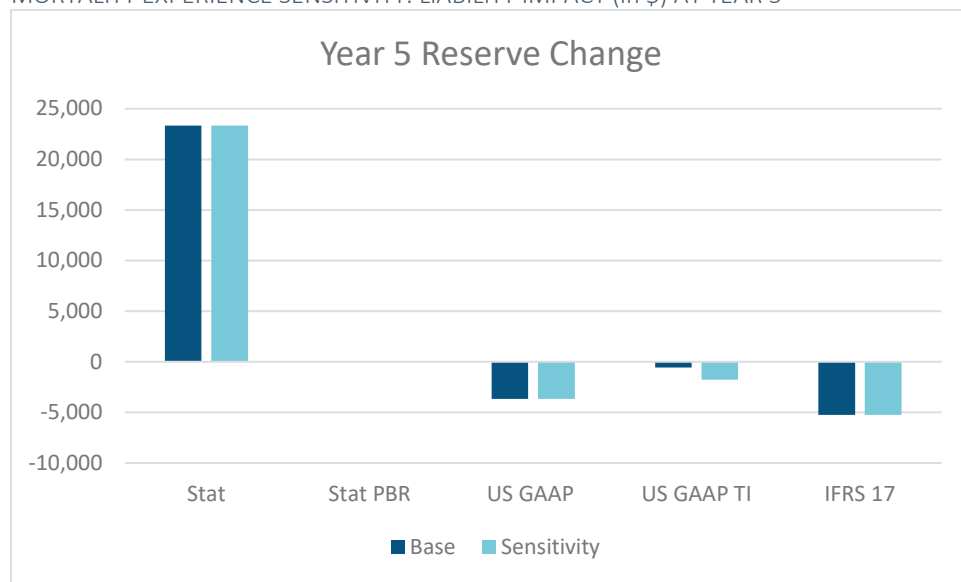
Figure 7
 MORTALITY EXPERIENCE SENSITIVITY: PROJECTED NET CASH FLOWS (in \$) BY PROJECTION YEAR



Liability Projections

Figure 8 shows the impact on the liabilities for each basis after five years. Other than U.S. GAAP with proposed targeted improvements and PBR, there is a slight reduction in the magnitude of the reserve on each basis purely due to the higher decrements. These reductions are too small to be observed directly in the graph.

Figure 8
MORTALITY EXPERIENCE SENSITIVITY: LIABILITY IMPACT (in \$) AT YEAR 5



For U.S. GAAP, under the current approach and proposed targeted improvements, the additional decrements result in slight decreases to the DAC balance as a direct result of reduced premiums and policy counts, respectively.

For U.S. GAAP with proposed targeted improvements, in addition to the previously named effects, the net-to-gross ratio is unlocked for these experience variances. This results in a higher net premium and therefore produces a lower reserve.

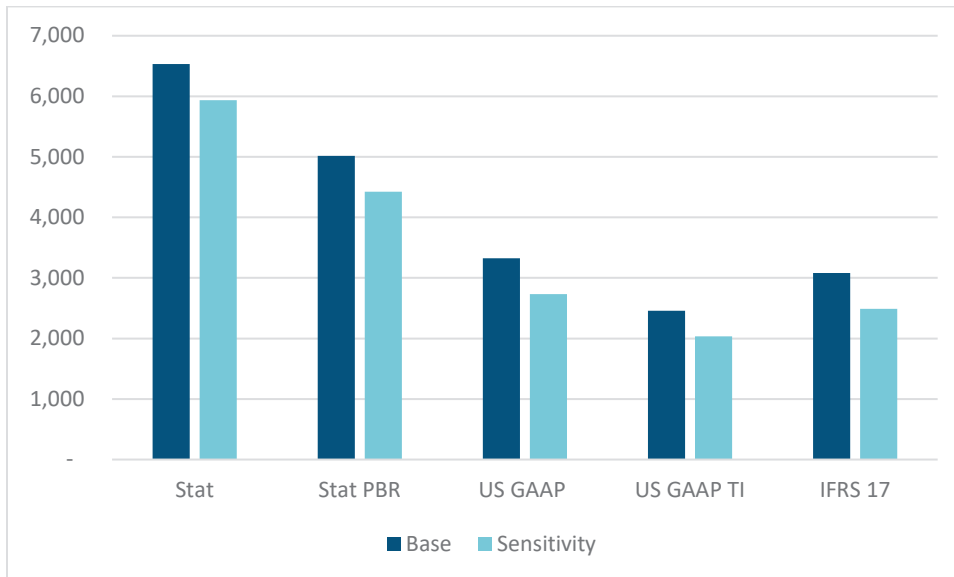
For statutory reserve per VM-20 (Stat PBR), the impact of sensitivity on reserve is zero, due to the zero floor.

Earnings Emergence

Figure 9 shows the impact to pretax income in year 5. Other than U.S. GAAP with proposed targeted improvements, the primary impact is the reduction to income across all reporting bases as a direct result of the increased death benefits. This is offset by a very small change to the liability in each of the reporting bases.

For U.S. GAAP with proposed targeted improvements, pretax income is reduced as a result of the increased claims, offset approximately 30% by the income generated by the reduced reserves described earlier.

Figure 9
MORTALITY EXPERIENCE SENSITIVITY: PRETAX INCOME IMPACT (in \$) IN YEAR 5



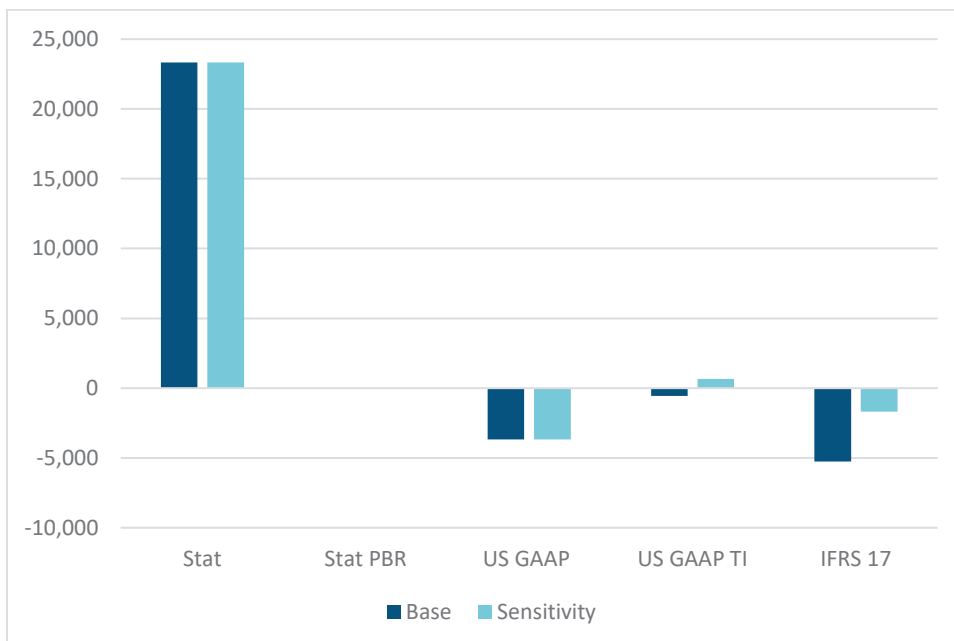
2.4.2 Sensitivity 2: Mortality Experience and Assumptions

Mortality experience is assumed to be 10% higher than anticipated, immediately and throughout the projection. Additionally, mortality assumptions are increased by 10% starting in year 5. The cash flows are identical to the prior sensitivity and are shown in Figure 7.

Liability Projections

Figure 10 shows the impact on the liabilities for each basis at year 5. For the statutory projections, the assumptions are prescribed and unchanged.

Figure 10
MORTALITY EXPERIENCE/ASSUMPTION SENSITIVITY: LIABILITY (in \$) AT YEAR 5



For PBR, the change in assumptions results in a significant increase to the calculated reserves (which are the greater of the DR and NPR) prior to the zero floor. However, there is no impact on income as a result of the zero floor.

For U.S. GAAP, the assumptions are locked in at issue and unchanged.

For U.S. GAAP with proposed targeted improvements, in addition to the effect of the mortality experience, the following changes are observed:

- The revised mortality assumption causes the net-to-gross ratio to be recalculated from inception. The result is that the increase in projected claims is partially offset within the reserve calculation by the increase in projected net premiums from that point forward (due to the higher net-to-gross ratio). The net result is an increase to the reserves.
- The revised mortality assumption causes the policy count to be reduced slightly, which results in a slight increase to the DAC balance in year 5.

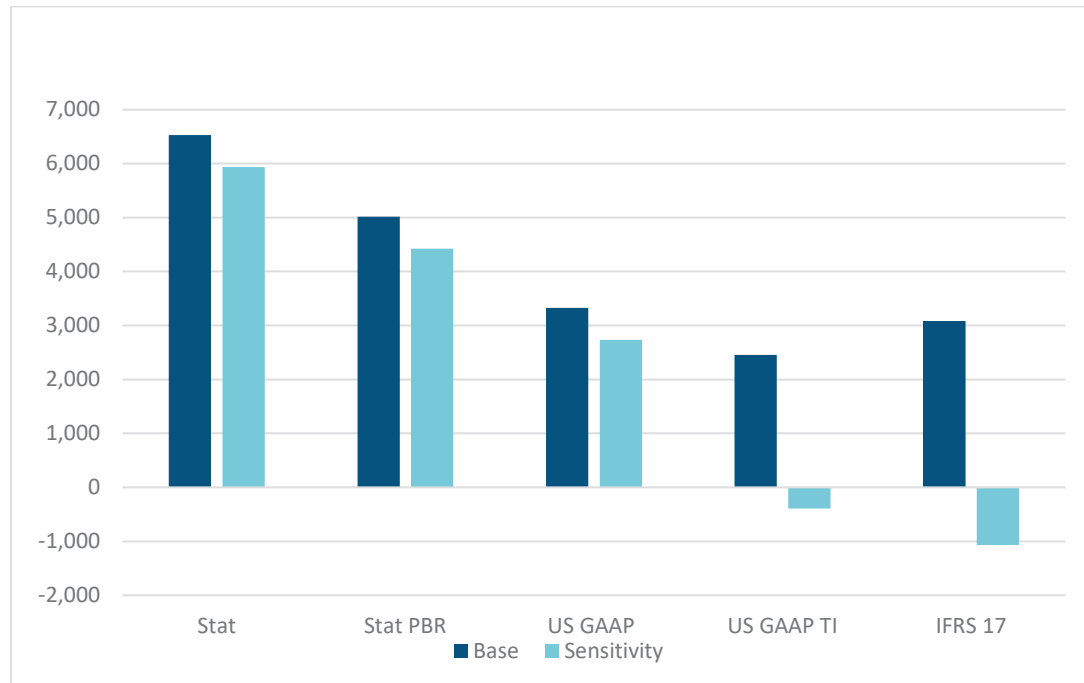
For IFRS 17, the full impact of the assumption change directly affects the fulfilment cash flows, increasing them by \$4,640. However, IFRS 17 uses the CSM as a buffer against assumption changes and certain experience variances. In this case, the CSM of \$1,080 is reduced down to its floor of zero to offset the change, so the net impact to the liability is only \$3,560.

Earnings Emergence

Figure 11 shows the impact to pretax income in year 5. These results illustrate how the different financial reporting bases generate different levels of volatility in income patterns:

- Current statutory and U.S. GAAP reporting both use locked-in or prescribed assumptions at issue and have the least sensitivity to current assumption changes. Note that we assume that no additional reserves are generated under either basis from liability adequacy tests (asset adequacy analysis for statutory or premium deficiency testing for current U.S. GAAP).
- PBR is the most exposed to upward changes to the liability with no mitigated effects, should the DR ever rise above the NPR and become positive. However, in this case, the DR remains negative, floored at zero, so there is no impact from this assumption update.
- U.S. GAAP with proposed targeted improvements and IFRS 17 both use current assumptions but have built-in mechanisms that reduce or eliminate volatility. U.S. GAAP with proposed targeted improvements unlocks the net-to-gross ratio, which dampens any effects, but it has an upper bound of 100%. The extent of the dampening depends on when in the life cycle of the product the assumption change occurs. IFRS 17 uses the CSM to provide a 100% buffer of any changes, but the CSM has a lower bound of zero. In our example, the lower bound is reached, so substantial volatility is introduced as a result of the assumption change.

Figure 11
MORTALITY EXPERIENCE/ASSUMPTION SENSITIVITY: PRETAX INCOME IMPACT (in \$) IN YEAR 5



2.4.3 Sensitivity 3: Risk-Free Rate

The risk-free rate is assumed to increase 1% at the end of year 6.

The study makes certain assumptions to perform this sensitivity test for the purposes of the illustration:

1. Assets are recorded as available for sale, which means that the change in fair value of assets does not flow through net income but is recorded on the balance sheet through accumulated other comprehensive income. For U.S. GAAP and IFRS, the change in the market value of assets is recorded on the income statement through other comprehensive income (OCI).
2. Under U.S. GAAP with proposed targeted improvements and IFRS 17, the changes in liability due to changes in the discount rate flow through other comprehensive income instead of net income. This treatment is required under the proposed GAAP basis but is by election for IFRS 17.

Product cash flows for the term product are unchanged as a result of the change in risk-free rates.

Figures 12 and 13 illustrate the liability projections and earnings emergence under the baseline scenario and risk-free rate sensitivity.

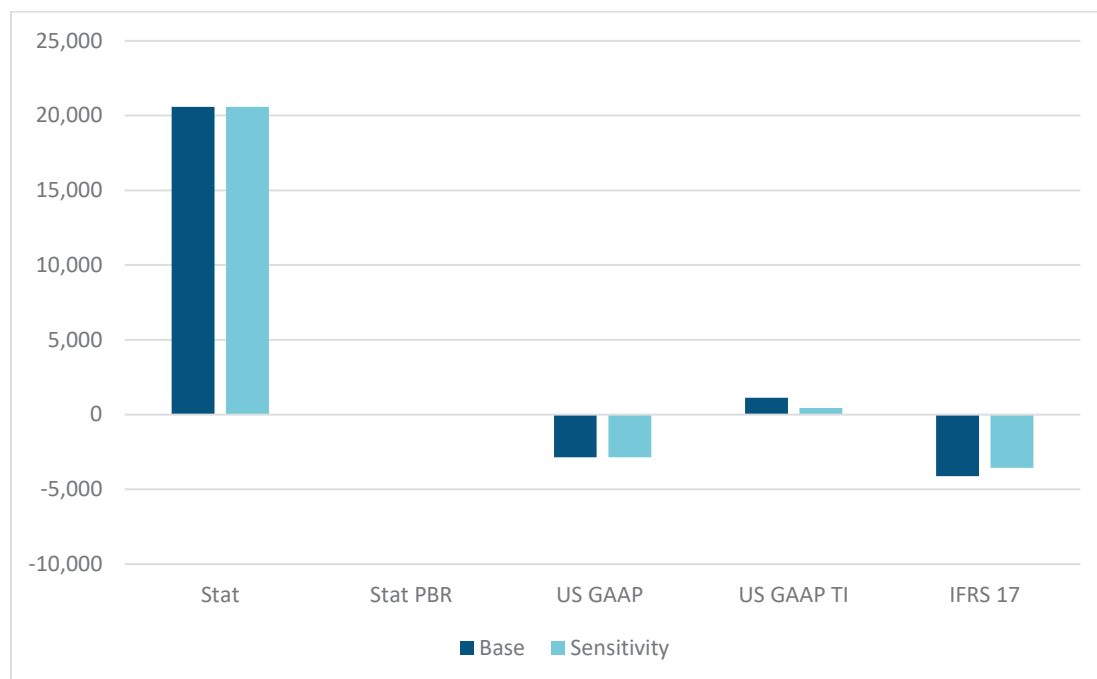
Net Liability Projections

Figure 12 shows the impact of the risk-free rate sensitivity on the net liability for each basis at the end of year 6.

- For statutory, the assumptions are prescribed and unchanged.
- For PBR, the change in assumptions has no impact on the reserves (which are the greater of the DR and NPR floored at zero). Prior to flooring, the DR component of the liability is discounted at higher interest rates, yet there is an increase in net liability because it is negative. The DR behaved similarly to PVCF under IFRS 17 in this case, increasing from $-\$1,761$ to $-\$1,669$.
- For U.S. GAAP, the assumptions are locked in at issue and unchanged.

