IASB Insurance Contracts Earnings Emergence

February 2014

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I. Executive Summary

This is our report on the research we performed to analyze the impact of the proposals in the International Accounting Standards Board's (IASB's) Re-Exposure Draft, Insurance Contracts, issued in June 2013 (IASB ED). It illustrates differences in income emergence for new business projections between current US GAAP and the proposed standard for a sample of 12 products. Additionally, it shows the impact on income emergence of various sensitivity tests. These sensitivity tests seek to investigate the impact of:

•   Stressed economic and demographic scenarios

•   Various interpretations of aspects of the proposed guidance

•   Applying several key elements of the proposed guidance from the Exposure Draft issued by the Financial Accounting Standards Board (FASB), also issued in June 2013.

The results illustrate differences in income emergence graphically along with narrative descriptions of the drivers for any differences.

On the whole, we observe significant differences in the emergence of income between current US GAAP and the proposed framework. For the products studied in this research project, income emergence under current US GAAP is driven by either premiums or estimated gross profits (depending on the product US GAAP classification). However, income emergence under the proposed standard depends on the selected risk adjustment and contractual service margin (CSM) drivers.

We noted several key observations on the profit emergence under the proposed framework:

- Different drivers for contractual service margin amortization produce different profit emergence patterns.
- The use of other comprehensive income (OCI) for changes in the liability discount rate reduces income statement volatility under the new framework, transferring that volatility to equity in cases where assets and liabilities are not well matched.
- Unlocking the margin for changes in demographic assumptions reduces income statement volatility.
- The definition of asset-dependent and non-asset-dependent cash flows for products with discretionary participation features (e.g., participating whole life, universal life, etc.) impacts the income emergence pattern and produces equity volatility when the accounting treatment for assets and liabilities is different.

Since the studies are performed on blocks of new business, transition requirements have not been tested under this exercise. Testing of transition and impacts on in-force blocks of business and presentation and disclosure requirements remain an opportunity for the SOA and its members to analyze.

The individual product results are included in the body of this report, and a description of the risk adjustment approach used in this exercise is included as Appendix B.

II. Reliances and Limitations

II.A. Responsible Party for Methods and Assumptions

Tara Hansen and Rodrigo Careaga are responsible for this report. We meet the Qualification Standards of the American Academy of Actuaries to perform this engagement and provide the findings contained herein. Comments or questions regarding this report should be directed to Tara Hansen at (212) 773-2329 or Rodrigo Careaga at (312) 879-3418, who are also available to provide certain supplemental information and/or explanation as requested.

II.B. Data and Qualitative Information

Data provided by participating companies was limited to financial projections under US GAAP, US statutory and the proposed IASB Exposure Draft (ED) standards. We performed analytics and reasonability checks on the data provided to us, including calculating the discounted value of the cash flows. We did not validate the actuarial models used to project the cash flows and statement balances under the above-mentioned reporting frameworks. We relied on participating companies to validate actuarial models and underlying assumptions used in this study.

III. Introduction

III.A.   Background and Objectives

The International Accounting Standards Board (IASB) is working to produce a new standard for insurance contracts for general purpose financial reporting. The IASB issued for public comment an updated Exposure Draft on June 20, 2013. This revised IASB ED builds upon proposals published in 2010, and reflects feedback received during the public consultation period that followed the publication of the 2010 proposal.

In response to the IASB ED publication, the SOA's Financial Reporting Section recruited a number of actuarial task forces (ATFs) to model the impact of the proposed International Financial Reporting Standard (IFRS) for various product lines. ATFs are working groups comprised of company actuaries who modeled cash flows and select balances under existing and proposed standards and any alternatives using insurance product data of their individual companies or their clients.

The research analyzes the impact of moving from the current US GAAP standards to the IASB proposal, as well as studying a few key areas where the FASB proposal differs from the IASB proposal in their latest respective EDs.

There are ultimately two goals for this project:

1. To assist the American Academy of Actuaries (the Academy) or members of the Society of Actuaries (the SOA) in developing their opinions and commenting to the IASB on the ED.

2. To educate practicing actuaries on the key issues and impacts of the proposed standard.

This study does not address the earned premium presentation of income proposed in the ED.

This report summarizes the results from the study, and analyzes the practical implications of the proposed standard in the following areas:

1. Discount rate development—"top down" vs. "bottom up"

2. Treatment of participating products

3. Explicit risk adjustment and CSM vs. FASB margin

4. Definition of qualifying acquisition expenses (successful vs. unsuccessful)

5. Unlocking of the CSM.

6. CSM amortization methods

7. Volatility caused by:

    a. Discount rates on assets and/or liabilities

    b. Demographic experience emerging differently than expected

    c. Changes to demographic valuation assumptions

8. Use of other comprehensive income in income statement presentation.

III.B.   Project Approach

The research project followed a phased approach:

Phase	Primary Activities
1. Pre-planning	• Determined which products will be modeled • Developed format for model outputs
2. Planning and kick-off	• Developed approach to analyze product profit objectives • Provided approach for deriving baseline assumptions • Recommended sensitivity tests • Recommended IASB areas to be tested
3. ATF modeling—stage 1	• Generated stochastic scenarios • Set up projection systems per specifications • Pricing modeling • Baseline model runs under IASB and current US GAAP • Compilation of initial results • Initial analysis of results
4. ATF modeling—stage 2	• Stage 1 re-runs • Sensitivity model runs • Compilation of results • Analysis of results
5. Analysis and summary of findings	• Compiled and analyzed results

III.C.   Product Selection

The ATFs modeled the following products as part of this study:

1. Individual Life Products

    a. Participating whole life (Par WL)

    b. Term life (Term)

    c. Universal life (UL)

    d. Universal life with secondary guarantee (ULSG)

    e. Variable universal life (VUL)

2. Individual Annuity Products

    a. Fixed indexed annuity (FIA)

    b. Single premium deferred annuity (SPDA)

    c. Single premium immediate annuity (SPIA)

    d. Variable annuity (VA)

3. Accident and Health Products

    a. Cancer

    b. Long-term care (LTC)

    c. Medicare supplement (MedSupp)

III.D.   Project Methodology

The baseline scenario follows a set of general guidelines for all products as well as more specific guidelines for certain products. The guidelines are generally intended for valuation purposes, but in certain cases apply to projected experience as well for the purpose of calculating future balance sheets and income statements.

The following are key guidelines used in the study:

Guideline	Description
1. General	• New business projections only • May be seriatim or grouped policies • Results presented on a policy year basis including day-one activity • Assets assumed to be designated as available for sale with the market value of the assets shown on the balance sheet and the change in the book value of the assets shown in the income statement
2. Pricing target	• ATFs chose product-specific pricing targets that they viewed to be common industry returns consistent with the baseline economic scenario (described below).

3. Economic assumptions	• Risk-free rate: 4.00 percent
	• Credit spread: 1.50 percent
	• Expected default rate: 0.60 percent
	• Stochastic interest rate parameters—risk neutral (for IASB valuation only)
	    • 4.00 percent mean return
	    • 25.00 percent annual volatility
	• Stochastic equity return parameters—risk neutral (for IASB valuation only)
	    • 4.00 percent mean return
	    • 25.00 percent annual volatility
	• Stochastic equity return parameters—real world (for US GAAP valuation only)
	    • 9.00 percent mean return
	    • 15.00 percent annual volatility
	• Illiquidity premium: credit spread/2 (for IASB bottom-up valuation only)
	• Own credit spread: 1.00 percent (for US GAAP valuation only)
	• Equity returns: 9.00 percent (for experience only)

4. Actuarial assumptions	• Best-estimate mortality, morbidity, lapse, renewal premiums, expense and other policyholder behavior assumptions

Guideline	Description		

5. Credited interest rates and dividend rates	<u>Variable products</u>
	Credited interest is based on:
	  + Equity returns (for experience) or risk-free rates (for valuation)
	  - management and expense charges
	
	<u>General account products</u>
	Credited interest and dividend rates are based on:
	  + Gross investment yield on a book basis using above economic assumptions
	  - expected defaults using above economic assumptions
	  - pricing target spread (subject to minimum guarantees)
	(subject to competitor constraints, if applicable)		

6. Expenses	• Overhead costs go into experience cash flows but are not reflected in reserve/deferrable acquisition cost (DAC) calculations for either US GAAP or IASB. • Acquisition cost treatment varied by product and details are included below.		
7. Cash flows for participating products	Use the mirroring approach for variable annuities, where the separate account liability is set equal to the separate account asset value, and an additional balance (typically an asset balance) is held for riders and guarantees as well as other fees to be collected from the separate account balance such as mortality and expense (M&E) fees.		
8. Scenario to determine expected cash flows for IASB valuation purposes	Risk-neutral stochastic scenarios	• Universal life with secondary guarantee • Fixed indexed annuity • Variable annuity with guaranteed living benefits • Variable universal life	
	Deterministic scenario plus a basis point (bp) cost of option adjustment representing the embedded interest guarantee (varied by product as shown to the right)	• Universal life (20 bps increase to the credited rate) • Single premium deferred annuity (20 bps reduction to the discount rate) • Participating whole life (20 bps increase to the dividend rate)	

Guideline	Description
	Deterministic scenario • Term life • Single premium immediate annuity • Long-term care • Medicare supplement • Cancer

9. Discount rates—IASB valuation	Variable products
	Assumed to be invested in equity assets, therefore bottom-up approach, where discount rate is:
	    + Risk-free rate
	    + illiquidity adjustment for guarantees, if applicable
	
	General account products
	Assumed to be invested in fixed income securities, therefore top-down approach, where discount rate is:
	    + Project future gross investment yield on a book basis using above economic assumptions
	    - expected defaults using above economic assumptions [convert from book basis to market basis]
	    - spread for the risk surrounding the expected default losses

10. Risk adjustment	Uses factors that vary by product and duration 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. More detail on how the risk adjustment was calculated is included in Appendix B located below.
11. Portfolio	Each product was assumed to be a distinct portfolio.
12. Unbundling	Products that contain embedded derivative are unbundled so that non-insurance and insurance components are measured independently (i.e., the non-insurance components are not included in the fulfillment cash flows, and were valued consistent with current US GAAP practices).
13. US GAAP assumptions	US GAAP assumptions and methodology are consistent with the ATFs' existing accounting practices except where specifically noted otherwise above. Reserve and other actuarial balances by product: Term, Par WL: Net premium reserves and FAS 60/FAS 120 DAC SPIA: FAS 60 reserve and FAS 97 limited pay deferred profit liability VA, SPDA, FIA, UL and VUL: Account Value, FAS 97 DAC and FAS 133 host and embedded derivatives where applicable ULSG: Account Value, FAS 97 DAC and SOP 03-1 Cancer, LTC, MedSupp: Net premium reserves and FAS 60 DAC

Guideline	Description
14. Provisions for adverse deviation on FAS 60 reserves and DAC	SPIA: 10 percent lower mortality Term: • Mortality—10 percent increase • Lapses—10 percent reduction • Interest—50 bps Cancer: 4 percent higher claim costs LTC: 80 bps reduction to earned rate MedSupp: 5 percent higher claims costs

Acquisition cost treatment by product

Product	Acquisition Cost Treatment
Term	Deferrals for US GAAP and IASB were identical, since commissions were the only deferrable expense.
Par WL	Deferrals under IASB were higher than under US GAAP, since US GAAP considered only successful efforts.
UL	Deferrals for US GAAP and IASB were identical, since all expenses were considered to be related to successful efforts.
ULSG	Deferrals under IASB were higher than under US GAAP, since US GAAP considered only successful efforts.
FIA	Deferrals for US GAAP and IASB were identical, since commissions were the only deferrable expense.
SPIA	Deferrals for US GAAP and IASB were identical, since commissions were the only deferrable expense.
SPDA	Deferrals for US GAAP and IASB were identical, since commissions and premium taxes were the only deferrable expense.
VA	Deferrals for US GAAP and IASB were identical, since commissions were the only deferrable expense.
VUL	Deferrals for US GAAP and IASB were identical, since commissions were the only deferrable expense.
Cancer	Deferrals under IASB were higher than under US GAAP, since US GAAP considered only successful efforts.
LTC	Deferrals for US GAAP and IASB were identical, since all expenses were considered to be related to successful efforts.
MedSupp	Deferrals for US GAAP and IASB were identical, since all expenses were considered to be related to successful efforts.

Except where noted in the table above, the ATFs assumed no non-commission acquisition expenses in the projections.

The baseline scenario incorporates certain modeling simplifications that we made in order to make the modeling feasible in the given timelines and easily comparable across ATFs. In each of these cases, we recommend that companies pursuing similar research consider expanding on them and modeling more sophisticated variations. Key simplifications included:

1. Use of flat yield curves, credit spreads and all other economic assumptions.

2. Simplified approach to value options and guarantees.

3. For many products, use of a single scenario.

4. We projected new business only. There are many other modeling considerations that would apply to in-force business being converted to the new standards.

5. Contract modifications or conversions (i.e., settlements, commutations, etc.) are not being considered for this study.

6. Factors derived to estimate the cost of capital approach to calculating the risk adjustment.

The ATFs also tested the following sensitivities for each of the products as follows:

	Cancer	FIA	LTC	MedSupp	Par WL	SPDA	SPIA	Term	UL	ULSG	VA	VUL
Actuarial assumptions												
Mortality									✓	✓		
Morbidity			✓	✓								
Lapses	✓							✓				
Economic assumptions												
Credit spread/illiquidity premium					✓		✓					
Separate account return											✓	
Other												
Stochastic vs. deterministic						✓						
Discount rate methodology							✓					
Reinsurance									✓			
Alternate CSM amortization												✓
FASB margin										✓		

	Cancer	FIA	LTC	MedSupp	Par WL	SPDA	SPIA	Term	UL	ULSG	VA	VUL
Qualifying acquisition cost										✓		

The following are descriptions of the sensitivities:

1. Mortality (ULSG and UL)

    •   Experience only: Twenty percent multiplicative increase in mortality experience in year 5 only. Mortality experience reverts back to original levels in year 6 for ULSG. For the UL product, the multiplicative increase was 10 percent and it was applied in year 5 and future years.

    •   Experience and valuation: Five percent multiplicative increase in mortality for both experience and valuation assumptions in year 5 and all subsequent years of the projection for ULSG. For the UL product, the multiplicative increase was 10 percent.

2. Morbidity (MedSupp)

    •   Experience only: For MedSupp, a 10 percent additive increase in claim trend in year 5, and for LTC, a 20 percent additive increase in morbidity experience in year 5. Experience reverts back to normal in year 6. For MedSupp, the increased claim trend in year 5 increased renewal premiums in year 7 due to the one year catch-up.

    •   Experience and valuation: Five percent additive increase in claim trend/morbidity for both experience and valuation assumptions in year 5 and all subsequent years of the projection. The increased claim trend impacted the projected MedSupp premium levels for both experience and valuation.

3. Lapses (Cancer and Term Life)

    •   Experience only: Twenty percent multiplicative increase in lapse experience in year 5 only.

    •   Experience and valuation: Ten percent multiplicative increase in lapses in year 5 and all subsequent years of the projection for both experience and valuation.

4. Credit spread/illiquidity premium (Par WL and SPIA)

    •   Par WL: 50 bps increase to credit spread for experience and valuation in year 5 and all subsequent years of the projection.

- SPIA: For asset and liability valuation purposes we assumed a 100 bps increase to credit spreads and a 50 bps increase to the illiquidity premium using a bottom-up discounting approach. This shock was applied in year 5 and all subsequent years of the projection for valuation purposes. Note: We assumed for purposes of this sensitivity that the assets and liabilities were cash flow matched, so there was no impact on any disinvestment activity.

5. Separate account return (VA)

   - Twenty percent reduction in separate account value in year 5. No change to valuation assumptions.

6. Stochastic versus deterministic scenarios (SPDA)

   - Compare the reserve under a full stochastic projection to the reserve under the baseline scenario that uses a deterministic projection with an additional 20 bps reduction to the discount rate.

7. Discount rate methodology (SPIA)

   - Test impact on financials due to use of a bottom-up approach for developing the discount rate versus the top-down approach. (See

- _Appendix A—Summary of the Proposed IASB_ for more information on how the two approaches are calculated.)

8. Alternate CSM amortization (VUL)

   - Test impact on income emergence due to an alternate definition of "the pattern of services provided" for the purposes of releasing the CSM. Test amortization based on (a) death benefits, (b) total cash flows, (c) reduction in net amount at risk and (d) face amount.

9. FASB margin (ULSG)

   - Test impact on income emergence due to use of a single margin as proposed in the FASB Insurance Contracts Exposure Draft.

10. Qualifying acquisition costs (successful vs. unsuccessful efforts) (ULSG)

    - Test impact on income emergence due to an alternate definition of qualifying acquisition costs. Test based on qualifying acquisition costs for successful efforts only as defined in the FASB Insurance Contracts Exposure Draft.

IV. Study Results

IV.A.   Cancer

<u>Product Overview</u>

This product is guaranteed renewable. The policyholder pays the insurance company level premiums over the lifetime of the contract. Benefits result from cancer diagnosis; and duration of benefits relates to length and severity of treatment with no lifetime maximum. There are no nonforfeiture benefits. The level premiums are set at issue and subject to rate increases over time, which require the insurance company to file for an increase with the regulators. Note that the combination of level premiums and no nonforfeiture benefits implies this product is lapse supported. This projection assumes no rate increases in future projection years. The hypothetical contract used in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory return on investment (ROI) of 10 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart A.1: Cancer—Liability Cash Flows for Baseline Projection
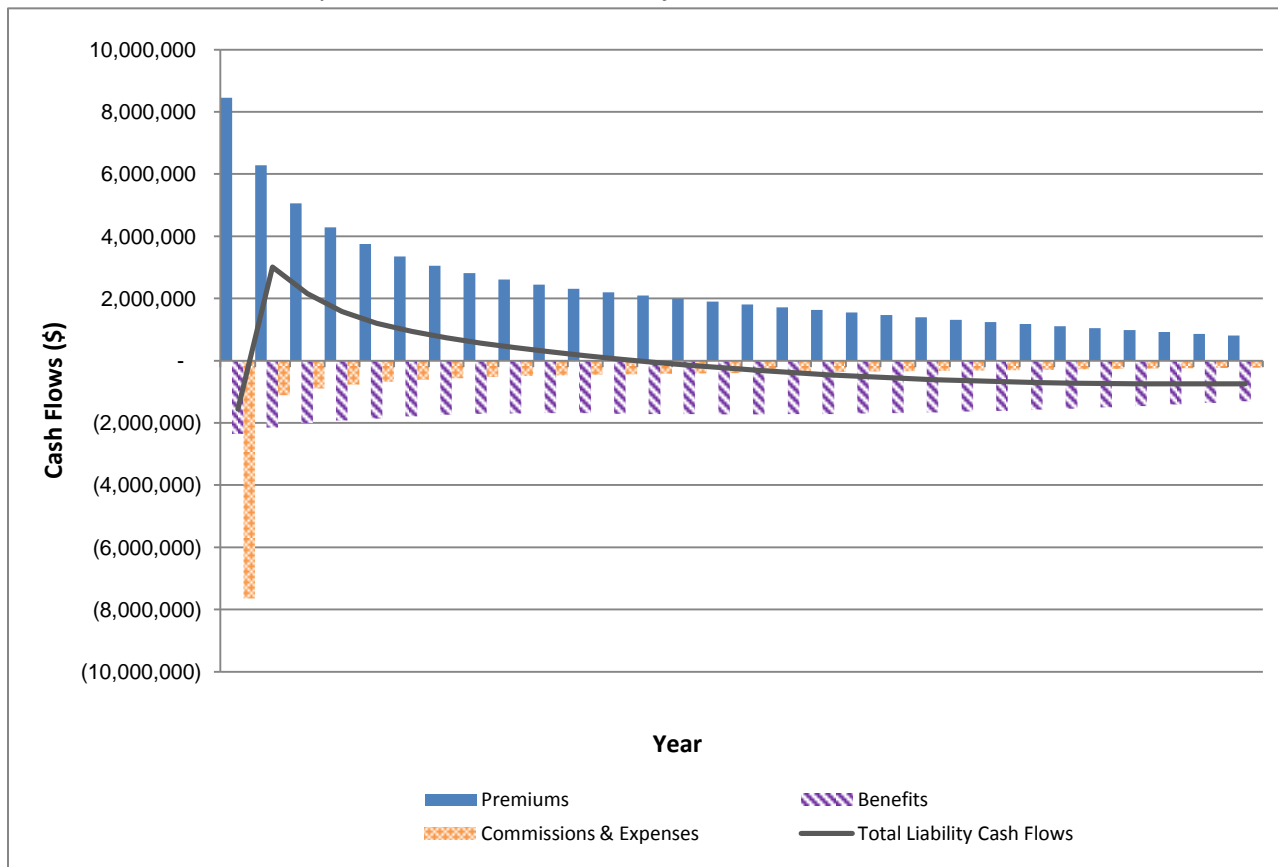
US GAAP Valuation

- SFAS60 contract.
- Reserves are calculated based on a net level premium approach.
- Deferrable acquisition expenses are amortized over premiums.

IASB Proposed Standard

- Single deterministic scenario.
- Risk adjustment equal to a level percentage of annual premiums.
- Contractual service margin (CSM) is released based on the present value of benefits.

Chart A.2: Cancer—Comparison of GAAP and IASB Pretax Income: Baseline Projection
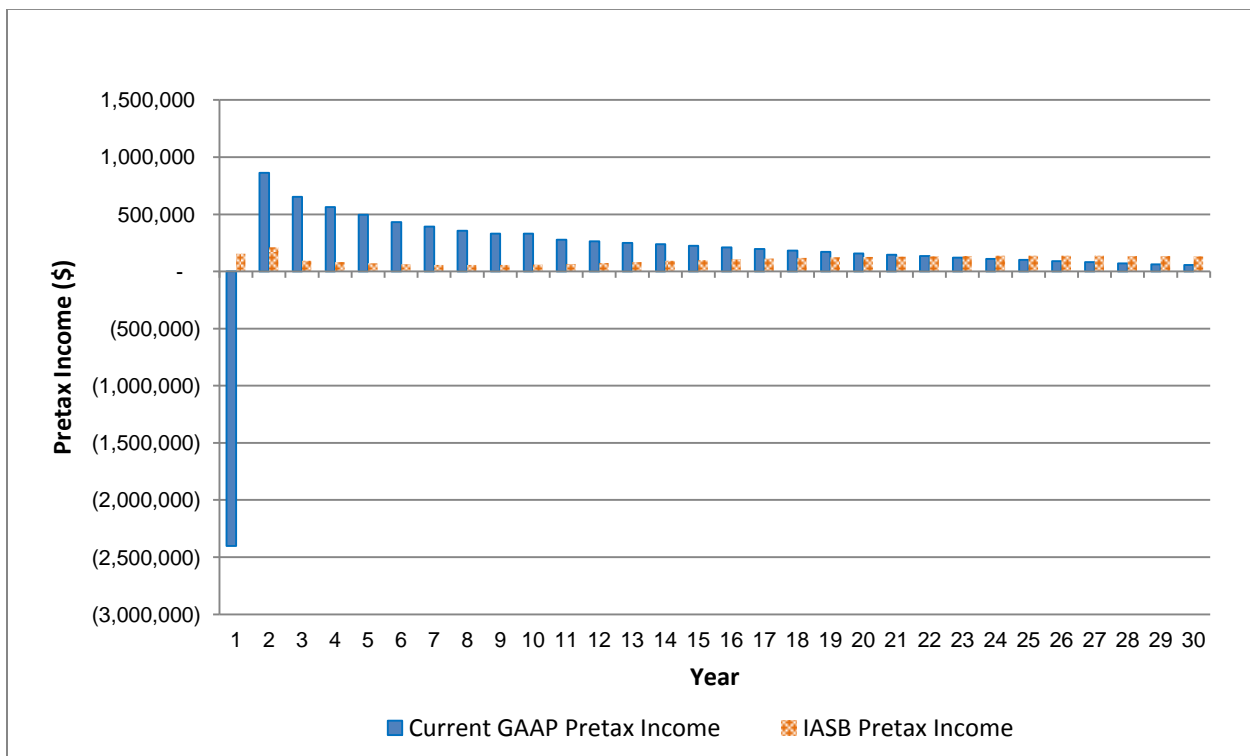
The level of deferrals under current US GAAP and the proposed IASB standard is the key driver behind the differences in the profit emergence. Under current US GAAP, only commissions and expenses related to successful attempts are capitalized. This results in the large loss at issue that reverses in the later periods. Under the proposed IASB standard, the deferred amount is more liberal as all acquisition expenses are included in the CSM.

Current GAAP liabilities are based on a net level premium approach, which accrues benefits as a level percentage of gross premiums. Under the proposed IASB standard, the CSM is amortized over the

present value of benefits. This results in a different income emergence between current GAAP and the proposed IASB standard. In addition, the benefits for cancer are expected to be incurred in the latter period of the life of the insurance contract. This is the main driver in the increase in profits under the IASB proposed standard in years 10 and later as the CSM amortization follows this pattern.

The risk adjustment is calculated as a level percentage of the annual premiums.

Chart A.3: Cancer—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
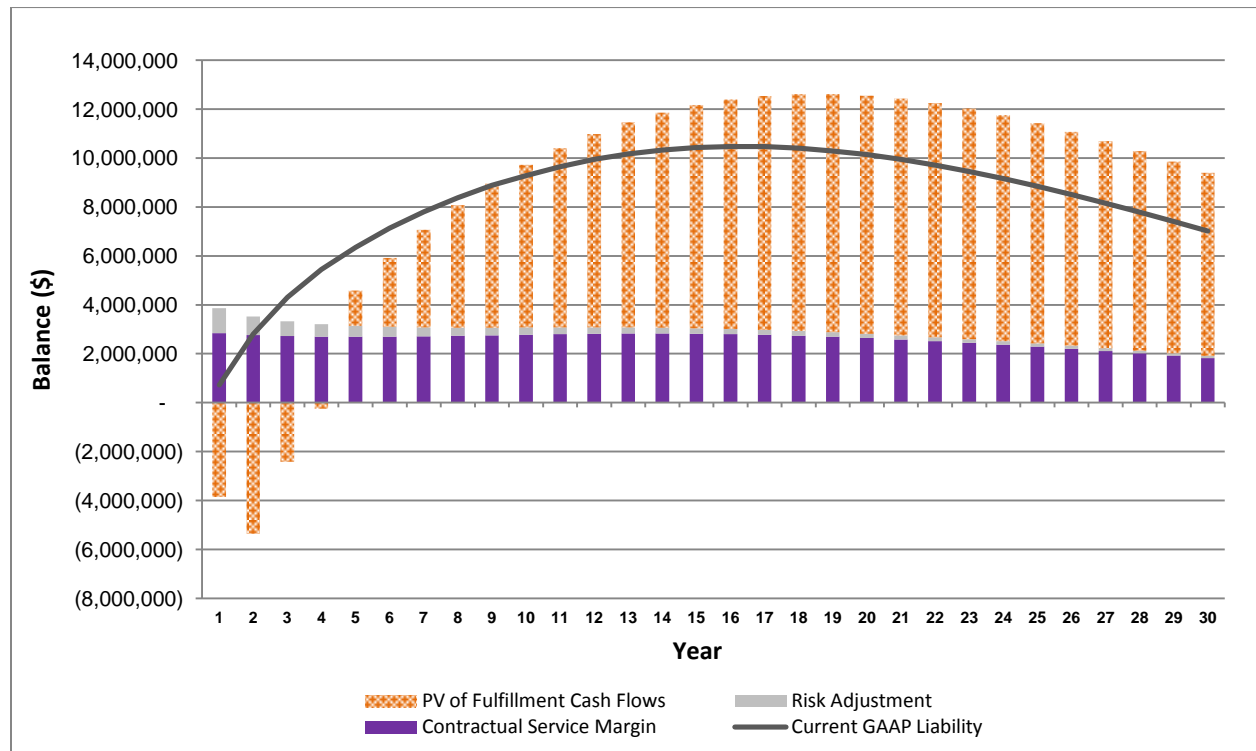
Chart A.4: Cancer—Risk Adjustment and Contractual Service Margin: Baseline Projection
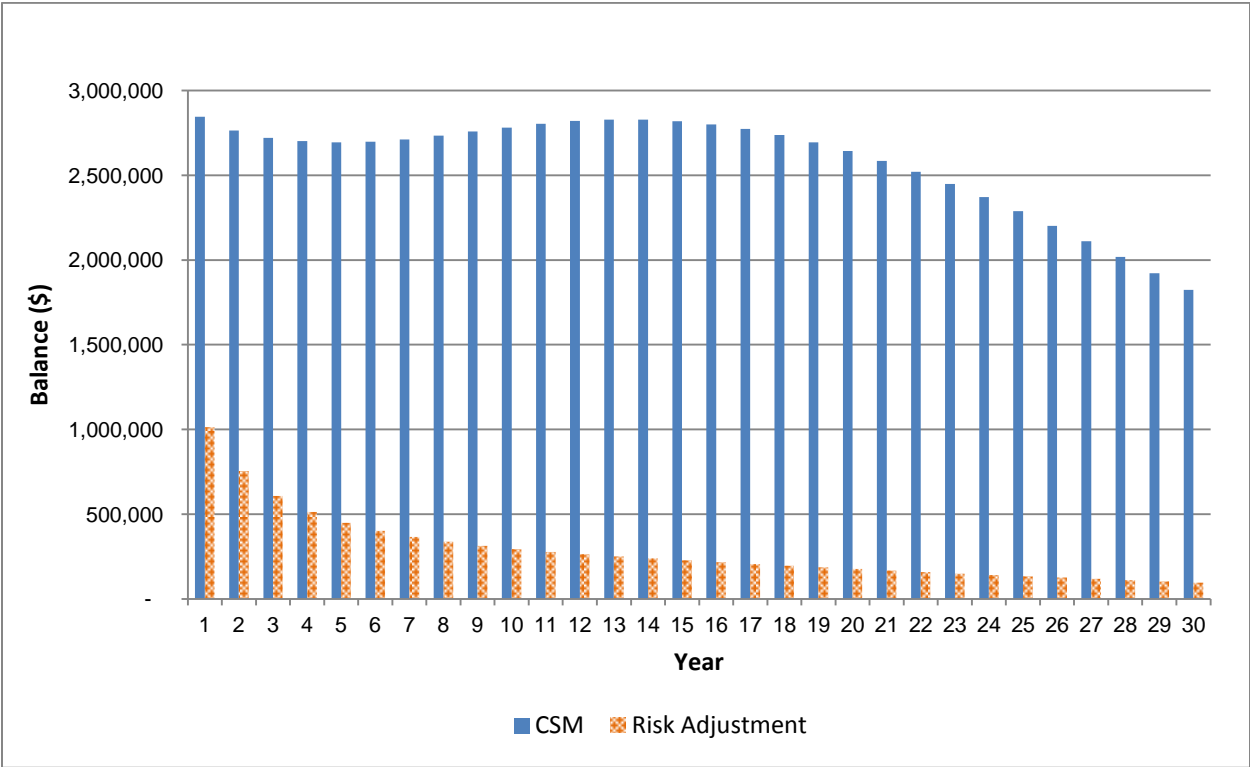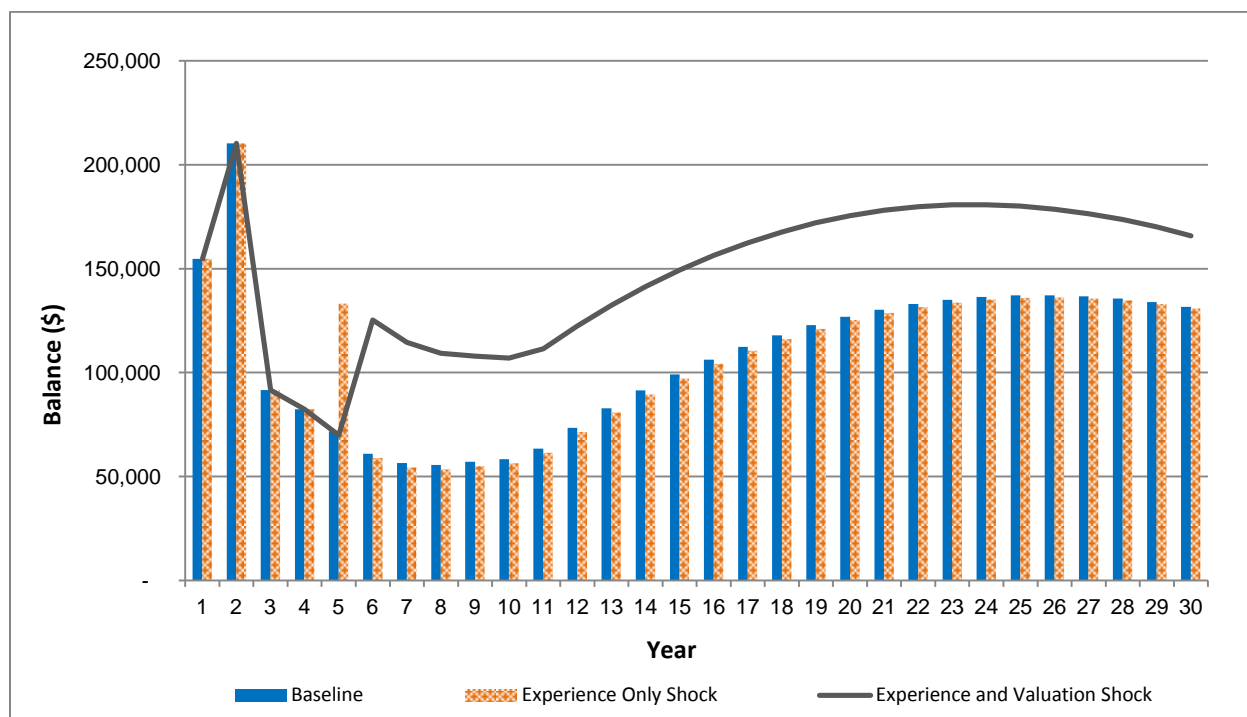
Chart A.5: Cancer—Comparison of IASB Pretax Income: Lapse Sensitivity

In this sensitivity test, the actuarial task force (ATF) projects 20 percent higher lapses in year 5 only in the experience only shock and 10 percent higher lapses in year 5 and later in the experience and valuation shocks. These additional lapses are applied as multiplicative adjustments to the base lapses. For example, if the lapses in year 5 are 10 percent, then the additional shock lapses are 2 percent (20 percent of the 10 percent base lapses).

In the first set of results (experience only shock), the income in year 5 relates to the release of the present value of fulfillment cash flows and CSM and to a lesser extent the decrease in the risk adjustment (given it is calculated as a function of annual premiums). The release in the IASB liability is not offset by any benefits payable upon surrender since there is no cash surrender value on this product. The profits in years 6 and later are approximately 2 percent lower than baseline.

In the second set of results (experience and valuation shock), the income is not impacted in year 5 as the decrease in the present value of fulfillment cash flows is offset by the increase in the CSM, as both of these are unlocked for higher future lapses. The CSM is then released over the remaining life of the contract, which contributes to the higher income relative to the baseline.

IV.B.　　Fixed Indexed Annuity (FIA)

<u>Product Overview</u>

The policyholder pays the insurance company a single premium at the inception of the contract and the premium is set up as an account value for the policyholder. The insurance company credits interest to the account value based on the performance of an underlying index such as the S&P 500. Index returns are subject to a cap and are floored at 0. Additionally, the full account value is available upon the death of the insured. The analysis was done using a single cell with issue age 50. The contract used in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory ROI of 10 percent.