- For U.S. GAAP with proposed targeted improvements, the reserve is reduced from \$10,928 to \$10,237. (Figure 12 shows balances net of DAC, reduced from \$1,123 to \$433.)
- For IFRS 17, the PVCF increases from -\$11,094 to -\$10,541. (Figure 12 shows balances including RA and CSM, for an increase from -\$4,116 to -\$3,563). In contrast to U.S. GAAP with proposed targeted improvements, the PVCF includes the full premium, and the increased discount rate applied to a large negative reserve has the counterintuitive effect of increasing the liability.

Figure 12
RISK-FREE RATE SENSITIVITY: LIABILITY (in \$) AT YEAR 6



Earnings Emergence

For statutory, as previously noted, pre-PBR statutory liabilities are not affected by this sensitivity. PBR would have been affected if the DR were greater than both NPR and the floor. Assets are recorded at amortized cost and consequently show no change in recorded value due to a change in market interest rates as well.

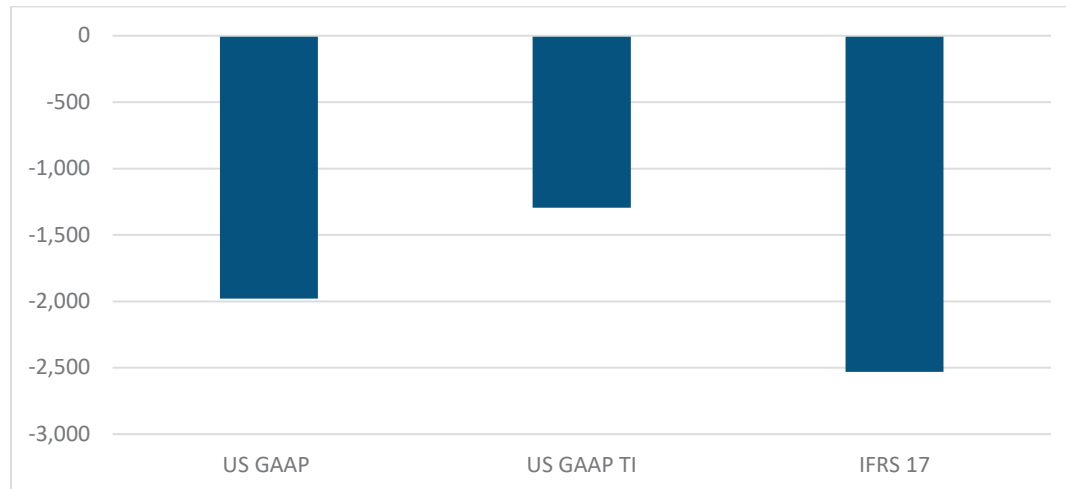
For U.S. GAAP, as previously noted, the liabilities under current U.S. GAAP accounting are not affected by this sensitivity.

For both U.S. GAAP with proposed targeted improvements and IFRS 17, the impact of changes to the discount rate on the liability are recorded on the income statement through OCI. This is by requirement under U.S. GAAP with proposed targeted improvements and by election under IFRS 17.

Assets are classified as available for sale, so the impact of changing risk-free rates is classified as an unrealized loss of \$1,979. The impact of the loss affects equity and on the balance sheet is held in accumulated other comprehensive income (AOCI). Figure 13 summarizes the asset/liability impacts recorded in AOCI. The net impact is a reduction to equity, a reflection of the fact that the duration of the assets used in this example is longer than the duration of the liability cash flows, resulting in greater sensitivity of asset values than of liability values to movements in market interest rates.

Figure 13

RISK-FREE RATE SENSITIVITY: IMPACT (in \$) TO AOCI



These results illustrate how statutory equity results can be very dependent on market conditions, as reduced asset values can affect a company's solvency position. Statutory accounting has little focus on income and does not provide any options to mitigate volatility in income.

U.S. GAAP with proposed targeted improvements and IFRS 17, in contrast, have a significant focus on income and provide insurers with elections for both assets and liabilities that they can leverage to align asset and liability accounting, thus stabilizing income emergence. However, even under U.S. GAAP and IFRS, equity is generally based on the market value of assets and liabilities discounted at current interest rates, with the exception of certain asset classes that are recorded at amortized cost. Nonetheless, we observed that AOCI (and hence equity) values have even more volatility under IFRS 17 than under U.S. GAAP, at least in this example. This is because the IFRS 17 liability value is negative, so an increase in market interest rates results in asset movements and liability movements generating reductions to equity. We expect that insurance companies will be wary of these types of effects and consider these implications accordingly.

Section 3: Universal Life Insurance

3.1 Product Information

3.1.1 Features

The universal life insurance product is modeled as a protection-oriented, no-lapse-guarantee product. Premiums are invested in the company's general account, and the company has a target pricing spread so that in any given year, the company credits to the account value (AV) approximately what the company earns on its assets less that spread. The company has discretion in setting the credited rate, subject to a guaranteed minimum credited rate set at the point of issue, and can change the credited rate at the beginning of each year. This illustration models a single policy that has been issued to a 40-year-old male nonsmoker.

The no-lapse guarantee is in the form of a shadow account. The policy will remain in force if the shadow account remains positive, even if the fund value runs out. Modeled premiums are based on the level premium necessary for the shadow account to remain positive over the coverage period.

3.1.2 Pricing Targets

The universal life product pricing is based on U.S. statutory distributable earnings. The primary pricing metric is the return on investment (ROI). This metric compares the present value of pretax U.S. statutory income to the initial premium deposit. Cost of insurance rates, expense charges and shadow account parameters are designed to achieve the target ROI, given expectations of mortality rates, lapses rates and expenses. Additional details on the development of the assumptions are provided in the following section. The baseline universal life product generates a pretax ROI of approximately 11% under the baseline scenario.

3.1.3 Assumptions

For the purpose of this exercise, experience emerges as expected under the best-estimate assumptions for the baseline scenario. With the exception of U.S. statutory reserves, valuation assumptions are developed using the best-estimate assumptions with provisions for adverse deviation or risk margins as applicable under the various standards. Valuation assumptions for U.S. statutory, non-PBR reserves are prescribed. Following is a summary of the key best-estimate assumptions and their corresponding provisions and margins, as applicable, under the baseline scenario.

Demographics

The mortality and surrender assumptions are developed to be consistent with current industry experience studies. The best-estimate mortality assumption is 70% of the 2017 CSO mortality table.

The surrender assumption is level at 3% per year for all years when the account value is greater than zero and 1.5% when the no-lapse guarantee is keeping the policy from lapsing.

Expenses

The expenses include commissions, acquisition expenses and ongoing policy maintenance expenses. Commissions are modeled as 90% of premiums for year 1 and 4% thereafter, and other acquisition expenses are \$1,000 per policy. Commissions and acquisition expenses are assumed to meet the deferral criteria under U.S. GAAP.

The best-estimate initial maintenance expense assumption is \$180 per policy. The model includes an expense inflation assumption of 2% per year for maintenance expenses.

Asset Portfolio

The asset portfolio is assumed to be invested predominantly in fixed-income securities and other traditional assets, with a duration of approximately 10 years.

Asset Yield

For calculating investment income, the asset yield is developed as a combination of the risk-free rate plus a credit spread, less a spread for expected defaults. For the experience projection, the model includes a flat yield curve and level spread factors, such that the best-estimate asset yield is level over the product's lifetime. For valuation purposes, where discount rates are dependent on expected asset yields, the development of those assumptions is described in the corresponding methodology section.

Crediting Rate

The best-estimate crediting rate is determined as the maximum of the asset yield minus a target spread and a guaranteed minimum crediting rate where:

1. The asset yield is developed as described in the asset yield assumption section 1.3 above;
2. The target spread equals 1.80% for all years; and
3. The guaranteed minimum crediting rate equals 2.00% for all years.

3.2 Accounting Methodology

This section describes the financial reporting bases covered in the study in relation to the modeling of the universal life insurance product.

3.2.1 US Statutory, Non-PBR

The valuation of U.S. statutory reserves follows the Universal life Insurance Model Regulation, the Valuation of Life Insurance Model Regulation (Regulation XXX), and Actuarial Guideline XXXVIII (AG 38).

The analysis is performed using both the 2001 CSO and 2017 CSO mortality tables at 3.5% interest. Separate sets of X factors were developed such that alternative minimum mortality is (1) the same under both the 2001 and 2017 CSO table and (2) consistent with the best-estimate mortality assumption.

3.2.2 US Statutory, PBR

The valuation under PBR is based on the NAIC *Valuation Manual* minimum standard for life products, VM-20. The PBR reserve is the maximum of the net premium reserve (NPR), deterministic reserve (DR) and stochastic reserve (SR).

The NPR is formulaic, using prescribed assumptions. The DR is a gross premium reserve using pretax cash flows from a single economic scenario using prudent estimate assumptions. The discount rate is based on modeled earned rate. The SR is the sum of the statutory carrying value of a basket of starting assets and CTE 70 of the greatest negative present value of projected asset values for each scenario of modeled asset and liability cash flows. The discount rate is 1.05 times the one-year Treasury rate. Assumptions used for the DR and SR are a mix of prescribed and prudent estimate assumptions plus a margin.

Where applicable, assumptions used in the calculation of the DR and SR are the best-estimate assumptions used for GAAP, IFRS and Solvency II plus a margin. For mortality, the analysis assumes 100% credibility. Mortality begins to grade to the industry table after 10 years and assumes a 25-year grading period. Mortality margins are set based on prescribed VM-20 margins. A 10% margin is assumed for lapses and expenses.

3.2.3 US GAAP, Current

The U.S. GAAP reserves for the universal life products are set equal to the AV consistent with ASC 944-825 (previously FAS 97) plus a reserve for the no-lapse guarantee feature, per ASC 944-605-25 (previously SOP 03-1).

Commissions and acquisition-related costs are capitalized when incurred and recorded as a DAC asset. The DAC asset is amortized in proportion to estimated gross profits consistent with ASC 944-30 requirements. The gross profits consist of an interest margin, a mortality margin, a surrender margin and an expense margin.

3.2.4 US GAAP With Proposed Targeted Improvements

U.S. GAAP under the proposed targeted improvements is the same as current U.S. GAAP except that under the proposed targeted improvements, DAC is amortized in a constant level basis over the expected term of the contracts. This is approximated by amortizing DAC over periods proportional to the undiscounted amount of insurance in force. There is no change to the reserve from the methods used for current GAAP.

3.2.5 IFRS 17

There are three components to the liabilities under IFRS 17 *Insurance Contracts*, the new IFRS accounting standard for insurance contracts effective January 1, 2021. For the purposes of this study, the calculation of each component is as follows:

The **estimate of future cash flows** is calculated as a present value of all liability cash flows, using best-estimate assumptions. For the purpose of this exercise, the cash flows are projected under a single deterministic scenario, with a cost-of-option adjustment to the discount rate to account for the embedded no-lapse guarantee. This is a computational simplification introduced to avoid the necessity of performing calculations on multiple scenarios, as would be required under IFRS 17. The interest rate for discounting cash flows is developed using a top-down approach, where the rate is equal to $Y - SD - SR - COA$, where:

- Y = projected gross investment yield;
- SD = spread for defaults;
- SR = spread for the risk surrounding the expected default losses; and
- COA = cost-of-option adjustment.

The **risk adjustment** is calculated based on a cost-of-capital method. Under this approach, the risk adjustment is estimated based on the cost of holding a sufficient amount of capital in order to fulfill the insurance contract obligations. It is set to 0.5% of the in-force face amount. The estimate of future cash flows and the risk adjustment are collectively called the **fulfilment cash flows**. A reasonability test on the risk adjustment compares the time 0 fulfilment cash flows calculated under (a) best-estimate assumptions and (b) best-estimate assumptions with a 10% margin for mortality. The difference in the fulfilment cash flows under (a) and (b) is within 10% of the amount of the risk adjustment at issue.

The **contractual service margin (CSM)** eliminates the gain at issue (i.e., the sum of the fulfilment cash flows and the risk adjustment, if less than zero). For the subsequent valuations, the CSM is amortized in proportion to the face amount in force. The interest rate used in the amortization is the discount rate applied to expected cash flows at contract inception.

3.2.6 Solvency II

For the purposes of this study, the valuation of liabilities under a Solvency II market-consistent framework is approximated by calculating the following two components:

1. The **best-estimate liability** is calculated as a present value of all gross liability cash flows using best-estimate assumptions. For the purpose of the study, the gross liability cash flows are projected under a single deterministic scenario, with a cost-of-option adjustment to the discount rate to account for the embedded, no-lapse guarantee. The interest rate for discounting cash flows is equal to $RF + MA - COA$, where:

RF = risk-free rate;

MA = spread to represent the Solvency II “matching adjustment”; and

COA = cost-of-option adjustment.

For the purpose of this exercise, the matching-adjustment spread (MA) is set equal to $CS - SD - SR$, where:

CS = credit spread;

SD = spread for defaults; and

SR = spread for the risk related to expected default losses.

The resulting discount rate is equal to the discount rate used for the proposed IFRS projections.

2. The **risk margin** is calculated based on a cost-of-capital method identical to the IFRS risk adjustment. It is set to 0.5% of the in-force face amount.

3.3 Baseline Results

Figures 14 through 19 provide graphical illustrations of the baseline results. For the full income statements and balance sheets, please refer to the appendix. Income is shown for years 1 through 5 and every five years thereafter. The following naming conventions are used to identify results for the different reporting bases:

Stat 01: non-PBR statutory using the 2001 CSO table

Stat 17: non-PBR statutory using the 2017 CSO table

Stat PBR: statutory reserve per VM-20

GAAP: net GAAP liability for current U.S. GAAP

GAAP TI: net GAAP liability for U.S. GAAP with proposed targeted improvements

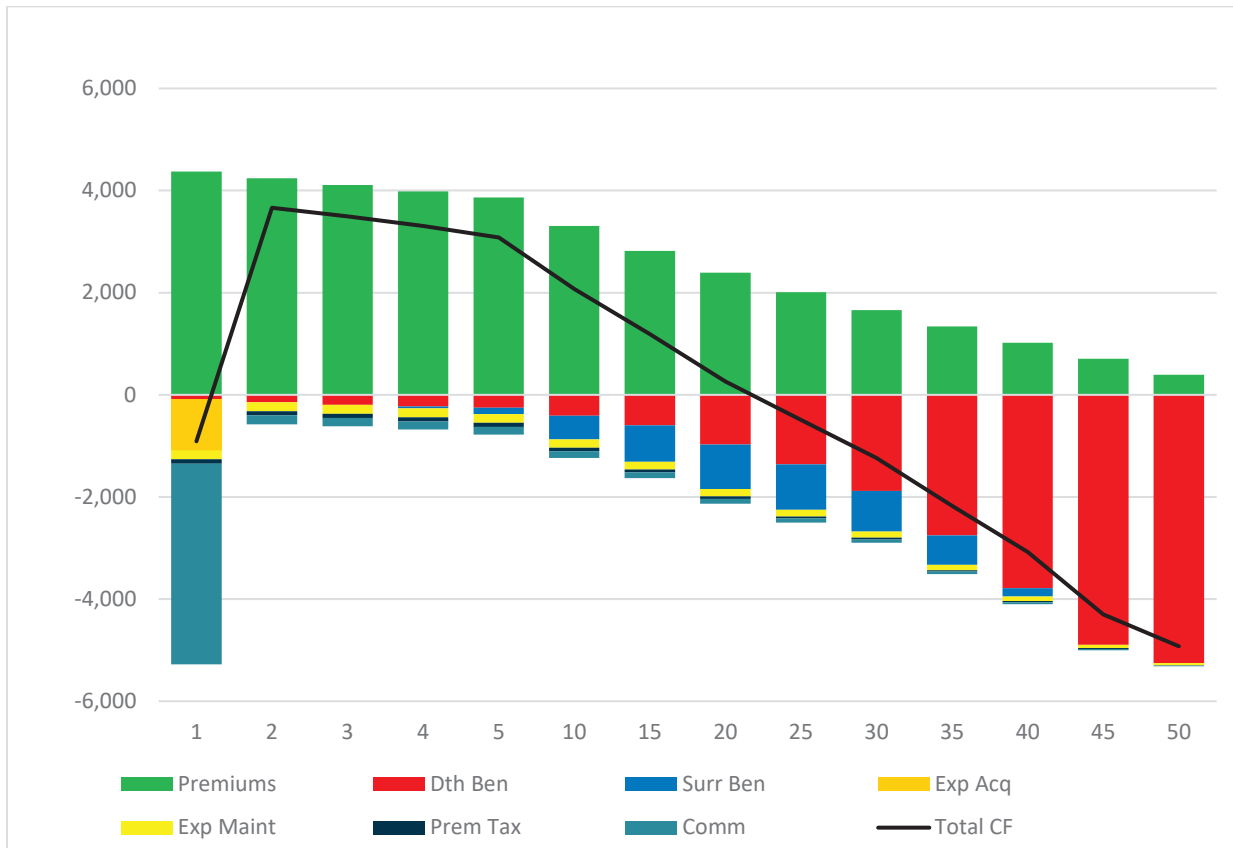
IFRS: IFRS 17

Solv II: Solvency II

3.3.1 Cash Flow Projections

The cash flow projections shown in Figure 14 are based on the product information described in Section 3.1 and are used consistently across all measurement bases.

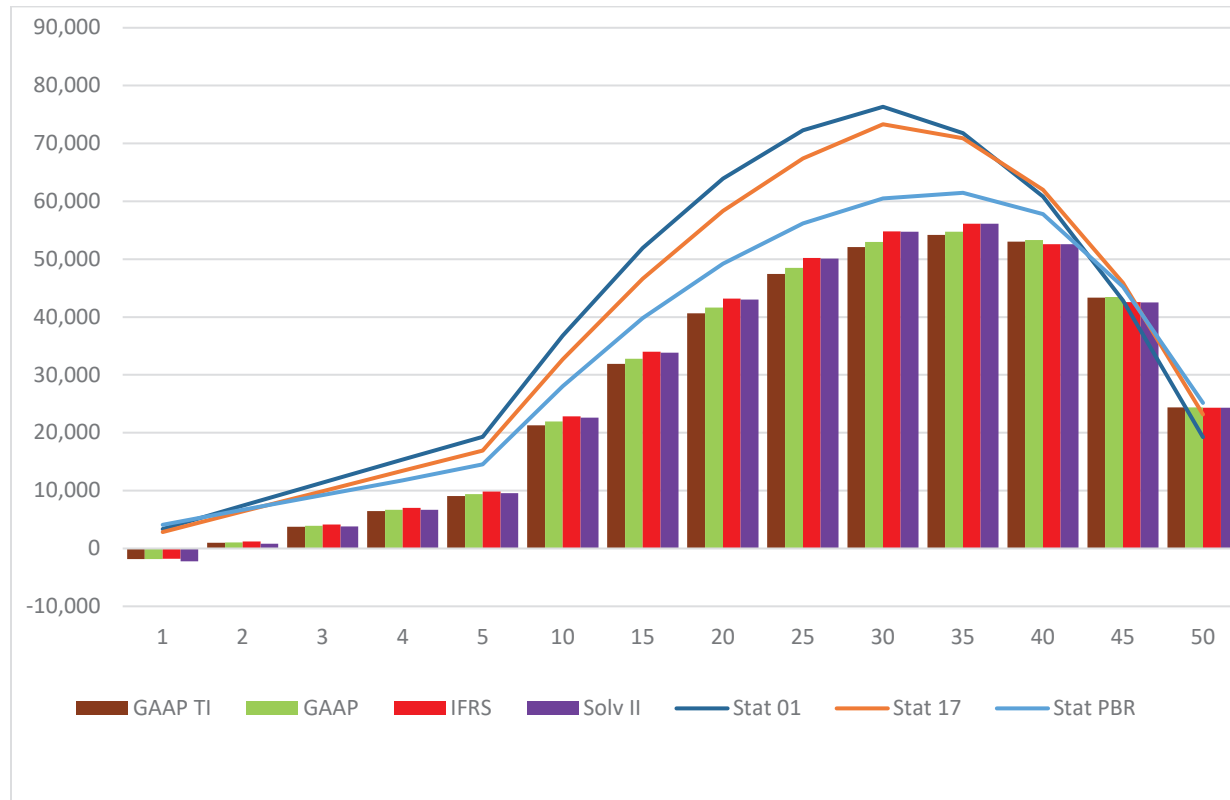
Figure 14
 UNIVERSAL LIFE INSURANCE CASH FLOW PROJECTIONS (in \$) BY PROJECTION YEAR



3.3.2 Liability Projections

Figure 15 illustrates the net liability (liability minus DAC asset) projections under the various measurement bases. The statutory values are represented by line graphs, and the values for the other measurement bases are shown as bars. This is purely for ease of visualization and is not intended to convey any additional, fundamental difference.

Figure 15
 UNIVERSAL LIFE LIABILITY PROJECTION (in \$) BY PROJECTION YEAR—ALL BASES

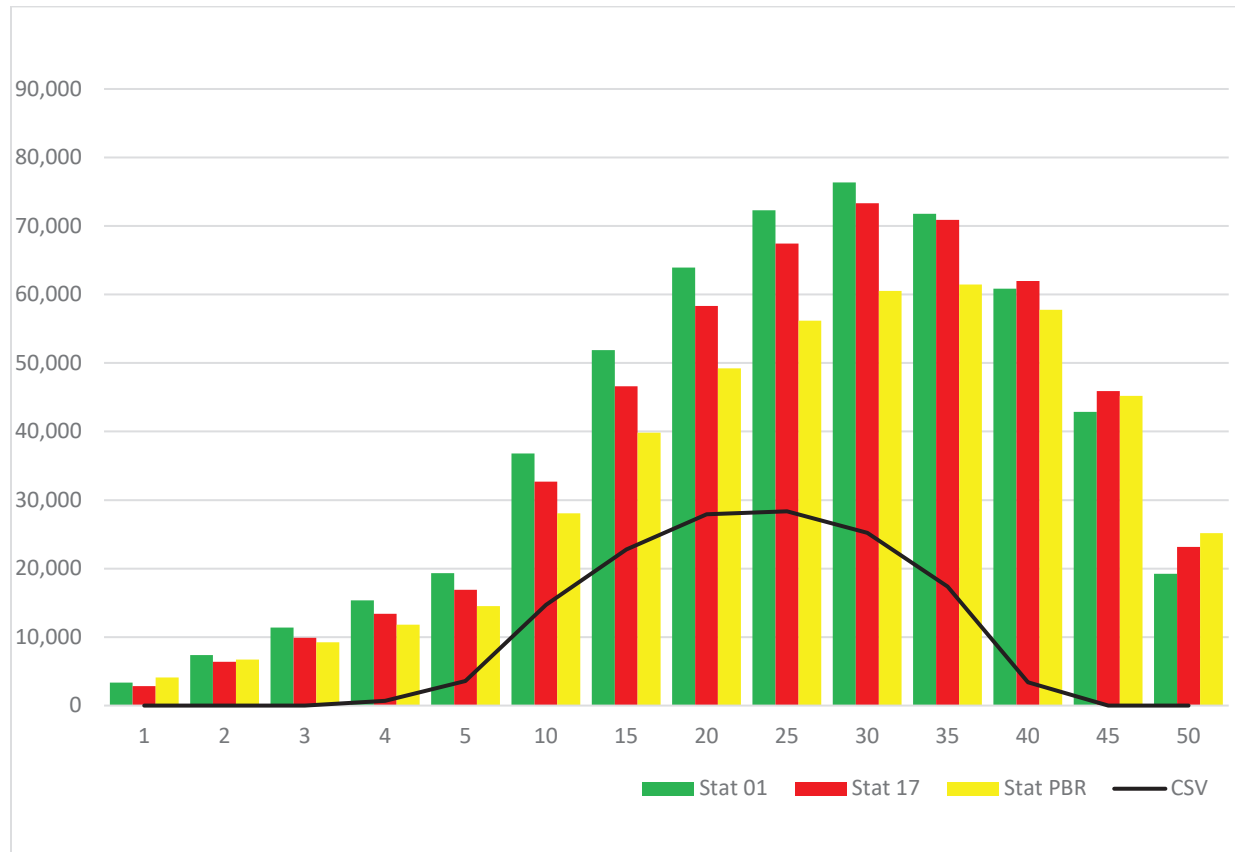


The U.S. GAAP liability shown is the reserve (Account value (AV) + Statement of Position 03-1 (SOP 03 – 1)) less DAC. The IFRS basis includes a risk adjustment, and the CSM amortizes fairly slowly. Both of these impacts keep the IFRS liability higher than U.S. GAAP for many years. Though largely imperceptible in the graphs, the net liability for current U.S. GAAP exceeds the net liability under GAAP post-targeted improvements, because the DAC asset amortizes more quickly under current GAAP. This is largely because once the account value runs out, expected gross profits (EGPs) are zero, so DAC under existing GAAP is fully amortized. Under GAAP with targeted improvements, there is still insurance in force when the account value is zero, so DAC continues to exist. The two U.S. GAAP bases are examined in more detail in Figure 18.

The net liability under the Solvency II measurement basis is negative at issue, because it is not constrained by a requirement to break even at contract issue. It remains slightly below the level of the liability for IFRS for this reason (i.e., there is no CSM under Solvency II, as there is under IFRS, yet all other elements are largely the same).

As expected, the statutory measurement bases generate the highest level of liability, due to their inherently conservative nature. The statutory bases are examined in more detail in Figure 16.

Figure 16
 UNIVERSAL LIFE LIABILITY PROJECTION (in \$) BY PROJECTION YEAR: STATUTORY



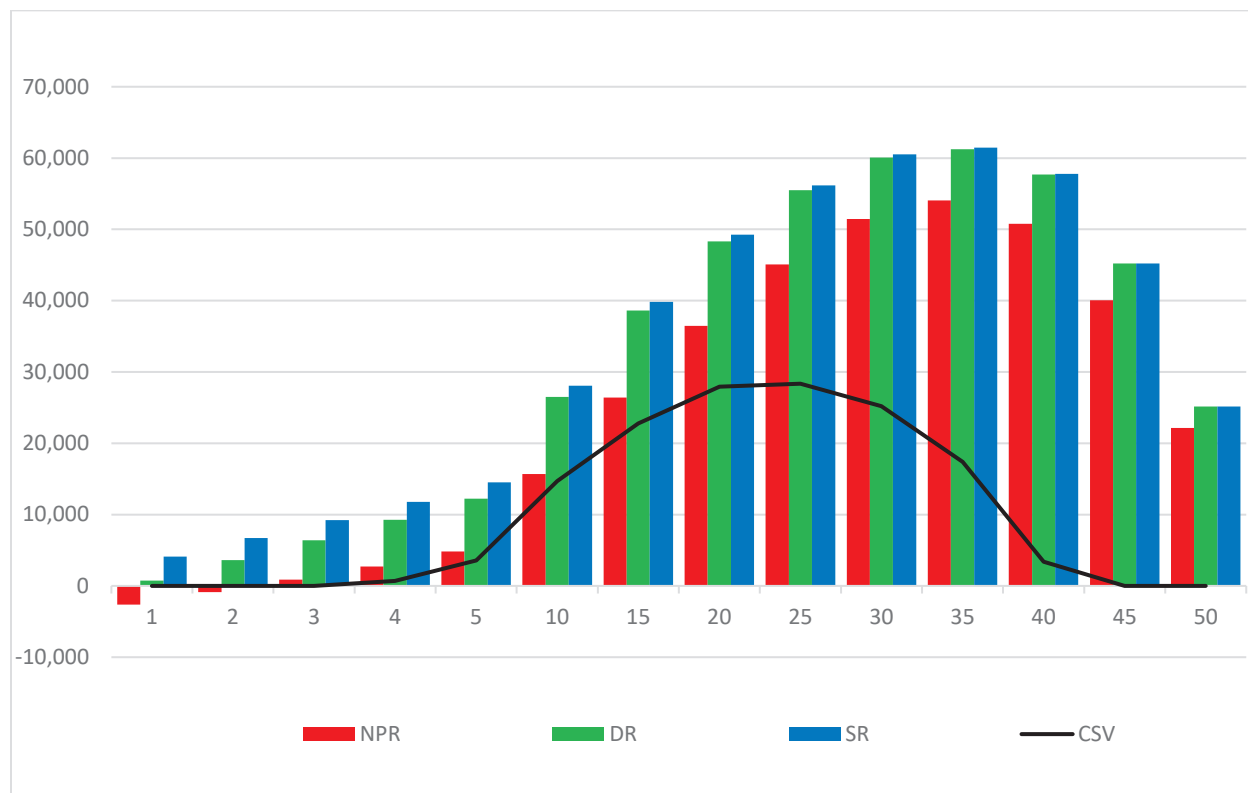
CSV – cash surrender value

Reserves are highest for most of the projection period for the non-PBR statutory bases. This is a consequence of the inherent differences in the calculation bases, which manifest themselves differently depending on product design. A different universal life product with a different design might have shown a different relationship. For the product illustrated, PBR reserves are higher at the end of the first year, mainly because of the expense allowance in the non-PBR analysis, which results in no Regulation XXX reserves at the end of the first year. By the end of year 2, PBR reserves are lower due to the relatively steep reserve pattern that is typical for non-PBR reserves early in the policy lifetime. The ratio of PBR to non-PBR reserves starts to increase in projection year 32, with the PBR reserve exceeding the non-PBR reserve in year 48. Again, this is a consequence of product design that generates different reserve patterns due to fundamental differences in the methods and assumptions between non-PBR (Regulation XXX and AG 38) and PBR. The non-PBR reserve is founded on adjusting the Regulation XXX reserve based on the relative funding level. The projections assume a level premium such that the shadow account becomes 0 at age 120. This produces a pattern of increasing funding levels that decrease later in the projection as the shadow account goes to zero. In this analysis, the AG 38 funding peaks in year 46, just two years before the PBR reserve starts to exceed the AG 38 reserve.

Non-PBR reserves based on the 2001 CSO are higher than reserves based on the 2017 CSO until projection year 40. Although 2017 CSO mortality rates are lower than 2001 in all durations, the 2017 table has a steeper slope from built-in select factors (2001 CSO reserves do not use select factors in the basic reserve). Net premiums are based on the mortality in all years, and once the select factors wear off, there is a greater difference between the valuation net premium and mortality cost with the 2017 CSO table, resulting in a higher reserve.

Figure 17 shows the development of the PBR reserve as the greatest of three calculations: the NPR, the DR and the SR. The PBR reserve for this product is driven by the SR for all projection periods. The difference between the SR and DR narrows later in the projection. Again, this pattern is associated with the product design illustrated; a different product design could show a very different pattern in the relationships between the three calculations and, consequently, to the recorded reserves.

Figure 17
 UNIVERSAL LIFE LIABILITY PROJECTION (in \$) BY PROJECTION YEAR — : STATUTORY, PBR COMPONENTS

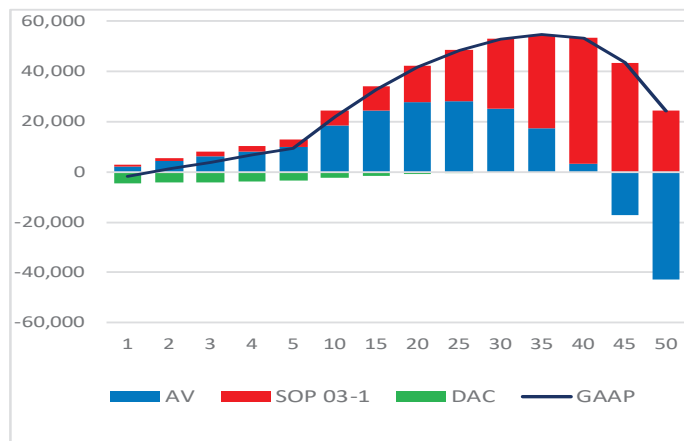


CSV – cash surrender value

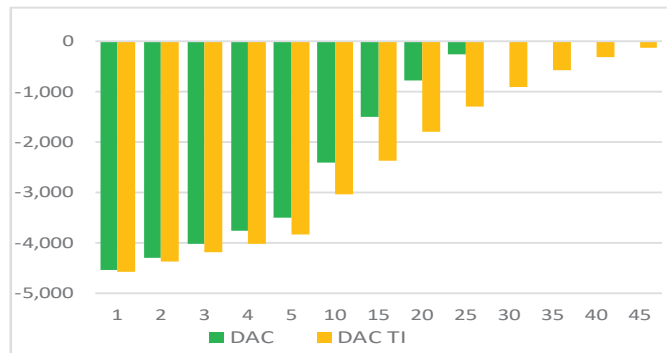
Figure 18 shows that the net GAAP liability is similar between current U.S. GAAP and U.S. GAAP with targeted improvements, as the net liability consists primarily of the account value and SOP 03-1 reserve, which are the same under both bases. The only difference is in the DAC balances. The graph in the right panel compares the DAC between the two bases and shows faster DAC amortization with current U.S. GAAP. In this example, U.S. GAAP DAC is fully amortized by projection year 30 as EGPs go to zero in the later years. DAC under U.S. GAAP with proposed targeted improvements is amortized over the full 50-year amortization period, because insurance remains in force over that full time period. Although the product illustrated does not have front-end loads, it is worth noting that the amortization of a deferred profit liability would exhibit the same type of amortization differences between current GAAP and targeted-improvements GAAP as are witnessed for DAC.