The product cash flows are as follows:

Chart B.1: FIA—Liability Cash Flows for Baseline Projection
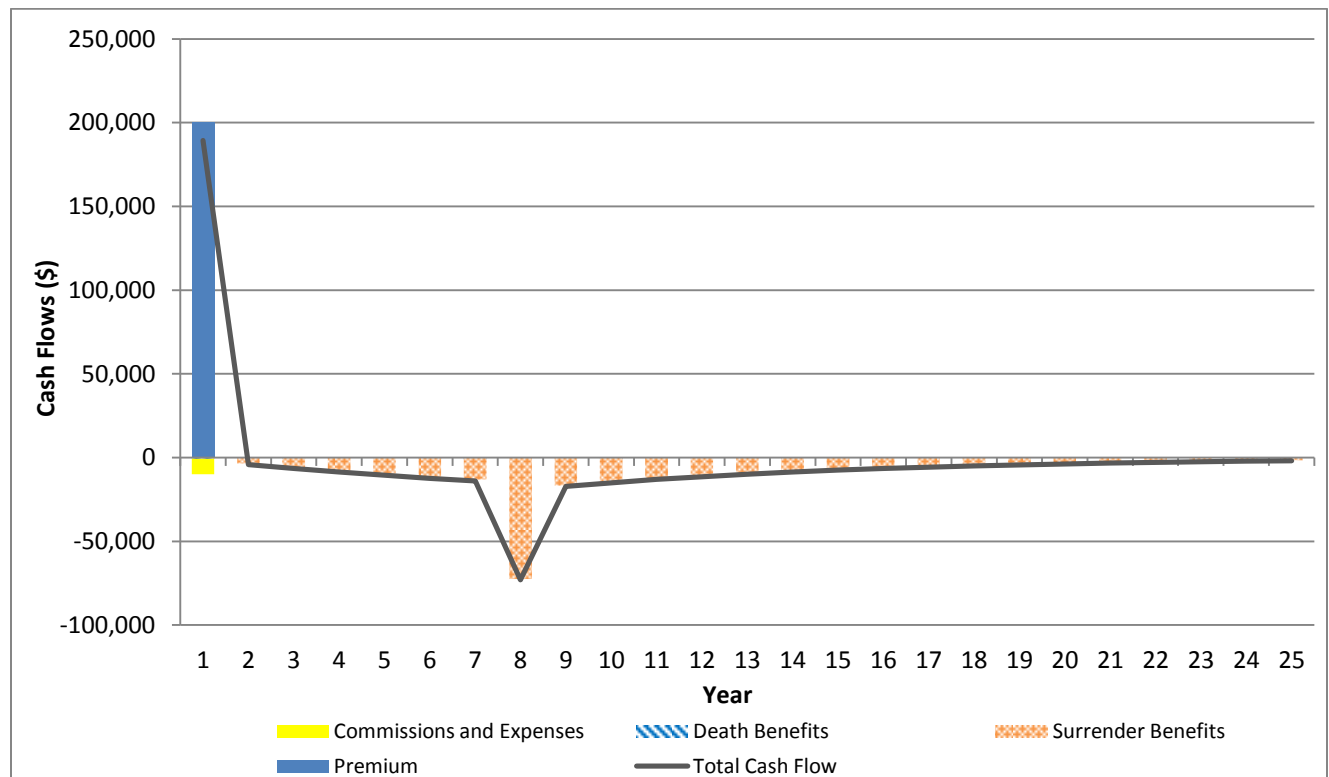

<u>US GAAP Valuation</u>

- SFAS97 investment contract, where SFAS133/157 is used to value the host and embedded derivative
- Deferrable acquisition costs are amortized over estimated gross profits. Estimated gross profits consist of interest margin, expense margin, surrender margin and mortality margin plus an

additional component for the difference in the change in the host plus embedded derivative and the change in account value.

IASB Proposed Standard

• Risk adjustment equal to a percentage of the best-estimate liability
• CSM released based on policy count

Chart B.2: FIA—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
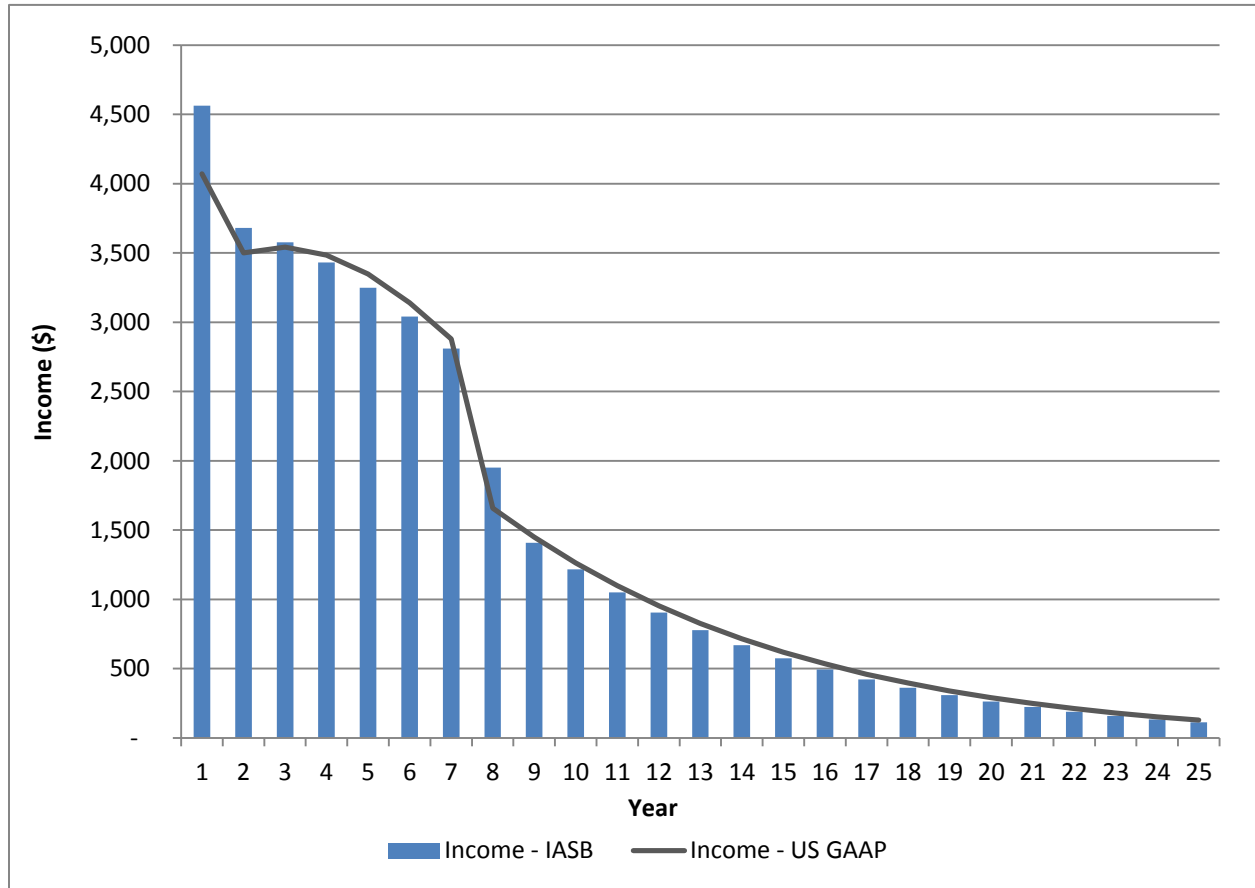
Income emergence under the current US GAAP framework is generally consistent with the projection under the IASB framework. Although the reserves under the old and new basis, as shown in the table below, are similar in magnitude and pattern, there are slight differences between the two frameworks which cause the difference in profit emergence illustrated above. These differences are driven by current US GAAP framework with profits that emerge as a percent of estimated gross profits, while the IASB framework includes amortization of the risk adjustment consistent with the fulfillment cash flows

and the CSM that amortizes according to policy count. The differences are particularly notable in years 1 and 8 where amortization of the CSM using policy count results in accelerated income recognition as compared to US GAAP income, which is driven by estimated gross profits. Since all of the first year acquisition expenses are treated the same for both US GAAP and IASB, there is no impact on first year income from this item.

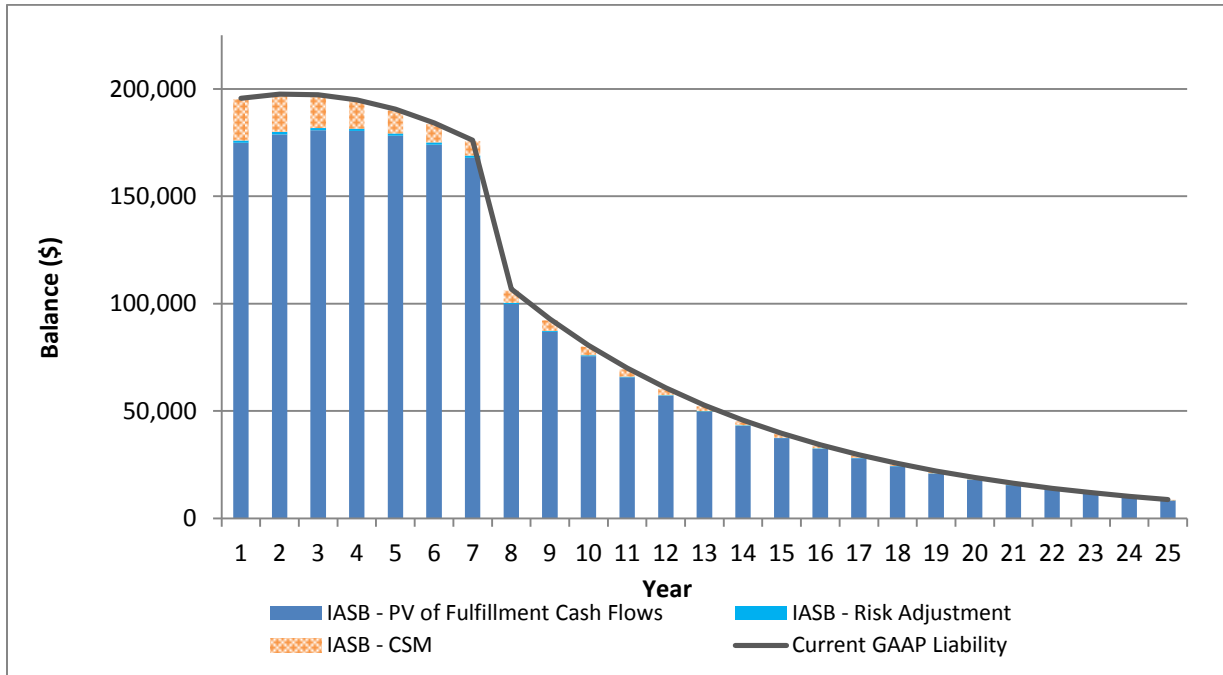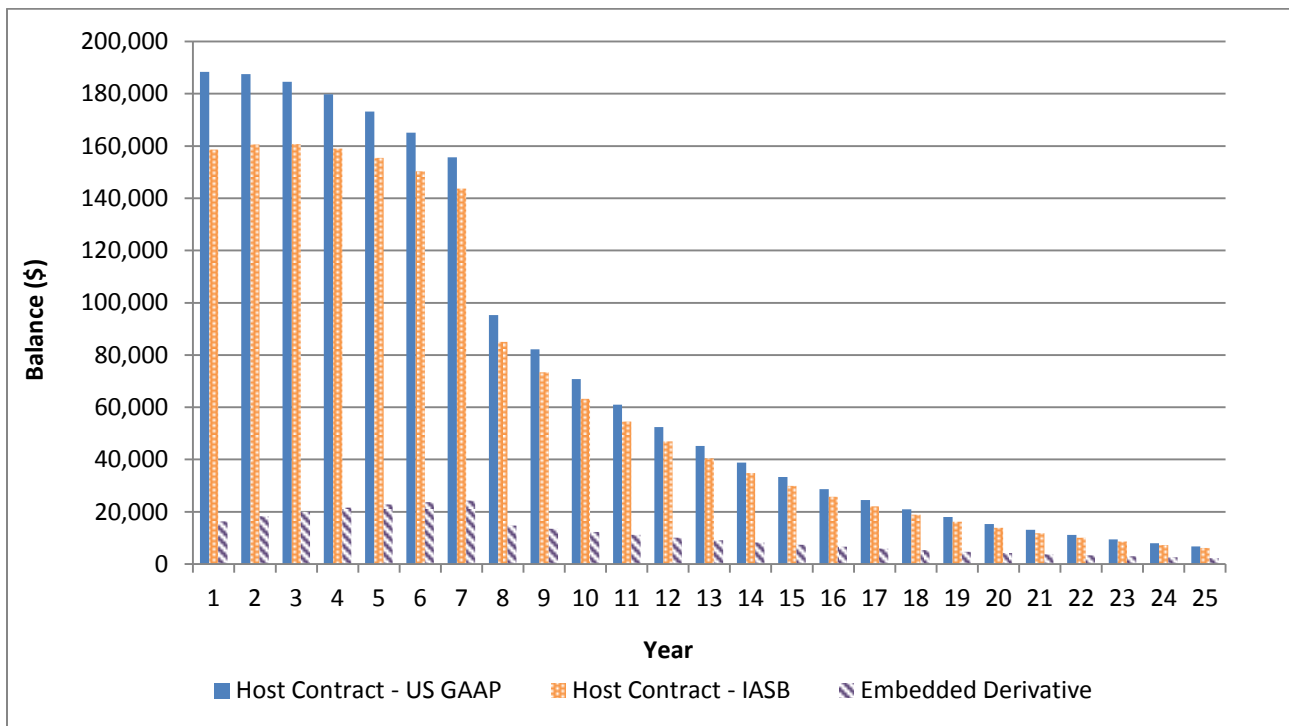Chart B.3: FIA—Comparison of Net GAAP Liability and IASB Reserve

Chart B.4: FIA—Host and Embedded Derivative

The host contract under US GAAP is higher than the IASB host because the US GAAP host is the premium at issue less the embedded derivative and therefore includes implicit margins. The IASB host is calculated directly by discounting the cash flows that are attributed to the host and does not include any margins. The embedded derivative under US GAAP and IASB is the same.

IV.C. Long-Term Care (LTC)

<u>Product Overview</u>

This product is guaranteed renewable. The policyholder pays the insurance company level premiums over the lifetime of the contract. LTC insurance provides benefits to policyholders when they are unable to perform activities of daily living (ADLs). The type of benefits can be categorized into home health, assisted living and nursing home.

The level premiums are set at issue and there is no surrender benefit. Since the hypothetical contracts are priced to be profitable at issue, the ATF assumes no future rate increases. The combination of level premiums and no nonforfeiture benefits makes this product highly lapse supported. The hypothetical contract used in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory ROI of 15 percent.

The product cash flows under the baseline experience assumption are shown in the chart below. Note that the net cash flows are positive for the first 15 years the policy is in force. This makes the duration of the contract extremely long.

Chart C.1: LTC—Liability Cash Flows for Baseline Projection
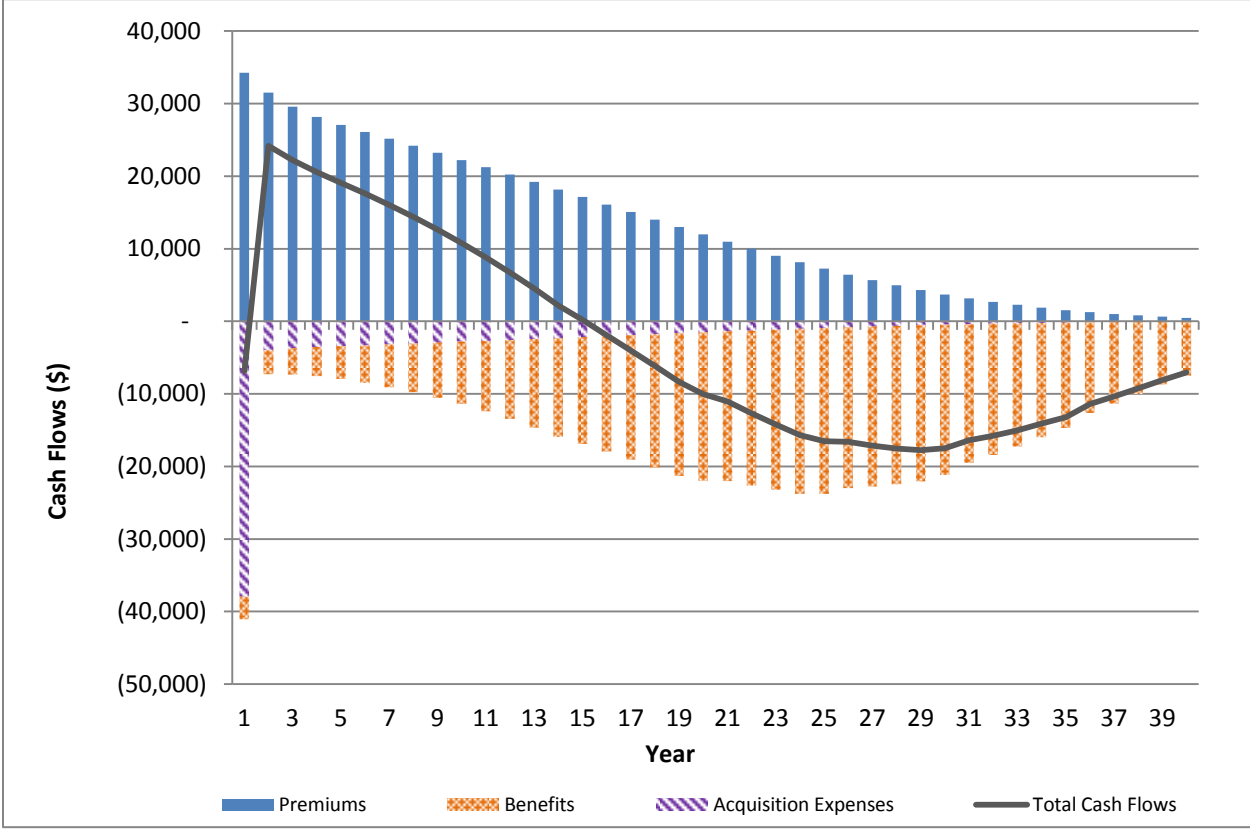
US GAAP Valuation

- SFAS60 contract
- Reserves are calculated based on a net level premium approach.
- Deferrable acquisition expenses are amortized over premiums.

IASB Proposed Standard

- Single deterministic scenario
- Risk adjustment equal to a level percentage of annual premiums
- CSM released based on expected benefits

Chart C.2: LTC—Comparison of GAAP and IASB Pretax Income: Baseline Projection
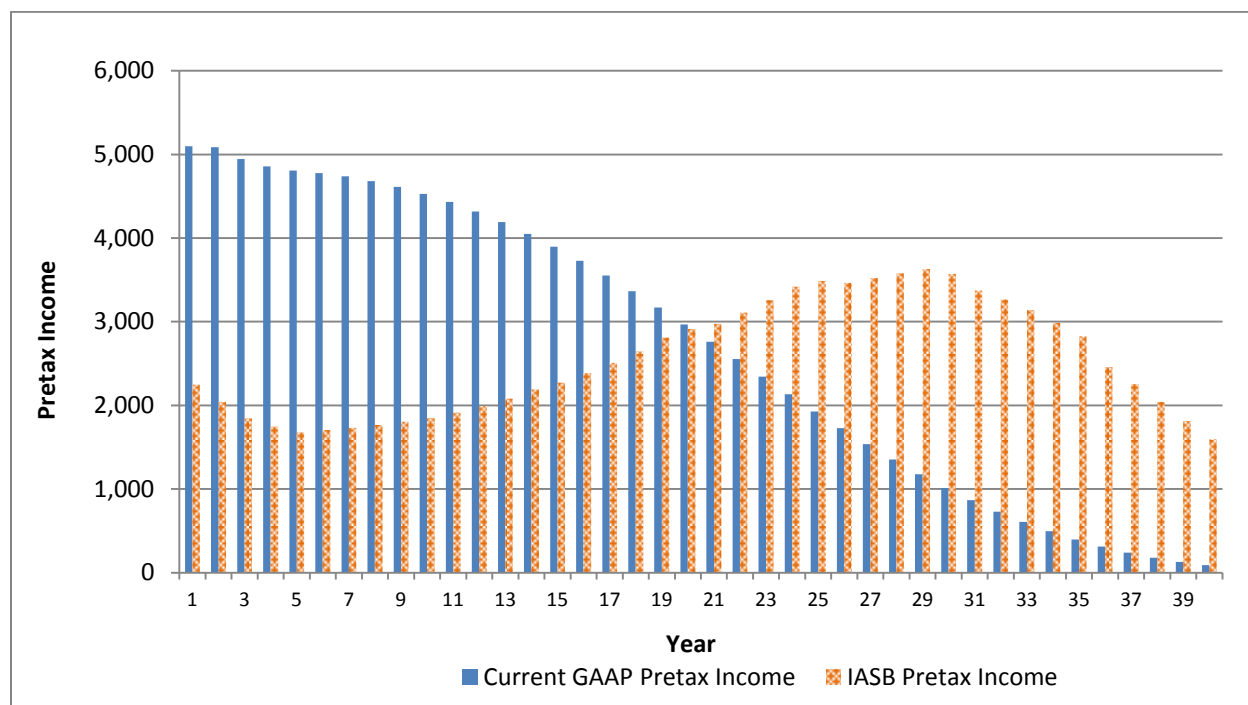

Under current GAAP, the reserving system accrues benefits as a slightly increasing percent of premium, as a result of the net level method and a provision for adverse deviation (PAD) on the assumptions. The PAD for this exercise is an 80-basis-point reduction in the discount rate. The profits under current GAAP are therefore a level percent of premiums plus a release of PAD. This translates to a slightly increasing percent of premium book profit over time.

Under the proposed IASB standard, book profits are driven by the release of risk adjustment plus the release of the CSM. Since the risk adjustment is fairly small, the largest driver is the release of the CSM, which is amortized over expected benefits. This results in income emerging differently from current GAAP under the proposed IASB standard.

The benefits for LTC are expected to be incurred in the latter period of the life of the insurance contract. The profits under the IASB standard are substantially deferred since the CSM grows with interest in the early years at a faster rate than the amortization of the CSM based on expected benefits. The risk adjustment is calculated as a level percentage of the annual premiums, and therefore decreases over the life of the portfolio as policies terminate for death or lapsation. There are no differences in the income pattern caused by expense deferrals since all efforts are assumed to be successful, causing the acquisition expenses to be the same under current GAAP and the proposed IASB standard.

Chart C.3: LTC—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
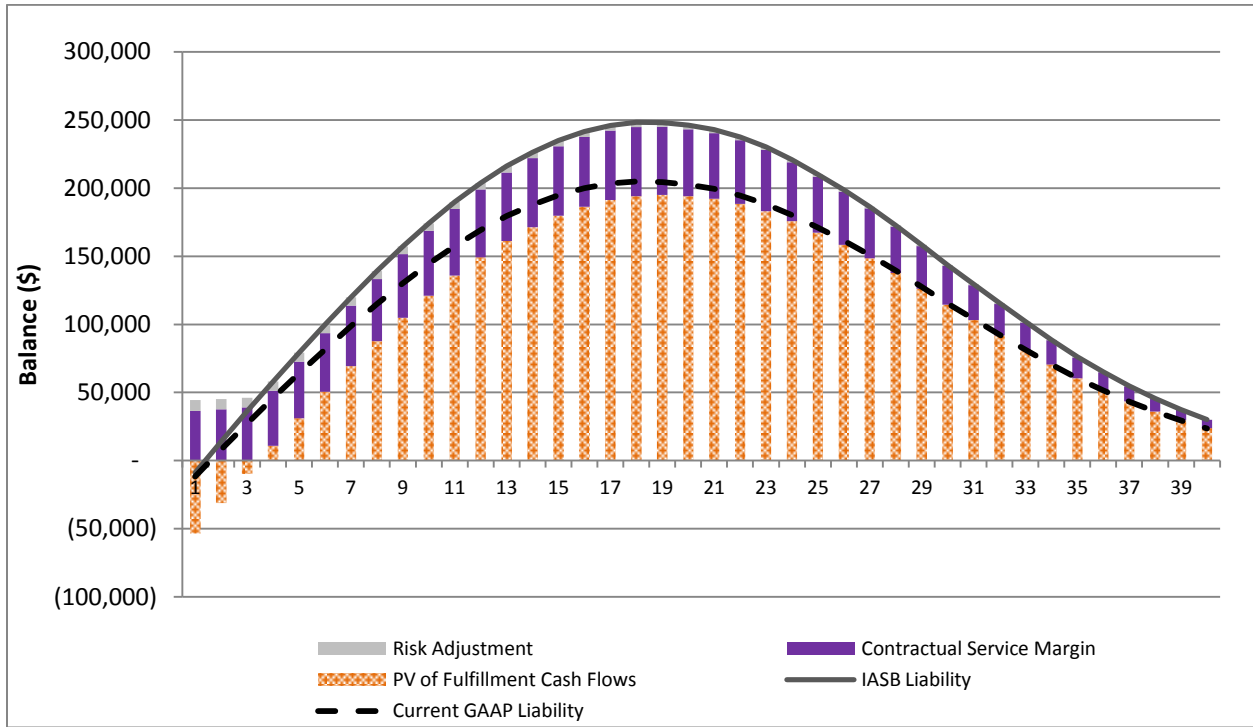
Chart C.4: LTC—Risk Adjustment and Contractual Service Margin: Baseline Projection
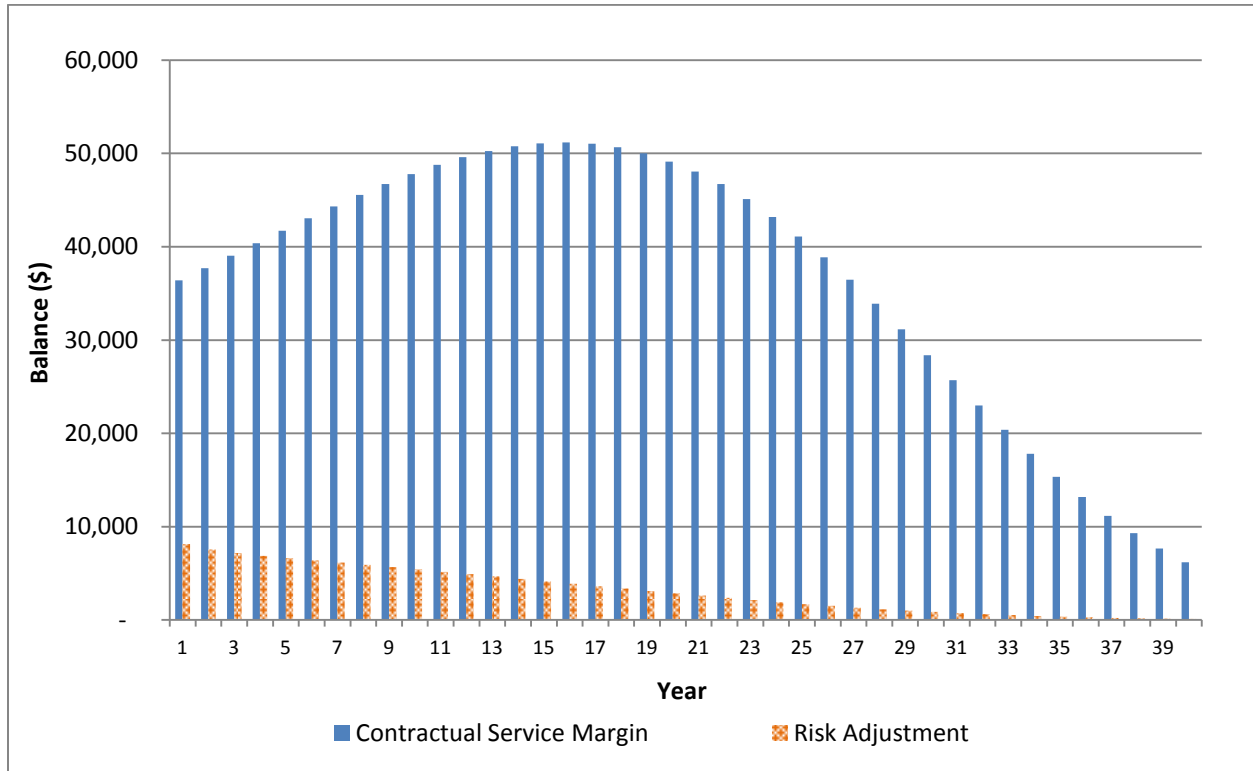
The ATF performs two sensitivity tests. In the first test, the ATF projects 20 percent higher incidence rates in year 5 only (the "experience only" shock). In the second, it projects 5 percent higher incidence rates in year 5 and later (the "experience and valuation" shock). These higher incidence rates are applied as multiplicative adjustments to the base incidence rates. The second sensitivity is closer to a real-life event since a 20 percent increase in benefits is likely to change the actuary's view of future benefit costs.

Chart C.5: LTC—Comparison of IASB Pretax Income: Morbidity Sensitivity
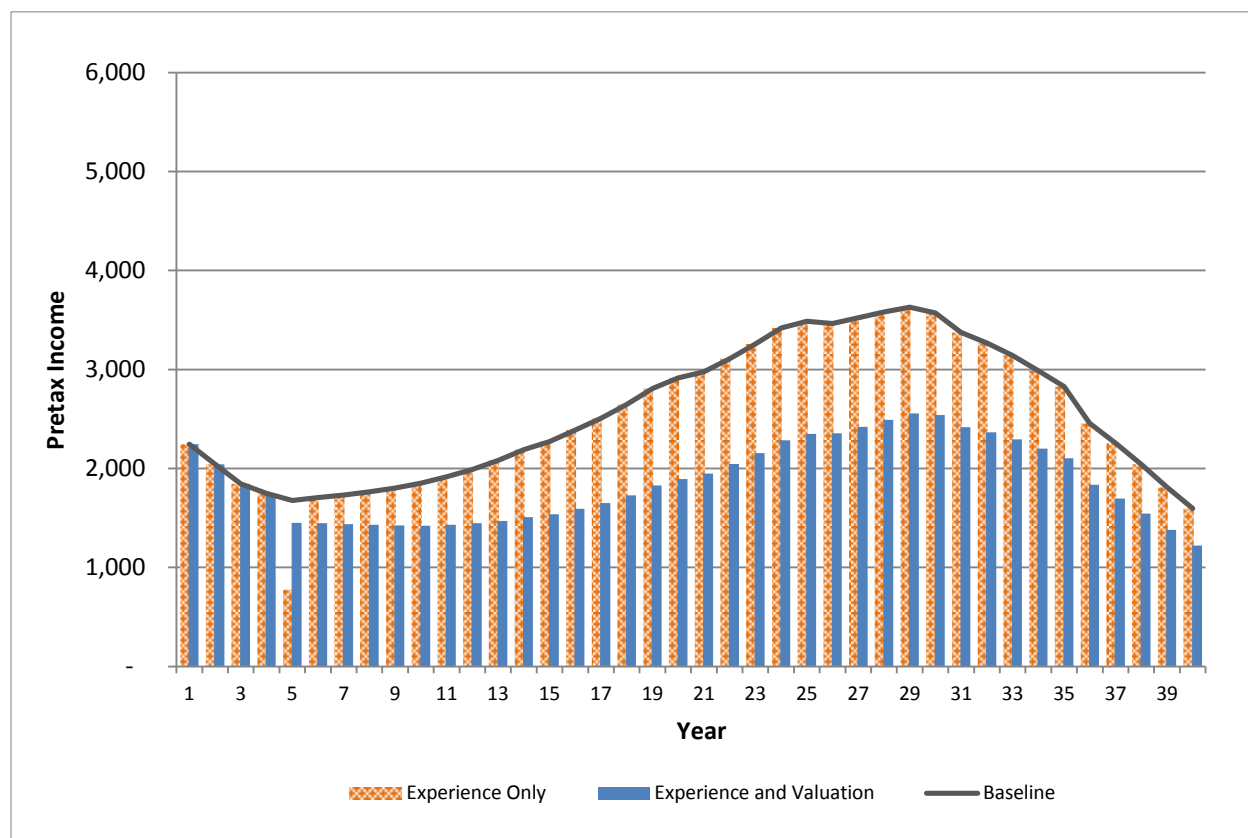
The benefit payments are modeled on an incurred basis for this exercise. The cash flows assume claims are paid in a lump sum rather than as a series of payments as would be the case in reality. Therefore, the benefits in any year are equal to the present value of benefits that would be paid in that year and subsequent years based on the assumed termination rates for claims incurred in that year.

In the first sensitivity test (experience only), the decrease in income in year 5 is driven by the 20 percent higher incidence rates. Given the benefits are modeled on an incurred basis, the impact of the 20 percent higher incidence comes through as additional benefits in year 5 only. This causes a decrease in income in year 5. This has no impact on the present value of fulfillment cash flows as expectations of benefit incidence in year 6 and onwards do not change. We note that the CSM is not unlocked as a result of the experience only shock, consistent with Paragraph B68 (a) of the Exposure Draft. Similarly, there is no impact on the CSM amortization in subsequent years as the temporary increase in incidence rates in year 5 does not represent an unlocking, and future expected benefits (used for amortization) are the same as those in the baseline scenario.

In the second set of results (experience and valuation), the present value of fulfillment cash flows and the CSM are unlocked at the end of year 4 to reflect the 5 percent higher incidence in year 5 and

onwards. The higher incidence rates cause a large increase in the present value of fulfillment cash flows (as measured at the end of year 4). This is offset by the release in the CSM resulting (as measured at the end of year 4) in a minimal impact to income in year 5. The income in subsequent years, however, is lower relative to the baseline as there is less of the CSM remaining to be amortized into income. This result illustrates that the income on the contract has proven to be less than anticipated at issue due to the unfavorable morbidity experience.

The higher incidence rates do not have an impact on the risk adjustment since it was based on a level percentage of the annual premiums and neither the percentage nor the amount of premium changes during this sensitivity.

## IV.D.   Medicare Supplement (MedSupp)

Product Overview

The policyholder pays the insurance company premiums over the lifetime of the contract in exchange for supplemental coverage of eligible benefits under a Medicare plan. There are three types of MedSupp plans: community-rated (also known as no-age-rated); issue-age-rated; and attained-age-rated. For the community-rated plans, the same premium rate is charged to all policyholders, irrespective of age. For issue-age-rated, the premiums are based on the issue age of the policyholder. For attained-age-rated plans, the premiums are based on the attained age of the policyholder. For any of these types of plans, the premiums could increase due to inflation or other factors. For attained-age-rated plans, the premiums would also increase with age.

For the purposes of this exercise, the ATF models issue-age-rated MedSupp plans only, which are accounted as long-duration FAS 60 contracts under current GAAP, and would be accounted using the building block approach under the proposed IASB standard. The sample policy is issue-age-rated with claim cost assumptions that vary by attained age, with the overall magnitude of claims increasing by a trend of 8 percent every year. The ATF assumes that, on average, the insurer will be able to receive premium rate increases equal to 95 percent of the claim trend, going into effect the year after the observed claim trend increase. For example, the increase in premium in year 7, under the baseline scenario, would equal to the observed claim trend of 8 percent in year 5; thereby resulting in a premium increase of 7.6 percent (95 percent of a claim trend of 8 percent). The policy pays commissions equal to 27 percent of premium for the first six policy years, and 10 percent thereafter. Lapses are higher in the earlier durations but grade to an ultimate lapse rate of 20 percent, consistent with the ATF's experience.