Figure 18
 UNIVERSAL LIFE US GAAP LIABILITY AND DAC PROJECTION (in \$) BY PROJECTION YEAR

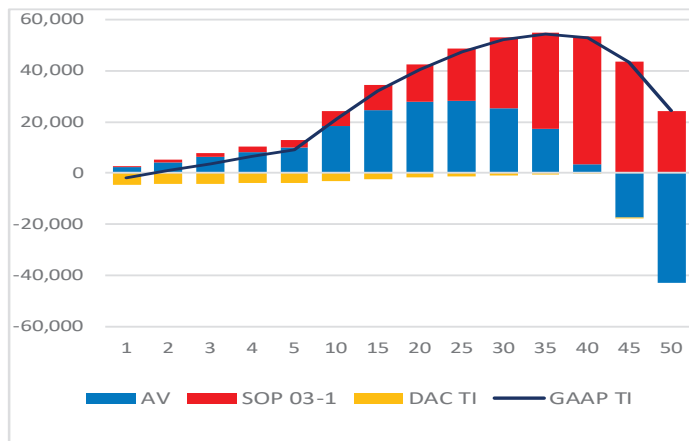
Current US GAAP



DAC Comparison

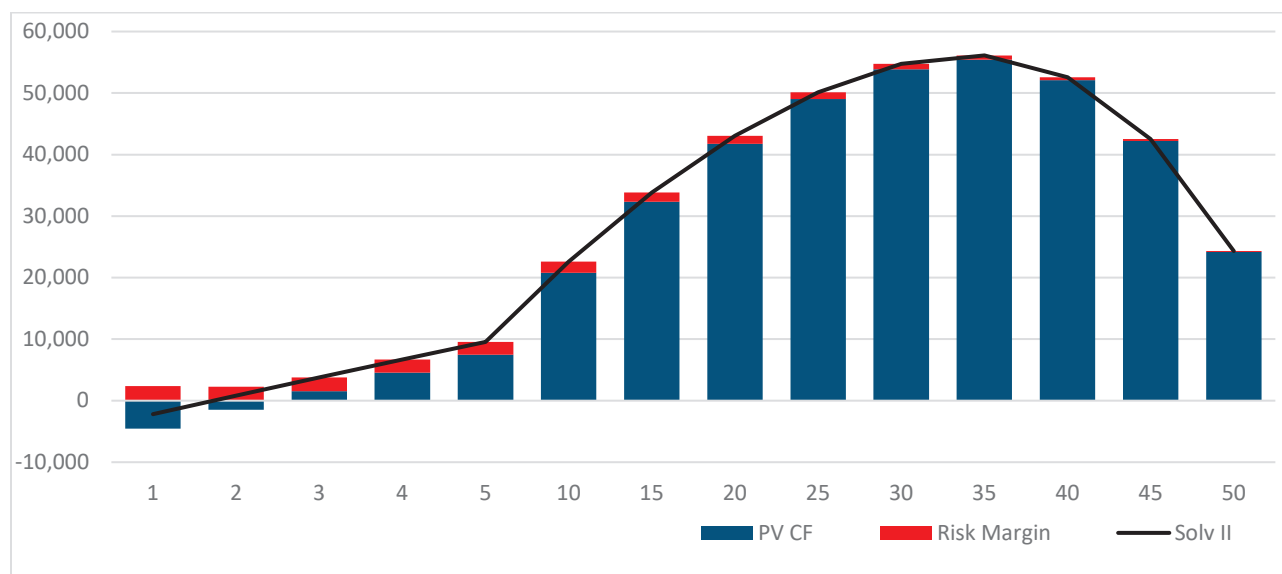
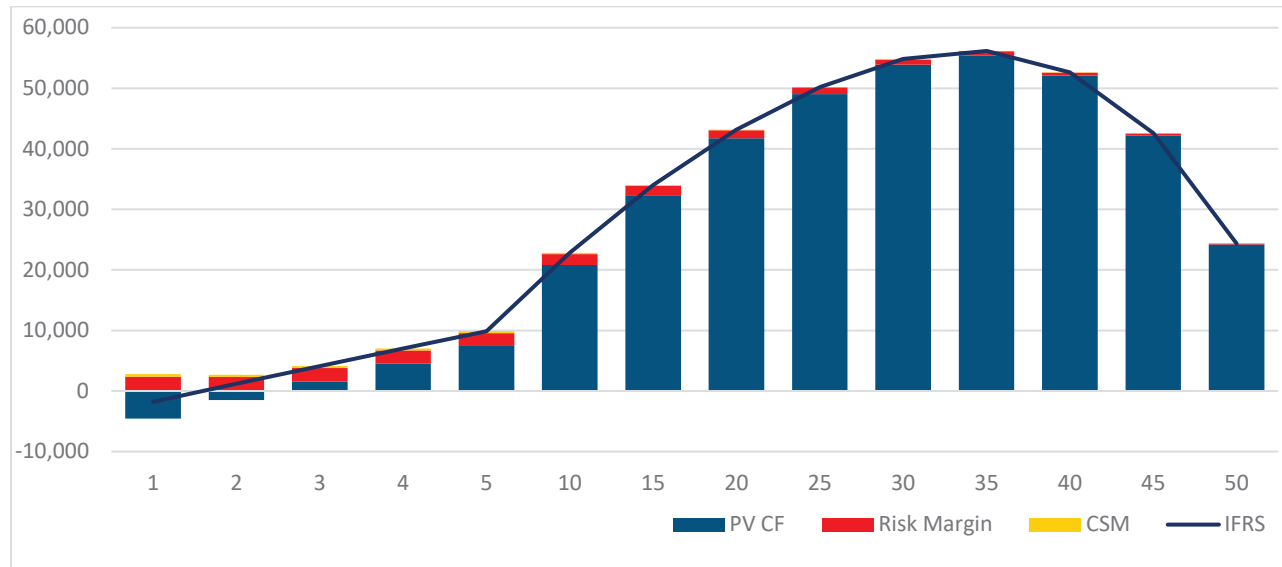


GAAP with Targeted Improvements



The liability pattern is similar between IFRS and Solvency II in our example, with the only difference being the CSM under IFRS. For the product shown in Figure 19, the CSM is small relative to the fulfilment cash flows, indicating that the product has a narrow profit margin. This fact will contribute to the volatility in earnings under IFRS for this product, discussed in Section 3.4.

Figure 19
 UNIVERSAL LIFE IFRS AND SOLVENCY II LIABILITY PROJECTIONS (in \$) BY PROJECTION YEAR

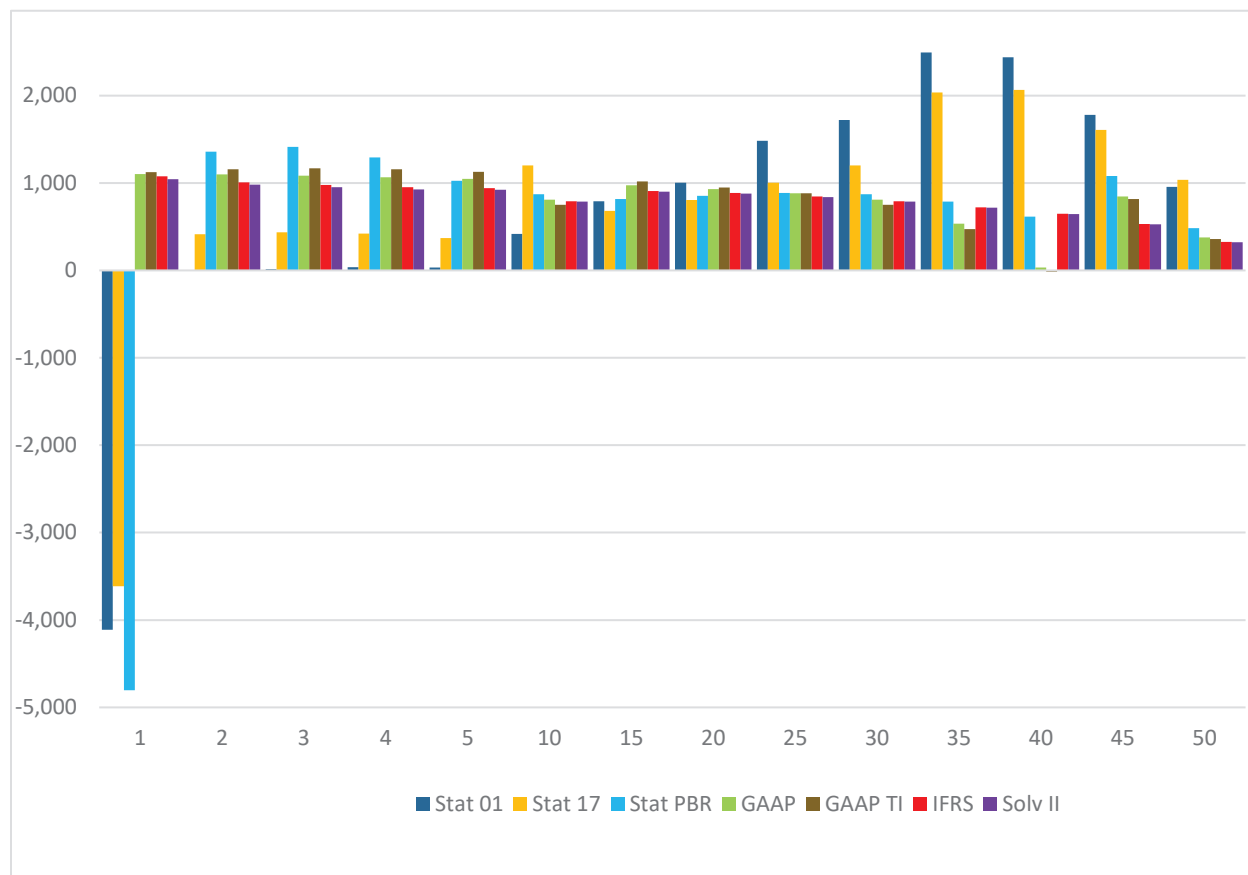


PV CF – present value of cash flows

3.3.3 Earnings Emergence

The earnings emergence in Figure 20 shows interesting comparisons across bases. Readers should take this result with caution, as the relationship between bases could change depending on product features and assumptions.

Figure 20
 UNIVERSAL LIFE PRETAX INCOME (in \$) BY PROJECTION YEAR: ALL BASES



US Statutory

U.S. statutory reporting is characterized as a solvency-targeted measurement regime with focus on producing a conservative balance sheet. It has little focus on earnings and therefore less focus on matching revenues and expenses and no explicit effort to eliminate gains or losses at contract inception. Conservatism in the measurement basis for this product is reflected in the use of prescribed valuation assumptions for Regulation XXX and AG 38 and margins on assumptions for PBR.

Earnings emergence is characterized by lower earnings in the early years followed by higher earnings in the later years as the margin in the reserve is released. Earnings pattern differences are fully explained by the differences in reserve patterns under the various bases, as discussed in Section 3.3.2.

US GAAP

U.S. GAAP measurement is focused primarily on the income statement. Under current GAAP, DAC is used to effect a matching of acquisition costs with the generation of profits over the life of the policy. This relationship is broken under GAAP with targeted improvements, because DAC is amortized on a constant level basis over the expected life of the insurance in force. For ULSG, this difference can be significant, because GAAP profits evaporate when the account value goes to zero. But insurance may remain in force for many years thereafter, due to the secondary guarantee. The choice of account value as the base reserve reflects the investment component of the product directly and positions earnings emergence to be driven by mortality margins and investment margins, rather than implicitly via

reserve release. The SOP 03-1 reserve for secondary guarantees introduces a further element under which losses projected from excess benefits arising from the guarantees are pre-funded, thereby reducing early-period profits in order to prevent late-period losses.

IFRS

IFRS balances income statement and balance sheet objectives, with a similar driving philosophy, and is a principle-based measurement. IFRS 17 considers the assumption of risk to be the fundamental service provided by the contract and thus has an explicit risk adjustment incorporated in the measurement model. Earnings emergence follows the release from risk, consistent with this conceptual underpinning. Conservatism is provided through the CSM, which eliminates any gain at inception of a contract. Earnings are generated largely through the release of risk margins and the release of the CSM over the lifetime of the insurance in force, with the CSM playing a companion role of absorbing gains and losses from assumption changes (i.e., changes in amounts related to future insurance services) on the fulfilment cash flows that constitute the contract liability. This serves to reduce earnings volatility, at least until such time as the CSM is exhausted, in which case further increases in fulfilment cash flows are not offset by reductions in the CSM.

Income emerges in proportion to the in-force over the lifetime of the in-force.

Solvency II Market-Consistent Balance Sheet

The Solvency II balance sheet is part of a larger framework designed for solvency purposes. This study shows “income emergence,” in order to provide a comparison across the other measurement bases, but the focus of this framework is on the market-consistent balance sheet.

The Solvency II model is very similar to the fulfilment cash flows used in IFRS. The main difference with IFRS is the lack of conservatism via a CSM. Without a CSM, the results show a larger gain at inception and reduced “earnings” in the remaining years. Solvency II measures are more volatile as well, since there is no CSM to absorb changes to the balance sheet resulting from prospective assumption changes.

Comparisons Across Bases

Statutory income for both PBR and non-PBR reserves exhibit the familiar pattern of upfront losses followed by gains in future years as the margin in the reserve is released. The difference in income between the 2001 CSO and the 2017 CSO under pre-PBR statutory methods is driven by differences in mortality slope between the two mortality tables, as described in the section on reserves. The difference between PBR and non-PBR earnings is a consequence of the two fundamentally different natures of the calculations, which result in variations between pre-PBR and PBR measures that vary by product design and cannot be readily captured by a broad-brush explanation.

Income for U.S. GAAP, IFRS and Solvency II show relative smooth patterns of earnings emergence in the situation where experience occurs consistent with expected assumptions. Current GAAP earnings emergence tends to be more back-ended than GAAP earnings under targeted improvements, because DAC amortizes more quickly under current GAAP than under GAAP with targeted improvements. IFRS earnings emergence tends to be more back-ended than U.S. GAAP as well, due to the presence of risk margins and the CSM which, being amortized relative to the discounted value of insurance in force, releases slowly over the life of the business. Under U.S. GAAP, in contrast, most profit emergence is concentrated in the years before account values reach zero, a consequence of the SOP 03-1 mechanism that pre-funds the secondary guarantees to eliminate future losses and largely break even once the excess benefits occur. With no breakeven constraint at issue, the market value balance sheet of Solvency II generates gains at contract issue. Future earnings then follow the same pattern as IFRS, but for the lack of CSM amortization.

3.4 Sensitivity Analysis

Three sensitivities for the universal life product exhibit each reporting basis’s treatment of emerging experience and evolving economic assumptions. Table 3 summarizes the sensitivities tested.

Table 3
SENSITIVITIES TESTED: UNIVERSAL LIFE

Sensitivity	Description
1	20% reduction in surrender rate, starting at end of projection year 10 for experience and valuation
2	1% parallel increase to risk-free rate at end of projection year 10 for experience and valuation
3	10% increase in mortality rate starting at end of projection year 10 for experience and valuation

The following sections discuss the results of the sensitivities.

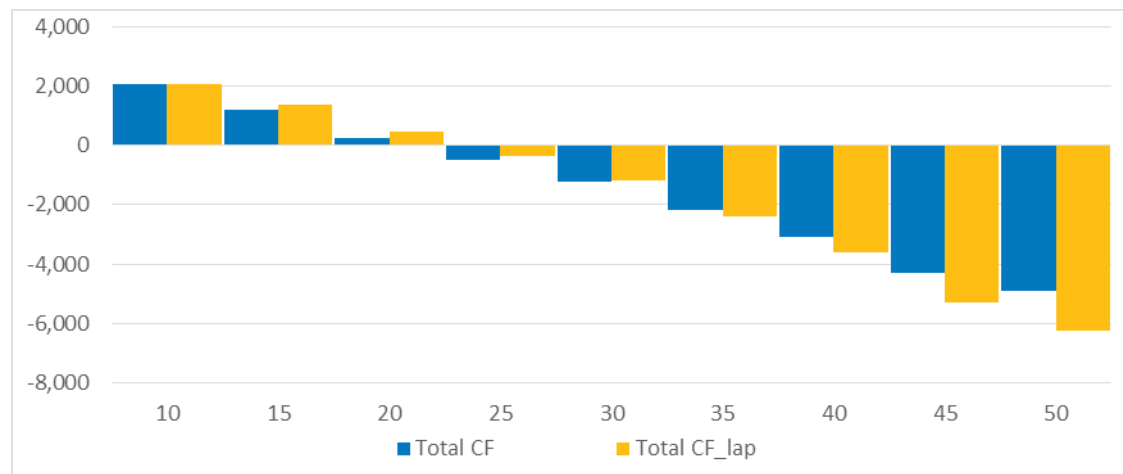
3.4.1 Sensitivity 1: Surrender Rate

The surrender rate is assumed to decrease by 20% starting at the end of projection year 10. The decrease is immediately recognized and assumed to be permanent, and the valuation assumptions are revised accordingly.

Cash Flow Projections

Figure 21 illustrates the change to net cash flows under the lapse sensitivity. Benefits decrease in the near term because cash paid on contract termination goes down. Benefits paid are higher later in the projection from the higher volume of persisting business.

Figure 21
UNIVERSAL LIFE SURRENDER SENSITIVITY: PRODUCT CASH FLOWS (in \$) BY PROJECTION YEAR



Total CF – Total Cash Flow

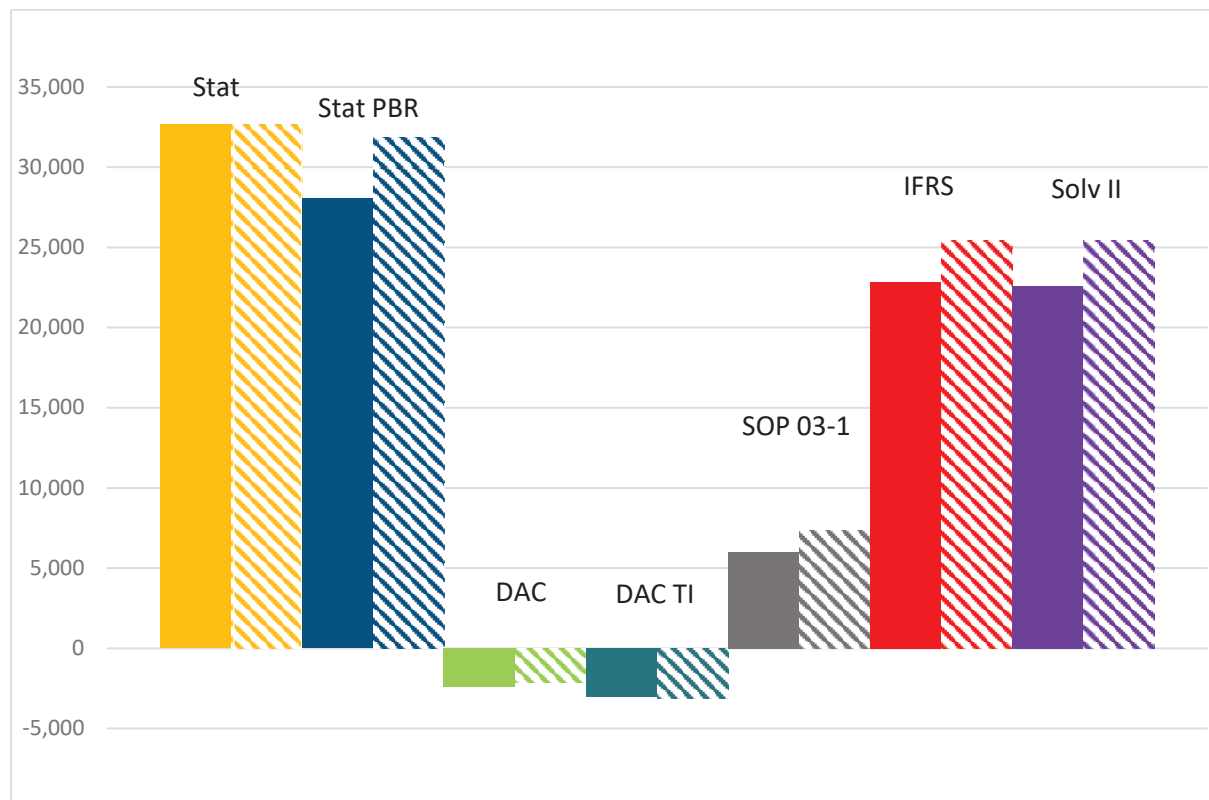
Total CF – Total Cash Flow with revised lapse rate

Liability Projections

Figure 22 shows the impact on the liabilities for each basis in the year of the assumption change. Solid colors represent the baseline results. For the two GAAP bases, the components of net GAAP liability are shown separately. The base reserve, which equals the account value, is not shown, as it is unchanged by the movement in risk-free rates.

Figure 22

UNIVERSAL LIFE SURRENDER SENSITIVITY (in \$): LIABILITY IMPACT FOR ALL BASES



The solid bars in the graph represent the baseline results, and the shaded bars represent the results of the sensitivity—in this case, a reduction in the surrender rates. Similar graphical presentation carries through the other sensitivity graphs in this paper.

- US statutory.** For non-PBR, the surrender assumption is prescribed, and changes in the best-estimate surrender rate do not affect the reserve. For PBR, the lower surrender rate increases projected benefits in the deterministic and stochastic projections and increases the reserve. The percentage increase is approximately the same for the DR and SR.
- US GAAP.** For current U.S. GAAP, the lower surrender rate increases projected excess benefits from the no-lapse guarantee feature, thereby increasing the SOP 03-1 liability. In addition, the higher projected excess benefits cause future estimated gross profits to decline, so the DAC balance, which is amortized in proportion to estimated gross profits, decreases. There is a second-order impact whereby the increase in the SOP 03-1 liability in year 10 reduces the estimated gross profits in that year, thereby reducing DAC amortization, somewhat mitigating the increase in net GAAP liability arising from the other two impacts.

For U.S. GAAP with proposed targeted Improvements, the impact on the SOP 03-1 liability is identical to the impact described for current GAAP. There is no impact on DAC in the year of the assumption change, as there is no cumulative catch-up in DAC amortization due to the expected change in surrender rates.

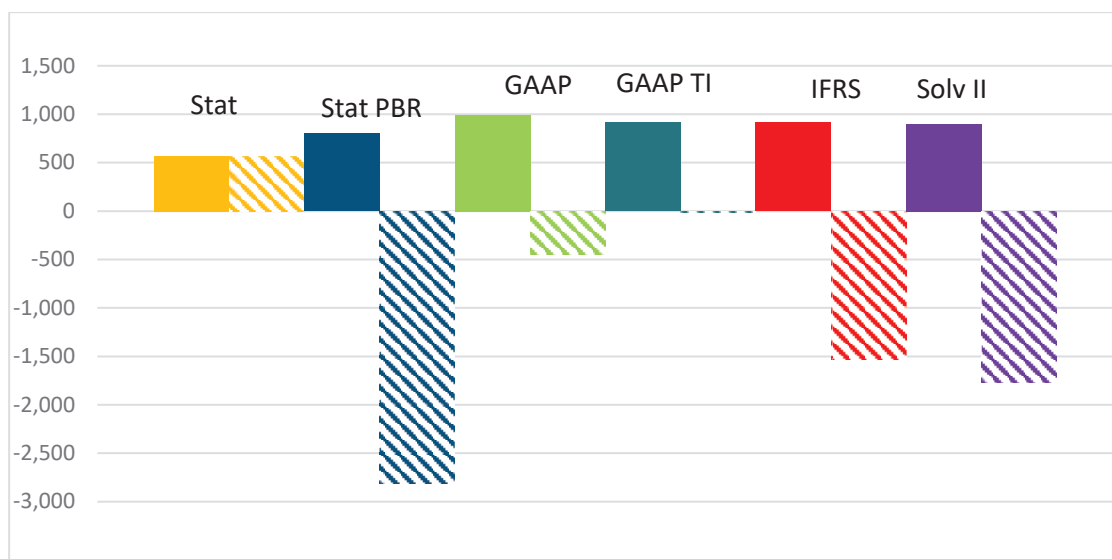
- IFRS and Solvency II.** The liability increases for both IFRS and Solvency II, due to the increase in fulfilment cash flows. For IFRS, the increase in fulfilment cash flows from the lapse decrease is offset by a decrease in the CSM. In this example, the increase in fulfilment cash flows exceeds the CSM, and the CSM goes to zero. Had the CSM been larger, it would have absorbed the entire impact of the change in fulfilment cash flows arising from the assumption change, and the change in liability (and earnings) would be eliminated.

Earnings Emergence

Figure 23 shows the income difference between the baseline and lapse sensitivity for all bases in projection year 10. Solid colors represent the baseline results.

Figure 23

UNIVERSAL LIFE SURRENDER SENSITIVITY: INCOME IMPACT (in \$) BY PROJECTION YEAR FOR ALL BASES



At the time of the assumption change at the end of year 10, income decreases from the increase in the liability for all bases except non-PBR statutory, where reserves are not affected by the lapse change. The income decrease is less for IFRS compared with Solvency II, as a portion of the IFRS reserve increase is offset by release of the CSM. Had the CSM been larger, the impact would have been even more muted and, at the extreme, eliminated entirely, had the CSM been large enough to absorb all of the change in fulfilment cash flows.

The income impact for the two GAAP bases are smaller than PBR, IFRS and Solvency II because the net liability under the GAAP bases is only indirectly affected by the change in the estimate of future cash flows through the DAC amortization and the SOP 03-1 liability. PBR and Solvency II, in contrast, reflect the increase in expected future benefit payments fully and immediately in the liability. The same is largely true for IFRS, because the CSM is too small to absorb much of the change in fulfilment cash flows. Had a more profitable product design been modeled, this might not have been true, and IFRS earnings might have shown little, if any, impact from the assumption change. The income impact is larger for current U.S. GAAP than for U.S. GAAP with targeted improvements because DAC amortization accelerates for current GAAP due to the cumulative catch-up aspect of an amortization method based on lifetime estimated gross profits. PBR is showing the largest decrease in earnings from the surrender rate decrease because it has a reserve increase that fully reflects the higher future cash flows using conservative assumptions.

3.4.2 Sensitivity 2: Risk-Free Rate

The risk-free rate is assumed to increase 1% at the end of year 10.

The study makes certain assumptions to perform this sensitivity test for the purposes of the illustration:

1. Assets are recorded as available for sale, which means the change in fair value of assets does not flow through net income but is recorded on the balance sheet through accumulated other comprehensive income. For U.S. GAAP and IFRS, the change in the market value of assets is recorded through other comprehensive income.
2. Under IFRS, the insurance company elects to have changes in projected fulfilment cash flows due to changes in the discount rate flow through other comprehensive income instead of regular income.

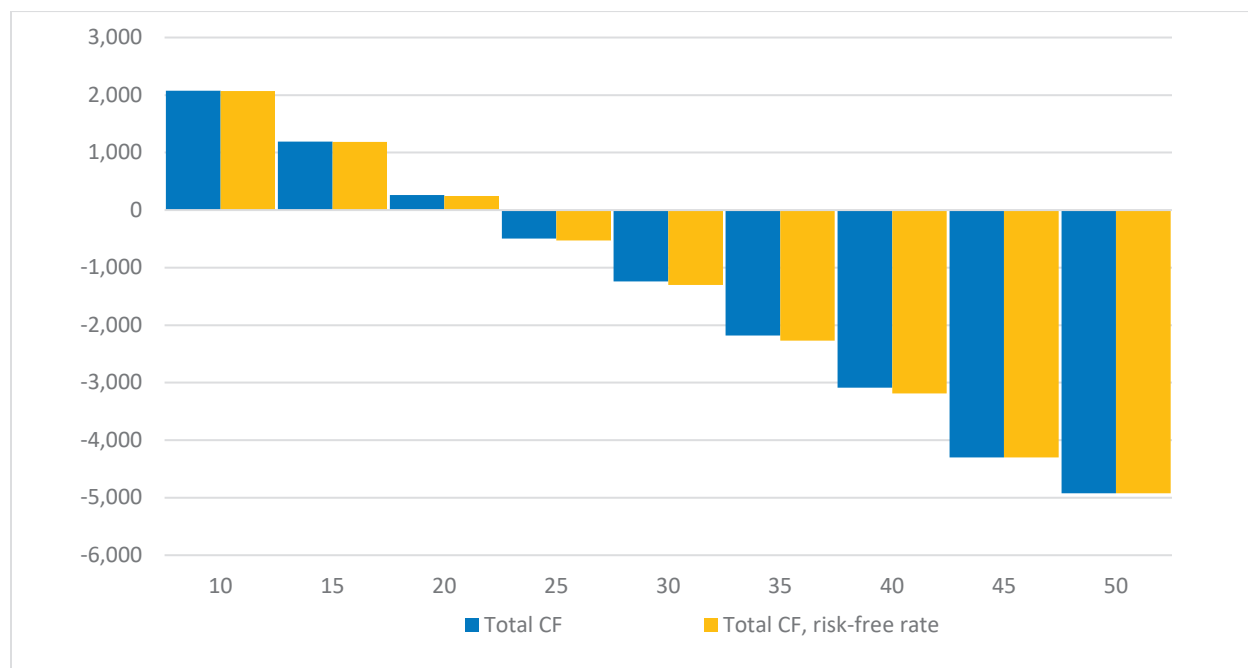
Figures 24 through 26 illustrate the cash flow and liability projections as well as earnings emergence under the baseline scenario and risk-free rate sensitivity.

Cash Flow Projections

Figure 24 illustrates the change to net product cash flows under the risk-free rate sensitivity. The product cash flows are affected indirectly by the impact of credited rates to the account value, which grows over time. The impact on cash flows is small, as the earned and credited rates gradually increase from the higher reinvestment rate. There is no change in cash flows in later years, when all benefits are from the no-lapse guarantee.