The contract used in this exercise is priced based on the economic assumptions described above to achieve a statutory ROI of 8.5 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart D.1: MedSupp—Liability Cash Flows for Baseline Projection
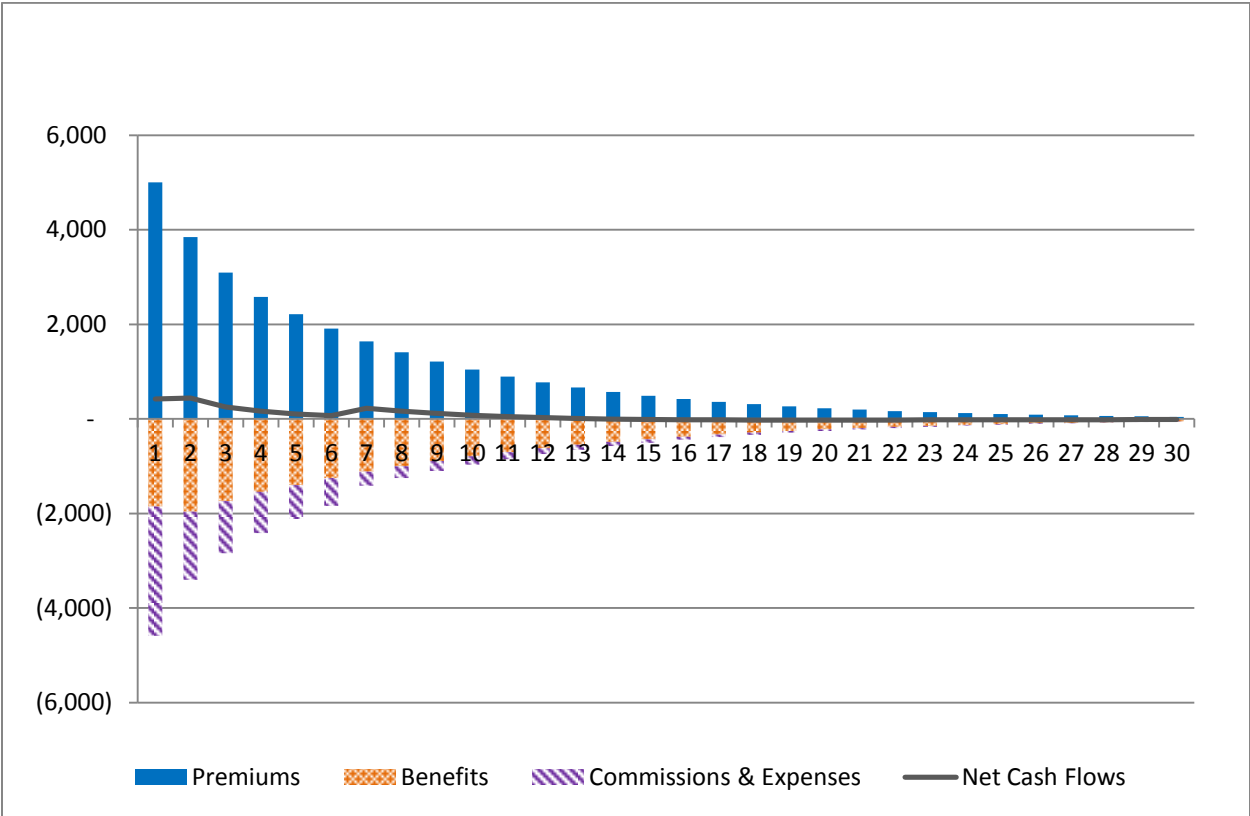
US GAAP Valuation

- Long-duration SFAS60 contract
- Reserves are calculated based on a net level premium approach.
- Deferrable acquisition expenses are capitalized and amortized over premiums.

IASB Proposed Standard

- Single deterministic scenario
- Risk adjustment equal to a level percentage of annual premiums
- CSM released based on the present value of benefits and expenses

Chart D.2: MedSupp—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
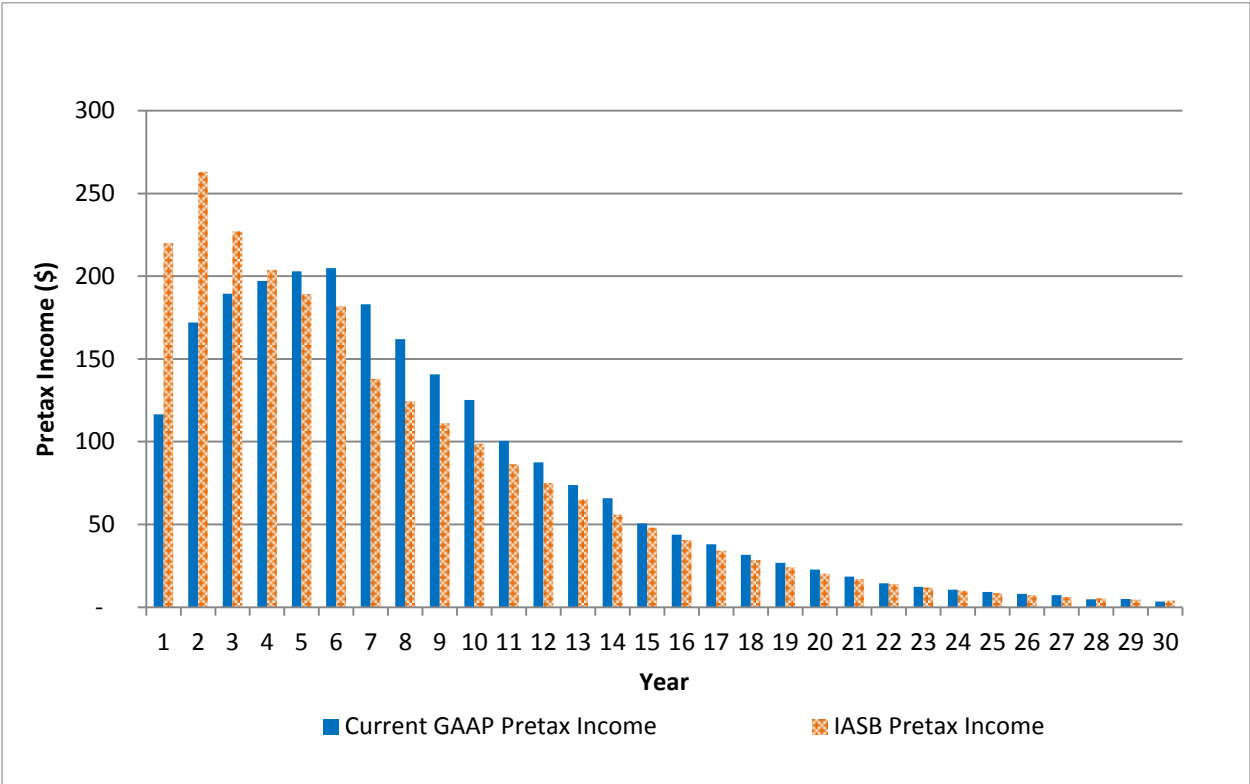
The income under current US GAAP emerges as a level percent of premiums as well as the release of the 5 percent PAD on claims costs. The PADs are released later in the projection, causing US GAAP income to be an increasing percent of premiums over time. Under IASB, the higher income in the early periods is driven by the release of the risk adjustment (amortized over annual premiums) and CSM (amortized over present value of benefits and expenses), which are released more quickly than the GAAP PADs. The CSM amortizes using the present value of benefits and expenses.

Since deferrals of acquisition costs are identical for both GAAP and IASB, there is no impact of acquisition expenses on the emergence of income in the first year.

Chart D.3: MedSupp—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
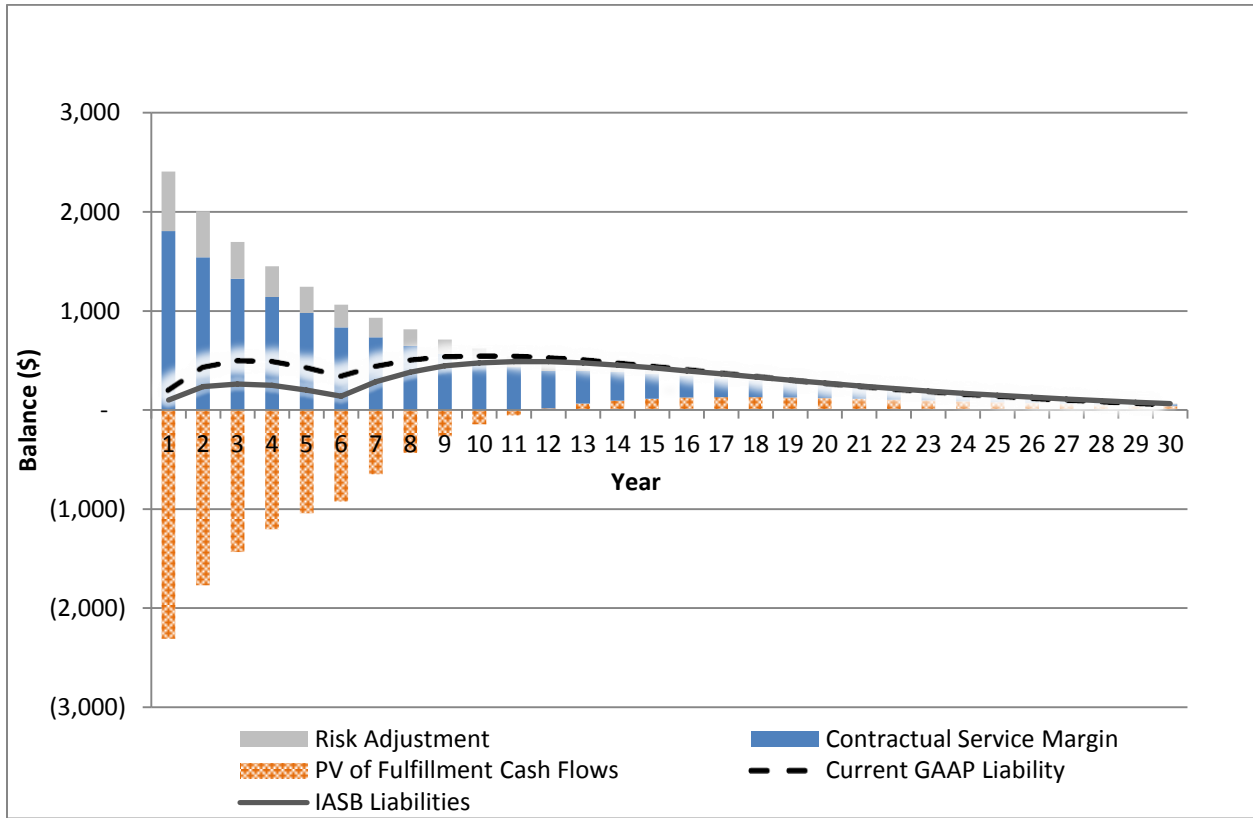
Chart D.4: MedSupp—Risk Adjustment and Contractual Service Margin: Baseline Projection
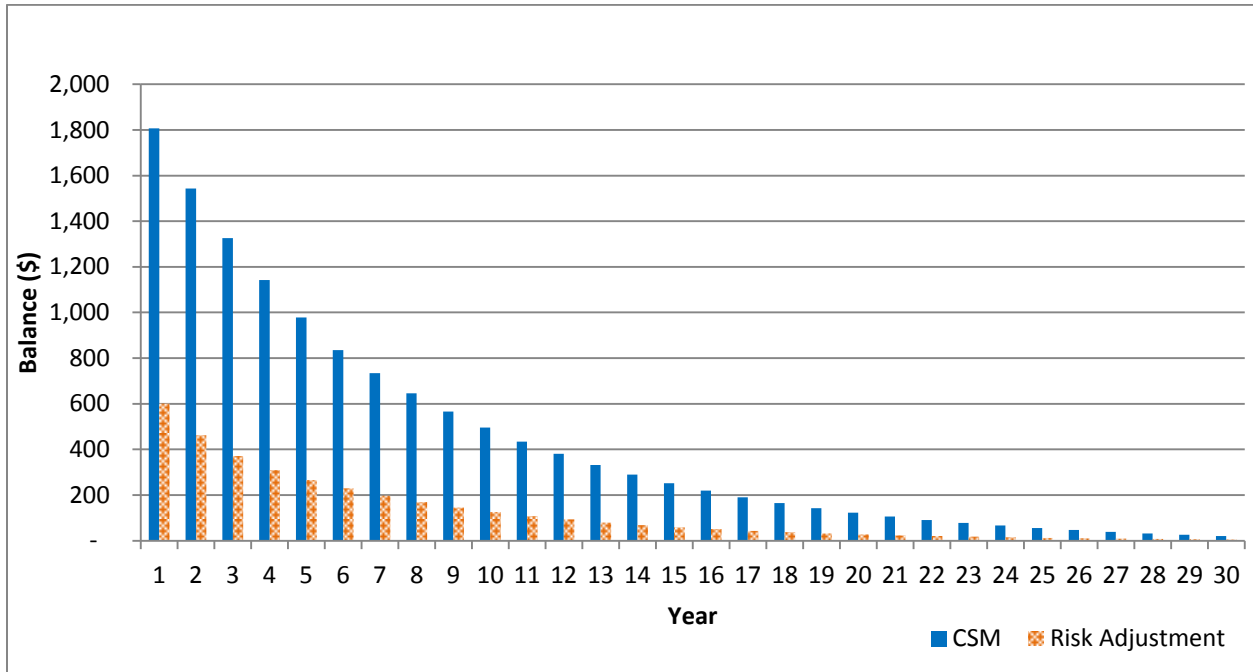
Chart D.5: MedSupp—Comparison of IASB Pretax Income: Morbidity Sensitivity
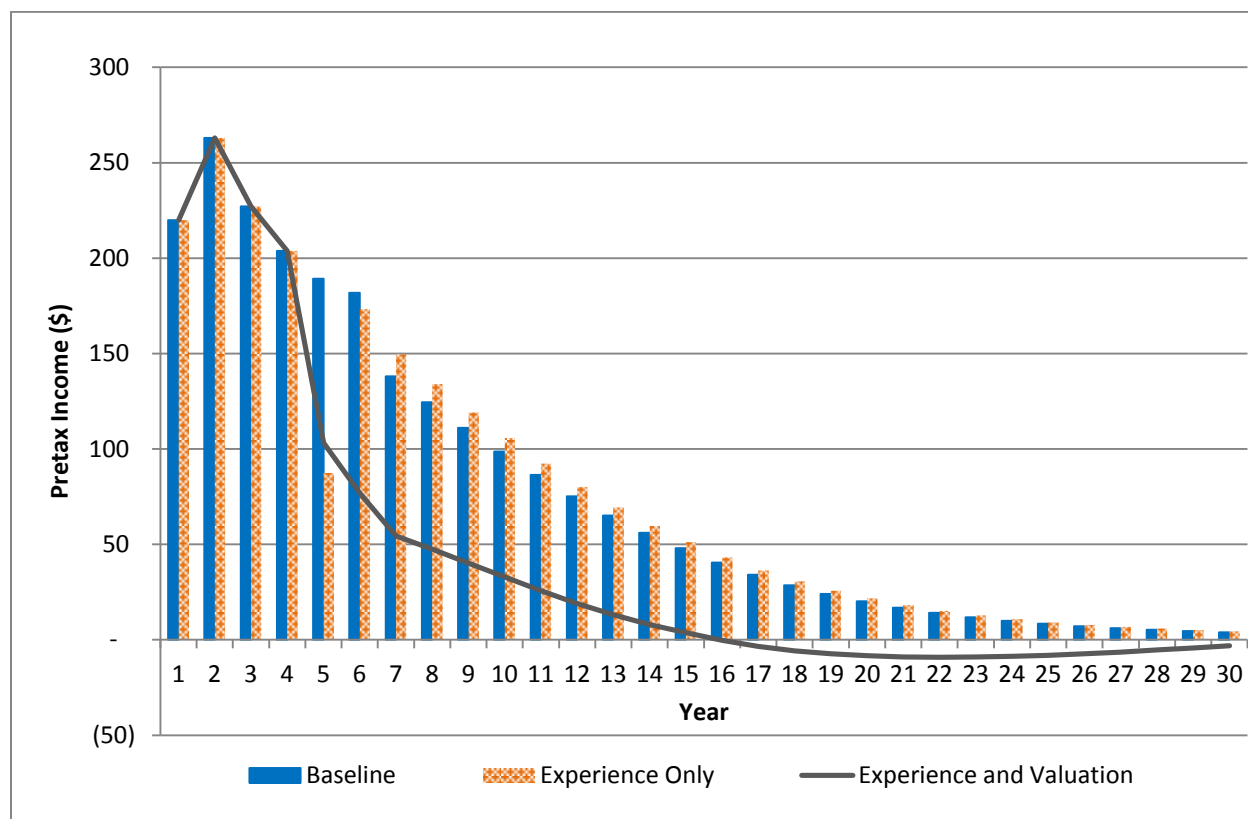
In this sensitivity test, the ATF projects a temporary additive increase of 10 percent in claim trend in year 5 only (cumulative trend of 18 percent when including the base trend) in the experience only shock, and a permanent additive increase of 5 percent in claim trend in years 5 and later (cumulative trend of 13 percent when including the base trend) in the experience and valuation shock. Under the experience only shock, the claim trend reverts back to 8 percent in years 6 and thereafter.

In the first set of results (experience only shock), the income in year 5 decreases relative to the baseline due to the higher claim level. Some of these higher claims, while incurred in year 5, are reported in year 6. This explains the decrease in income in year 6 relative to the baseline. Income in year 7 is higher compared to baseline as the premium rate increases that reflect the higher claims in year 5 are first reflected in this period. The income in subsequent years continues to be higher than the baseline as subsequent rate increases are applied to a higher base premium. The rate increases after year 7 are based on the baseline claim trend of 8 percent.

In the second set of results (experience and valuation shock), the decrease in income in year 5 is comprised of an increase in PV of fulfillment cash flows, which is partly offset by a release in the CSM. While rate increases continue to be assumed as 95 percent of the claim trend, the growth in claims outpaces the premium increases. This explains the decreased income relative to baseline and

experience only scenarios. The negative income in the latter periods relative to baseline and experience only scenarios is also primarily caused by the compounded effect of the 95 percent success rate.

IV.E. Participating Whole Life (Par WL)

<u>Product Overview</u>

Par WL contracts are long-duration life insurance contracts that pay dividends to policyholders. The contract provides death benefit coverage over the life of the insured and non-forfeiture values such as cash values in exchange for level premiums paid by the policyholder. The dividends paid in these projections are assumed to be paid in cash. The contract used in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory ROI of 11 percent. The projected business consists of several model points issued in a single year.

The product cash flows under the baseline experience assumption are as follows.

Chart E.1: Par WL—Liability Cash Flows for Baseline Projection
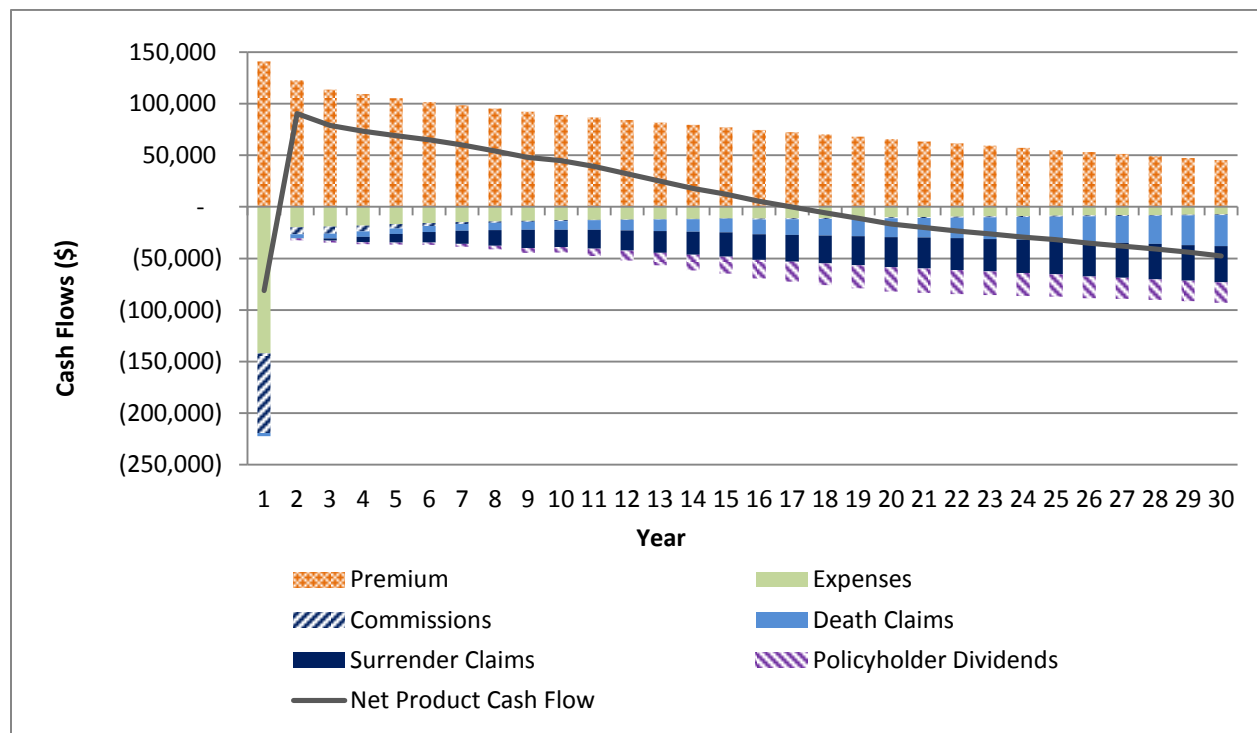
<u>US GAAP Valuation</u>

- Classified according to SOP 95-1

- Reserves set equal to net premium reserves using dividend interest and mortality rates

- Deferrable acquisition costs amortized according to estimated gross margins

IASB Proposed Standard

- Risk adjustment equal to a percentage of face amount that decreases over time

- CSM released based on net amount at risk (NAR)

Chart E.2: Par WL—Comparison of GAAP and IASB Net Pretax Income: Baseline Projection
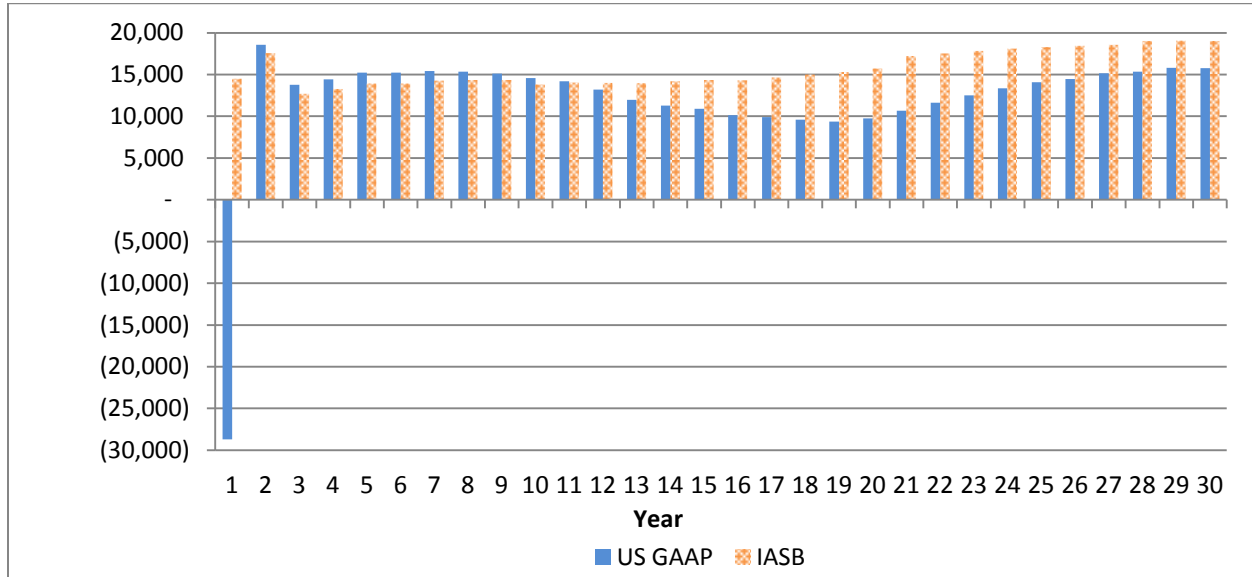
The year-one loss observed under US GAAP is due to the treatment of deferrable expenses. Under US GAAP, deferrable expenses are related to successful efforts only while IASB considers both successful and unsuccessful efforts.

The income emergence pattern under the proposed IASB standard is driven by the release of the risk adjustment and the CSM. Higher lapses accelerate the release of the risk adjustment, which produces slightly higher income in the first two years and after year 20. The CSM accelerates income in early years as well, as its release is based on the net amount at risk. The NAR decreases as the contract's non-forfeiture benefits are built up.

Under US GAAP, book profits are approximately proportional to estimated gross margins. The graphs that follow below illustrate the movement of reserves, CSM and risk adjustment over the baseline projection.

Chart E.3: Par WL—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
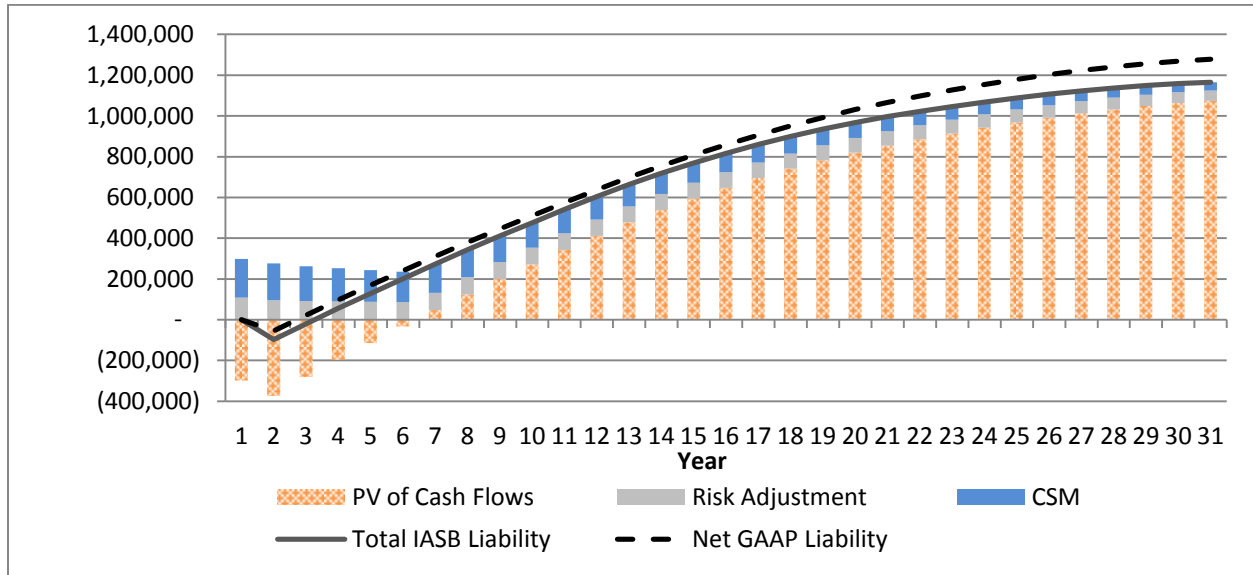
Chart E.4: Par WL—Risk Adjustment and Contractual Service Margin: Baseline Projection
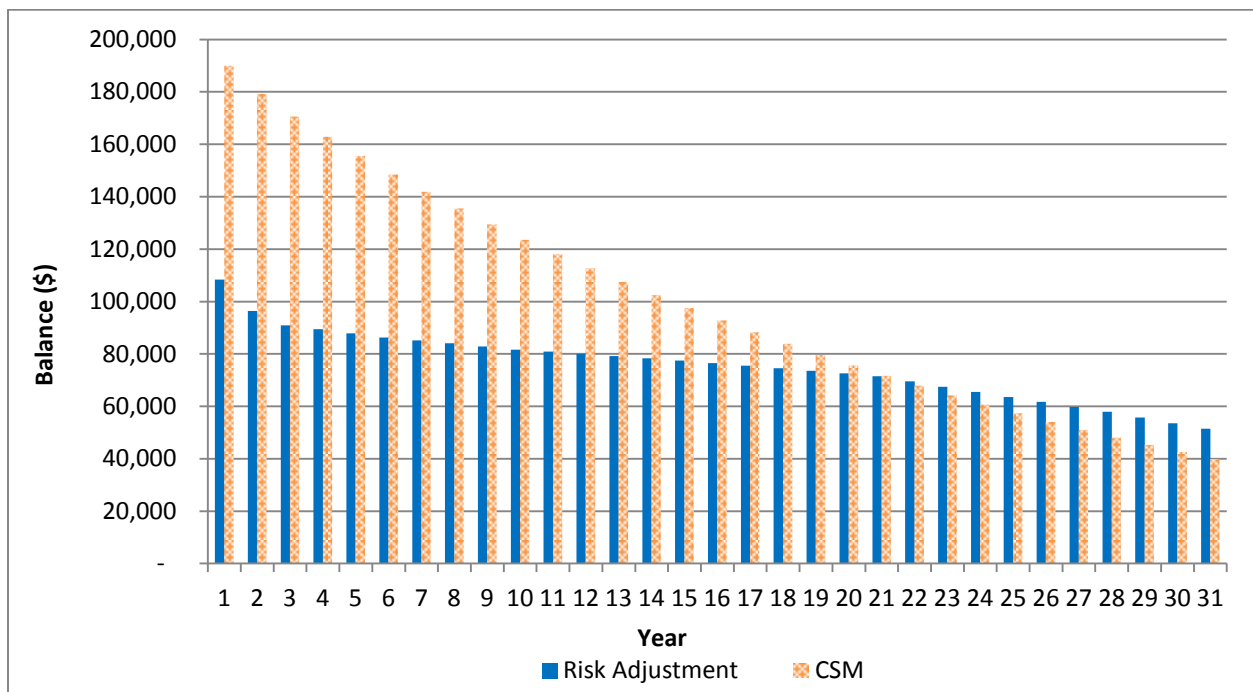
Chart E.5: Par WL—Comparison of IASB Pretax Income: Credit Spread Sensitivity
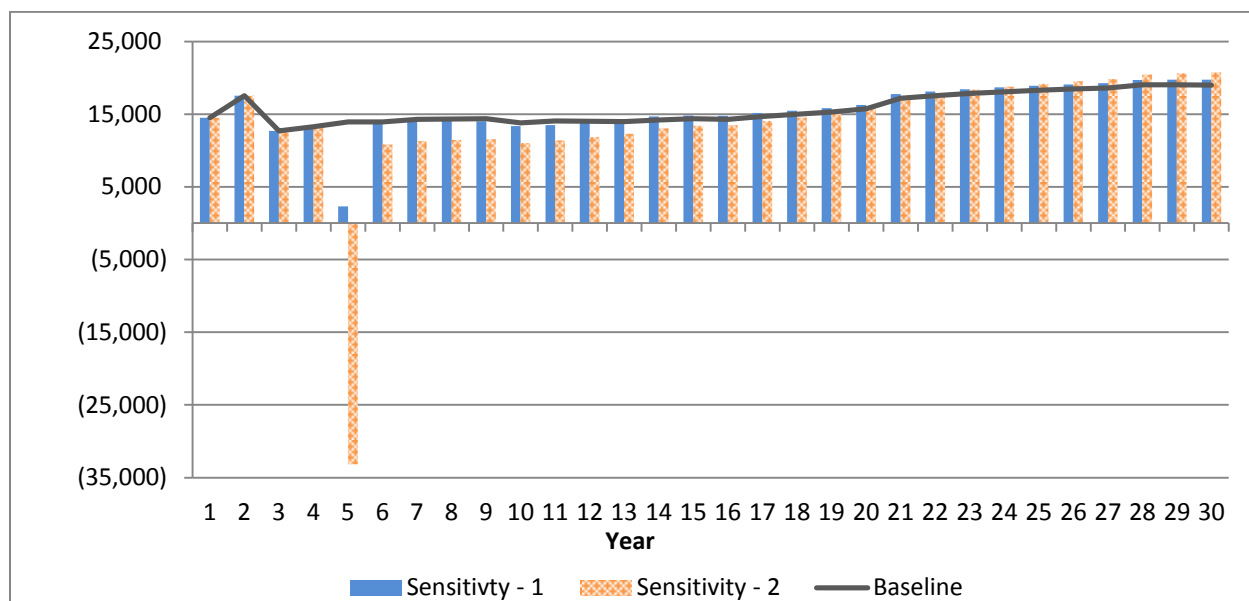
In these sensitivity tests, the ATF increases credit spreads in years 5 and later, without any changes to expected or unexpected defaults (i.e., the increase in the credit spreads is fully reflected in the liability discount rate. The increase in the credit spreads is applied to both experience and valuation assumptions. The dividend payments in years 6 and later fully reflect the increase in credit spreads; however, the dividend payment in year 5 itself is not changed as it is considered to be already declared prior to the shock.

In the first set of results, all cash flows are assumed to be asset dependent, for purposes of determining the interest to be accreted on the liability in the income statement. In the second set of results, only dividend cash flows are assumed to be asset dependent. For both sets of results, income is lower than the baseline scenario at the end of year 5 and the following few years as additional reserves had to be set up due to the credit spread increase. The impact of the additional dividend payments projected to be paid in future years is not fully offset by the increase of the liability discount rate because the dividend fund is based on statutory reserves and not the IASB liability. The following two charts depict the impact of the change in investment income, dividend payments and IASB liability on net income.