Figure 24

UNIVERSAL LIFE RISK-FREE RATE SENSITIVITY: LIABILITY CASH FLOWS (in \$) BY PROJECTION YEAR



Total CF – Total Cash Flow

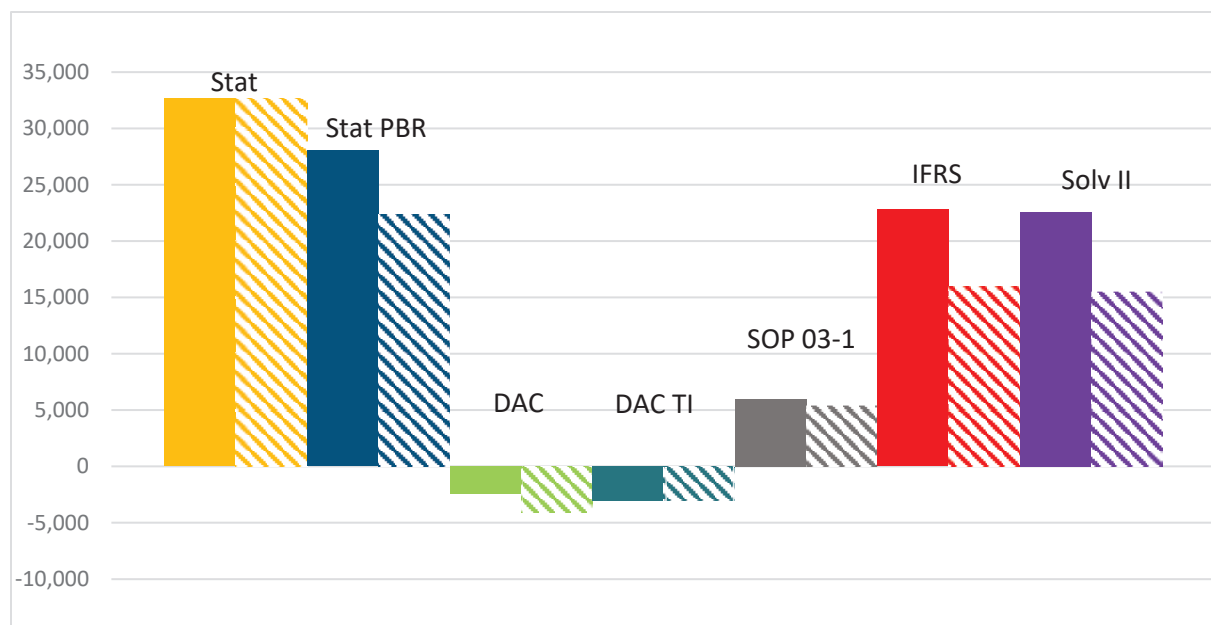
Total CF, risk-free rate – Total Cash Flow with revised risk-free rate

Net Liability Projections

Figure 25 shows the impact of the risk-free rate sensitivity on the net liability for each basis at the end of year 10. Solid colors represent the baseline results. For the two GAAP bases, the components of the net GAAP liability are shown

separately. The year 10 base reserve, which equals the account value, is not shown, as it is unchanged by the movement in risk-free rates.

Figure 25
UNIVERSAL LIFE RISK-FREE RATE SENSITIVITY: LIABILITY IMPACT (in \$) FOR ALL BASES



- US Statutory.** For non-PBR, the increase in risk-free rate has no impact on the statutory reserves, as valuation rates are locked in at issue. For PBR, the increase in the risk-free rate is modeled as a parallel shift in the interest rate scenarios used for the deterministic and stochastic reserve. The impact of a higher discount rate is more than the increase in benefits from the higher account values, resulting in a lower reserve. In our projections, the decrease in reserve was higher for the SR than the DR, although the SR was still higher than the DR. Had the NPR been the highest value, there would have been no impact from the interest rate change.
 - US GAAP.** For current U.S. GAAP, there is an increase in DAC from the increase in the risk-free rate as a result of higher account values from the projected earned rates, which increase crediting rates. In this example, discount rates for DAC amortization are locked in at contract issue, so there is no impact from the discount rate in the DAC value. The SOP 03-1 reserve decreases from the decrease in projected excess benefits and increased assessments from the higher account values. Shadow DAC and SOP 03-1 liabilities reflect the unrealized capital losses from the increase in interest rates.
- For U.S. GAAP with proposed targeted improvements, the risk-free rate change has no impact on DAC, as the change does not affect the term of the contracts. The impact to the SOP 03-1 reserve is the same as under current GAAP.
- IFRS and Solvency II.** The impact of higher discounts is more than the increase in benefits from the higher account values, resulting in a lower reserve.

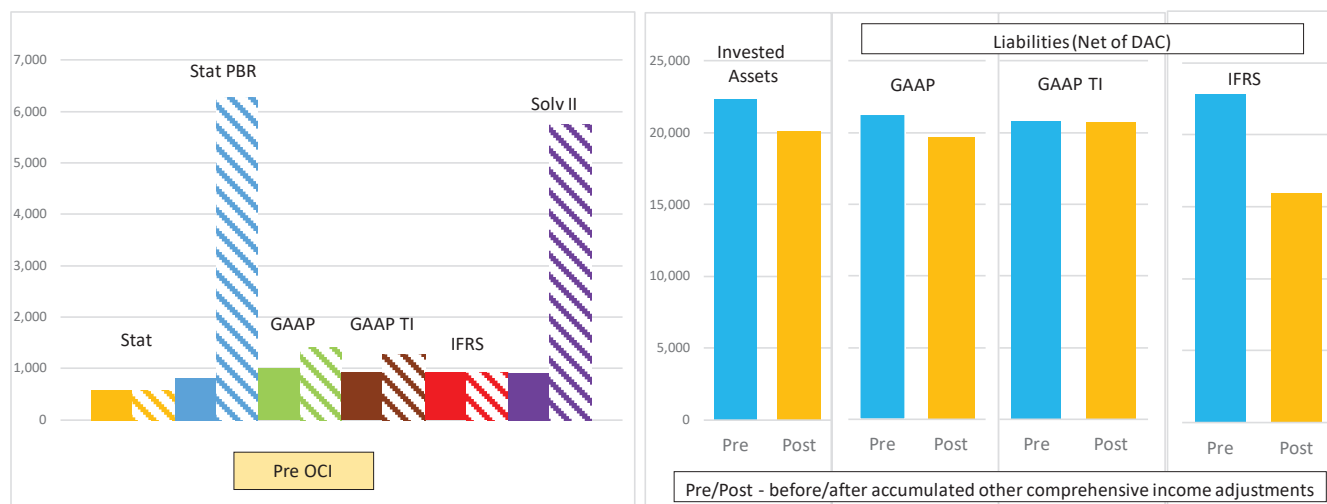
Earnings Emergence

Figure 26 highlights the changes in earnings in year 10. Solid colors in the earnings comparison chart represent the baseline results. The right panel shows the liabilities and assets with and without the balances recorded to accumulated other comprehensive income (OCI).

Figure 26**UNIVERSAL LIFE RISK-FREE RATE SENSITIVITY: EARNINGS IMPACT FOR ALL BASES**

Year 10 Earnings, Pre OCI

Year 10 Balance Sheet



At the time of the increase in the risk-free rate at the end of year 10, income increases substantially under PBR because the liability value declines with the increase in the discount rate. There is no change in the valuation basis of the assets to cause asset movements that would offset the liability increase. Conversely, because discount rates for liabilities are locked in under pre-PBR statutory rules, there is no immediate impact on statutory income or surplus when interest rates move.

The two U.S. GAAP analyses show relatively muted sensitivities. The liabilities are largely unchanged; the base contract reserve remains the account value, and the SOP 03-1 liability declines slightly due to the impact of higher projected asset returns on assessments and excess benefits. Assets are classified as available for sale, so income is not affected by the change in the fair value of assets that occurs with the increase in market rates. GAAP surplus, in contrast, falls as the impact of the decrease in the market value of assets, along with shadow DAC and shadow SOP 03-1 liability adjustments, is recorded to accumulated other comprehensive income. The income increase is larger for current U.S. GAAP than for GAAP with proposed targeted improvements because of the retrospective unlocking mechanism for amortizing DAC in proportion to EGPs under current GAAP. The higher interest rates generate an expectation of higher earnings in the future that serve to reallocate more of the DAC amortization to future periods. By contrast, DAC amortization is purely prospective under GAAP targeted improvements, so there is no impact on current-period DAC amortization from the change in market interest rates.

The changes to the balance sheet under IFRS 17 and to the market value balance sheet of Solvency II are quite similar. Under IFRS 17, we assume that all changes in future cash flows arising from the change in the risk-free rate are nondiscretionary (i.e., consistent with the company's established methodology for determining crediting rates that participate in the performance of underlying assets). This eliminates the impact of such changes from the reserve established after the risk-free rate moves. In addition, the company has elected to reflect movements in the liability due to changes in the discount rate through other comprehensive income, to align with the treatment of assets. This removes the remaining movement in liability values from net income resulting in no change in current period net income when risk-free rates rise. The balance sheet, in contrast, reflects the full carrying (fair) value of assets as well as the value of fulfillment cash flows discounted at a current rate. The resulting surplus differs from surplus prior to the increase in risk-free rates, reflecting the fact that the effects on assets and liabilities differ, primarily due to the difference between asset and liability durations.

3.4.3 Sensitivity 3: Mortality Rate

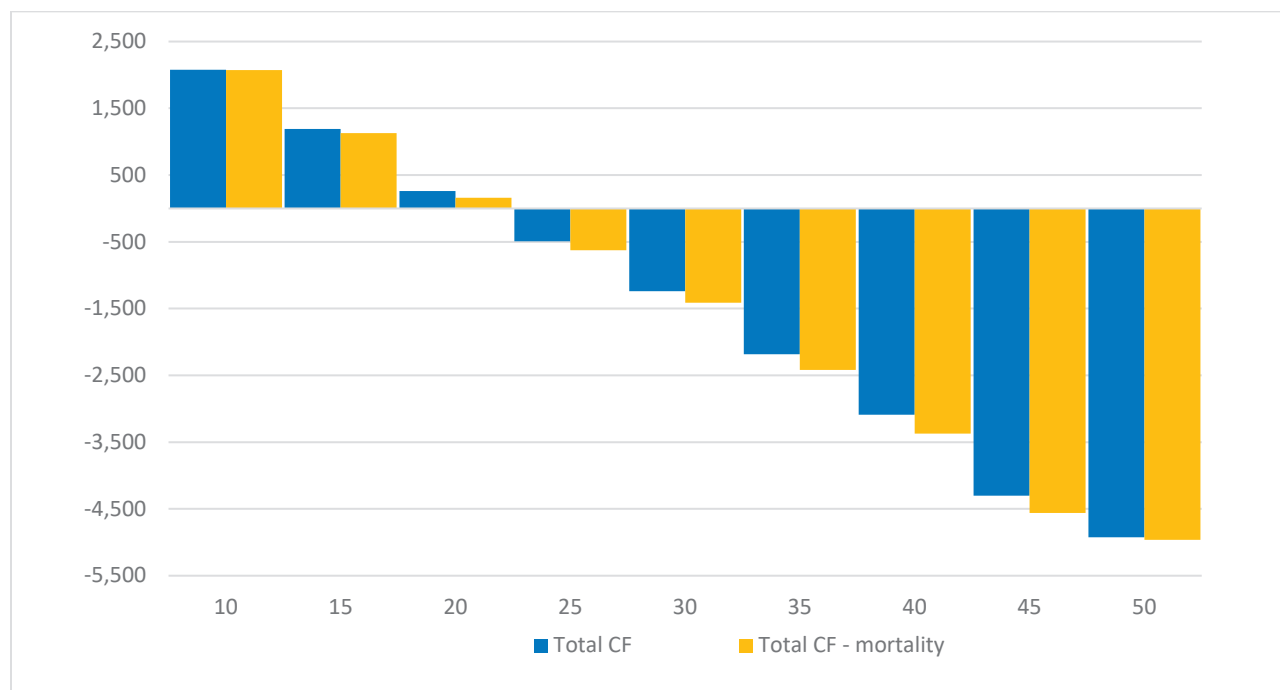
The mortality rate is assumed to increase 10% after year 10. The increase is immediately recognized and assumed to be permanent, and the valuation assumptions are revised accordingly.

Figures 27 to 29 illustrate the cash flow and liability projections and the earnings emergence under the baseline scenario and mortality sensitivity.

Cash Flow Projections

Figure 27 illustrates the change to net product cash flows under the mortality sensitivity. The higher death benefits decrease net cash inflows (premiums minus benefits minus expenses) in all years. They make the net cash flows less positive in years 15 and 20, when premiums exceed benefits and expenses, and more negative in the following years, when claims dominate the cash flows.

Figure 27
UNIVERSAL LIFE MORTALITY SENSITIVITY: PRODUCT CASH FLOWS (in \$)

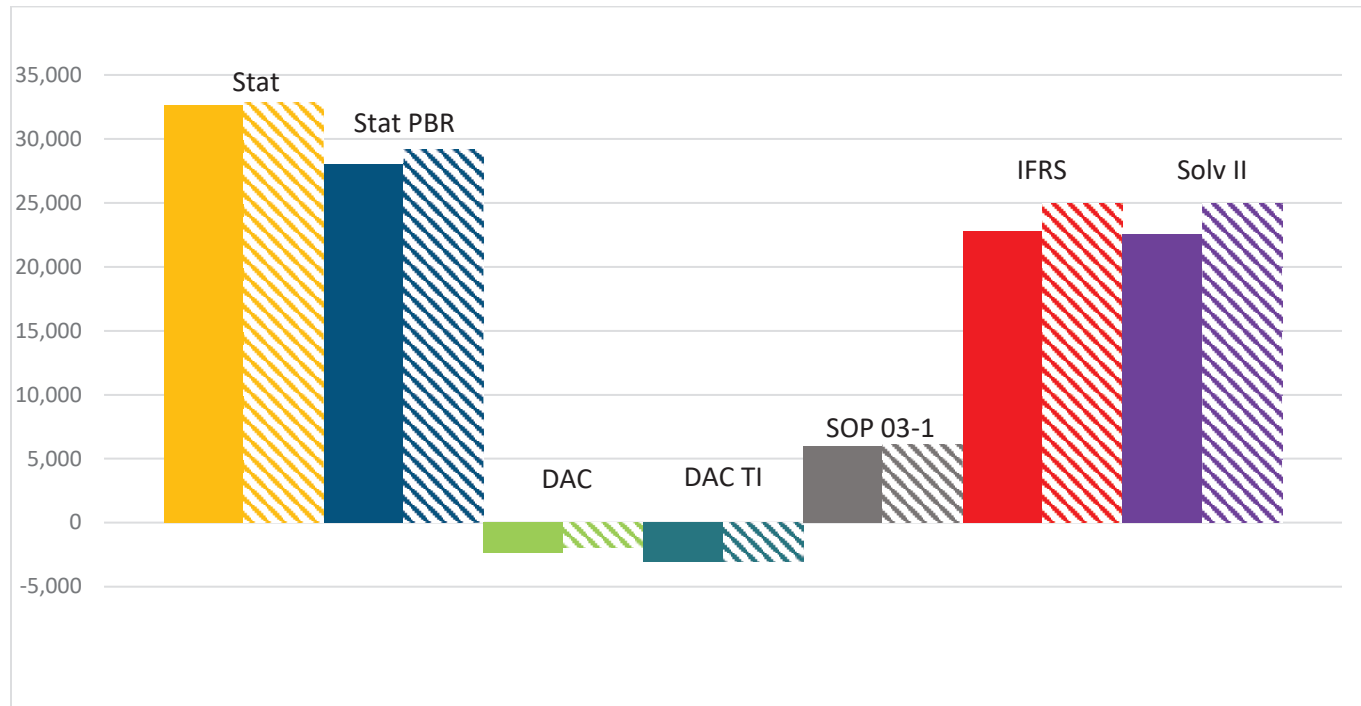


Liability Projections

Figure 28 shows the impact of the sensitivities on the net liability for each basis at the end of year 10. Solid colors represent the baseline results. For the two GAAP bases, the components of the net GAAP liability are shown separately. The year 10 base reserve, which equals the account value, is not shown as it is unchanged by the movement in mortality rates.

Figure 28

UNIVERSAL LIFE MORTALITY SENSITIVITY: LIABILITY IMPACT FOR ALL BASES



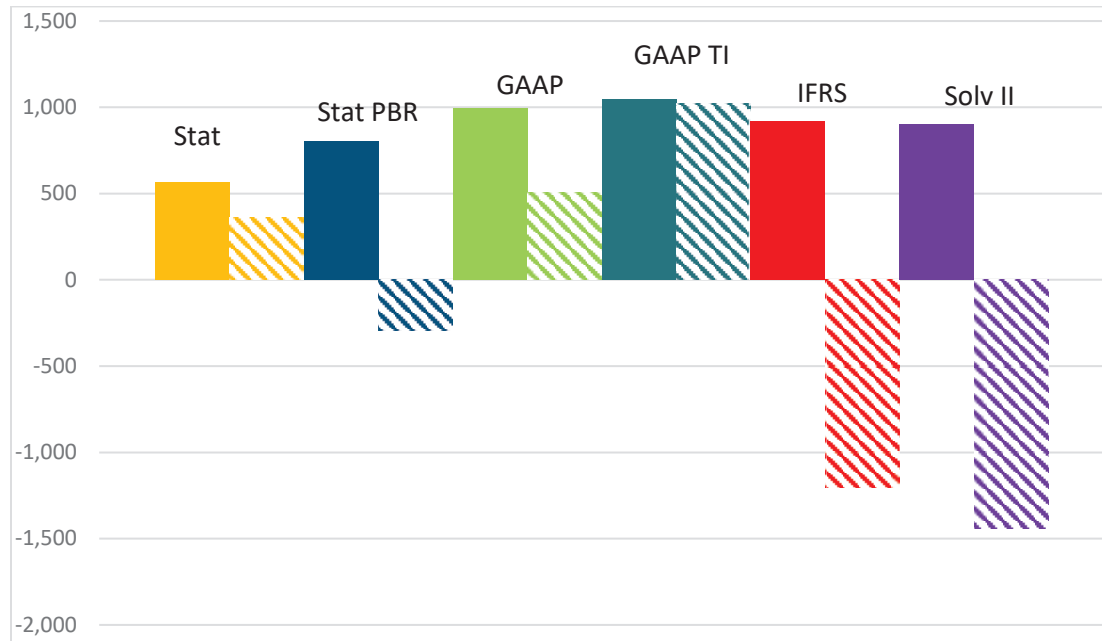
- US Statutory.** For non-PBR, the increase in mortality has a slight impact on the statutory reserve as X factors used in the alternative minimum reserve calculation are increased to match the increase in best-estimate mortality. For PBR, the increase in best-estimate mortality increases the PBR reserve. The reserve increase is less than for IFRS and Solvency II because PBR mortality is a blend of company best-estimate mortality and an industry table, and only company mortality has increased.
- US GAAP.** For current U.S. GAAP, there is a negative unlocking from the higher projected death benefits from the higher mortality rate. The SOP 03-1 reserve increases from the increase in excess benefits from the higher mortality. For U.S. GAAP with proposed targeted improvements, the impact on the SOP 03-1 liability is identical to the impact described for current GAAP. There is no impact on DAC in the year of the assumption change, as there is no cumulative catch-up in DAC amortization due to the expected change in mortality rates.
- IFRS and Solvency II.** The IFRS and Solvency II reserves increase due to an increase in fulfilment cash flows from the higher death benefits. For IFRS, the increase in fulfilment cash flows from the mortality increase is somewhat offset by a decrease in the CSM. In this example, the increase in fulfilment cash flows exceeds the CSM, and the CSM is floored at zero. Had the CSM been larger, the earnings impact from the change in fulfilment cash flows would have been offset entirely by the change in CSM.

Earnings Emergence

Figure 29 highlights the changes in earnings during year 10. Solid colors represent the baseline results.

Figure 29

UNIVERSAL LIFE MORTALITY SENSITIVITY: EARNINGS IMPACT FOR ALL BASES (in \$)



At the time of the mortality rate increase at the end of year 10, income decreases from the increase in the liability for all bases. The liability increase under IFRS is a consequence of the fact that the CSM prior to the assumption change is not high enough to absorb the entire change in fulfillment cash flows from the assumption change and, consequently, is floored at zero. Otherwise, the IFRS liability would have been unchanged from the change in mortality assumptions as well.

For the two U.S. GAAP bases, the earnings decrease is larger under U.S. GAAP pre-targeted improvements, from the decrease in DAC. The decrease in DAC is caused by the lower projection of future EGPs and the retrospective unlocking of DAC. This causes GAAP income to decrease. The decrease in GAAP income for GAAP with proposed targeted improvements reflects only the increase in the SOP 03-1 reserve. Under GAAP with proposed targeted improvements, the expectation of higher mortality in the future has no impact on the current period DAC balance; all assumption changes have a prospective impact only.

Section 4: Reliances and Limitations

4.1 Responsible Parties for Method and Assumptions

Keith Bucich, Robert Frasca and Bruce Rosner are responsible for this report. Preparation of this report and the analysis contained herein meet the Qualification Standards of the American Academy of Actuaries. Comments or questions regarding this report should be directed to Keith Bucich at 708 764 1295, Robert Frasca at 617 585 0799 or Bruce Rosner at 212 773 1190. They are available to provide certain supplemental information and explanation as requested.

4.2 Data and Qualitative Information

This report does not rely on external sources of data, as the inputs into the models used to generate the results discussed in the report were constructed to be illustrative, not necessarily realistic.

4.3 Other Limitations

The financial reporting frameworks used in this study are generally intended to reflect regulations and common practices in place on December 31, 2017.

Different insurance companies have different interpretations and applications of accounting standards. This is true of existing standards, such as U.S. GAAP and U.S. statutory accounting standards that have been around for years, and is even more pronounced in the interpretation of standards such as IFRS 17 and PBR, which have only recently been adopted. The interpretations adopted in preparing this report should not be viewed as suggestions that the accounting methods used are “right” or “wrong” but rather as illustrations of methods that are observed in the industry. Nothing within this report should be interpreted as constituting accounting advice.

In various instances, simplified assumptions and methods are used in preparing the analysis, but these simplifications may not be appropriate for actual financial reporting.

Appendix: Balance Sheets and Income Statements

A.1 Term Life

Table 4

US STATUTORY (2001 CSO)

	1	2	3	4	5	6	10	15	20
Consolidated statutory income statement									
Revenue									
(+) Gross premiums	17,500	14,872	13,083	11,900	11,061	10,280	7,665	2,551	1,399
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58
Total revenue	19,694	16,795	15,073	13,863	12,966	12,061	8,587	2,626	1,457
Benefits outgo									
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-
(-) Change in gross reserve	19,367	4,235	1,229	18	(1,514)	(2,750)	(7,089)	(4)	(1)
(-) Change in ceded reserve	-	-	-	-	-	-	-	-	-
Total benefits outgo	22,170	8,474	6,485	5,577	4,428	3,478	214	1,628	891
Expenses									
(-) Commissions	15,750	744	654	595	553	514	383	-	-
(-) Expense allowances	-	-	-	-	-	-	-	-	-
(-) Acquisition expense	12,700	-	-	-	-	-	-	-	-
(-) Other issuance expense	-	-	-	-	-	-	-	-	-
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39
(-) Financing expense	-	-	-	-	-	-	-	-	-
(-) Premium tax	350	297	262	238	221	206	153	51	28
Total expenses	30,600	2,601	2,316	2,132	2,006	1,887	1,479	113	67
Pre-tax income	(33,076)	5,720	6,272	6,154	6,531	6,696	6,894	886	498
Consolidated statutory balance sheet									
Assets									
Invested assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Alternate assets	-	-	-	-	-	-	-	-	-
Total assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Liability and surplus									
Gross reserve									
Basic statutory reserve	-	8,462	14,114	17,949	19,633	19,007	1,403	860	824
Deficiency statutory reserve	19,367	15,140	10,717	6,900	3,702	1,579	-	-	-
Target surplus	23,370	20,623	18,784	17,473	16,243	15,081	2,032	718	366
Total liability and surplus	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190

Table 5
US STATUTORY (2017 CSO)

	1	2	3	4	5	6	10	15	20
Consolidated statutory income statement									
Revenue									
(+) Gross premiums	17,500	14,872	13,083	11,900	11,061	10,280	7,665	2,551	1,399
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58
Total revenue	19,694	16,795	15,073	13,863	12,966	12,061	8,587	2,626	1,457
Benefits outgo									
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-
(-) Change in gross reserve	2,255	2,609	2,585	1,519	438	(466)	(3,523)	0	(5)
(-) Change in ceded reserve	-	-	-	-	-	-	-	-	-
Total benefits outgo	5,059	6,849	7,841	7,078	6,381	5,762	3,780	1,632	888
Expenses									
(-) Commissions	15,750	744	654	595	553	514	383	-	-
(-) Expense allowances	-	-	-	-	-	-	-	-	-
(-) Acquisition expense	12,700	-	-	-	-	-	-	-	-
(-) Other issuance expense	-	-	-	-	-	-	-	-	-
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39
(-) Financing expense	-	-	-	-	-	-	-	-	-
(-) Premium tax	350	297	262	238	221	206	153	51	28
Total expenses	30,600	2,601	2,316	2,132	2,006	1,887	1,479	113	67
Pre-tax income	(15,965)	7,345	4,916	4,653	4,579	4,413	3,328	882	502
Consolidated statutory balance sheet									
Assets									
Invested assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Alternate assets	-	-	-	-	-	-	-	-	-
Total assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Liability and surplus									
Gross reserve									
Basic statutory reserve	2,255	4,865	7,450	8,969	9,407	8,941	706	427	470
Target surplus	23,154	20,386	18,565	17,272	16,067	14,934	2,023	713	362
Total liability and surplus	25,409	25,251	26,015	26,241	25,474	23,875	2,730	1,139	831

Table 6
US STATUTORY: PBR

	1	2	3	4	5	6	10	15	20
Consolidated statutory income statement									
Revenue									
(+) Gross premiums	17,500	14,872	13,083	11,900	11,061	10,280	7,665	2,551	1,399
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58
Total revenue	19,694	16,795	15,073	13,863	12,966	12,061	8,587	2,626	1,457
Benefits outgo									
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-
(-) Change in gross reserve	-	-	-	-	-	-	-	-	-
(-) Change in ceded reserve	-	-	-	-	-	-	-	-	-
Total benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
Expenses									
(-) Commissions	15,750	744	654	595	553	514	383	-	-
(-) Expense allowances	-	-	-	-	-	-	-	-	-
(-) Acquisition expense	12,700	-	-	-	-	-	-	-	-
(-) Other issuance expense	-	-	-	-	-	-	-	-	-
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39
(-) Financing expense	-	-	-	-	-	-	-	-	-
(-) Premium tax	350	297	262	238	221	206	153	51	28
Total expenses	30,600	2,601	2,316	2,132	2,006	1,887	1,479	113	67
Pre-tax income	(13,709)	9,955	7,501	6,171	5,018	3,946	(195)	882	497
Consolidated statutory balance sheet									
Assets									
Invested assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Alternate assets	-	-	-	-	-	-	-	-	-
Total assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Liability and surplus									
Gross reserve									
Basic statutory reserve	-	-	-	-	-	-	-	-	-
Surplus	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Total liability and surplus	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190

Table 7
US GAAP

	1	2	3	4	5	6	10	15	20
Consolidated GAAP income statement									
Revenue									
(+) Gross premiums	17,500	14,872	13,083	11,900	11,061	10,280	7,665	2,551	1,399
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58
Total revenue	19,694	16,795	15,073	13,863	12,966	12,061	8,587	2,626	1,457
Benefits outgo									
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-
(-) Change in gross reserve	6,528	3,714	1,758	841	(32)	(795)	(3,711)	(92)	(48)
(-) Change in FAS113 reinsurance recoverable	-	-	-	-	-	-	-	-	-
Total benefit outgo	9,331	7,953	7,013	6,400	5,910	5,433	3,592	1,540	845
Expenses									
(-) Commissions	15,750	744	654	595	553	514	383	-	-
(-) Reinsurance allowance	-	-	-	-	-	-	-	-	-
(-) Acquisition expense	12,700	-	-	-	-	-	-	-	-
(-) Other issuance expense	-	-	-	-	-	-	-	-	-
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39
(-) Financing expense	-	-	-	-	-	-	-	-	-
(-) Premium tax	350	297	262	238	221	206	153	51	28
(-) Change in DAC asset	(24,556)	2,449	2,065	1,837	1,723	1,617	1,198	476	231
Total expenses	6,044	5,050	4,381	3,969	3,729	3,504	2,676	589	299
Pre-tax income	4,319	3,792	3,679	3,493	3,326	3,124	2,318	497	313

Consolidated GAAP balance sheet

Assets									
Invested assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Deferred acquisition cost asset	24,556	22,108	20,043	18,206	16,482	14,865	9,374	5,703	4,060
Total assets	67,293	66,332	63,659	60,527	56,060	50,532	12,809	7,281	5,251
Liability and surplus									
Gross reserve	6,528	10,242	12,000	12,841	12,809	12,014	1,890	1,200	873
Shareholder equity	60,765	56,090	51,659	47,687	43,251	38,518	10,919	6,081	4,378
Total liability and shareholder equity	67,293	66,332	63,659	60,527	56,060	50,532	12,809	7,281	5,251

Table 8
US GAAP WITH PROPOSED TARGETED IMPROVEMENTS

	0	1	2	3	4	5	6	10	15	20
Consolidated GAAP TI income statement										
Revenue										
(+) Gross premiums	17,500	14,872	13,083	11,900	11,061	10,280	7,665	2,551	1,399	
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58	
Total revenue	19,694	16,795	15,073	13,863	12,966	12,061	8,587	2,626	1,457	
Benefits outgo										
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893	
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-	
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-	
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-	
(-) Change in gross reserve	5,985	3,417	1,602	740	(59)	(758)	(3,452)	(72)	(38)	
(-) Change in FAS113 reinsurance recoverable	-	-	-	-	-	-	-	-	-	
Total benefit outgo	8,788	7,657	6,858	6,299	5,883	5,470	3,851	1,559	855	
Expenses										
(-) Commissions	15,750	744	654	595	553	514	383	-	-	
(-) Reinsurance allowance	-	-	-	-	-	-	-	-	-	
(-) Acquisition expense	12,700	-	-	-	-	-	-	-	-	
(-) Other issuance expense	-	-	-	-	-	-	-	-	-	
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39	
(-) Financing expense	-	-	-	-	-	-	-	-	-	
(-) Premium tax	350	297	262	238	221	206	153	51	28	
(-) Change in DAC asset	(24,304)	3,524	3,100	2,819	2,621	2,436	1,816	107	62	
Total expenses	6,296	6,125	5,416	4,951	4,626	4,323	3,295	220	129	
Pre-tax income	4,609	3,014	2,800	2,612	2,456	2,269	1,441	847	473	

Consolidated GAAP TI balance sheet

Assets										
Invested assets	48,753	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
FAS113 reinsurance recoverable	-	-	-	-	-	-	-	-	-	-
Deferred acquisition cost asset	28,450	24,304	20,780	17,680	14,861	12,240	9,804	1,667	867	475
Total assets	77,203	67,041	65,005	61,296	57,183	51,818	45,471	5,102	2,445	1,666
Liability and surplus										
Gross reserve	0	5,985	9,402	11,005	11,745	11,686	10,928	1,501	951	691
Shareholder equity	77,203	61,056	55,602	50,291	45,438	40,132	34,543	3,601	1,494	974
Total liability and shareholder equity	77,203	67,041	65,005	61,296	57,183	51,818	45,471	5,102	2,445	1,666

Table 9
IFRS 17

	1	2	3	4	5	6	10	15	20
Consolidated IFRS income statement									
Revenue									
(+) Expected claims	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(+) Expected expenses and premium taxes	2,350	2,028	1,811	1,673	1,579	1,491	1,183	118	70
(+) Release of risk adjustment	1,689	1,150	761	539	502	467	4,189	30	17
(+) Release of contractual service margin	400	275	186	135	125	116	847	7	4
(+) Release of acquisition expense	5,131	3,524	2,378	1,731	1,603	1,485	10,857	85	46
Insurance contract revenue	12,374	11,216	10,392	9,637	9,752	9,787	24,380	1,871	1,030
(+) Investment income	2,194	1,923	1,990	1,963	1,904	1,781	922	75	58
Total revenue	14,568	13,139	12,382	11,600	11,656	11,568	25,302	1,946	1,088
Benefits outgo									
(-) Death benefits outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
(-) Ceded death benefits outgo	-	-	-	-	-	-	-	-	-
(-) Surrender benefits outgo	-	-	-	-	-	-	-	-	-
(-) Partial withdrawal outgo	-	-	-	-	-	-	-	-	-
Total benefit outgo	2,803	4,239	5,256	5,559	5,942	6,228	7,303	1,632	893
Expenses									
(-) Commissions	-	-	-	-	-	-	-	-	-
(-) Reinsurance allowance	-	-	-	-	-	-	-	-	-
(-) Acquisition expense	-	-	-	-	-	-	-	-	-
(-) Other issuance expense	-	-	-	-	-	-	-	-	-
(-) Maintenance expense	1,800	1,560	1,400	1,299	1,231	1,167	942	62	39
(-) Financing expense	-	-	-	-	-	-	-	-	-
(-) Premium tax	350	297	262	238	221	206	153	51	28
(-) Acquisition expense amortization	5,131	3,524	2,378	1,731	1,603	1,485	10,857	85	46
(-) Interest accretion	(1,192)	(835)	(591)	(424)	(295)	(205)	(176)	(220)	(169)
Total expenses	6,090	4,547	3,449	2,843	2,761	2,653	11,777	(23)	(55)
Pre-tax income	5,675	4,353	3,677	3,198	2,953	2,686	6,222	337	251
Consolidated IFRS balance sheet									
Assets									
Invested assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Total assets	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190
Liability and surplus									
PV of fulfillment cashflows	(31,075)	(24,048)	(19,277)	(15,629)	(12,937)	(11,094)	(11,471)	(6,857)	(4,892)
Risk adjustment	9,561	8,411	7,650	7,111	6,609	6,142	738	261	151
Contractual service margin	2,129	1,854	1,669	1,534	1,409	1,293	147	47	24
Ceded PV of fulfillment cashflows	-	-	-	-	-	-	-	-	-
Ceded risk adjustment	-	-	-	-	-	-	-	-	-
Ceded contractual service margin	-	-	-	-	-	-	-	-	-
Shareholder equity	62,122	58,008	53,574	49,306	44,497	39,326	14,021	8,126	5,907
Total liability and shareholder equity	42,737	44,225	43,616	42,322	39,578	35,667	3,435	1,578	1,190