Chart E.6: Par WL—Net Income Impact: First Set of Results (Sensitivity Projection)
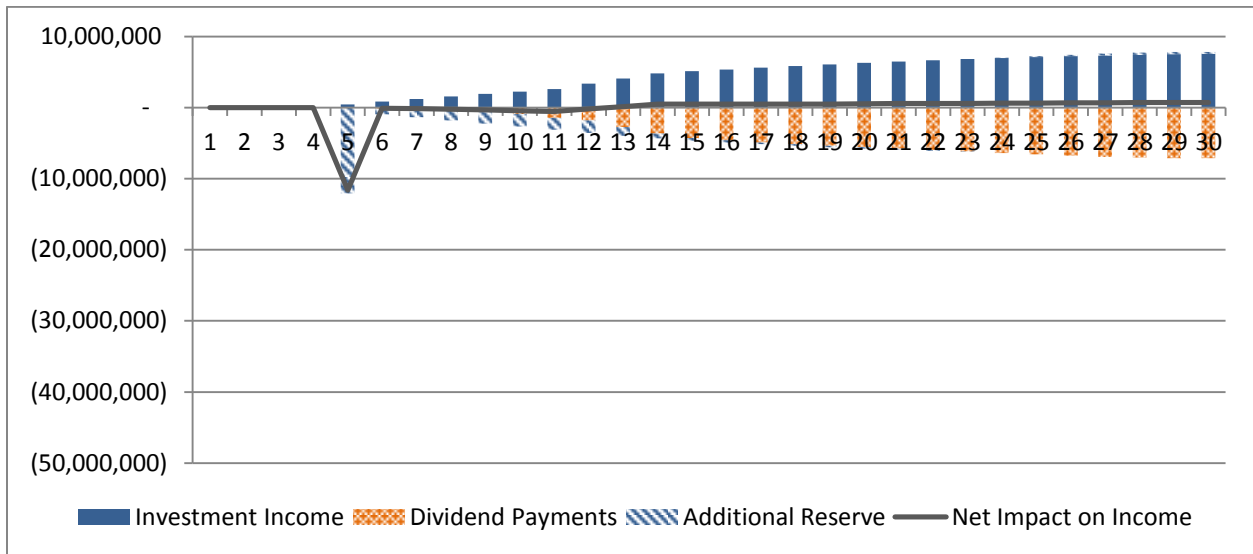
Chart E.7: Par WL—Net Income Impact: Second Set of Results (Sensitivity Projection)
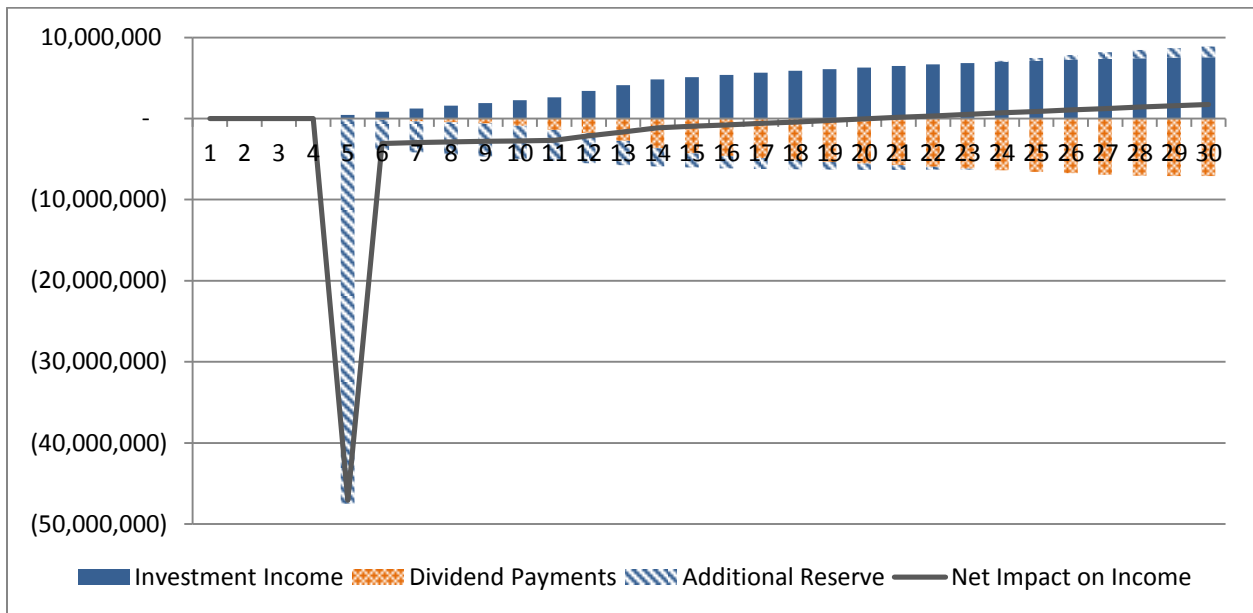
The impact of the credit spread sensitivity is higher for the second set of results because the discount rate impact on non-asset-dependent cash flows (e.g., cash flows other than dividend payments) is accounted for in other comprehensive income (OCI). For OCI purposes, the present value of non-asset-

dependent cash flows decreases in response to the liability discount rate increase. Chart E.8 below illustrates the impact of the credit spread increase in accumulated other comprehensive income (AOCI).

The graph below shows the impact of the change on AOCI for the second set of results. For the first set of results there is no impact on OCI because all cash flows are assumed to be asset dependent.

Chart E.8: Par WL—Accumulated Other Comprehensive Income: Sensitivity Projection
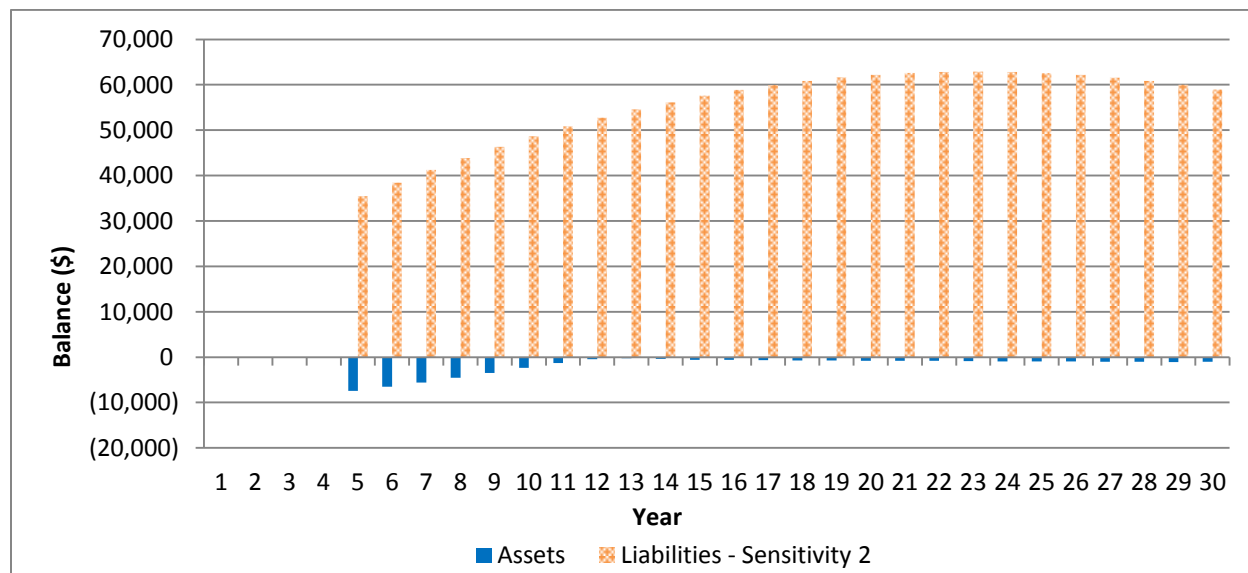
The asset-accumulated OCI is significantly lower than the liability-accumulated OCI. This difference is almost totally due to the subjective split of asset- and non-asset-dependent cash flows used in this sensitivity. The slight asset liability mismatch is another factor that contributes to the results. The average duration of the liabilities and assets is approximately 7 and 8 years, respectively.

IV.F. Single Premium Deferred Annuity (SPDA)

Product Overview

The policyholder pays a single premium at the inception of the contract and the premium is deposited into the general account for the policyholder. The insurance company credits interest to and deducts expense charges based on general account returns and management discretion. The policyholder can surrender the contract at any time, subject to a surrender charge in the first 10 years. A minimum credited rate is set at the point of policy issue, lasting for 10 years. This minimum credited rate can be reset for subsequent 10-year periods at the discretion of the insurer. Additionally, the full account value is available upon the death of the insured. The contract used in this exercise is priced based on the

economic assumptions described above and to achieve an ROI of 15 percent on an economic capital basis.

The product cash flows under the baseline experience assumption are as follows.

Chart F.1: SPDA—Liability Cash Flows for Baseline Projection
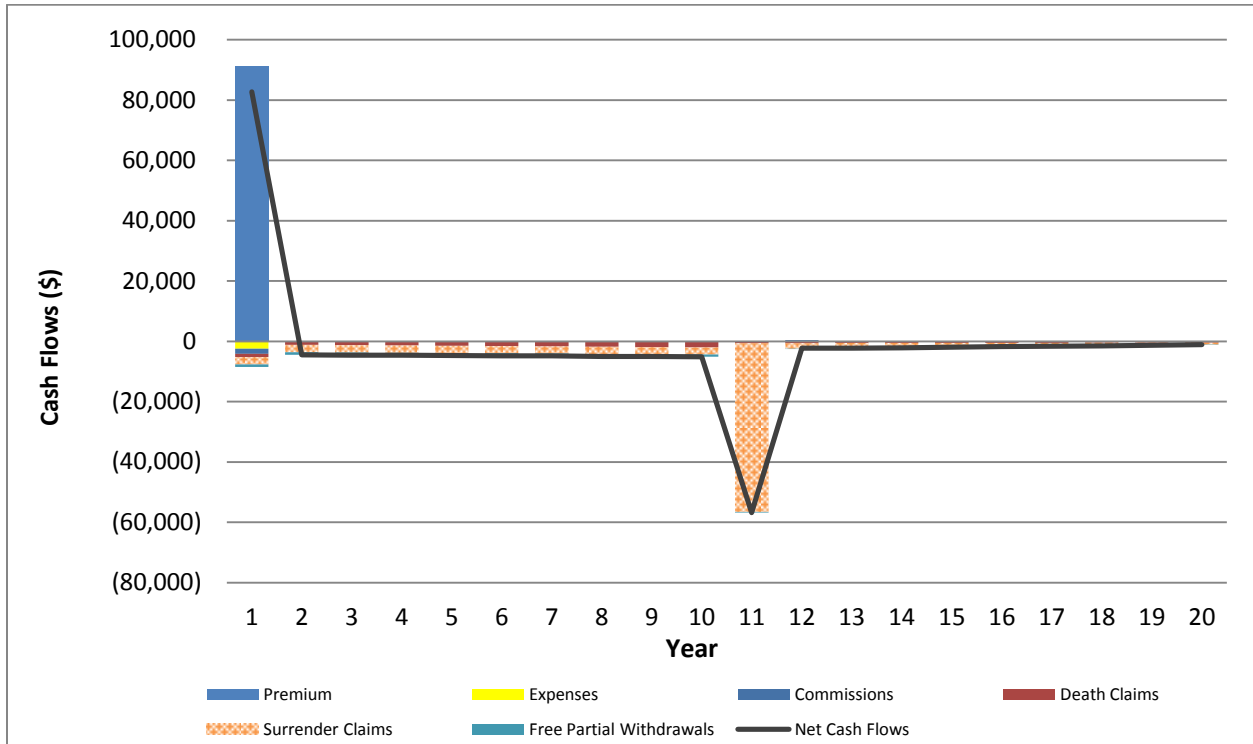
US GAAP Valuation

- SFAS97 investment contract

- Reserves set equal to account value

- Commissions and premium taxes are capitalized and amortized over estimated gross profits.

IASB Proposed Standard

- Single deterministic scenario with a 20 bps reduction to the discount rate as an estimate for the cost of options embedded in the contract

- Risk adjustment equal to a percentage of best-estimate liability that reduces over time

- CSM released based on policy count

Chart F.2: SPDA—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
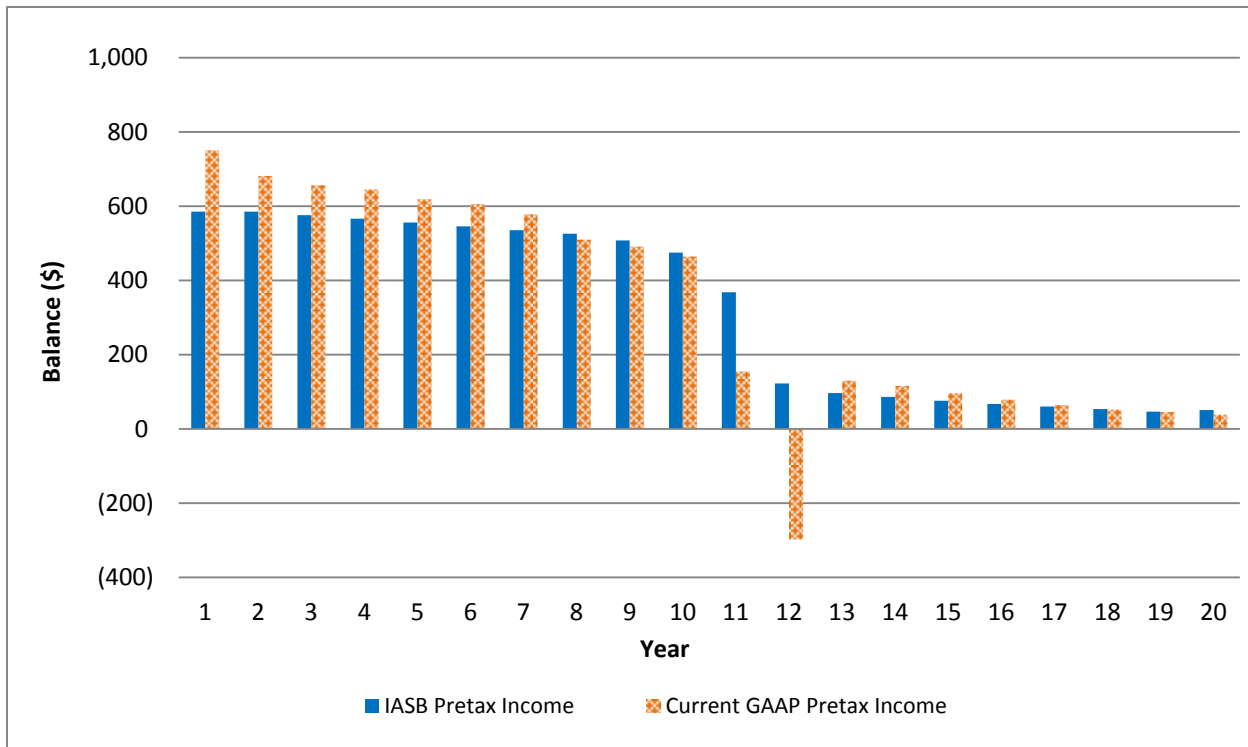
The income under the current US GAAP framework emerges earlier in the projection than under the IASB framework. This is primarily driven by the difference in the CSM amortization basis and estimated gross profits. It is also impacted by the slow release of the risk adjustment as illustrated in the graph below. Although the reserves under the old and new basis, as shown in the table below, are similar in magnitude and pattern, there are slight differences between the two frameworks that cause the difference in profit emergence illustrated above. Additionally, there is a renewal commission under this product paid in year 12. This commission is reflected in the IASB basis reserves, but not in the current US GAAP reserves, resulting in the income impact shown in year 12 in the table above. Since all of the first year commissions and premium taxes were treated the same for both US GAAP and IASB (all efforts are considered successful), there is no impact on first year income from this item.

Chart F.3: SPDA—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
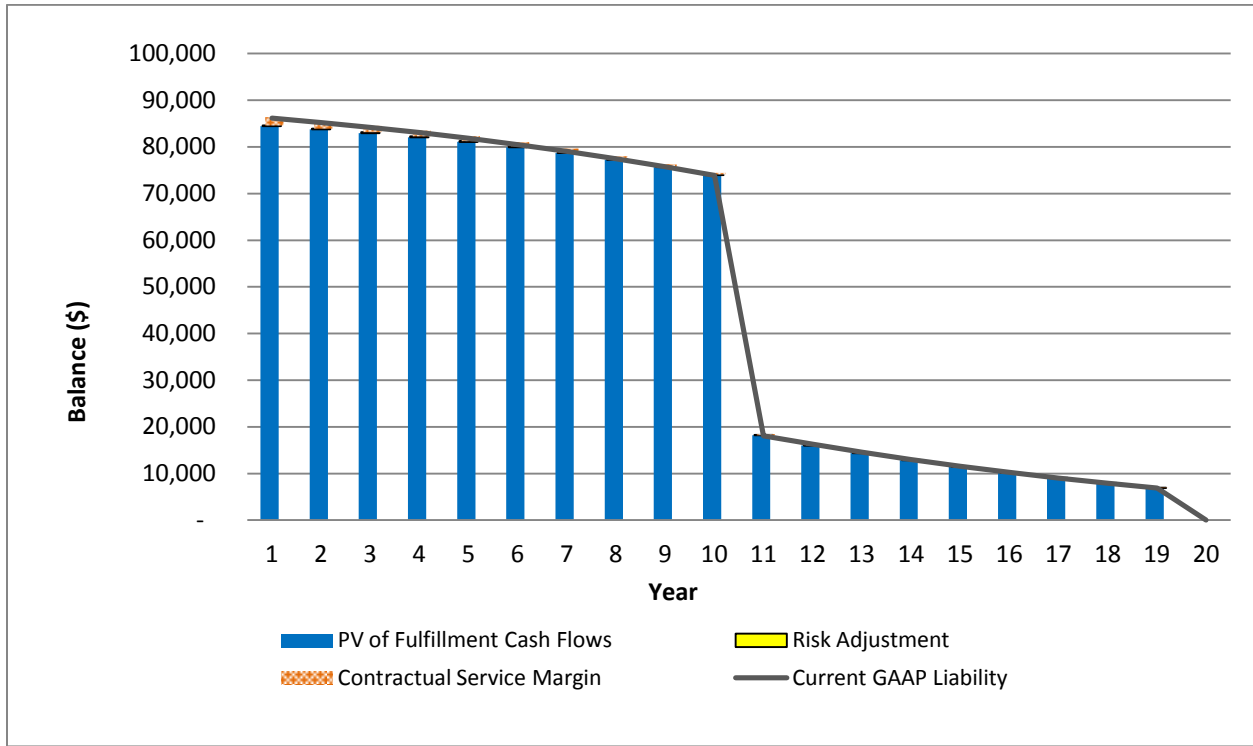
Chart F.4: SPDA—Risk Adjustment and Contractual Service Margin: Baseline Projection
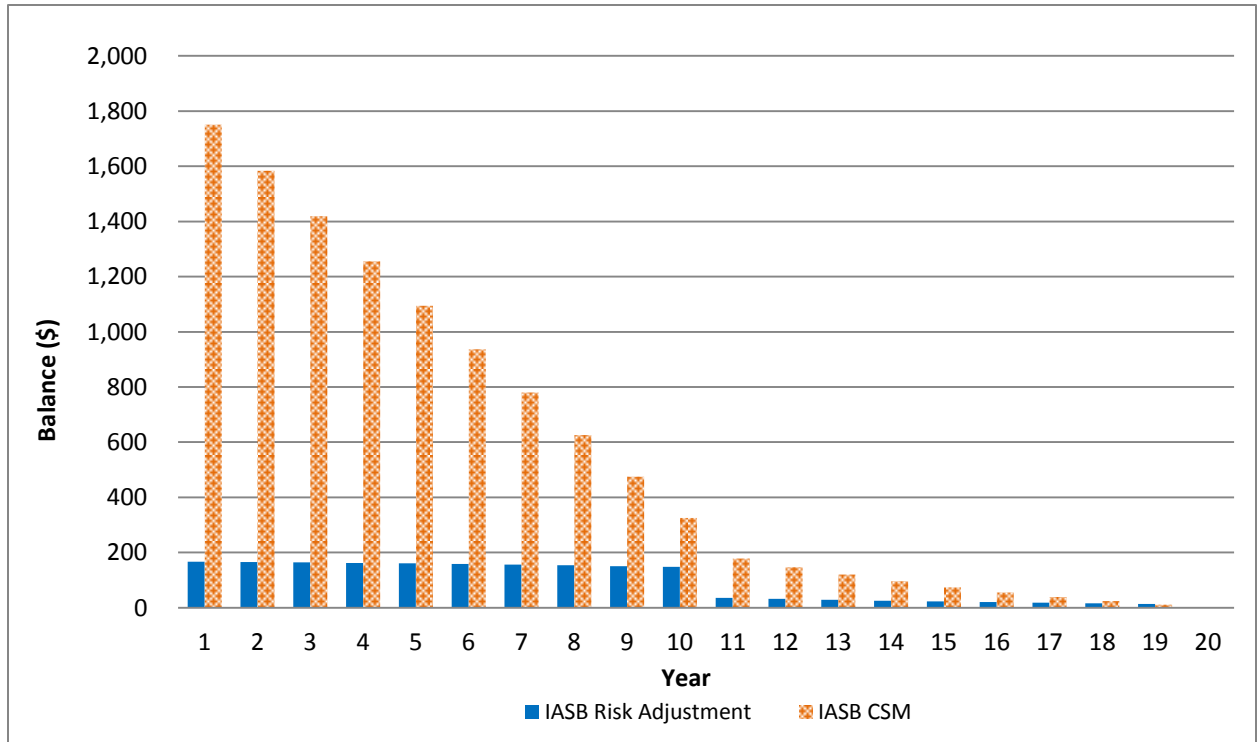
Table F.5: SPDA—Total IASB Liability (Baseline vs. Sensitivity)

Present Value of Fulfillment Cash Flows (at time 1)		
	Without Dynamic Lapse	With Dynamic Lapse
Deterministic—Best Estimate	83,176	83,176
Deterministic—Cost of Option (Baseline)	84,567	84,567
Stochastic (Sensitivity)	83,232	83,318

In this sensitivity test, the ATF calculates the present value of fulfillment cash flows at time 1 under a stochastic interest rate projection to compare results to the baseline scenario, where they use a single deterministic scenario with a cost of option adjustment to the discount rate. The stochastic projection was performed using a set of risk-neutral interest rate scenarios with a mean of 4 percent. The analysis is performed with and without the use of a dynamic lapse function. The results indicate that the stochastic valuation does not generate additional reserves indicating that the 20-basis-point reduction to the discount rate is not required in order to estimate the value of the stochastic result in this instance where the guaranteed rate is 1 percent and the mean of the risk-neutral scenarios is 4 percent. In this case, the guarantee is sufficiently out of the money such that no cost of option adjustment is required.

IV.G. Single Premium Immediate Annuity (SPIA)

Product Overview

The policyholder pays the insurance company a single premium at the inception of the contract in exchange for level monthly payments for life. The payments are not sensitive to market movements, and the policyholder has no options to settle the contract for cash other than the periodic payments provided for in the contract. The contract used in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory ROI of 12.5 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart G.1: SPIA—Liability Cash Flows for Baseline Projection
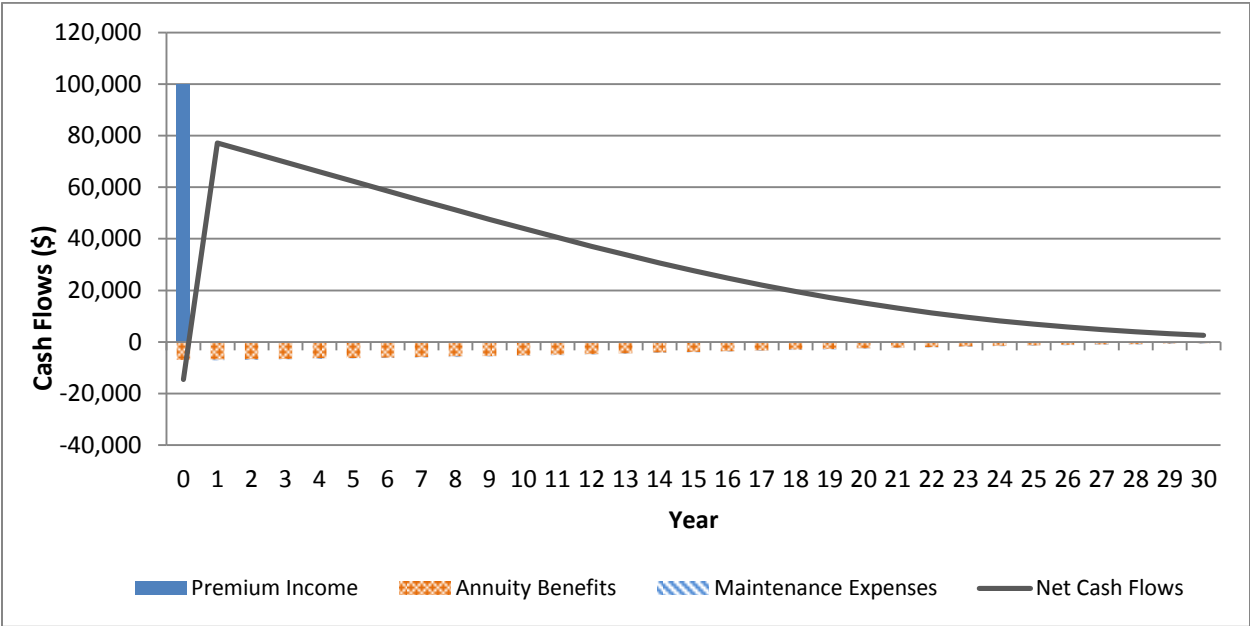
US GAAP Valuation

- SFAS97 limited pay contract

- Net premium reserves at locked-in assumptions with PADs

- Deferred profit liability established for gross premium in excess of net premium

IASB Proposed Standard

- Single deterministic scenario

- Risk adjustment equal to a percentage of best-estimate liability that reduces over time

- CSM released based on pattern of benefit payments

Chart G.2: SPIA—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
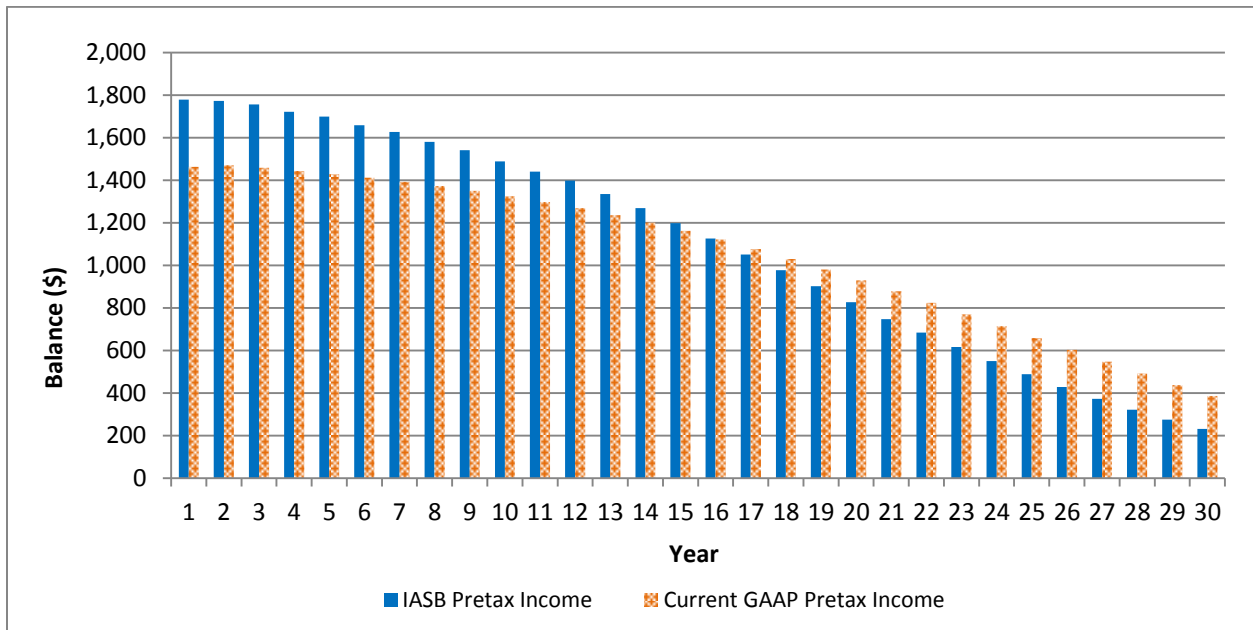
The IASB framework recognizes income more quickly than the current US GAAP framework does. This is due to the inclusion of the 10 percent mortality PAD in the US GAAP reserves as compared to the risk adjustment and CSM in the IASB reserve figures. The risk adjustment used under the proposed IASB framework runs off roughly in proportion to the base best-estimate liability, as opposed to the lengthened period over which benefits are expected to be paid under the "PADed" US GAAP reserves. The deferred profit liability (DPL) is released in proportion to US GAAP reserves, also deferring profits until later in the projection, when compared to the CSM amortization. Additionally, the treatment of acquisition expenses is identical between US GAAP and IASB, resulting in no impact on the income emergence in year one. The graphs below show the comparison of reserves under the two frameworks in order to more directly illustrate the income emergence patterns that are observed in the graph above.

Chart G.3: SPIA Liability Comparison: Baseline Projection
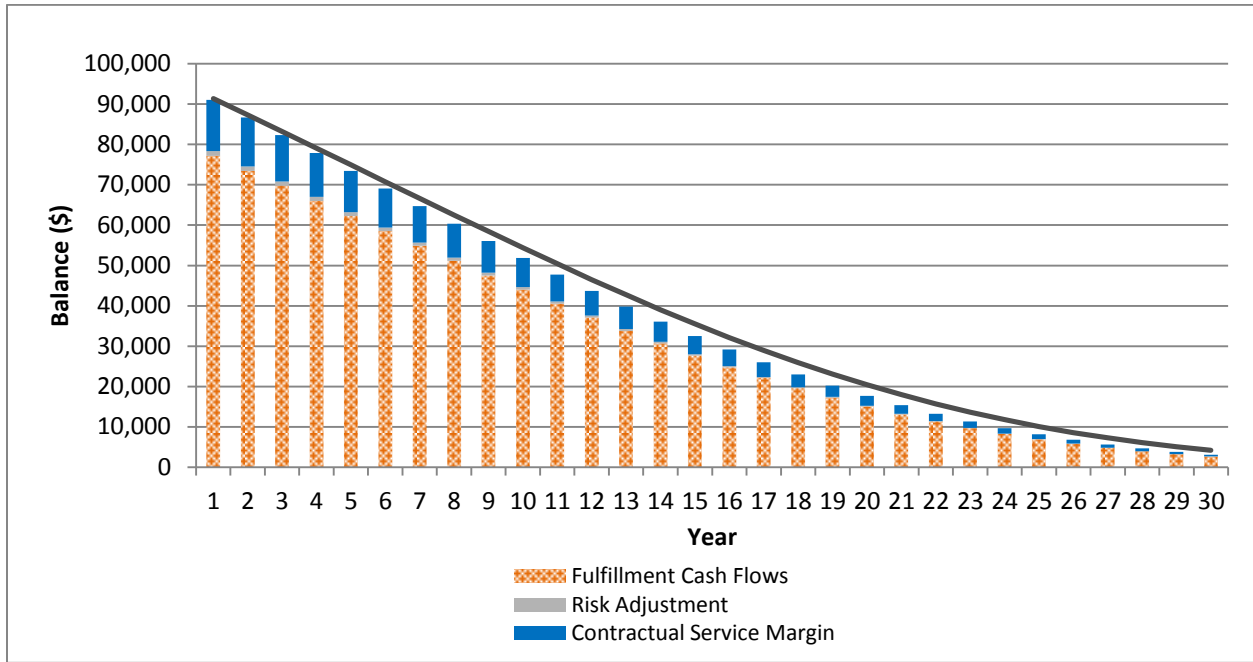
Chart G.4: SPIA Risk Adjustment and Contractual Service Margin: Baseline Projection
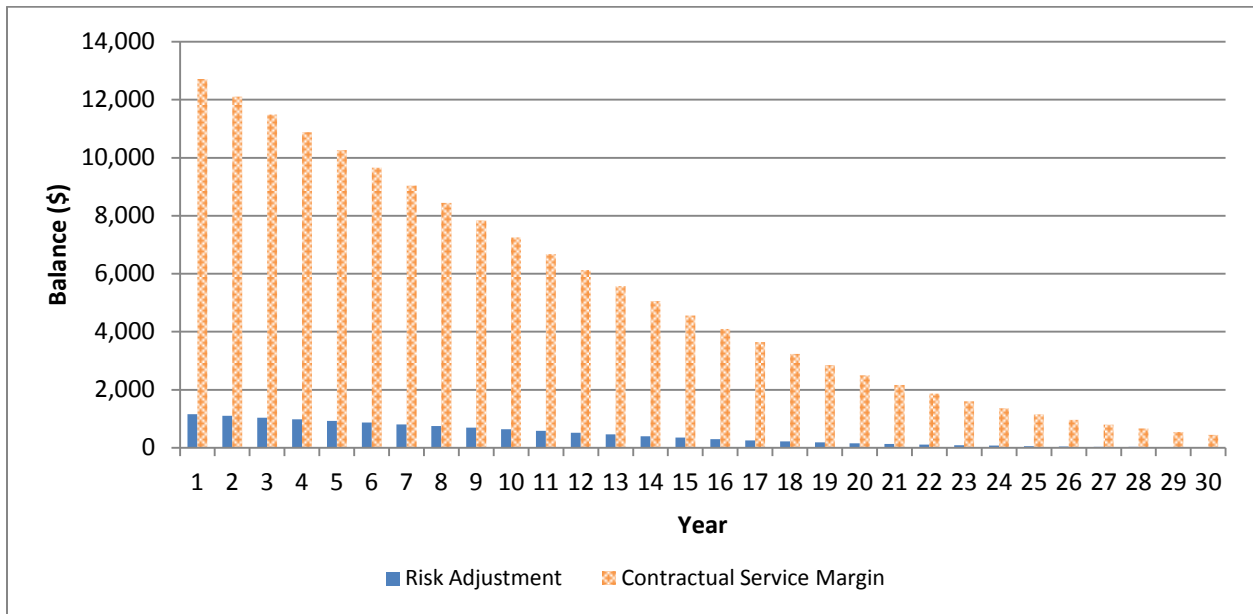
The total liability produced by the proposed standard is similar to the current liability under US GAAP, but with a slightly different slope as discussed above. The similarity in reserve level is driven by the

deferred profit liability for the US GAAP limited pay contract, which eliminates profit at inception; similar to the way the proposed standard uses the CSM to eliminate profit at inception.

The main differences in the slope of the reserves arise later in the projection where the total liability under US GAAP decreases more slowly due to the 10 percent mortality PAD included in the US GAAP reserve as compared to the more rapid amortization of the risk adjustment and the CSM, as illustrated in Chart G.4 above.

Sensitivity Projection Results

The ATF tests the impact on AOCI of using the bottom-up approach to developing the discount rate. AOCI is driven by the net of liability and asset balance sheet movements that do not go through income. This test is performed assuming a 100 bps increase in credit spreads along with an increase in the illiquidity premium of 50 bps assumed to begin in year 5 of the projection. The liability value on the balance sheet decreases as a result of the change in the illiquidity premium, generating the liability accumulated other comprehensive balance (liability AOCI balance) shown in Chart G.6 below. Liability AOCI is assumed to be the balance sheet value of the liability less the value of the liability used to report income at each valuation date. The asset value on the balance sheet decreases as a result of the change in the credit spread, generating the asset accumulated other comprehensive income balance (asset AOCI balance) shown in Chart G.6 below. Asset AOCI is assumed to be the difference between the market value and book value of assets. Note that we assume that the assets have a similar duration to the liability when determining the impact on asset values and that assets are designated as available for sale as described earlier in this document.

The graph below shows the other comprehensive income.