A.2 Universal Life

Table 10
US STATUTORY (2001 CSO)

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated statutory income statement														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	165	348	530	711	890	1,685	2,372	2,918	3,298	3,482	3,273	2,775	1,954	878
Total revenue	4,535	4,586	4,640	4,696	4,754	4,990	5,191	5,309	5,306	5,143	4,610	3,795	2,658	1,272
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Partial withdrawals	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Increase in Statutory reserve	3,368	4,014	4,009	3,981	3,946	3,344	2,773	2,175	1,320	520	-1,402	-2,752	-4,126	-5,000
Total benefits	3,451	4,159	4,206	4,247	4,318	4,214	4,080	4,020	3,570	3,201	1,932	1,207	770	254
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Financing expense	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
Total expenses	5,198	430	420	411	402	359	320	285	251	219	186	149	109	64
Pre-tax income	-4,113	-3	14	38	34	417	791	1,004	1,485	1,723	2,492	2,438	1,779	954
Consolidated statutory balance sheet														
Assets														
Invested assets	3,751	7,898	12,041	16,155	20,233	38,286	53,908	66,322	74,957	79,136	74,378	63,063	44,409	19,960
Total assets	3,751	7,898	12,041	16,155	20,233	38,286	53,908	66,322	74,957	79,136	74,378	63,063	44,409	19,960
Liability and surplus														
Statutory reserve	3,368	7,381	11,391	15,372	19,318	36,788	51,907	63,922	72,286	76,343	71,766	60,855	42,855	19,257
Deficiency statutory reserve	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Target surplus	383	517	651	783	915	1,498	2,002	2,399	2,671	2,793	2,612	2,208	1,554	703
Total liability and capital	3,751	7,898	12,041	16,155	20,233	38,286	53,908	66,322	74,957	79,136	74,378	63,063	44,409	19,960

Table 11
US STATUTORY (2017 CSO)

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated statutory income statement														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	141	303	462	622	781	1,497	2,131	2,663	3,076	3,344	3,233	2,826	2,092	1,057
Total revenue	4,512	4,541	4,573	4,607	4,645	4,802	4,950	5,054	5,085	5,006	4,570	3,846	2,796	1,451
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Partial withdrawals	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Increase in Statutory reserve	2,843	3,551	3,519	3,507	3,502	3,001	2,641	2,118	1,580	903	-984	-2,329	-3,816	-4,904
Total benefits	2,926	3,696	3,716	3,773	3,874	3,872	3,948	3,962	3,830	3,584	2,349	1,631	1,079	350
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Financing expense	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
Total expenses	5,198	430	420	411	402	359	320	285	251	219	186	149	109	64
Pre-tax income	-3,613	415	437	423	369	572	682	807	1,003	1,203	2,035	2,065	1,608	1,037
Consolidated statutory balance sheet														
Assets														
Invested assets	3,208	6,876	10,511	14,135	17,753	34,021	48,423	60,526	69,919	76,008	73,472	64,225	47,546	24,014
Total assets	3,208	6,876	10,511	14,135	17,753	34,021	48,423	60,526	69,919	76,008	73,472	64,225	47,546	24,014
Liability and surplus														
Statutory reserve	2,843	6,394	9,913	13,420	16,923	32,669	46,608	58,324	67,419	73,321	70,891	61,977	45,885	23,173
Deficiency statutory reserve	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Target surplus	365	482	598	715	831	1,352	1,815	2,202	2,500	2,687	2,581	2,248	1,661	841
Total liability and capital	3,208	6,876	10,511	14,135	17,753	34,021	48,423	60,526	69,919	76,008	73,472	64,225	47,546	24,014

Table 12
US STATUTORY: PBR

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated statutory income statement														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	4,568	4,556	4,541	4,533	4,536	4,592	4,640	4,640	4,573	4,422	4,141	3,654	2,765	1,541
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Partial withdrawals	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Increase in Statutory reserve	4,091	2,622	2,511	2,564	2,735	2,555	2,196	1,657	1,185	650	-167	-1,069	-3,320	-4,262
Total benefits	4,174	2,768	2,707	2,830	3,107	3,426	3,503	3,501	3,435	3,332	3,166	2,890	1,576	993
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Financing expense	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
Total expenses	5,198	430	420	411	402	359	320	285	251	219	186	149	109	64
Pre-tax income	-4,804	1,358	1,414	1,292	1,026	808	817	854	886	871	789	614	1,081	484

Consolidated statutory balance sheet

Assets														
Invested assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Total assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Liability and surplus														
Statutory reserve	4,091	6,713	9,224	11,788	14,523	28,054	39,820	49,236	56,181	60,503	61,474	57,765	45,216	25,148
Deficiency statutory reserve	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Target surplus	409	493	574	657	746	1,190	1,575	1,881	2,103	2,235	2,249	2,099	1,638	911
Total liability and capital	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059

Table 13
US GAAP

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated U.S. GAAP income statement (FAS60 presentation)														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	4,568	4,556	4,541	4,533	4,536	4,592	4,640	4,640	4,573	4,422	4,141	3,654	2,765	1,541
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Increase in GAAP reserve	2,725	2,633	2,571	2,518	2,461	2,163	1,869	1,456	1,099	697	88	-487	-3,086	-4,156
Total benefits	2,808	2,778	2,767	2,784	2,833	3,033	3,176	3,300	3,349	3,378	3,422	3,472	1,809	1,098
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
(-) Decrease in DAC	-4,541	249	270	273	255	201	169	124	88	17	0	0	0	0
Total expenses	657	679	690	684	657	560	489	408	340	235	186	149	109	64
Pre-tax income	1,104	1,099	1,084	1,064	1,046	1,000	975	931	884	808	533	32	847	379

Consolidated U.S. GAAP balance sheet

Assets														
Invested assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Deferred acquisition cost asset	4,541	4,292	4,022	3,749	3,494	2,400	1,495	770	242	0	0	0	0	0
Total assets	9,041	11,499	13,821	16,194	18,764	31,644	42,890	51,888	58,526	62,738	63,723	59,864	46,854	26,059
Liability and shareholder equity														
GAAP reserve	2,725	5,358	7,928	10,447	12,907	24,339	34,279	42,437	48,730	52,986	54,746	53,329	43,473	24,361
Equity	6,316	6,141	5,892	5,748	5,857	7,305	8,611	9,450	9,796	9,752	8,978	6,535	3,381	1,698
Total liability and shareholder equity	9,041	11,499	13,821	16,194	18,764	31,644	42,890	51,888	58,526	62,738	63,723	59,864	46,854	26,059

Consolidated U.S. GAAP income statement (FAS97 presentation)

Revenue														
(+) Surrender charge	86	150	211	230	205	113	53	1	0	0	0	0	0	0
(+) Expense charges	2,069	1,964	1,864	1,769	1,680	1,296	1,000	770	587	441	321	219	0	0
(+) COI charges	90	158	213	244	269	426	604	953	1,296	1,763	2,617	3,896	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	2,443	2,589	2,719	2,791	2,825	3,121	3,479	3,973	4,447	4,964	5,742	6,749	2,765	1,541
Benefits and Expenses														
(-) Interest credited	104	131	183	232	279	489	646	738	753	677	486	137	0	0
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
(-) NAR death benefits	82	144	194	222	245	388	551	869	1,183	1,613	2,406	3,611	4,895	5,254
(-) Decrease in DAC	-4,541	249	270	273	255	201	169	124	88	17	0	0	0	0
(-) SOP 03-1 reserve increase	497	536	569	589	598	686	818	1,026	1,288	1,631	2,131	2,819	-3,086	-4,156
Total expenses	1,340	1,490	1,635	1,726	1,779	2,122	2,503	3,042	3,564	4,156	5,209	6,717	1,918	1,162
Pre-tax income	1,104	1,099	1,084	1,064	1,046	1,000	975	931	884	808	533	32	847	379

Table 14
US GAAP WITH PROPOSED TARGETED IMPROVEMENTS

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated U.S. GAAP income statement (FAS60 presentation) - Proposed Targeted Improvements														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	4,568	4,556	4,541	4,533	4,536	4,592	4,640	4,640	4,573	4,422	4,141	3,654	2,765	1,541
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Increase in GAAP reserve	2,725	2,633	2,571	2,518	2,461	2,163	1,869	1,456	1,099	697	88	-487	-3,086	-4,156
Total benefits	2,808	2,778	2,767	2,784	2,833	3,033	3,176	3,300	3,349	3,378	3,422	3,472	1,809	1,098
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
(-) Decrease in DAC	-4,562	191	185	180	174	149	127	108	90	75	60	46	32	18
Total expenses	636	621	606	590	576	508	447	392	342	294	246	195	140	81
Pre-tax income	1,124	1,157	1,168	1,158	1,127	1,051	1,017	947	882	750	473	-14	816	361
Consolidated U.S. GAAP balance sheet - Proposed Targeted Improvements														
Assets														
Invested assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Deferred acquisition cost asset	4,562	4,371	4,186	4,006	3,832	3,038	2,360	1,784	1,298	893	562	304	117	0
Total assets	9,062	11,578	13,984	16,451	19,102	32,282	43,755	52,901	59,582	63,630	64,286	60,168	46,971	26,059
Liability and shareholder equity														
GAAP reserve	2,725	5,358	7,928	10,447	12,907	24,339	34,279	42,437	48,730	52,986	54,746	53,329	43,473	24,361
Equity	6,337	6,220	6,056	6,005	6,194	7,943	9,476	10,464	10,852	10,645	9,540	6,839	3,498	1,698
Total liability and shareholder equity	9,062	11,578	13,984	16,451	19,102	32,282	43,755	52,901	59,582	63,630	64,286	60,168	46,971	26,059

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated U.S. GAAP income statement (FAS97 presentation) - Proposed Targeted Improvements														
Revenue														
(+) Surrender charge	86	150	211	230	205	113	53	1	0	0	0	0	0	0
(+) Expense charges	2,069	1,964	1,864	1,769	1,680	1,296	1,000	770	587	441	321	219	0	0
(+) COI charges	90	158	213	244	269	426	604	953	1,296	1,763	2,617	3,896	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	2,443	2,589	2,719	2,791	2,825	3,121	3,479	3,973	4,447	4,964	5,742	6,749	2,765	1,541
Benefits and Expenses														
(-) Interest credited	104	131	183	232	279	489	646	738	753	677	486	137	0	0
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
(-) NAR death benefits	82	144	194	222	245	388	551	869	1,183	1,613	2,406	3,611	4,895	5,254
(-) Decrease in DAC	-4,562	191	185	180	174	149	127	108	90	75	60	46	32	18
(-) SOP 03-1 reserve increase	497	536	569	589	598	686	818	1,026	1,288	1,631	2,131	2,819	-3,086	-4,156
Total expenses	1,319	1,432	1,550	1,633	1,698	2,070	2,462	3,026	3,566	4,215	5,269	6,763	1,950	1,180
Pre-tax income	1,124	1,157	1,168	1,158	1,127	1,051	1,017	947	882	750	473	-14	816	361

Table 15
IFRS 17

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated IFRS income statement														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	4,568	4,556	4,541	4,533	4,536	4,592	4,640	4,640	4,573	4,422	4,141	3,654	2,765	1,541
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Increase in PV of fulfillment cashflows	-1,690	3,072	3,043	2,995	2,906	2,513	2,164	1,677	1,273	772	-61	-1,064	-2,731	-4,070
(-) Increase in risk adjustment	-68	-72	-70	-68	-66	-57	-50	-45	-41	-37	-36	-36	-36	-31
(-) Increase in contractual service margin	-31	-28	-25	-23	-21	-14	-10	-8	-6	-5	-4	-3	-2	-1
Total benefits	-1,706	3,118	3,145	3,171	3,191	3,312	3,411	3,469	3,477	3,411	3,232	2,857	2,126	1,152
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
Total expenses	5,198	430	420	411	402	359	320	285	251	219	186	149	109	64
Pre-tax income	1,076	1,008	977	951	943	921	910	886	845	791	723	648	530	325
Consolidated IFRS balance sheet														
Assets														
Invested assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Total assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Liability and shareholder equity														
PV of fulfillment cashflows	-4,555	-1,483	1,561	4,556	7,462	20,806	32,324	41,762	49,041	53,884	55,419	52,071	42,215	24,180
Risk adjustment	2,363	2,291	2,222	2,154	2,088	1,784	1,519	1,284	881	698	517	336	167	
Contractual service margin	403	375	349	326	305	222	165	122	90	63	42	25	13	5
Equity	6,289	6,023	5,667	5,409	5,415	6,431	7,386	7,949	8,080	7,909	7,564	7,252	4,290	1,708
Total liability and shareholder equity	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059

Table 16
SOLVENCY II

	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Consolidated Solvency II income statement														
Revenue														
(+) Premiums	4,370	4,239	4,110	3,985	3,864	3,305	2,819	2,391	2,008	1,661	1,337	1,020	704	394
(+) Investment income	198	317	431	548	672	1,287	1,821	2,249	2,565	2,760	2,804	2,634	2,062	1,147
Total revenue	4,568	4,556	4,541	4,533	4,536	4,592	4,640	4,640	4,573	4,422	4,141	3,654	2,765	1,541
Benefits														
(-) Death benefits	83	145	197	227	251	409	598	973	1,360	1,879	2,755	3,790	4,895	5,254
(-) Surrender benefits	0	0	0	39	121	462	709	871	891	803	579	170	0	0
(-) Increase in best-estimate liability	-1,690	3,072	3,043	2,995	2,906	2,513	2,164	1,677	1,273	772	-61	-1,064	-2,731	-4,070
(-) Increase in risk adjustment	-68	-72	-70	-68	-66	-57	-50	-45	-41	-37	-36	-36	-36	-31
(-) Increase in contractual service margin	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total benefits	-1,675	3,146	3,170	3,194	3,212	3,326	3,421	3,477	3,483	3,416	3,236	2,860	2,128	1,153
Expenses														
(-) Commissions	3,933	170	164	159	155	132	113	96	80	66	53	41	28	16
(-) Acquisition expense	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
(-) Maintenance expenses	177	176	174	172	170	160	151	141	131	119	106	88	66	40
(-) Premium tax	87	85	82	80	77	66	56	48	40	33	27	20	14	8
Total expenses	5,198	430	420	411	402	359	320	285	251	219	186	149	109	64
Pre-tax income	1,045	980	951	928	922	907	899	879	839	787	719	645	528	324
Consolidated Solvency II balance sheet														
Assets														
Invested assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Total assets	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059
Liability and shareholder equity														
PV of fulfillment cashflows	-4,555	-1,483	1,561	4,556	7,462	20,806	32,324	41,762	49,041	53,884	55,419	52,071	42,215	24,180
Risk adjustment	2,363	2,291	2,222	2,154	2,088	1,784	1,519	1,284	1,074	881	698	517	336	167
Contractual service margin	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equity	6,692	6,398	6,016	5,735	5,720	6,654	7,551	8,071	8,169	7,973	7,606	7,277	4,303	1,713
Total liability and shareholder equity	4,500	7,207	9,798	12,445	15,270	29,244	41,395	51,117	58,284	62,738	63,723	59,864	46,854	26,059

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