Chart G.5: SPIA Other Comprehensive Income: Sensitivity Projection
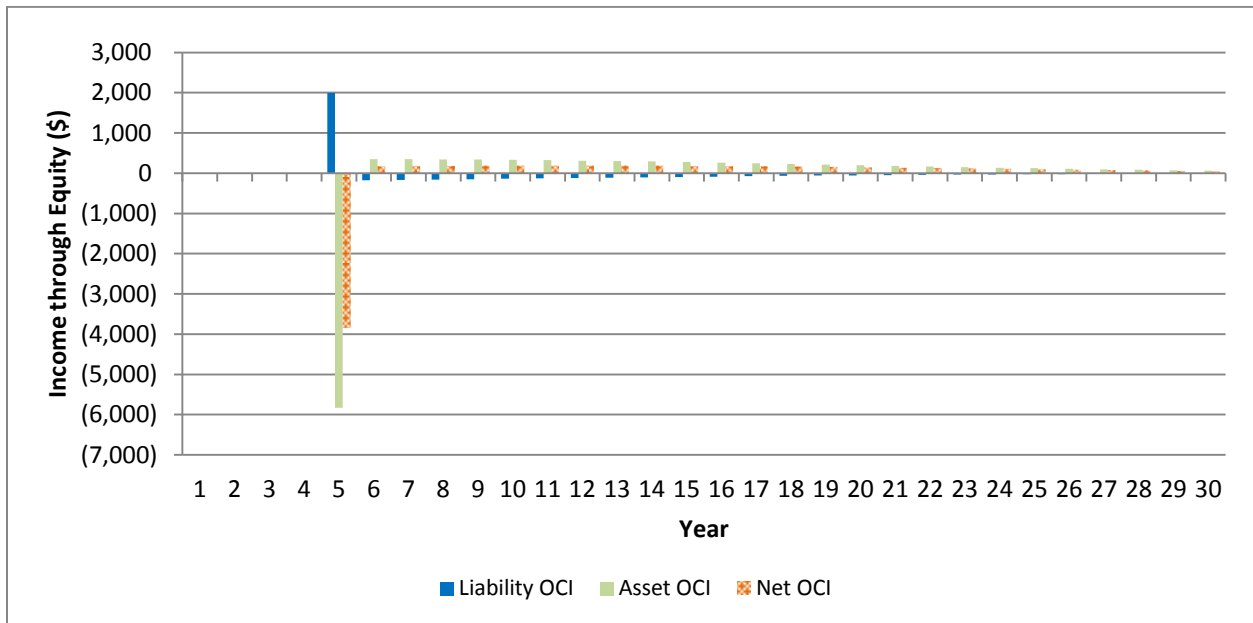
The graph below shows the accumulated other comprehensive income, which accumulates the equity impacts shown in the previous graph.

Chart G.6: SPIA Accumulated Other Comprehensive Income: Sensitivity Projection
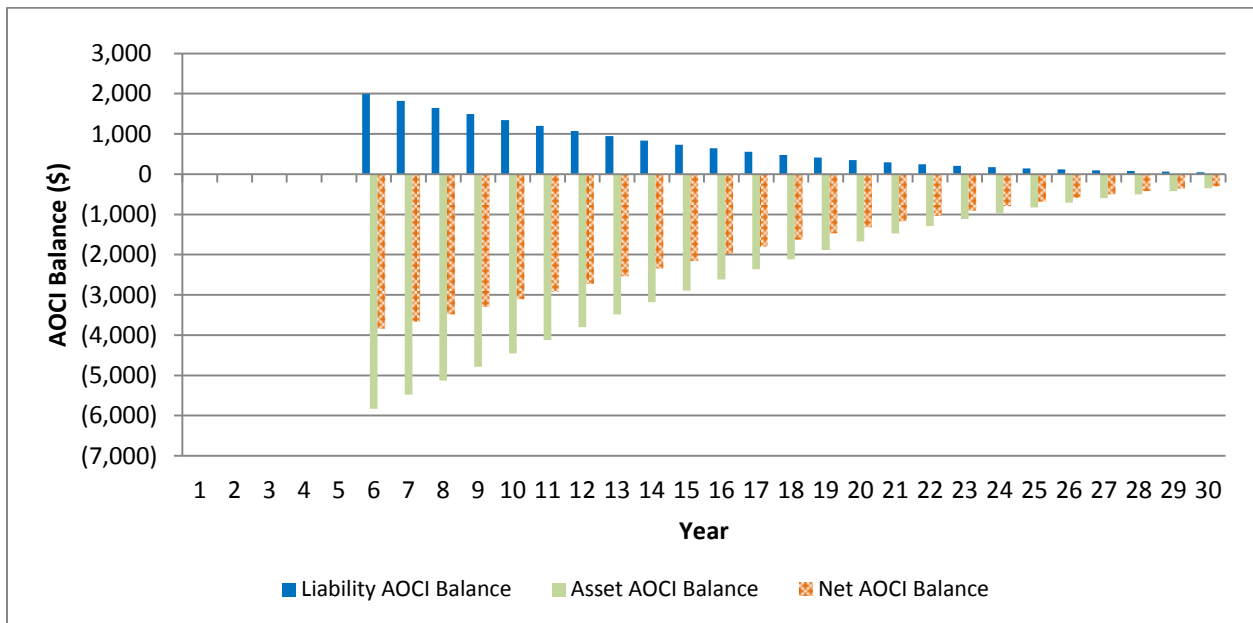
The asset AOCI balance in each year is larger than the liability AOCI balance for the following reasons:

1. The shock to the credit spread that is applied to the asset valuation is twice the size of the shock to the illiquidity premium that is applied to the liability valuation.

2. The liability valuation includes a component (the CSM) that is not affected by changes in the discount rate.

We also test the impact of using the top-down approach. We assume that the top-down approach will take a historical view of the expected and unexpected defaults that are subtracted from the asset earned rate. Hence, those components react slowly and by a smaller amount than under the bottom-up approach. For the purposes of this analysis, we assume that the combined default assumption increases by 20 percent (or 14 basis points), grading in over a 10-year period. This allows most of the 100-basis-point credit spread shock to flow through the liability discount rate, causing the liability balance sheet amount to move more than when the bottom-up approach was used. The AOCI produced by the bottom-up approach and the AOCI produced by the top-down approach are compared in Chart G.7 below.

Chart G.7: SPIA Accumulated Other Comprehensive Income: Sensitivity Projection
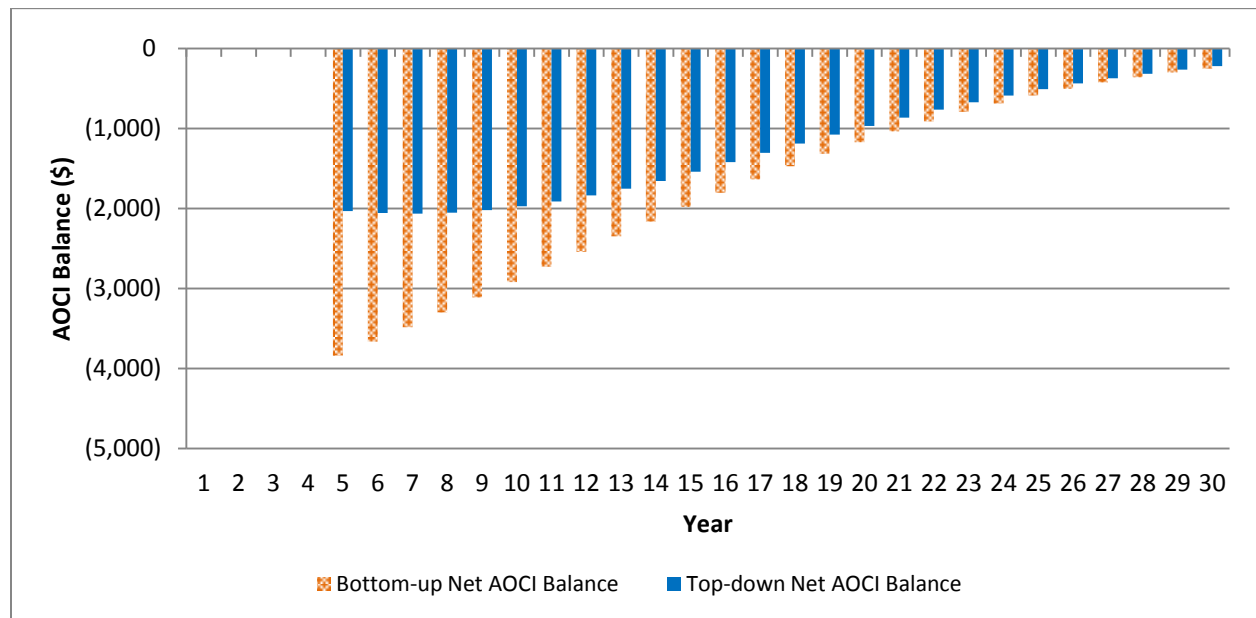
IV.H.   Term Life Insurance (Term Life)

Product Overview

These contracts have level premiums for a set period and then sharply increasing premiums after the level term period. Death benefits are level throughout the insured's life. There are no nonforfeiture benefits. The product tends to be lapse supported during the level term period, because of the lack of cash surrender values. After the level term period, there are shock lapses, because of the sharply increasing premiums, and mortality anti-selection that wears off over time.

The contract modeled in this exercise is priced based on the economic assumptions described above to achieve a U.S. statutory ROI of 10 percent. Cash flows are projected for a sample of 25 equal size cells, which cover both genders, different level premium periods, and a broad range of issue ages and risk classes. The number of cells related to each level premium period is as follows:

- 10-year—4 cells
- 15-year—4 cells
- 20-year—10 cells
- 30-year—7 cells.

The product cash flows under the baseline experience assumption are as follows.

Chart H.1: Term Life Product-Related Cash Flows for Baseline Projection
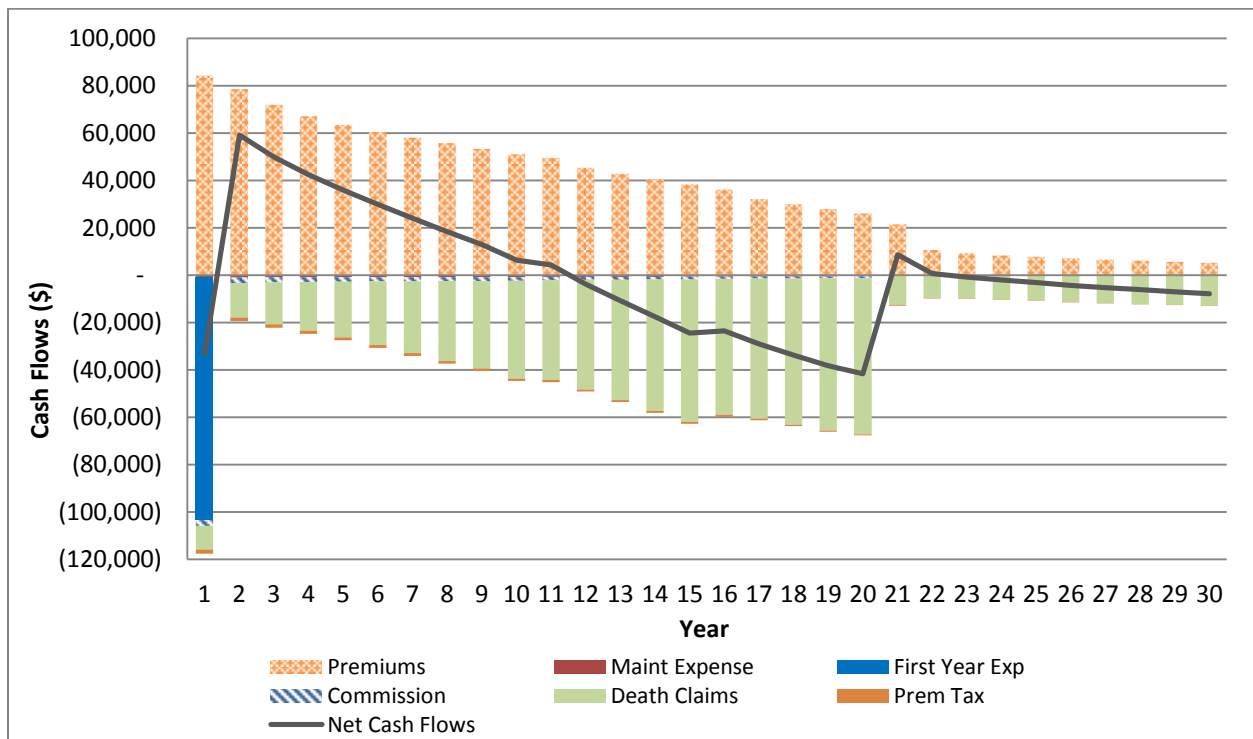
US GAAP Valuation

- SFAS60 contract

IASB Proposed Standard

- Risk adjustment equal to a percentage of face amount that decreases over time

- CSM released based on the projected face amount in force

Chart H.2: Term Life—Comparison of GAAP and IASB Pretax Income: Baseline Projection
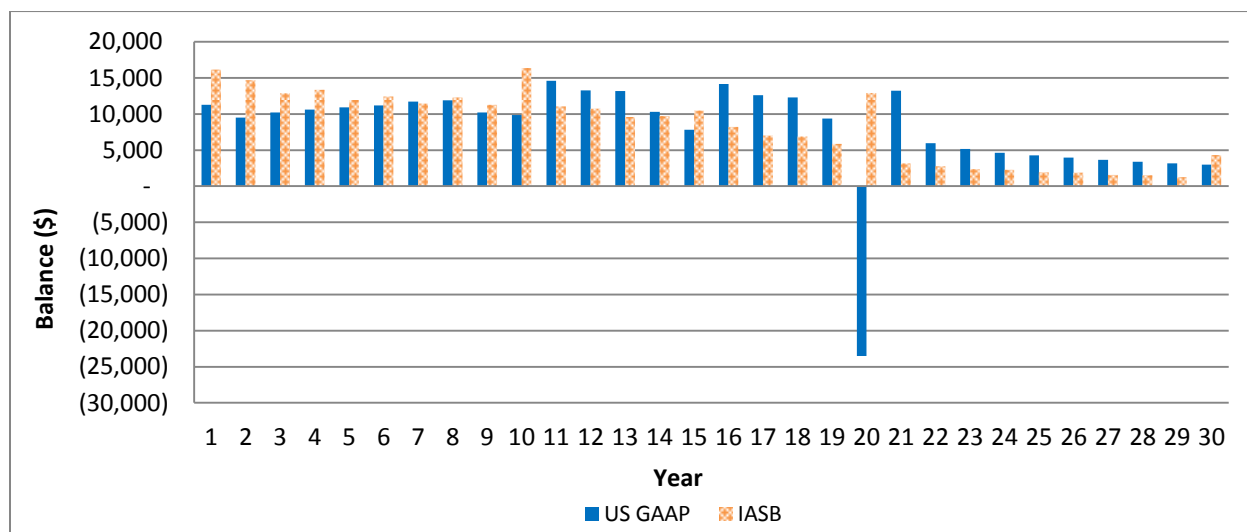
Under US GAAP, the contract produces negative reserves at the end of the level premium period due to the sharply increasing premiums. For the purpose of this exercise, negative reserves under US GAAP are not allowed and floored at zero, which results in lower income in year 10, 15, 20 and 30 (end of level premium periods). This is in contrast to the IASB basis results where reserves are not floored at zero, producing higher income than the US GAAP basis in those years. The impact of flooring negative reserves is magnified in year 20, and a loss is observed because approximately 40 percent of the business has a level premium period of 20 years.

US GAAP book profits emerge as a level percentage of premiums plus the release of the PAD. Additionally, income is higher after the level term period as the profit from those negative reserves that are floored at zero is recognized.

The income emergence pattern under the proposed IASB standard is primarily driven by the release of the CSM and the risk adjustment. As illustrated in Chart H.4, shock lapses at the end of years 10, 15, 20 and 30 accelerate the release of the risk adjustment. As discussed above, negative reserves were not floored at zero under the IASB basis results.

The graphs that follow below illustrate the movement of reserves, CSM and risk adjustment over the baseline projection.

Chart H.3: Term Life Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
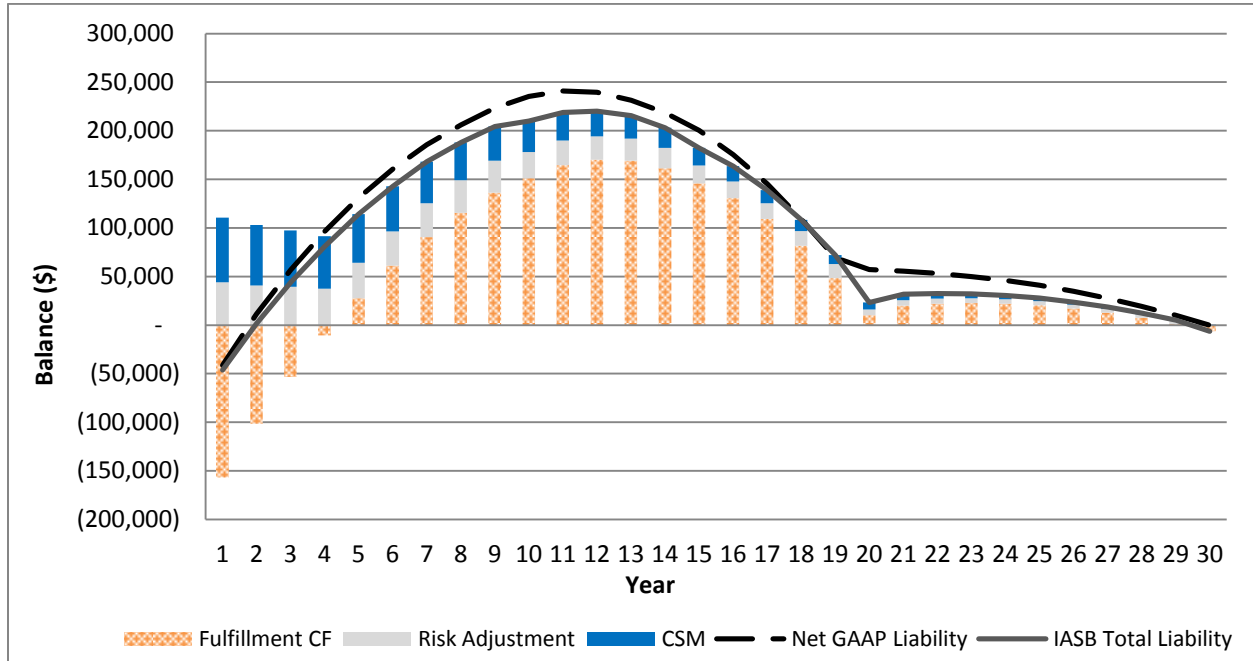
Chart H.4: Term Life Risk Adjustment and Contractual Service Margin: Baseline Projection
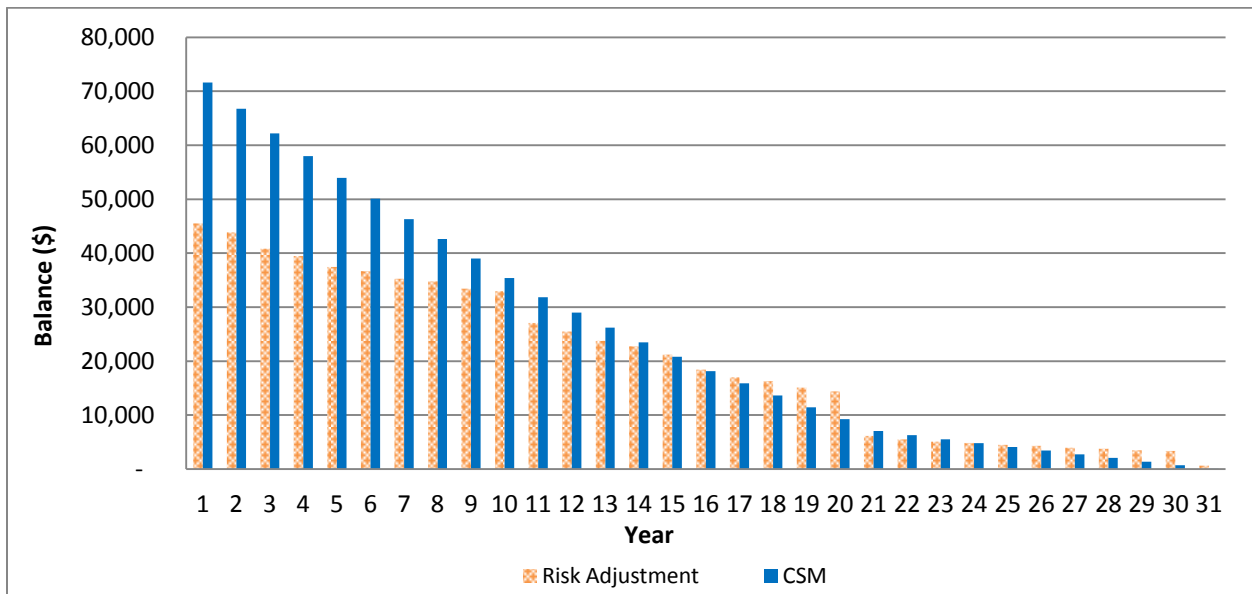
Chart H.5: Term Life—Comparison of IASB Pretax Income: Lapse Sensitivity
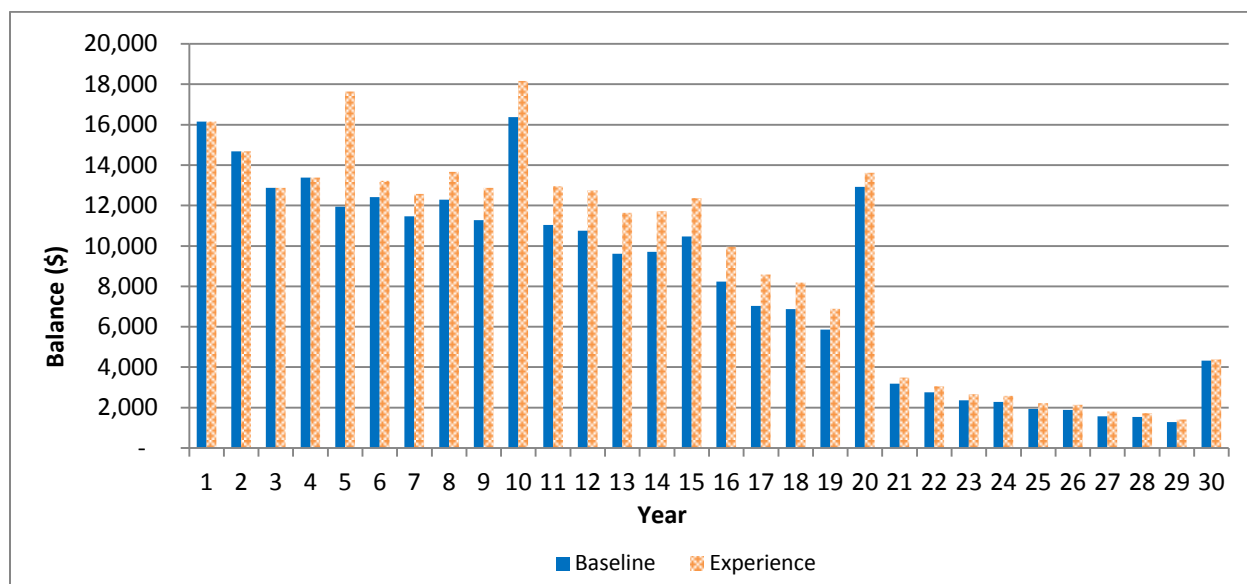
In this sensitivity test, the ATF projects higher lapses at the end of year 5. The additional lapses are included in the experience assumption only for the first set of results and in both experience and valuation assumptions for the second set of results.

In the first set of results, shown in the above graph, the ATF projects 20 percent (multiplicative adjustment) higher lapses in year 5. The additional lapses are included in the experience assumption only. For year 6 and future years, the lapse assumption is not modified from original levels. Profit emergence is higher under this sensitivity because the product is lapse supported and fewer people remain under the sensitivity scenario in order to collect death benefits. Valuation assumptions are not modified and therefore the CSM is not unlocked.

In the second set of results, the ATF projects 10 percent (multiplicative adjustment) higher lapses in year 5 and future years. The additional projected lapses are reflected in both experience and valuation assumptions. In this scenario, the CSM is increased to offset the reduction in the present value of cash flows due to the assumption change. In years 6 and forward, the income under this sensitivity is higher than the baseline scenario as the release of the additional CSM bolsters income. Please see the following graph.

Chart H.6: Term Life—Comparison of IASB Pretax Income: Lapse Sensitivity
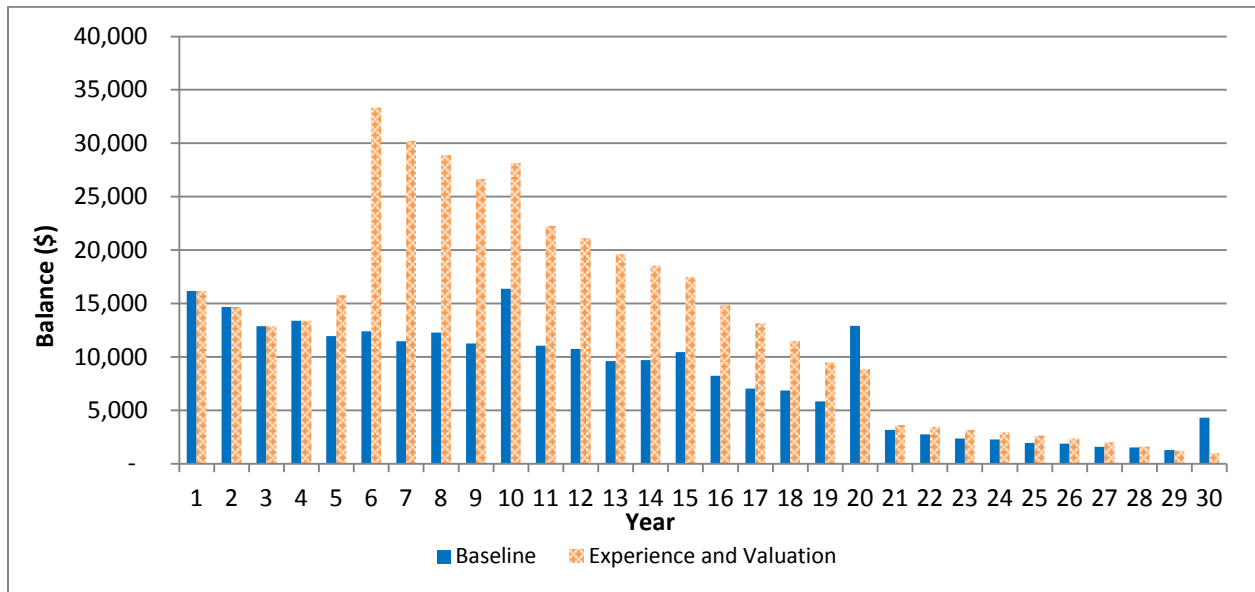
IV.I.   Universal Life (UL)

Product Overview

The policyholder pays the insurance company a series of flexible premiums over the lifetime of the contract and the premium is set up as an account value for the policyholder. The insurance company credits interest to and deducts cost of insurance and expense charges from the account value. The policyholder can surrender its account value at any time, subject to a surrender charge in the first 15 years. Additionally, the face amount of this life insurance contract is payable upon the death of the insured. The contract used in this exercise is priced based on the economic assumptions described above to achieve an after-tax statutory ROI of 8.5 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart I.1: UL—Liability Cash Flows for Baseline Projection
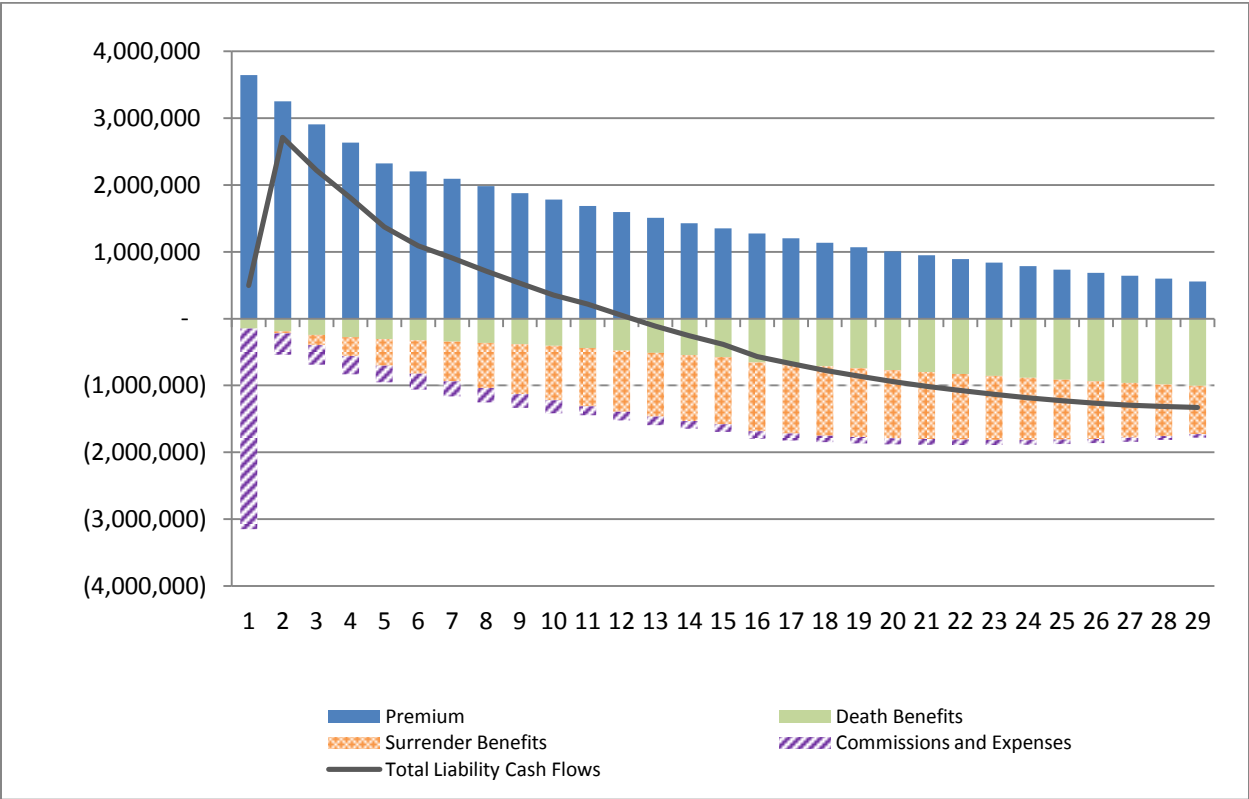
US GAAP Valuation

• SFAS97 contract

• Reserves set equal to account value

<u>IASB Proposed Standard</u>

- Single deterministic scenario with a 20 bps increase to the crediting rate as an estimate for the cost of options embedded in the contract (i.e., minimum guaranteed crediting rate of 2 percent)

- Risk adjustment equal to a percentage of face amount that decreases over time

- CSM released based on the net amount at risk

Chart I.2: UL—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
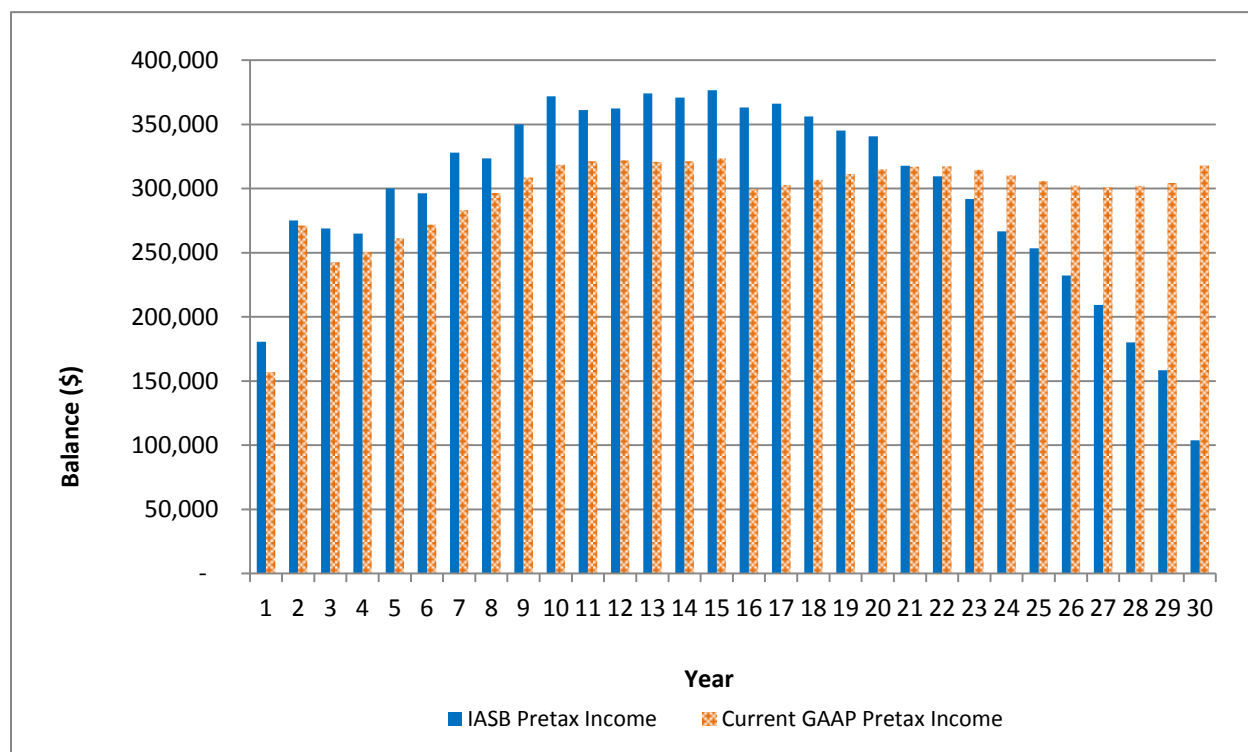
Income under the proposed IASB standard emerges earlier than under the current US GAAP framework for this product. This is primarily driven by the relatively more rapid amortization of the CSM and risk adjustment as compared to the estimated gross profits under US GAAP (since GAAP book profits are approximately proportional to estimated gross profits). The graphs that follow below illustrate the movement of reserves, CSM and risk adjustment over the baseline projection. Since for modeling purposes all efforts are considered successful, the treatment of deferrable expenses is identical between US GAAP and IASB; there is no difference in year-one profits related to deferrable expenses. We note here, as discussed in the executive summary above, that the choice of the driver for CSM amortization has a meaningful effect on the emergence of income under the proposed standard. A sensitivity of the results to various CSM amortization drivers is included in the VUL section below.

Chart I.3: UL Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
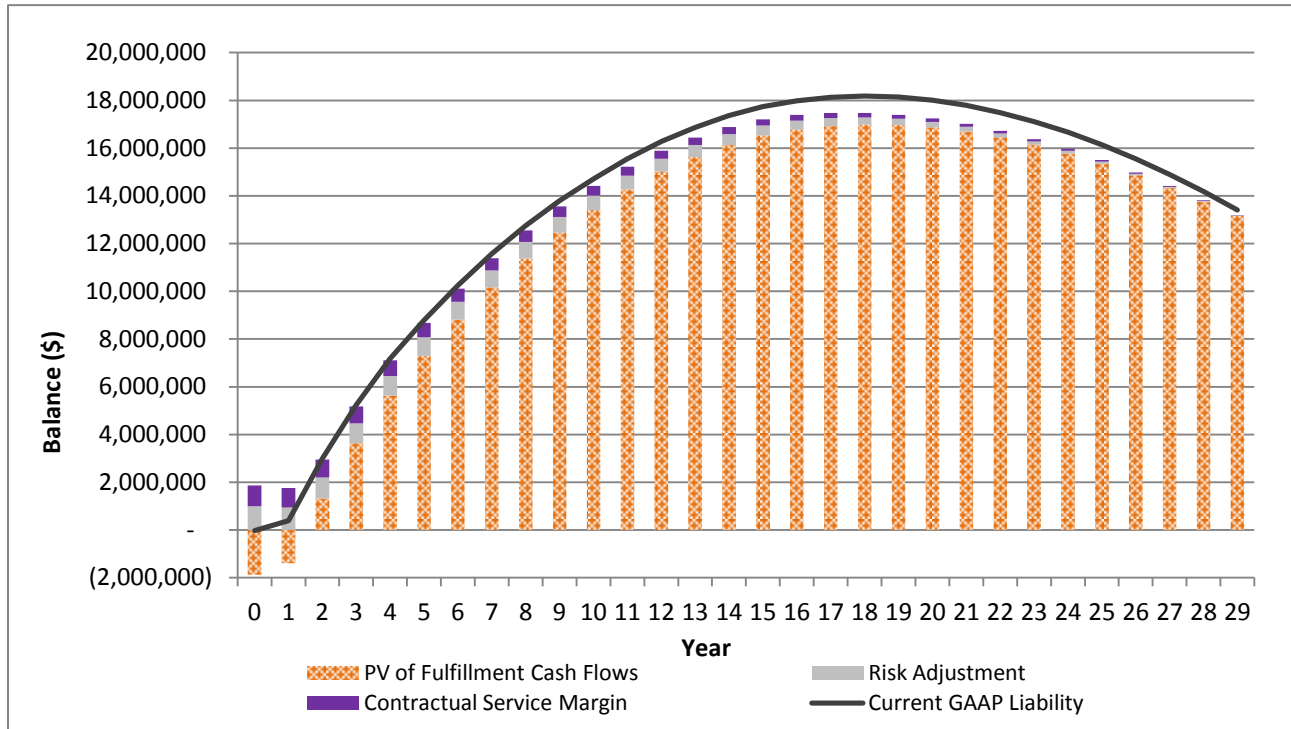
Chart I.4: UL Risk Adjustment and Contractual Service Margin: Baseline Projection
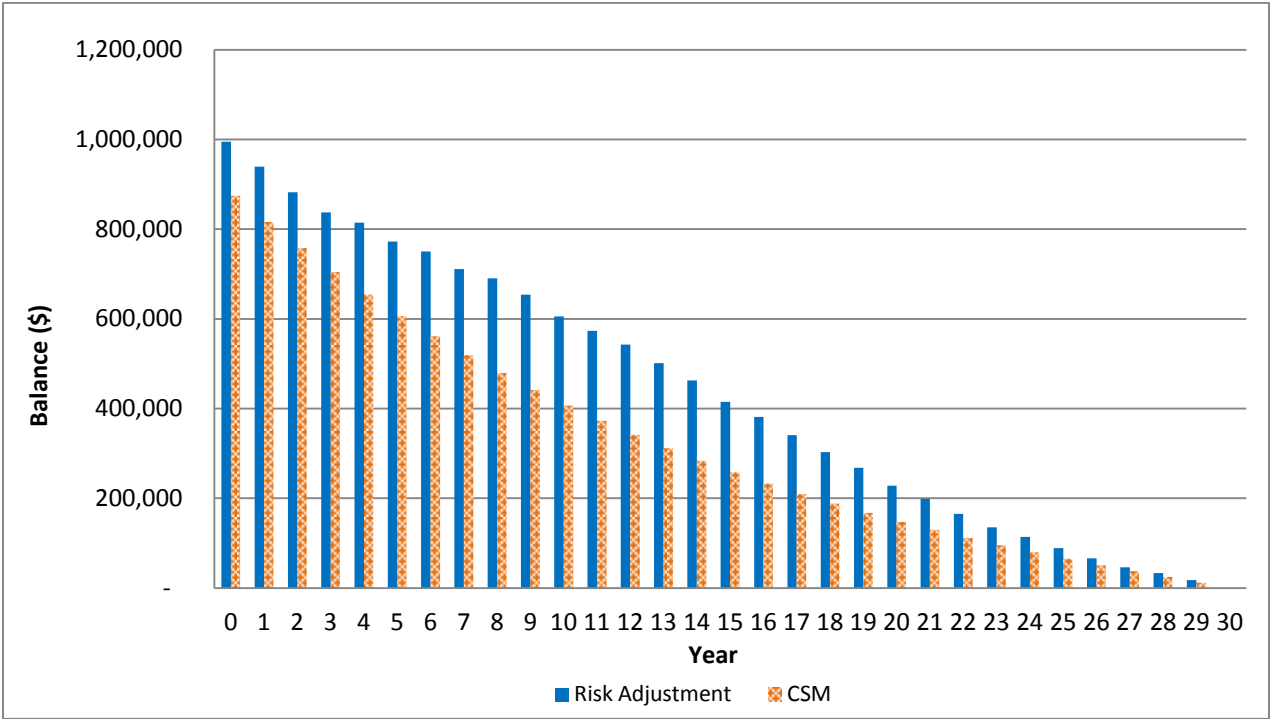
Chart I.5: UL - Comparison of GAAP and IASB Pretax Net Income - UL Mortality Sensitivity
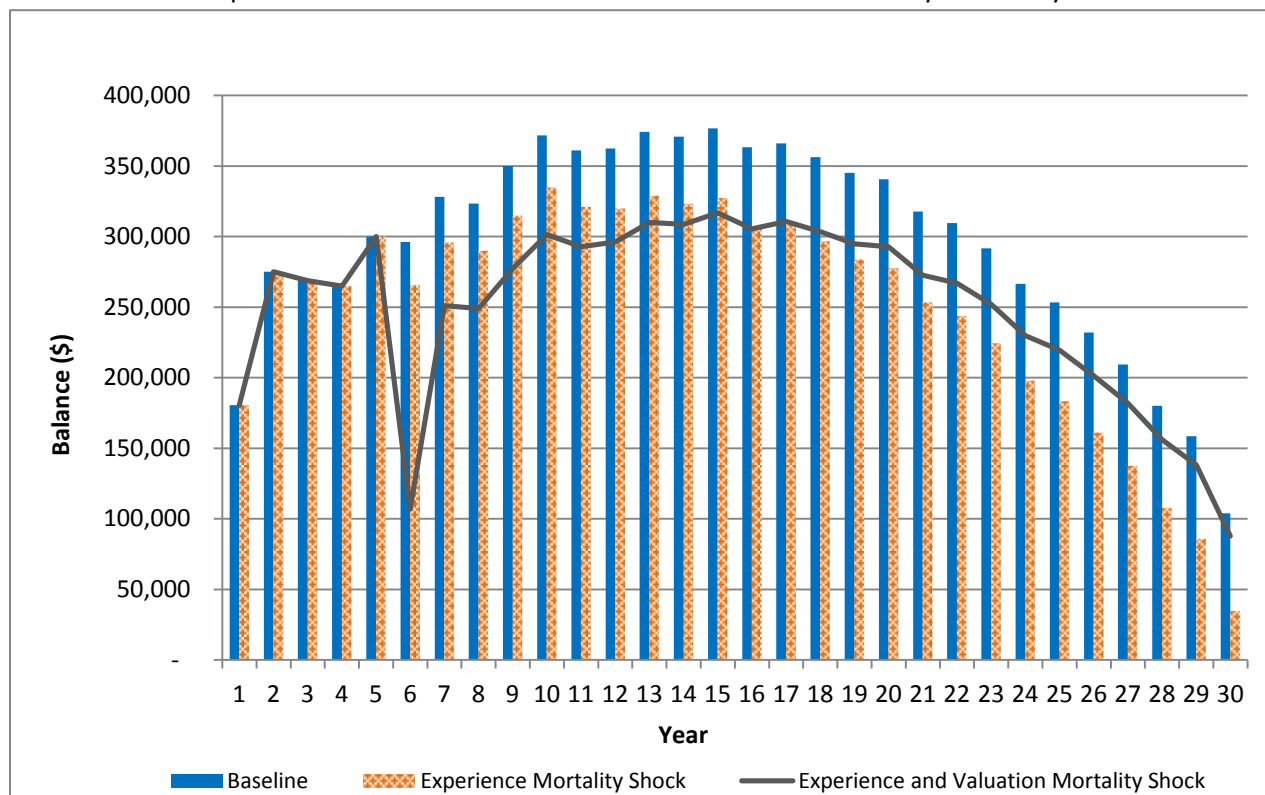
In this sensitivity test, the ATF projects 10 percent higher mortality in years 6 and later. This mortality deterioration is included in the experience assumption only for the first set of results and in both experience and valuation assumptions in the second set of results. In the first set of results, income is lower than the baseline in years 6 and later as a result of the higher mortality. In the second set of results, the reserve is increased in year 6 to reflect the deteriorating mortality experience. The reserve increase is partially offset by an unlocking of the CSM. The impact of the reserve increase is not completely offset by the CSM, since the CSM must be floored at zero. In years 7 through 14, the income under the second set of results continues to be below the first set of sensitivity results despite the release of the larger reserve. This is driven by the existence of the CSM release under the first set of sensitivity results that continues to bolster income until year 15.

IV.J. Universal Life with Secondary Guarantees (ULSG)

Product Overview

Universal life with secondary guarantee products offer permanent life insurance. Secondary guarantees ensure that the policy will not lapse even if the cash surrender value drops to zero. Due to the generally low premiums, ULSG policies generate very low or no cash surrender values.

The product modeled in this study is a single-life universal life product with a lifetime secondary guarantee provided by a shadow account. In this product design, there is no specific premium stated and the policy remains in force as long as the shadow fund is greater than or equal to zero, even if the policy account value is zero or negative. The contract used in this exercise is priced under the economic conditions described above to achieve a U.S. statutory ROI of 10 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart J.1: ULSG—Liability Cash Flows for Baseline Projection
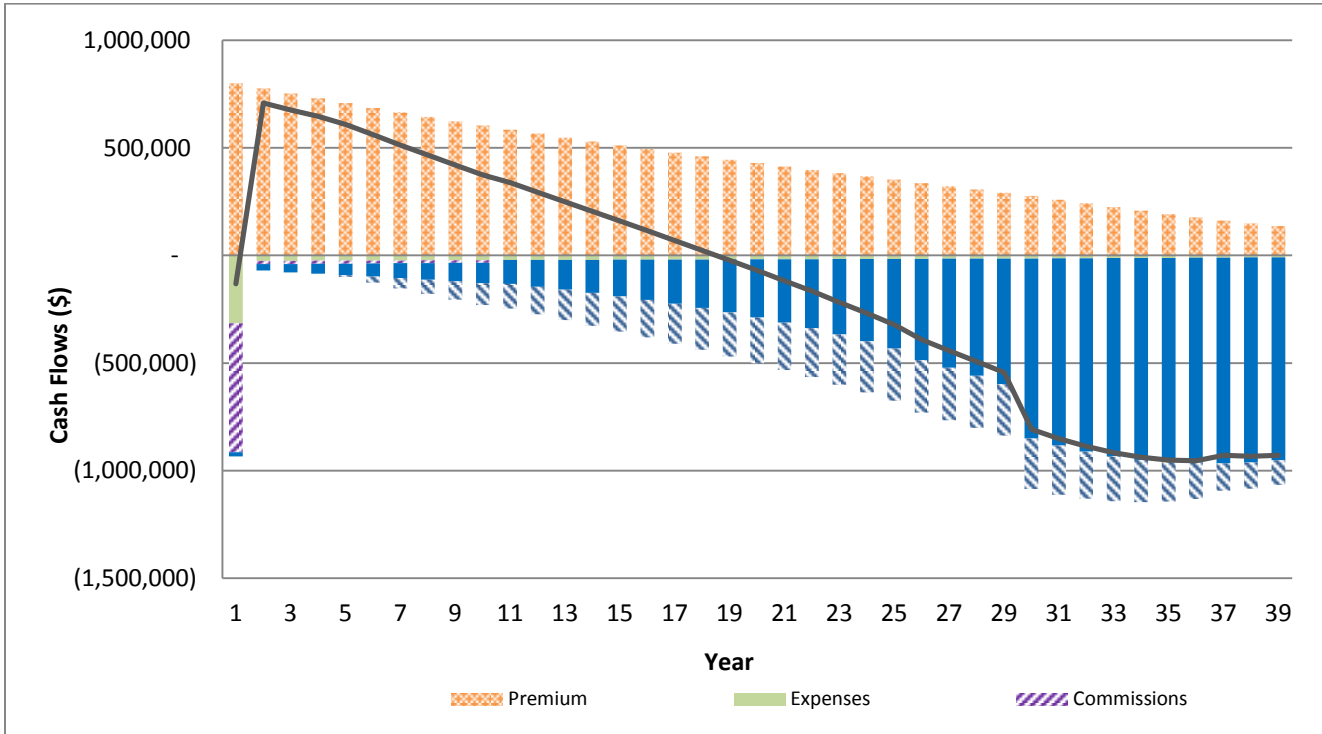
US GAAP Valuation

- SFAS97 contract
- SOP03-1 liability established for the no-lapse guarantee, using a single best-estimate scenario for US GAAP purposes

- Unearned revenue liability (URL) amortized over estimated gross profits
- Deferrable expenses amortized over estimated gross profits

<u>IASB Proposed Standard</u>

- Stochastic valuation using risk-neutral interest rate scenarios developed with a mean return of 4 percent
- Risk adjustment equal to a percentage of face amount that decreases over time
- No CSM was set up at issue as the model produces a loss at issue. This is driven by the use of risk-neutral scenarios to value the secondary guarantee.

Chart J.2: ULSG—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
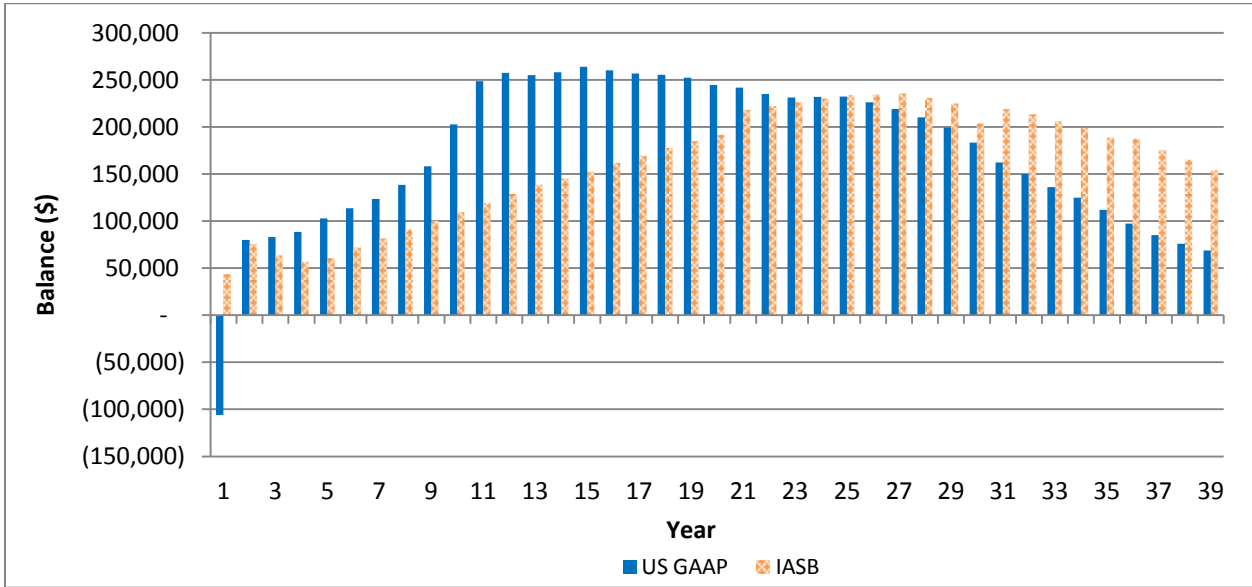
The loss in year one observed under US GAAP is driven by the treatment of acquisition expenses. Under US GAAP, only successful efforts qualify as deferrable. This reverses in subsequent years, as there is less DAC to amortize in the future, resulting in higher GAAP income. The acceleration of income in earlier years under the US GAAP framework is primarily driven by the pattern of estimated gross profits. The amortization period for the DAC and URL balances is assumed to be 25 years and not the life of the contract.

In contrast, the income emergence pattern under IASB is driven by the release of the risk adjustment and the unwinding of the additional reserve that is established due to the use of risk-neutral scenarios as opposed to the deterministic experience scenario. Both of these items delay income to later years. We observe a blip in year 30 when mortality rates increase dramatically and a smaller blip in year 20 when the surrender charge period is exhausted.

The impact on reserves of the secondary guarantee is higher under the proposed standard as it is valued using risk-neutral scenarios, whereas it was valued under a single best-estimate scenario for purposes of US GAAP. Additionally, the US GAAP reserves are developed using an SOP 03-1 benefit ratio mechanism which generally accrues the liability more slowly than a risk-neutral-type valuation.

The graphs that follow below illustrate the movement of reserves and risk adjustment over the baseline projection.

Chart J.3: ULSG—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
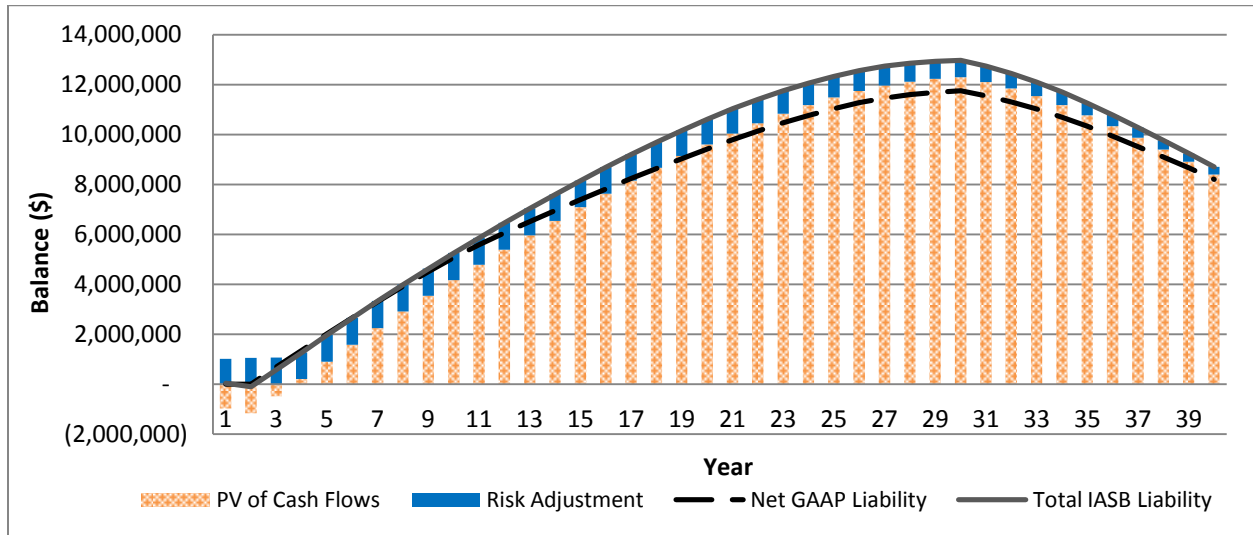
Chart J.4: ULSG—Risk Adjustment: Baseline Projection
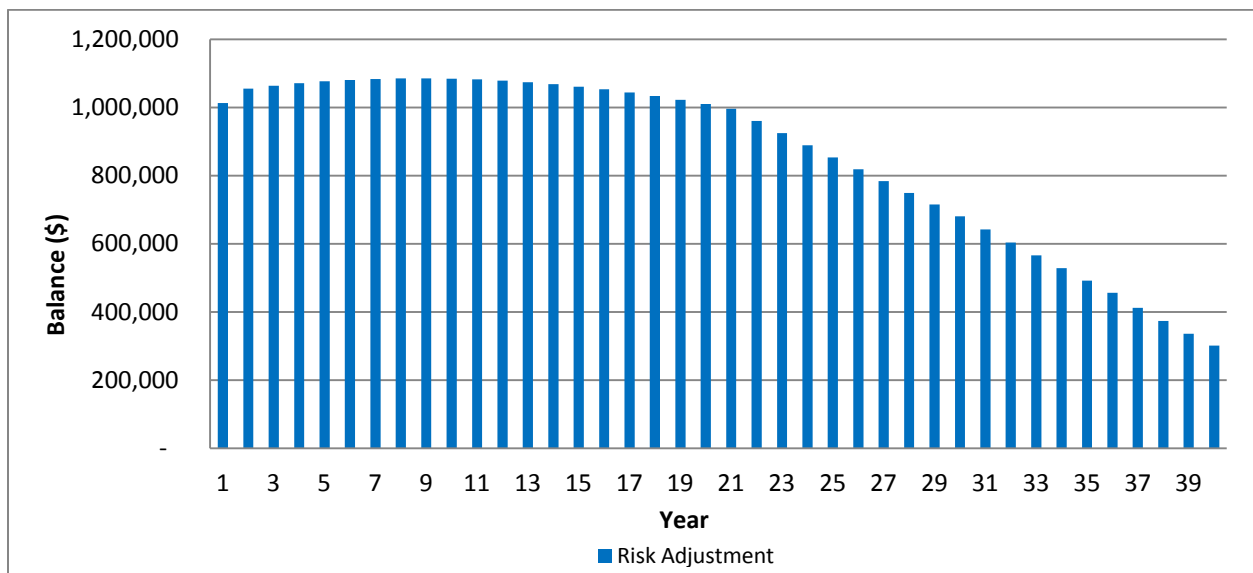
Chart J.5: ULSG—Mortality Shock Sensitivity (Baseline vs. Sensitivity Pretax Net Income)
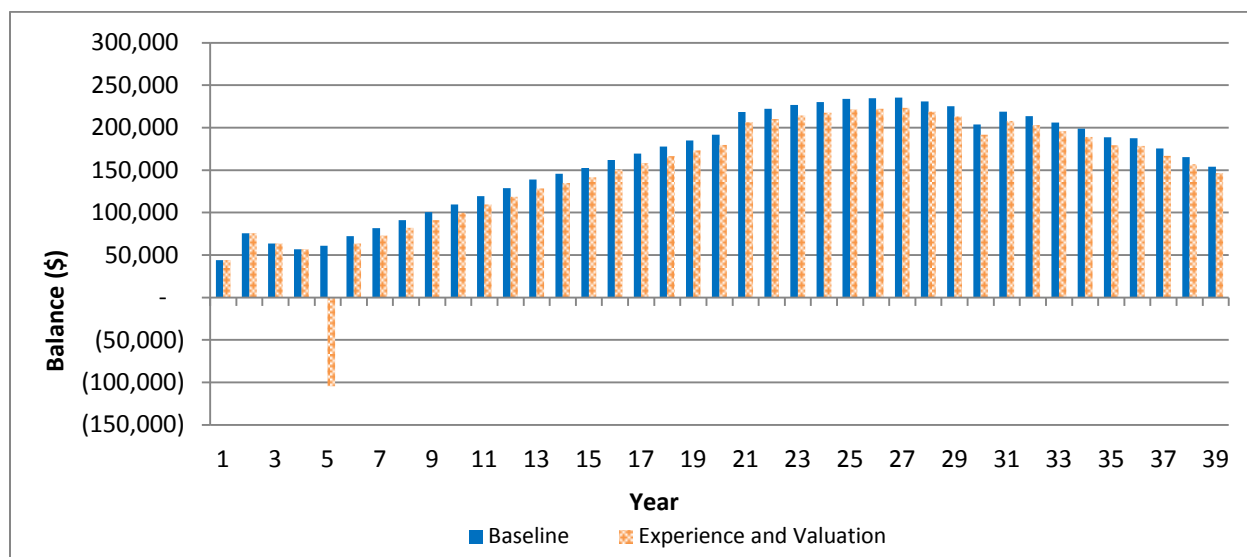
In this sensitivity test, the ATF projects higher mortality at the end of year 5. The mortality deterioration is included in the experience and valuation assumption in the first set of results, and in the experience assumptions only for the second set of results.

In Chart J.5, the mortality assumption (experience and valuation) is increased by 5 percent in year 5 and future years, resulting in lower income than the baseline in year 5 and after. The loss observed in year 5 is due to the assumption update, which triggers additional reserves with no offset from the CSM since it is zero at issue. Although this additional reserve is released in future years, the reduction in the projected investment income on the reduced statutory reserves and required surplus produces lower income under this scenario.

In the second set of results, the mortality assumption is increased by 20 percent. The assumption change is implemented in year 5 only, and valuation assumptions are not modified. As shown in Chart 6, income is lower in year 5 and future years due to the 20 percent additional deaths experienced in year 5. Although not evident due to the scale of the graph, income is lower after year 5 as well due to the in-force reduction.

Chart J.6: ULSG—Mortality Shock Sensitivity (Baseline vs. Sensitivity Pretax Net Income)
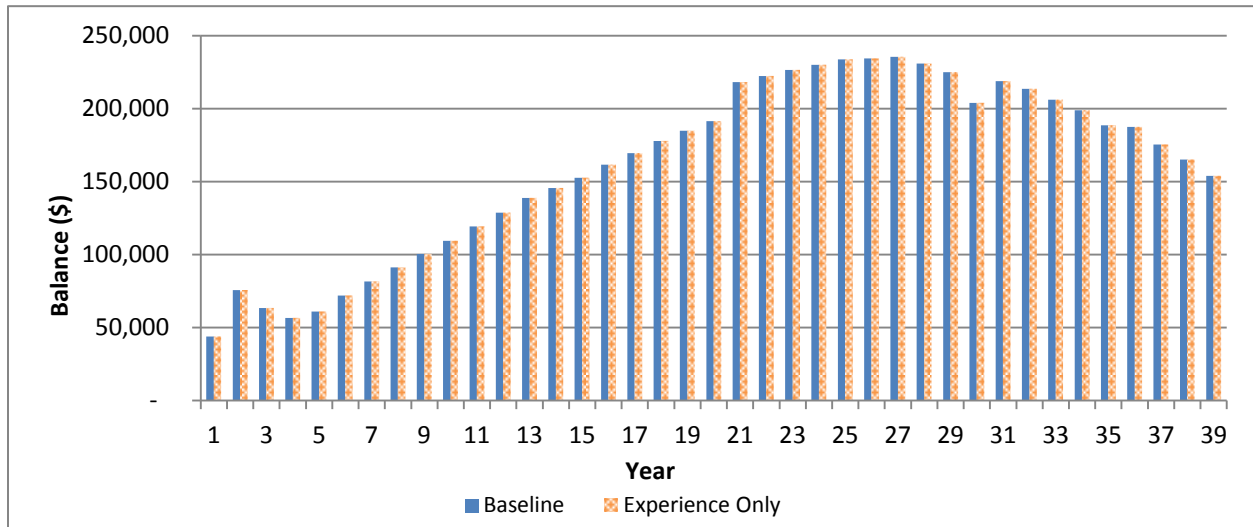
Chart J.7: ULSG—Acquisition Expense Sensitivity (Baseline vs. Sensitivity Pretax Net Income)

In this sensitivity test, the ATF assumes that qualifying expenses under IASB follow US GAAP guidelines. The present value of fulfillment cash flows includes acquisition expenses related to successful efforts only.
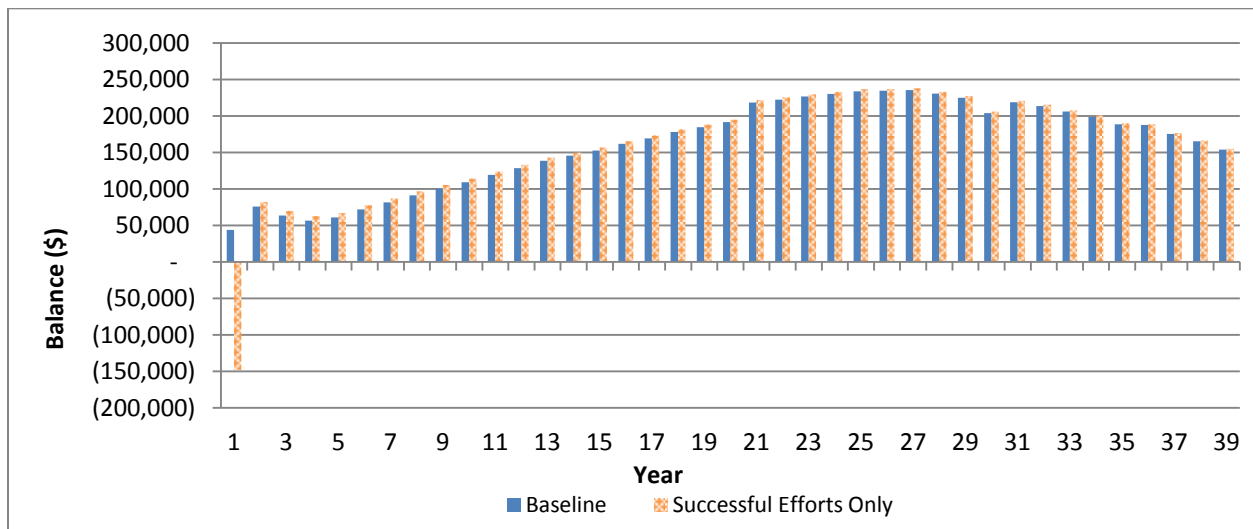
In this set of results, the acquisition expenses related to unsuccessful efforts are expensed immediately, resulting in a loss in year 1. Income emergence is higher in early years under this scenario, because a CSM is established. The CSM is amortized based on the NAR, which accelerates income as shown in the graph below.

Chart J.8: ULSG—Acquisition Expense Sensitivity (Sensitivity CSM)
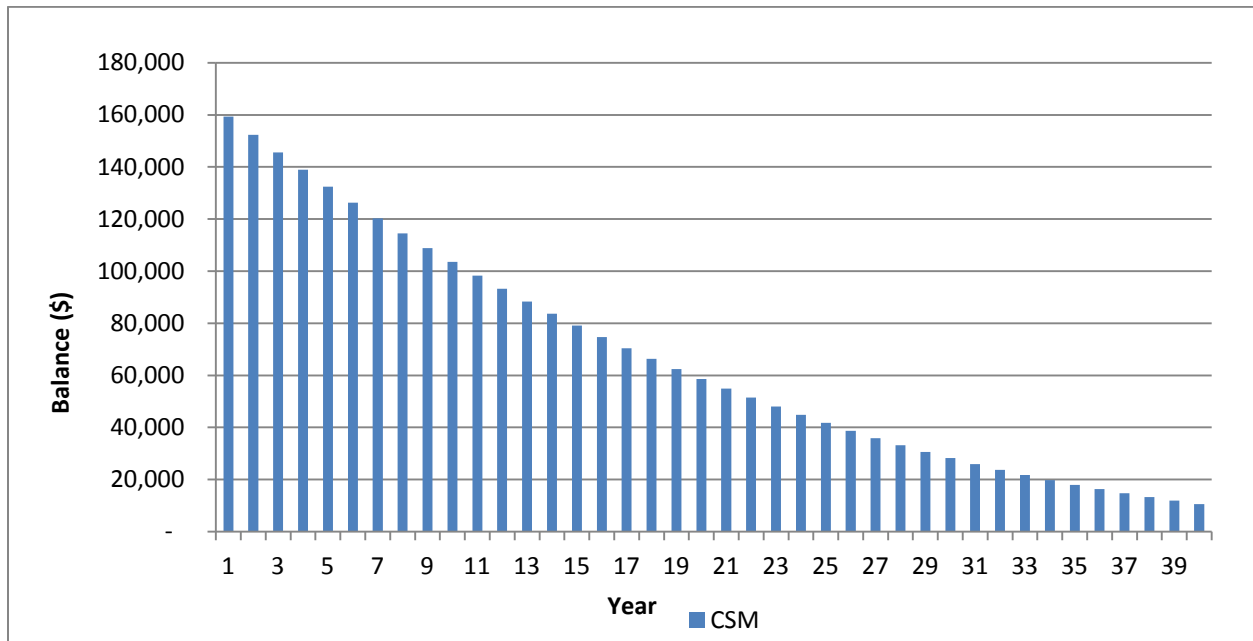
Chart J.9: ULSG—FASB Margin (Baseline vs. Sensitivity Pretax Net Income)

In this sensitivity test, the ATF does not estimate explicitly a risk adjustment and sets up a single margin as suggested in the FASB's proposed Insurance Contracts Standard.
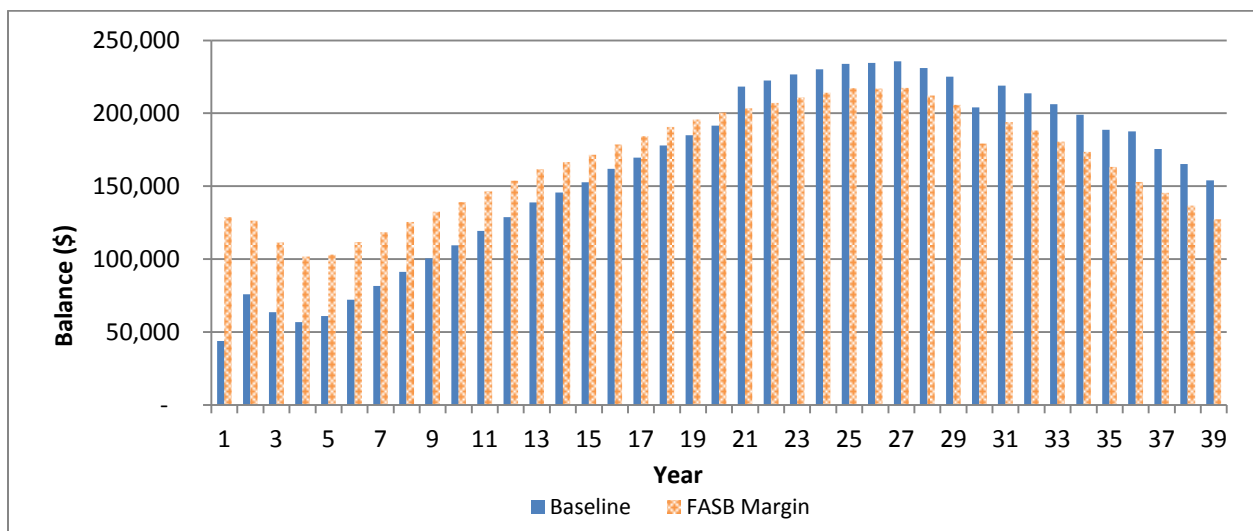
In the baseline scenario, no CSM is established as the risk adjustment exceeded the present value of fulfillment cash flows at inception. However, a single margin is established under this sensitivity

according to the FASB proposal since the risk adjustment is not explicitly calculated. As shown in the graph below, the faster release of the FASB margin compared to the risk adjustment accelerates profits in early years.

Chart J.10: ULSG—FASB Margin vs. Risk Adjustment Balances (Baseline)
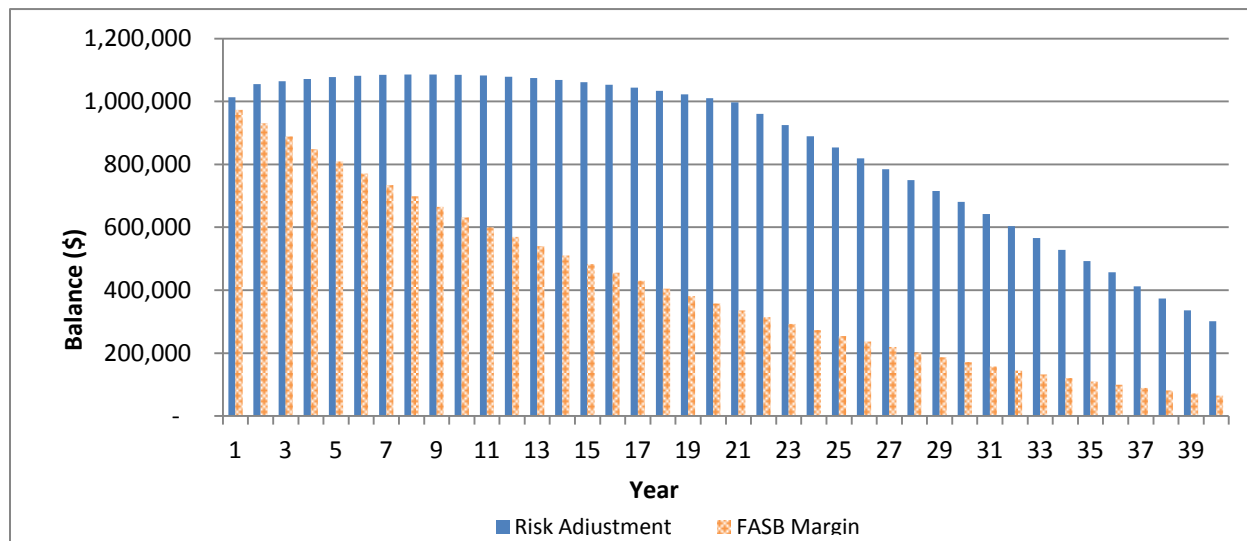
IV.K. Variable Annuity (VA)

<u>Product Overview</u>

The policyholder pays a single premium at the inception of the contract and the premium is deposited in a separate account portfolio for the policyholder. The insurance company passes through the investment performance (both favorable and unfavorable) of the separate account portfolio to the policyholder and deducts cost of insurance, rider fees and expense charges. The policyholder can surrender the contract at any time, subject to a surrender charge in the first seven years. The full account value is available upon the death of the insured.

Additionally, the contract contains two riders: a guaranteed minimum death benefit (GMDB) rider and a guaranteed minimum withdrawal benefit (GMWB) rider. The GMWB is a living benefit rider that guarantees a return of the premium deposits over time, even if the separate account value goes to zero, provided that withdrawals from the contract do not exceed the annual benefit payment each contract year. The GMDB rider guarantees a death benefit payment that is the greater of: the account value on the date of death, 100 percent of all premium deposits to date reduced for any partial withdrawals, or the highest contract anniversary account value.

The contract used in this exercise is priced based on the economic assumptions described above and to achieve a US statutory ROI of 10 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart K.1: VA—Liability Cash Flows for Baseline Projection
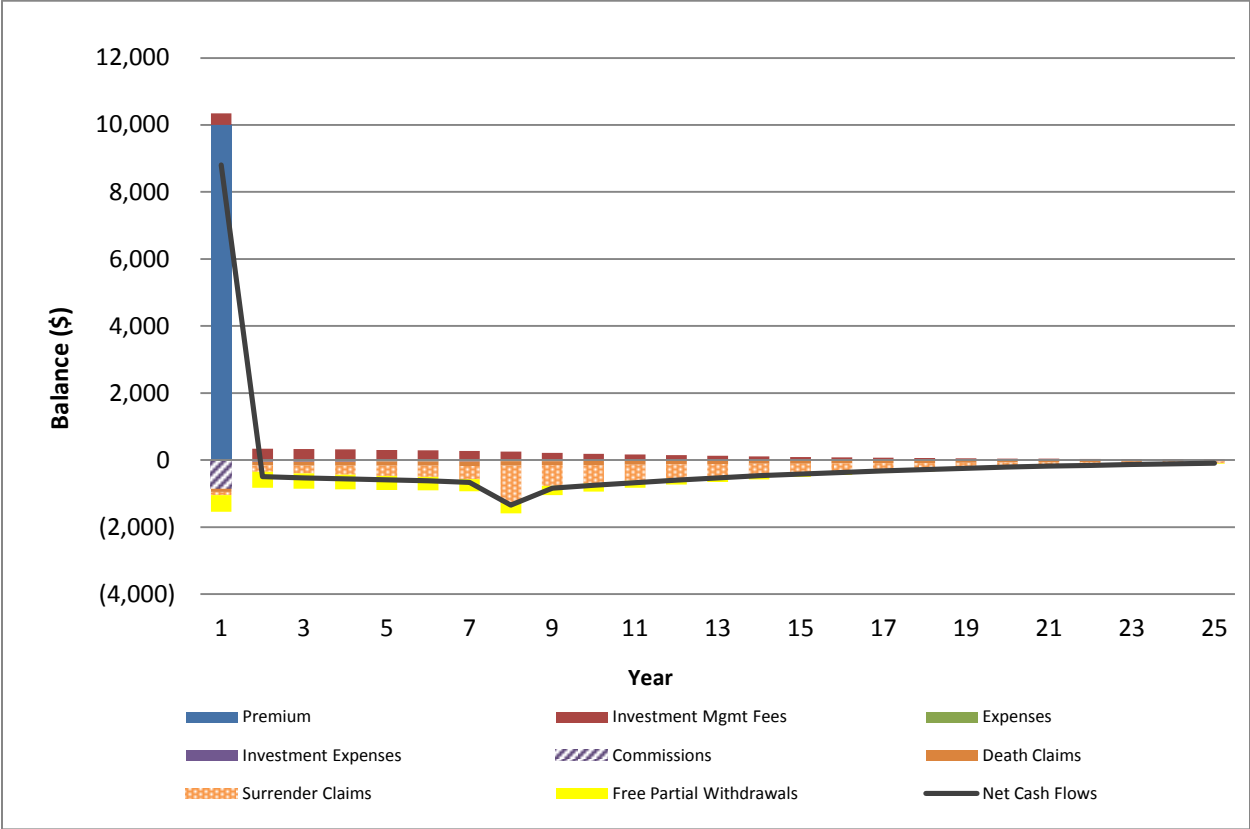

US GAAP Valuation

- SFAS97 universal-life-type contract
- Separate account reserves set equal to separate account balance
- SOP03-1 liability established for the GMDB rider
- FAS133 asset/liability established for the GMWB rider
- Commissions and premium tax capitalized and amortized over estimated gross profits (EGPs)

IASB Proposed Standard

- FAS133 asset/liability established for the GMWB rider
- Separate account reserves set equal to separate account balance

- Excess cash flows from base contract and GMDB rider (i.e., mortality and expense (M&E) fees, surrender charges, GMDB rider charges, GMDB rider guaranteed death benefit payments, maintenance expenses, etc.) valued using a stochastic valuation with 500 risk-neutral equity return scenarios
  - Scenarios developed with mean return of 4 percent and a standard deviation of 25 percent
  - Explicit stochastic valuation performed for every valuation period
- Risk adjustment equal to a percentage of the account value
- CSM released based on reduction in separate account value

Chart K.2: VA—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
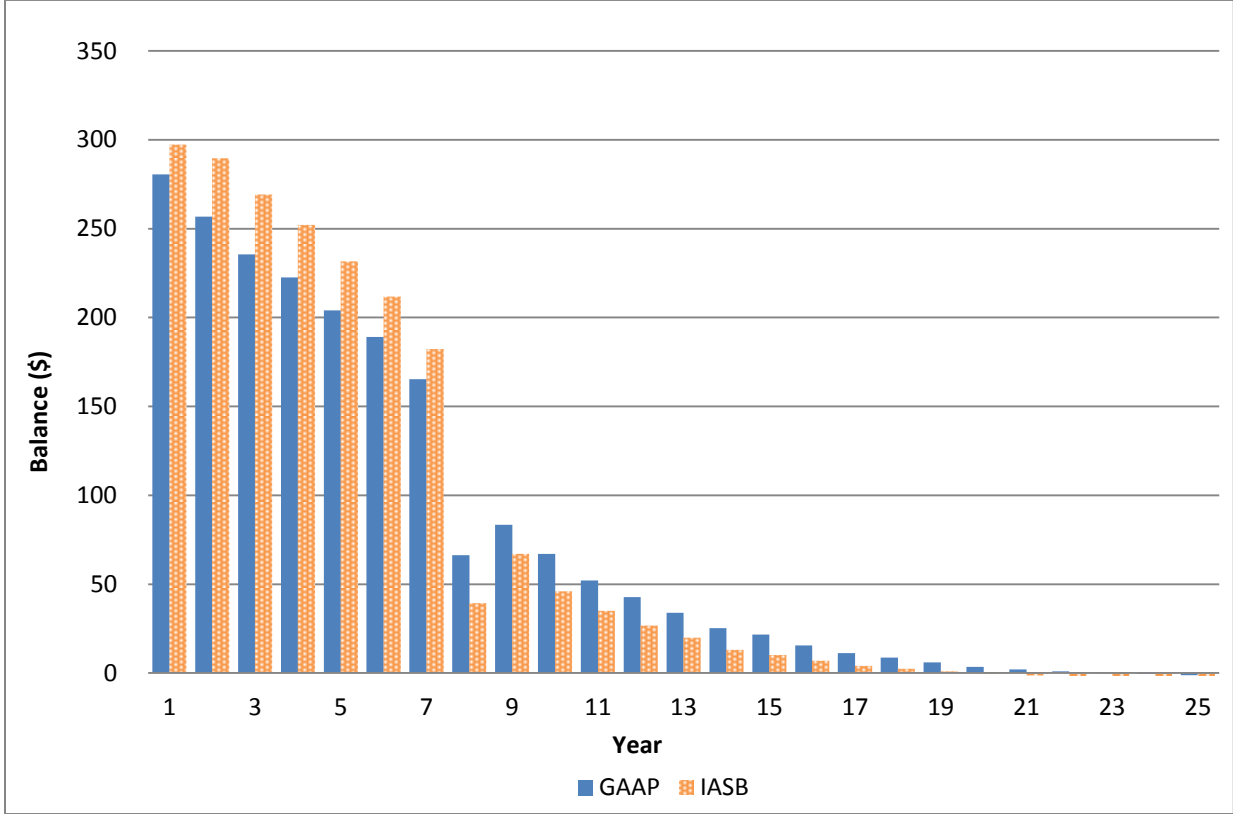
The income under the IASB framework emerges faster than the current US GAAP framework. Excluding the separate account liability and FAS133 asset/liability for the GMWB, which are identical under both US GAAP and IASB, the primary difference between the two frameworks is due to the pattern of release of the net insurance asset under IASB versus the amortization of DAC under US GAAP. The asset position of the fulfillment cash flows under IASB is due to profitable pricing of the product at issue combined with the inclusion of the projected M&E fees in the fulfillment cash flows. The slower release of the insurance asset under IASB relative to the DAC under US GAAP results in faster income emergence under IASB. The slower release of the insurance contract asset under IASB is a byproduct of the fact that

the present value of fulfillment cash flows remain in a large asset position for an extended period of time. For subsequent measurements, the baseline scenario assumes a favorable 9 percent experience assumption for equity returns, which results in a growing insurance asset position relative to the account value in force. This growth is driven by the favorable experience leading to the GMDB being more out of the money and also projecting greater M&E fees to be collected. In contrast, the amortization of DAC under US GAAP is proportional to EGPs, which are relatively front-ended due to the surrender charge margins in the earlier years. The graphs that follow below illustrate the movement of reserves, CSM and risk adjustment over the baseline projection. Since the treatment of deferrable expenses is identical between US GAAP and IASB, there is no difference in year-one profit related to deferrable expenses.

Chart K.3a: VA—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection

Chart K.3b: VA—Comparison of Net GAAP Liability* and IASB Reserve*: Baseline Projection
*Note the GAAP and IASB liability shown in the graph below excludes separate account value and
FAS133 liability, as those are identical under both standards.
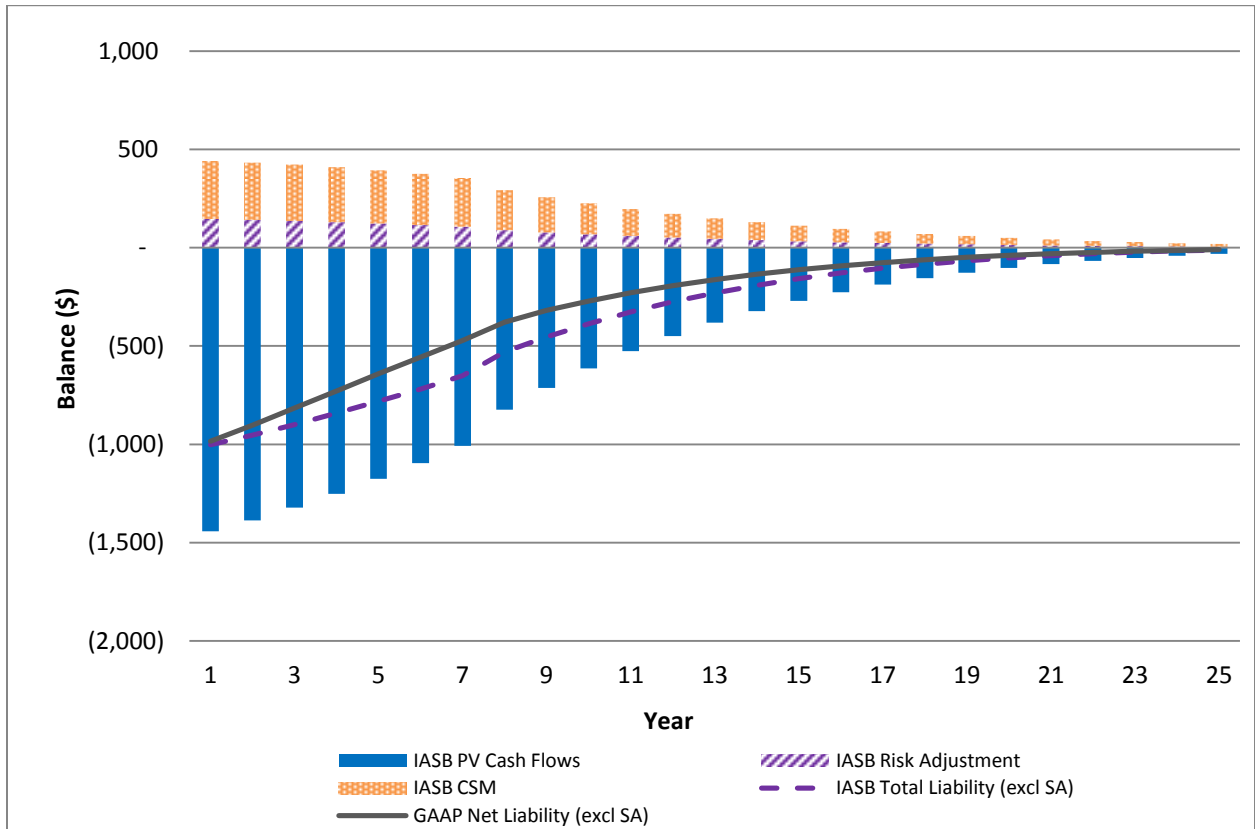
Chart K.4: VA—Risk Adjustment and Contractual Service Margin: Baseline Projection
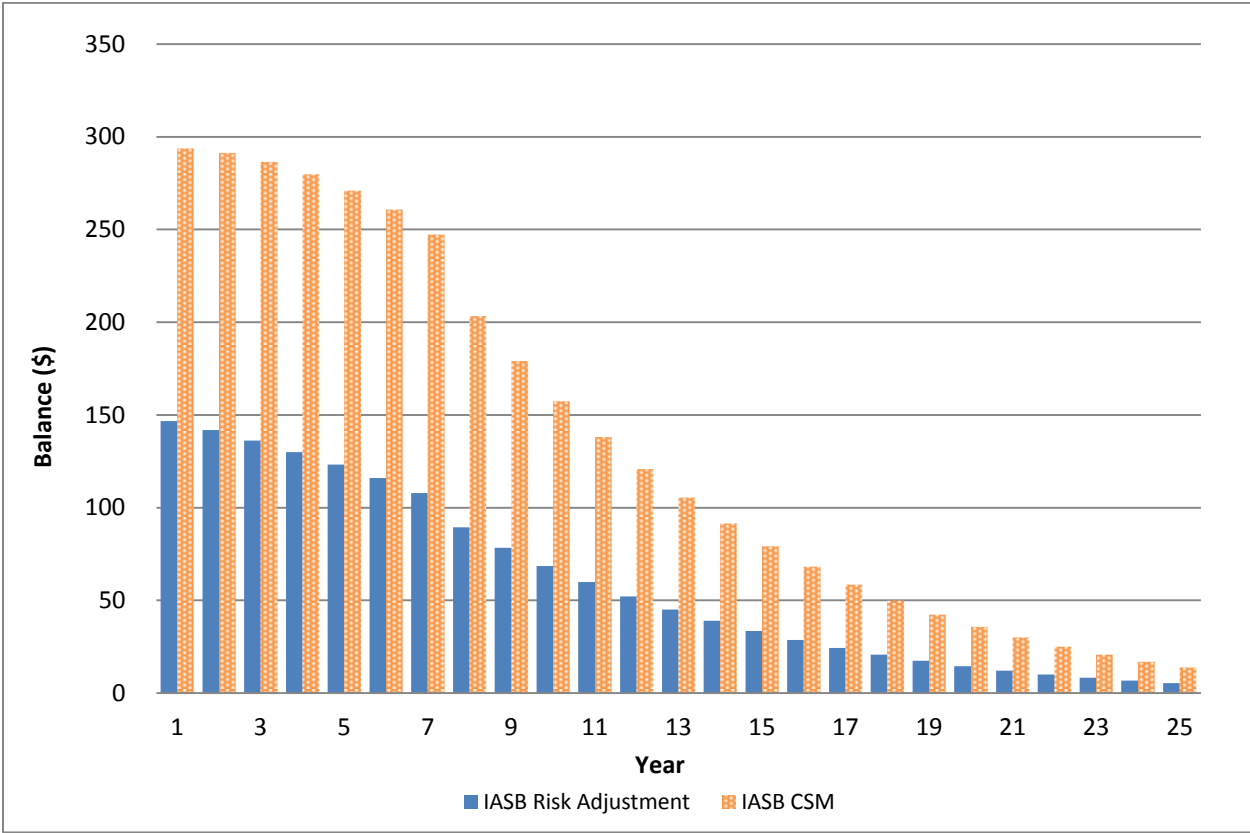
Chart K.5: VA—IASB Pretax Net Income: Baseline vs. Sensitivity
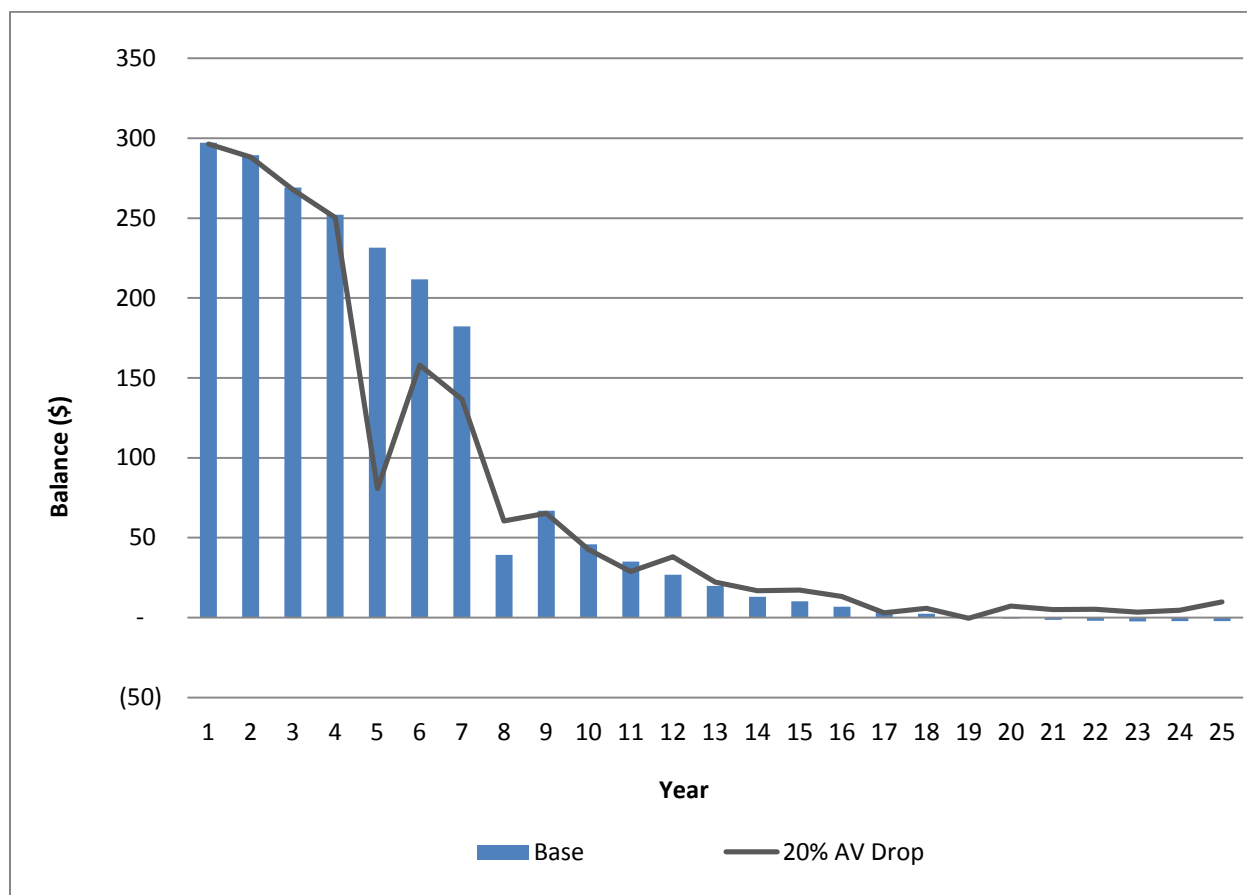
In this sensitivity test, the ATF projects a 20 percent drop in equity market experience in year 5 only, the experience reverted back to the baseline assumption of 9 percent equity growth in years 6 and onwards. There is no change in the valuation assumptions. The equity drop significantly decreases income in year 5 as shown in the chart above. This is driven by:

- A net increase in the IFRS liability components that flow through income (i.e., the non-separate-account components)
  - A large increase in the IFRS liability due to the present value of fulfillment cash flows decreasing from a large asset position to a smaller asset position related to the large reduction to the separate account balance
  - A small decrease in the IFRS liability due to the risk adjustment decreasing in proportion to the separate account asset balance decrease
  - A small decrease in the IFRS liability due to the CSM release driven by the reduction in the separate account
  - A large increase in the FAS133 liability for the GMWB rider

After year 5 the income under the sensitivity run is generally lower than the base run due to the lower separate account value upon which charges are assessed. However, there is an increase in income in several years related to the release of the FAS 133 liability that was established in year 5 that is not needed in subsequent years when account value growth returns to 9 percent in future years. This large liability is released into income, particularly in year 8, when policies lapse and the liability is no longer needed. This is in contrast to the base scenario when the FAS 133 embedded derivative is in an asset position and acts to reduce income in years 8 and later as it is released.

IV.L.   Variable Universal Life (VUL)

<u>Product Overview</u>

The policyholder pays a series of flexible premiums over the lifetime of the contract, and the premium is deposited in a separate account portfolio for the policyholder. The insurance company passes through the investment performance (both favorable and unfavorable) of the separate account portfolio to the policyholder and deducts cost of insurance, M&E fees and expense charges from the account value. The policyholder can surrender the contract at any time, subject to a surrender charge in the first 15 years. The face amount of this life insurance contract is payable upon the death of the insured; the NAR is the face amount less the account value. Additionally, the contract provides the policyholder a no-lapse guarantee, which specifies that if minimum target premiums are paid by the policyholder the policy is guaranteed to remain in force even if the account value goes below zero.

The contract used in this exercise is priced, based on the economic assumptions described above, to achieve a US statutory ROI of 15 percent.

The product cash flows under the baseline experience assumption are as follows.

Chart L.1: VUL—Liability Cash Flows for Baseline Projection
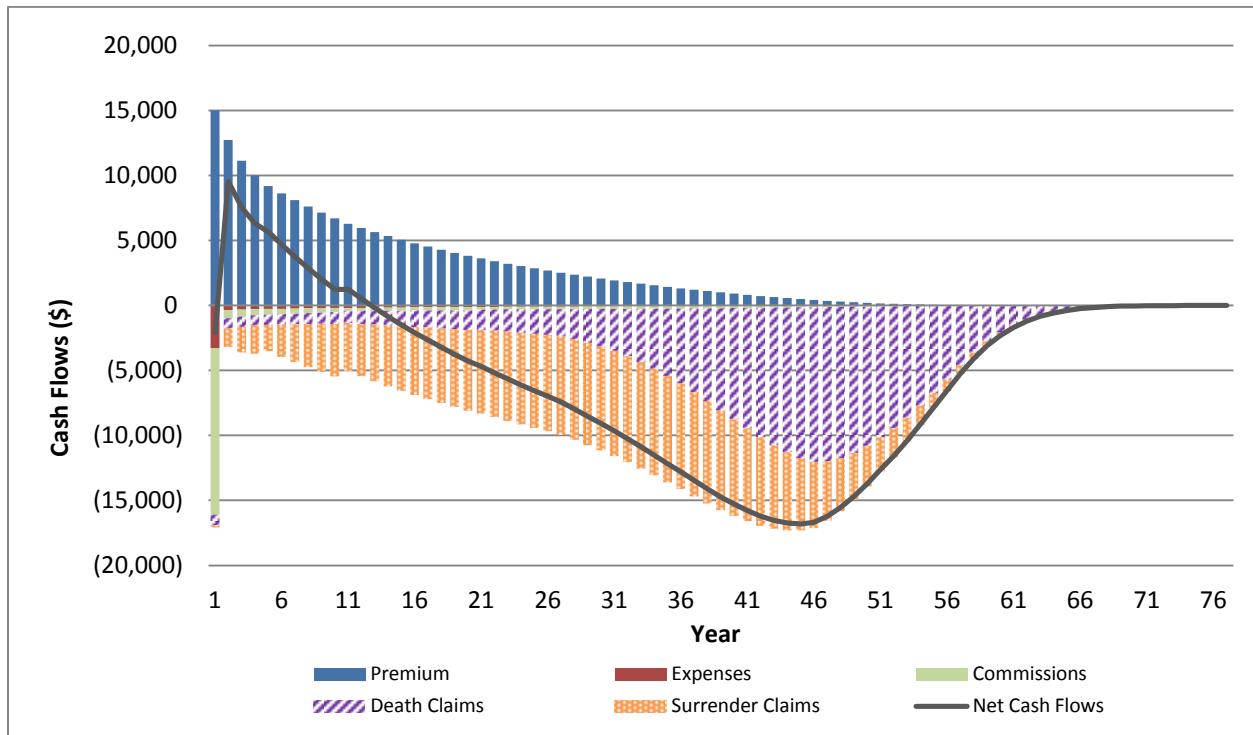
US GAAP Valuation

- SFAS97 contract
- Separate account reserves set equal to separate account balance
- SOP03-1 liability established for the no-lapse guarantee
- URL amortized over estimated gross profits
- Deferrable expenses amortized over estimated gross profits

IASB Proposed Standard

- Stochastic valuation using 500 risk-neutral equity return scenarios
  - Scenarios developed with mean return of 4 percent and a standard deviation of 25 percent
  - Explicit stochastic valuation performed for valuation periods of years 1 through 10, 20, 30, 40, 50, 60 and 70. Present value of fulfillment cash flows for intra-years estimated based on ratio of present value of fulfillment cash flows observed on valuation periods with explicit stochastic valuation.
- Risk adjustment equal to a percentage of face amount that decreases over time
- CSM released based on reduction in NAR

- Consideration of separating the account balance: It is assumed that there is no distinct investment component for this product. Consequently, any asset management or other investment-related fees are not unbundled.

Chart L.2: VUL—Comparison of GAAP and IASB Pretax Net Income: Baseline Projection
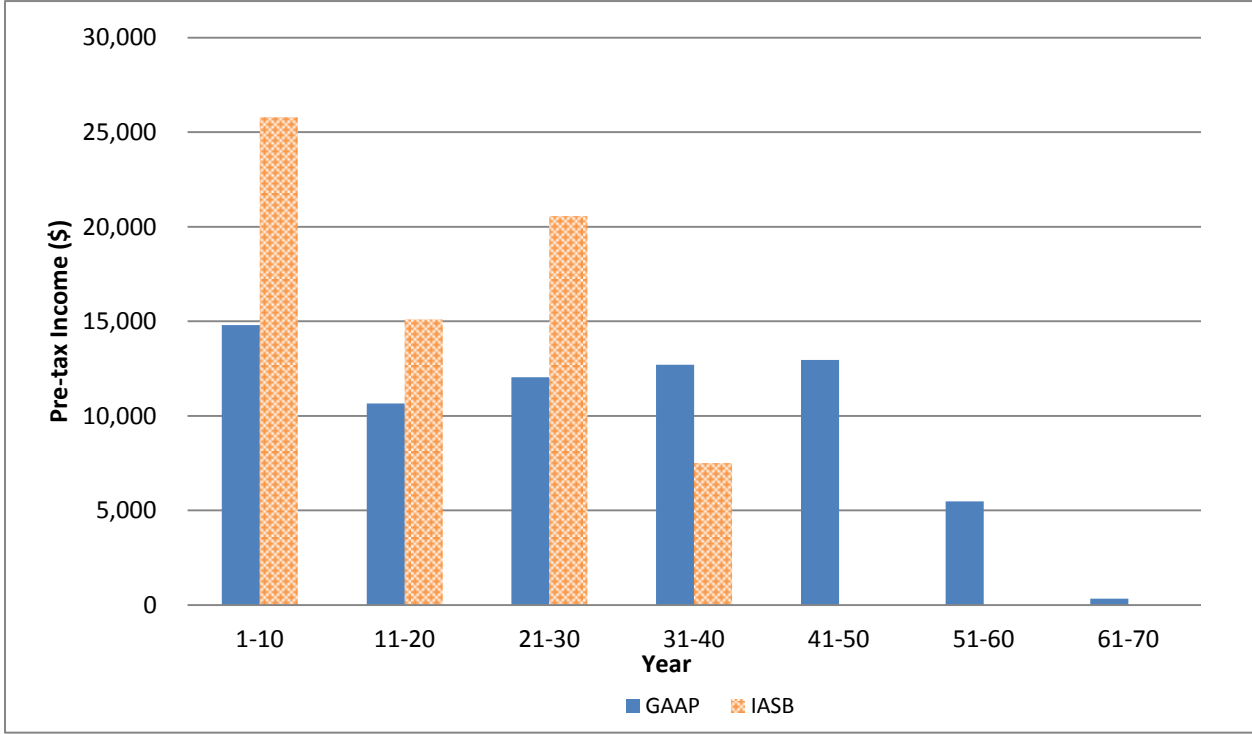
The income graph above is aggregated into 10-year increments for the periods where a stochastic valuation is explicitly performed. This is done to avoid distortion of the income emergence pattern due to this modeling limitation. Additionally, modeling limitations due to the stochastic nature of the calculations contributed to unexpectedly low or no IASB income in the later years of this study. More precise modeling would have produced slightly different IASB income in years 41 and later.

The acceleration of income in earlier years under the IASB framework is primarily driven by a rapid release of CSM, which is amortized based on the pattern of the reduction in the NAR in the baseline projection. In contrast, income under US GAAP is proportional to EGPs, which are relatively back-ended as the M&E fee margin and other elements of EGPs that grow with the AV in later years. Alternative CSM drivers produce alternative income emergence patterns as shown below.

The graphs that follow below illustrate the movement of reserves, CSM and risk adjustment over the baseline projection. Since the treatment of deferrable expenses is identical between US GAAP and IASB, there is no difference in year-one profit related to deferrable expenses.

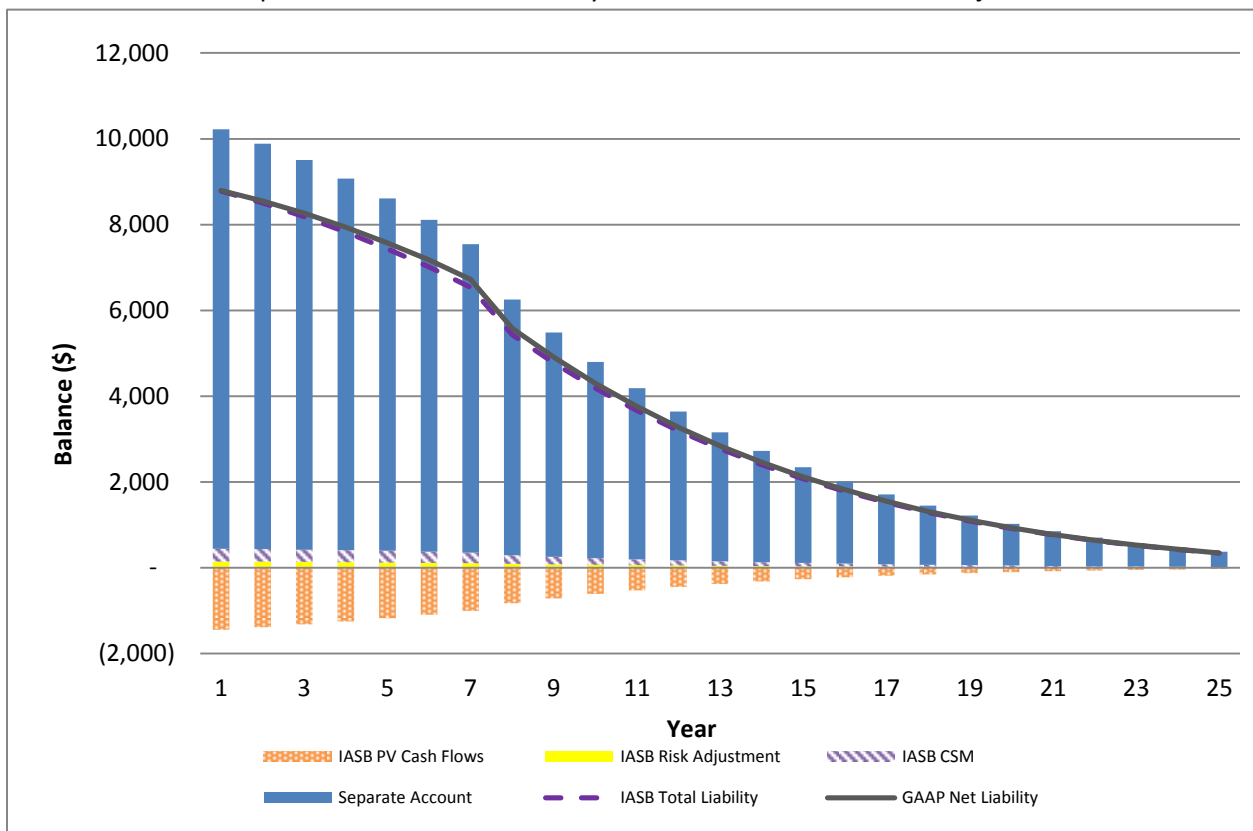Chart L.3: VUL—Comparison of Net GAAP Liability and IASB Reserve: Baseline Projection
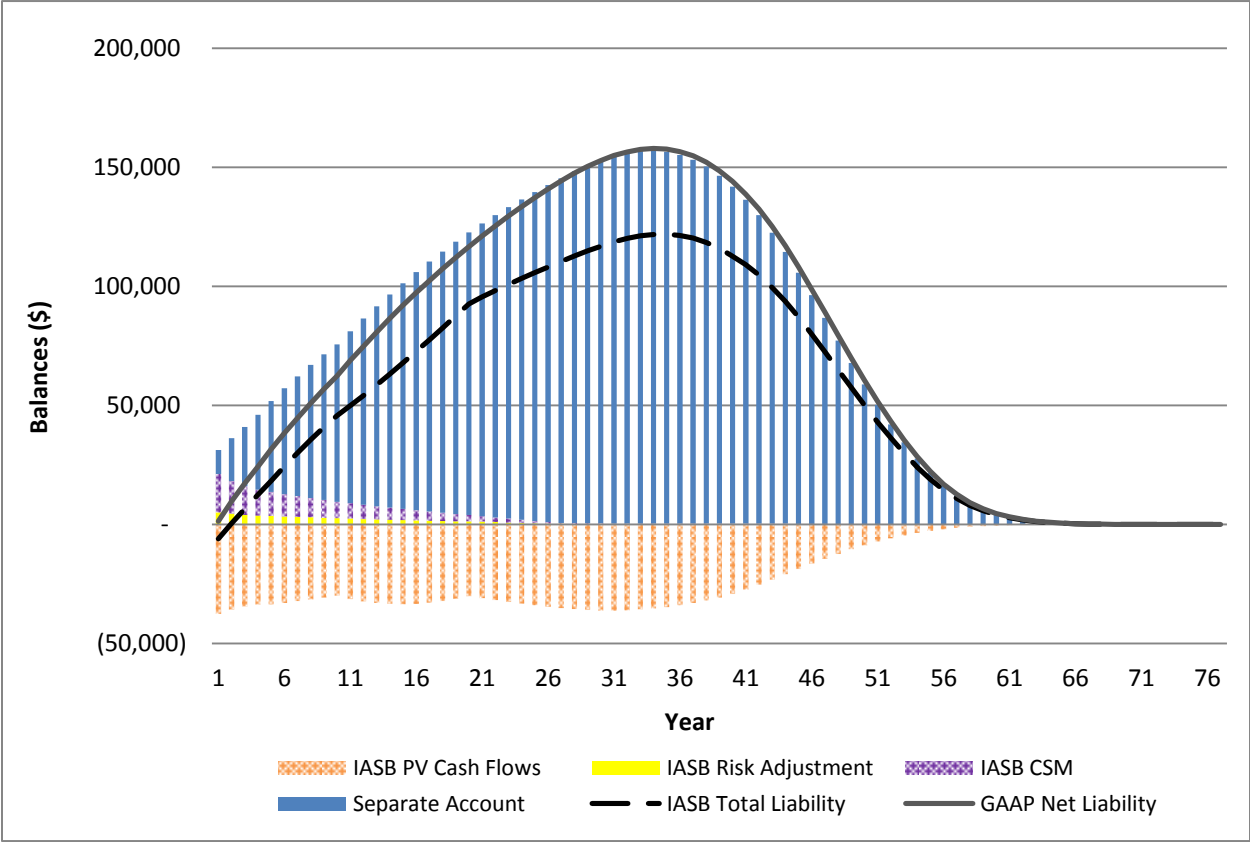
Chart L.4: VUL—Risk Adjustment and Contractual Service Margin: Baseline Projection
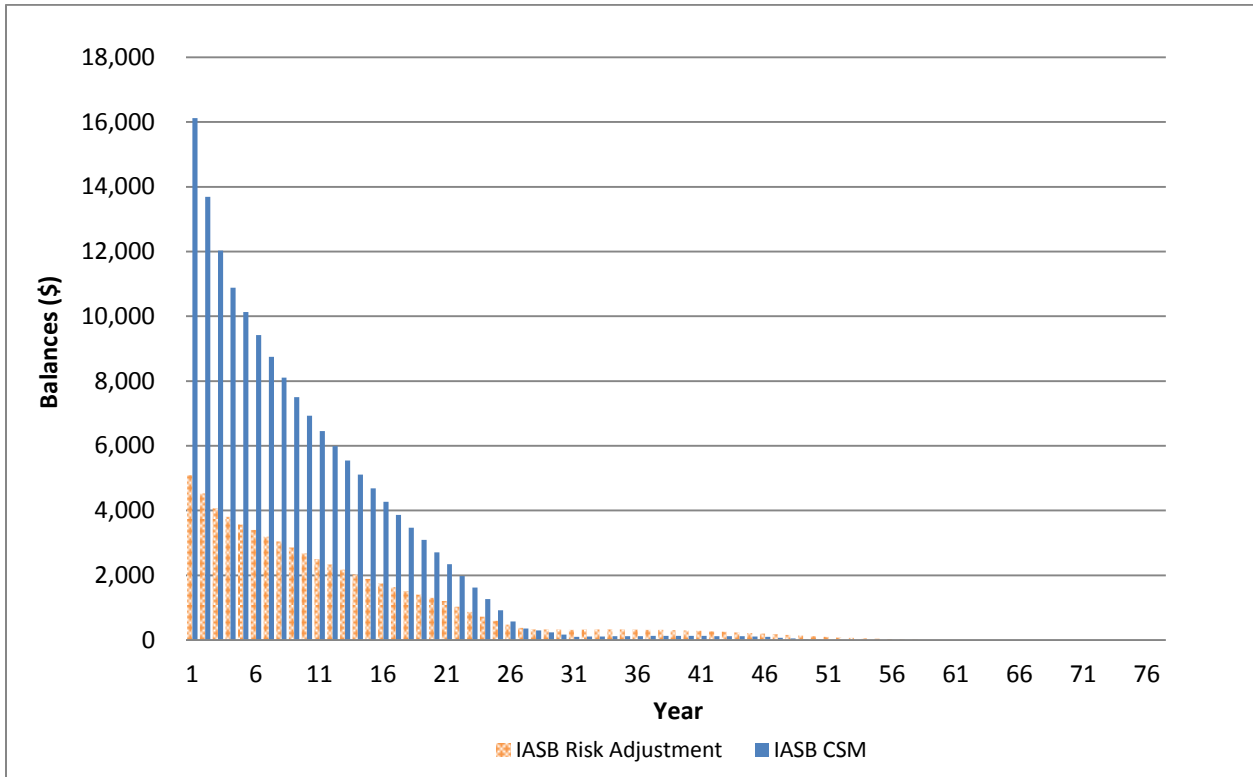
Chart L.5: VUL—Contractual Service Margin Balance (Baseline vs. Sensitivity)
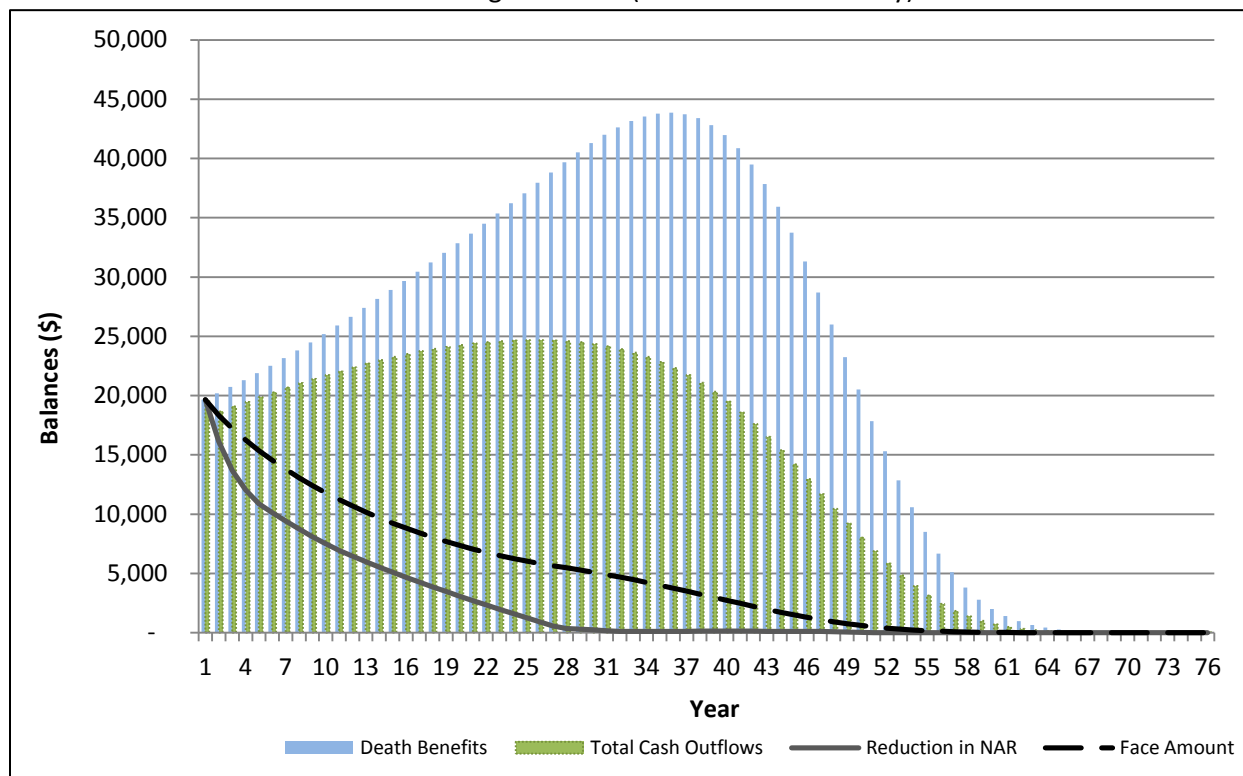
In this sensitivity test, the ATF releases the CSM using alternate measures for "pattern of services provided." The baseline assumption defines "pattern of services provided" as the pattern of reduction in NAR. For the sensitivity, the ATF releases the CSM using three additional drivers comprised of: the pattern of death benefits, the pattern of total cash outflows, and the pattern of the level of face amount in force. As evident by the graph above, the pattern of release for the CSM varies significantly depending on the driver used.

The CSM releases most rapidly when amortized based on the reduction in NAR. This fast release is driven by a rapid reduction in the NAR in early years of the policy due to large renewal premiums, favorable 9 percent separate account value growth, and low cost of insurance charges relative to later years.

The CSM release based on the reduction in face amount is slower than the reduction in NAR and follows the pattern of policy terminations. Policies have higher lapses in the first 10 years, resulting in a faster release of CSM, followed by a slower period of release between years 11 and 30. Ultimately the pattern of release accelerates again in the tail of the projection as terminations increase due to higher deaths.

Given the nature of the product, and as evidenced in the product cash flows graph, the cash outflows are significantly heavier in the tail of the projection. Therefore the CSM release based on the pattern of cash outflows is significantly slower. In fact, the CSM balance actually increases in the first 25 years as

the interest accrued outweighs the amortization. The CSM release pattern based on pattern of death benefits is the most delayed due to the same reasons as the pattern of cash outflows.

The selection of the amortization basis for the release of the CSM has a direct and significant impact on the pattern of income emergence under IASB. The following graph illustrates the IASB income pattern under the various CSM release pattern sensitivities.

Chart L.6: VUL—Comparison of GAAP and IASB Pretax Net Income (Baseline vs. Sensitivity)
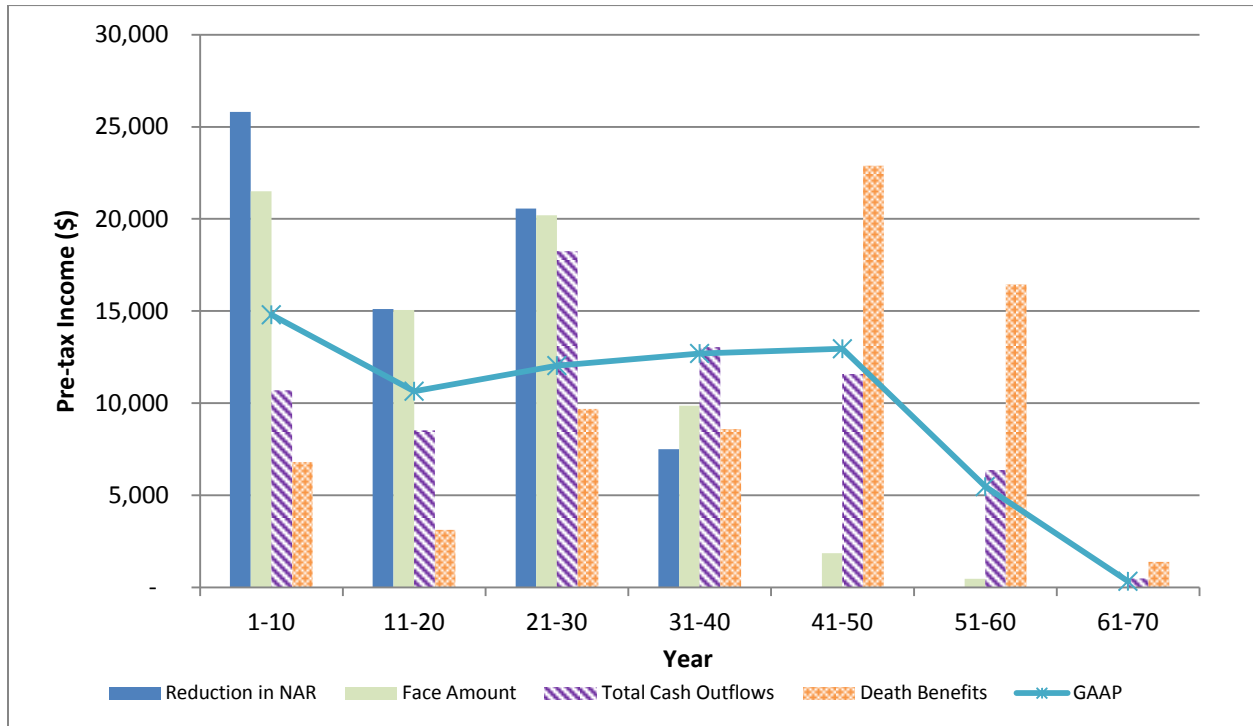
The pattern of income emergence is most accelerated when the CSM release drivers are face amount and reduction in NAR. These drivers of release for CSM accelerate income significantly in the first 30 years and produce lower income in the tail of the projection. Selecting a CSM release driver of total cash outflows delays the CSM amortization and results in smoother income emergence, while selecting death benefits delays a large portion of the IASB income to the tail of the projection. Based on the results of the sensitivities, using total cash flows as the driver of CSM release generates an income emergence pattern that tracks closest to current US GAAP.

Appendix A—Summary of the Proposed IASB Standard (June 2013 Exposure Draft)

The proposed standard for long-duration insurance contracts is a current fulfillment value measure, which is defined by the International Accounting Standards Board (IASB) as the present value of the cash flows required to fulfill the obligations under the insurance contract. The model used for measuring longer-duration contracts is referred to as the building block approach. The building block approach contains three components:

1. Expected present value of fulfillment cash flows

2. Risk adjustment

3. Contractual service margin (CSM).

The proposed standard includes guidance on determining discount rates, as well as other key features such as treatment of [acquisition] expenses, definition of a portfolio, unbundling and disaggregation. We summarize some of the main features here; for further information, please find the June 2013 Exposure Draft on the IASB website at:

http://www.ifrs.org/current-projects/iasb-projects/insurance-contracts/Pages/insurance-contracts.aspx

Expected Present Value of Fulfillment Cash Flows

- Re-measured at each reporting date

- Objective is an unbiased, probability-weighted mean

- Cash flows determined on a portfolio basis:

    - Current and explicit

    - From the perspective of the entity, but for market variables, as consistent as possible with observable market prices

    - Incorporate all available information in an unbiased manner

    - Consider trends and future events that may affect timing and amount

- Discounted using current discount rates (balance sheet measurement)

- For income statement purposes, interest accretes using rates locked in at inception unless a contract specifies a link to underlying returns

Risk Adjustment

- The risk adjustment measures the compensation that the entity would require to make the entity indifferent between fulfilling an insurance contract liability that:

  - Has a range of possible outcomes; and

  - Has fixed cash flows with the same expected present value as the range of outcomes.

- The risk adjustment also reflects:

  - The degree of diversification benefit that the entity considers when determining the compensation it requires for bearing that uncertainty; and

  - Both favorable and unfavorable outcomes in a way that reflects the entity's degree of risk aversion.

- Re-measured each reporting date

- May be calculated using any technique that meets the objective, but the result of a technique other than a confidence level (e.g., cost of capital) must be translated into a confidence level for disclosures.

Contractual Service Margin

- Set at inception of the contract to eliminate any gain

- Recognized over the coverage period in a systematic way that best reflects the remaining transfer of services that are provided under the contract

- Adjusted prospectively (unlocked) for favorable and unfavorable changes in estimates of future cash flows that relate to future coverage and other future services

- Not capped

- Cannot be negative

- Accretes interest using interest accretion rates locked in at inception

- Risk adjustment explicitly excluded from CSM

- Certain cash flow changes are excluded from the CSM unlocking.

Discount Rate

- Two approaches are allowed:

- Bottom-up: Risk free yield curve plus an adjustment for illiquidity

- Top-down: Yield curve for an actual or reference asset portfolio with similar cash flow characteristics to the liability adjusted for:

    - Differences in timing and amount of cash flows; and

    - Default risk and all risks present in the assets that are not relevant to the liability cash flow characteristics (i.e., prepayment risk on mortgage-backed securities (MBS)).

- No prescribed method for determining the discount rates, but the rates must:

    - Be consistent with observable current market prices for instruments with cash flows whose characteristics reflect those of the insurance contract liability, in terms of timing, currency and liquidity

    - Exclude any factors that influence the observed rates but are not relevant to the insurance contract liability

    - To the extent that the amount, timing or uncertainty of cash flows depends wholly or partly on the performance of specific assets, the discount rates used in measurement of the insurance contract liability shall reflect that dependence.

Miscellaneous

- Successful and unsuccessful acquisition costs are included in the fulfillment cash flows (and hence in the determination of the CSM) and are expensed over the life of the policy.
- Overhead expenses are not included in the fulfillment cash flows and are expensed as incurred.
- A portfolio is defined as a group of insurance contracts that: provide coverage for similar risks and that are priced similarly relative to the risk taken on; and are managed together as a single pool.
- An entity may simplify the measurement of the liability for the remaining coverage using the premium allocation approach (PAA) if:
    - The coverage period is one year or less; or
    - At contract inception, the entity does not expect significant variability, during the period before a claim is incurred, in the fulfillment cash flows that are required to fulfill the contract.

Appendix B—Summary of Risk Adjustment Approach

Background

Definition of Risk Adjustment

The risk adjustment measures the compensation that an entity requires for bearing the uncertainty about the amount and timing of the cash flows that arise as the entity fulfills the insurance contract. Excerpts from relevant sections of the Exposure Draft are included at the end of this section for reference.

Approach Used in Modeling

Cost of Capital Method

We used the cost of capital method to quantify the risk adjustment. Under this approach the risk adjustment is equal to the cost of holding a sufficient amount of capital in order to fulfill the insurance contract obligations. The risk adjustment under this approach is calculated as follows:

$$Risk\ Adjustment_t = \sum_{i=t}^{\infty} PV(EC_i) \times CoC$$

Where,

> *PV* represents the adjustment to account for the time value of money
> EC_t represents the required economic capital for unhedgeable risk at time t
> *CoC* represents the cost of capital parameter.

Implementation

We used the following key inputs in order to implement the cost of capital method:

1. Risk-free interest rate
2. The cost of capital parameter
3. Projections of required economic capital for non-hedgeable risk.

For the purpose of our exercise, the adjustment to account for the time value of money was based on a risk-free discount rate of 4 percent as defined in our economic assumptions.

We assumed the cost of capital parameter (CoC in the formula above) was equal to 6 percent for all durations and all products. The 6 percent CoC rate was derived from the Solvency II standard formula and based on various studies such as the CRO Forum study on "Market Value of Liabilities for Insurance Firms" issued in July 2008.

We calculated the required economic capital (EC in formula above) based on a simplified implementation of the post diversified Solvency II standard formula capital. The implementation of the Solvency II standard formula would require several calculations of the best-estimate liability, which would be time-consuming and impractical for participants. To avoid this complexity EY developed a simplified tool (EY EC calculator) to calculate the projected required economic capital. Details of how the EY EC calculator was used are described in the "EY EC Calculator" section below.

We used the EY EC calculator to project the required economic capital for each product. We then applied the cost of capital charge to the projected capital and discounted these projected values to explicitly calculate the risk adjustment for each valuation period. To assist with implementing the risk adjustment, we unitized these risk adjustments as a ratio of product-specific drivers (i.e., account value, face amount, etc.). These risk adjustment factors were then additionally smoothed to eliminate unexpected period-to-period noise in the factors. The smoothing process also adjusted the risk adjustment factors to achieve comparability across products with similar risks. A summary of the factors prior to and post smoothing is included below.

EY EC Calculator

Overview

The following are the key characteristics of the Solvency II standard formula:

- The capital is calculated based on a modular approach (mortality, lapse, etc.).
- Each risk factor is calibrated using a value-at-risk (VaR) measure, with a 99.5 percent confidence level, over a one-year period. The result of this calibration is a set of shocks related to the different risk factors (mortality, lapse, etc.).
- The economic capital for each individual risk is equal to the change in the net asset value pre- and post-stress (e.g., increase in mortality, etc.). For this purpose, market risks are not relevant, and therefore the economic capital is equal to the change in the best-estimate liability pre- and post-stress, where the best-estimate liability is the present value of best-estimate cash flows using a risk-free rate.
- The economic capital for the individual risks is aggregated using a correlation matrix to acknowledge the fact that the risks are not all expected to materialize at the same time and to recognize the benefits of risk diversification.
- We assumed that non-hedgeable risks are limited to the following: mortality, longevity, morbidity, lapse, expense, mortality catastrophe, annuitization, counterparty and operational risks.

The EY EC calculator uses some of the simplifications provided by Solvency II in the "Draft Implementing Measures Solvency II" paper, dated Oct. 31, 2011. Furthermore, we made additional simplifications and changes to the standard formula in developing the calculator as part of this project. The outcome of these simplifications is a factor-based model whereby factors can be applied to certain risk drivers (e.g., net amount at risk) in order to calculate the capital required for a particular risk. These factors vary by risk (i.e., mortality, lapse, etc.), and they are mainly a function of the following:

- The magnitude of the shock, which is based on the Solvency II standard formula
- Duration of the business line
- Average demographic assumption to which the shock is applied.

The total pre-diversified capital at each projection date was calculated as the sum of the required capital for each applicable risk. Details of the calculation of each risk are included below. There was an additional multiple based on Quantitative Impact Study 5 QIS5 results of 36 percent applied to reflect the diversification across risks and products to produce the total economic capital.

Limitations

Certain risk drivers (duration and average demographic assumptions) have been determined based on projected experience cash flows provided by the modeling teams. Where necessary, judgment was used to smooth imputed average demographic assumptions (i.e., imputed average lapse rates, etc.).

In certain cases where we deemed the Solvency II simplification to be inadequate in capturing a particular risk or difficult to implement for certain products, we utilized other proxies in developing a capital requirement estimate. In particular, we did not utilize the Solvency II simplification to quantify any of the risks for the variable annuity product; instead we used a benchmarking approach. The approach for the variable annuity product is summarized in a separate section below.

Estimating Capital for Risks Considered

The following section summarizes the simplifications we used for calculating economic capital for the various underwriting risks considered for the risk adjustment. The section is organized by risks, which include: mortality, longevity, morbidity, lapse, expense, catastrophe and operational risk. Each risk section includes information regarding: products to which the risk is applicable; the Solvency II formula; EY's further simplification to the Solvency II formula; and any other limitations or assumptions we made.

Mortality Risk

Applicable products	Universal life, variable universal life, term life, participating whole life, universal life with secondary guarantees
Solvency II simplifications	$$15\% \times NAR \times q \times \sum_{k=1-0.5}^{n-0.5} \left(\frac{1-q}{1+i_k}\right)^k$$ Where, q = average mortality at time of valuation n = modified duration of death claims
Additional simplifications for EY EC calculator	$$15\% \times NAR \times q \times n \times 1.1^{\left(\frac{n-1}{2}\right)}$$ Where, q = average mortality at time of valuation n = modified duration of death claims
Other limitations/ assumptions	• We multiplied the shock by duration of the product to extend the estimate of the impact of the shock over the lifetime of the contract • We assumed that average mortality at time of valuation increased by 10 percent each year when applying the shock. The 10 percent increase was chosen to reflect a similar approach used in the Solvency II standard formula when quantifying longevity risk.

Longevity Risk

Applicable products	Single premium immediate annuity
Solvency II simplifications	$$20\% \times q \times n \times 1.1^{\frac{(n-1)}{2}} BEL$$ Where, q = average mortality at time of valuation n = modified duration of death claims BEL = best-estimate liability

Additional simplifications for EY EC calculator	None, used Solvency II formula above
Other limitations/ assumptions	• The best-estimate liability used in the formula above is intended to represent a present value of best-estimate cash flows discounted at a risk-free rate. For the purposes of this exercise, we estimated the best-estimate liability by discounting the experience cash flows provided by the actuarial task forces (ATFs), rather than an explicit calculation within the actuarial projection models.

Morbidity Risk

Applicable products	Long-term care, cancer, Medicare supplement
Solvency II simplifications	$$35\% \times CAR_1 \times d_1 + 25\% \times 1.1^{\left(\frac{n-3}{2}\right)} \times (n-1) \times CAR_2 \times d_2 + 20\% \times 1.1^{\left(\frac{n-3}{2}\right)} \times t \times n \times BEL$$ Where, CAR_1 = capital at risk for the following 12 months CAR_2 = capital at risk for the period after 12 months d_1 = average disability rate for the following 12 months d_2 = average disability rate for the period after 12 months n = modified duration of disability claims BEL = best-estimate liability
Additional simplifications for EY EC calculator	$$350\% \times RBC\ C2$$ Where, RBC C2 = Authorized control level risk-based capital (ACL RBC) charge for insurance risk only
Other limitations/ assumptions	• Due to difficulties of implementing the Solvency II simplification because of limitations on available inputs to the formula, an alternate proxy using regulatory capital was used. • The simplification assumes that the statutory C2 capital appropriately captures the morbidity risk for these products. The simplification assumes the C2 capital primarily covers morbidity risk for these products. • The economic capital held for morbidity risk is set equal to 350 percent of the ACL RBC capital for insurance risk. This level of capital was calibrated based on the ratio of capital to ACL RBC observed for mortality risk in the term product where a Solvency II type approach was utilized to quantify the mortality risk. The simplification assumes the level of capital relative to ACL RBC for morbidity risk for these products will be similar to the level of capital relative to ACL RBC for mortality risk on a term product. • Due to lack of granularity in data provided, the C2 risk component for LTC was assumed to be 40 percent of total LTC ACL RBC. The C2 risk component proportion was based on the ratios observed for the cancer and Medicare supplement products.

Lapse Risk

Applicable products	Universal life, variable universal life, term life, participating whole life, universal life with secondary guarantees, single premium deferred annuity, fixed indexed annuity, long-term care, cancer, Medicare supplement
Solvency II simplifications	$$Lapse_{up} = 50\% \times l_{up} \times n_{up} \times S_{up}$$ $$Lapse_{down} = 50\% \times l_{down} \times n_{down} \times S_{down}$$ Where, l_{up} = max of average lapse rate of policies with positive lapse strain and 67 percent n_{up} = average period in years over which the policies with a positive surrender strains runs off S_{up} = sum of positive surrender strains L_{down} = max of average lapse rate of policies with positive lapse strain and 40 percent n_{down} = average period in years over which the policies with a negative surrender strains runs off S_{down} = sum of negative surrender strains
Additional simplifications for EY EC calculator	$$50\% \times |CSV - BEL| \times l \times n$$ Where, CSV = cash surrender value (0 if not applicable) BEL = best-estimate liability l = average lapse rate n = modified duration of liability
Other limitations/ assumptions	• The effect of a temporary change in lapse rates is measured by means of the surrender strain (i.e., difference between the cash surrender value and the best-estimate liability). The best-estimate liability used in the formula above is intended to represent a present value of best-estimate cash flows discounted at a risk-free rate. For the purposes of this exercise, we estimated the best-estimate liability by discounting the experience cash flows provided by the ATFs, rather than an explicit calculation within the actuarial projection models. In order to account for the permanence of the change in the scenarios, this loss is multiplied with the duration of the portfolio. • For products where the lapse strain direction varies through the life of the product (i.e., lapse supported in early years vs. non-lapse-supported in later years), a single positive or negative strain was assumed using the scenario with the larger total strain.

Expense Risk

Applicable products	All
Solvency II simplifications	$$10\% \times EI \times n + EI \times [(1/(i + 1\%))((1 + i + 1\%)\char`^n - 1) - 1/i \times ((1 + i)\char`^n - 1)]$$ Where, EI = expense level n = modified duration of liability i = average inflation rate
Additional simplifications	$$10\% \times EI \times n + EI \times (i/2 \times n^2)$$ Where,

for EY EC calculator	El = expense level n = modified duration of liability i = average inflation rate = 1%
Other limitations/ assumptions	• The simplification assumes that the impact of a 10 percent increase in total expenses is approximated as the sum, for each future year over which the risk runs off. • Multiply shock by duration to extend the estimate of the impact of the shock over the lifetime of the contract. • The impact of a 1 percent increase in expected future expense inflation was also approximated using an alternate approach.

Catastrophe Risk

Applicable products	Universal life, variable universal life, participating whole life, term life, universal life with secondary guarantees
Solvency II simplifications	$$0.15\% \times NAR$$ Where, NAR = net amount at risk
Additional simplifications for EY EC calculator	None, used Solvency II formula above
Other limitations/ assumptions	• This risk was only applied to products with an explicit death benefit

Operational Risk

Applicable products	All

Solvency II simplifications	$$Max(OPpremiums, OPprovisions) + 25\% \times Exp$$
	Where,
	   OPpremiums = operational risk charge based on earned premiums*
	   OPprovisions = operational risk charge based on technical provisions*
	   Exp = expenses related to separate account products
	*See details of formulas in Solvency II drafting note. Formula not presented here for brevity.

Additional simplifications for EY EC calculator	$$Max(4\% \times Prem, 0.45\% \times BEL) + 25\% \times Exp$$
	Where,
	   Prem = premiums for current year
	   BEL = best-estimate liability

Other limitations/ assumptions	None

Variable Annuity Proxy

The Solvency II standard formula was deemed to be impractical to implement for the variable annuity product due to the challenges with measuring the outstanding net amount at risk for the guarantees with the limited data available. Instead, a benchmarking approach was used by quantifying the risk adjustment as a proportion of fund value based on observations of calculations for other similar variable annuity products. The products included in the benchmarking were comprised of variable annuity products sold in the US market by two insurers who perform similar cost of capital approach calculations when quantifying the risk adjustments for their economic balance sheets.

Risk Adjustment Factors (Unsmoothed)

	Risk Adjustment Factors (Unsmoothed)										
Driver	Face	Face	Face	Face	Face	BEL	BEL	BEL	Premium	Premium	Premium
Duration	UL	VUL	Par WL	Term	ULSG	SPDA	FIA	SPIA	LTC	Cancer	MedSupp
0	0.47%	0.73%	0.99%	0.34%	1.18%	0.28%	0.67%	1.42%	56.25%	24.56%	12.27%
1	0.47%	0.73%	1.07%	0.34%	1.18%	0.28%	0.67%	1.42%	57.19%	24.56%	12.27%
2	0.48%	0.74%	1.10%	0.36%	1.24%	0.27%	0.65%	1.44%	59.59%	28.95%	12.52%
3	0.49%	0.75%	1.13%	0.38%	1.30%	0.25%	0.63%	1.45%	61.18%	32.59%	12.47%
4	0.51%	0.75%	1.16%	0.38%	1.37%	0.23%	0.62%	1.45%	62.22%	35.59%	12.21%
5	0.52%	0.75%	1.18%	0.39%	1.43%	0.22%	0.60%	1.45%	62.98%	38.10%	12.17%
6	0.53%	0.75%	1.21%	0.39%	1.48%	0.20%	0.59%	1.46%	63.80%	40.11%	12.04%
7	0.53%	0.76%	1.23%	0.39%	1.54%	0.18%	0.59%	1.45%	64.71%	41.72%	11.80%
8	0.53%	0.75%	1.26%	0.39%	1.61%	0.17%	0.87%	1.45%	65.74%	42.95%	11.70%
9	0.53%	0.74%	1.28%	0.39%	1.67%	0.14%	0.81%	1.44%	66.93%	43.86%	11.80%
10	0.53%	0.73%	1.29%	0.45%	1.73%	0.12%	0.80%	1.43%	68.25%	44.28%	12.11%
11	0.52%	0.70%	1.31%	0.39%	1.80%	0.38%	0.80%	1.42%	69.73%	44.28%	12.66%
12	0.51%	0.69%	1.32%	0.38%	1.86%	0.17%	0.79%	1.40%	71.38%	43.97%	13.20%
13	0.50%	0.68%	1.34%	0.36%	1.92%	0.15%	0.78%	1.38%	73.26%	43.35%	13.63%
14	0.48%	0.67%	1.35%	0.34%	1.98%	0.13%	0.78%	1.36%	75.23%	42.43%	13.94%
15	0.46%	0.65%	1.36%	0.37%	2.04%	0.11%	0.78%	1.33%	77.25%	41.22%	14.12%
16	0.44%	0.62%	1.37%	0.31%	2.09%	0.09%	0.77%	1.30%	79.35%	39.72%	14.19%
17	0.41%	0.59%	1.38%	0.29%	2.14%	0.07%	0.77%	1.26%	81.60%	37.95%	14.13%
18	0.38%	0.56%	1.38%	0.27%	2.19%	0.05%	0.77%	1.21%	84.08%	35.93%	13.95%

19	0.35%	0.52%	1.39%	0.25%	2.24%	0.02%	0.78%	1.15%	86.78%	33.66%	13.63%
20	0.32%	0.47%	1.39%	0.54%	2.29%		0.78%	1.09%	89.65%	31.18%	13.19%
21	0.28%	0.41%	1.40%	0.42%	2.34%		0.79%	1.01%	92.73%	28.49%	12.63%
22	0.25%	0.37%	1.40%	0.38%	2.38%		0.80%	0.92%	96.18%	25.64%	11.94%
23	0.21%	0.33%	1.40%	0.33%	2.43%		0.81%	0.83%	100.12%	22.65%	11.13%
24	0.18%	0.29%	1.40%	0.28%	2.47%		0.83%	0.72%	104.53%	19.55%	10.20%
25	0.14%	0.24%	1.40%	0.22%	2.51%		0.85%	0.61%	109.36%	16.39%	9.14%
26	0.11%	0.20%	1.40%	0.17%	2.55%		0.88%	0.50%	114.71%	13.20%	7.97%
27	0.08%	0.15%	1.39%	0.12%	2.58%		0.91%	0.39%	120.95%	10.07%	6.67%
28	0.05%	0.10%	1.39%	0.08%	2.62%		0.95%	0.27%	128.30%	7.07%	5.26%
29	0.02%	0.06%	1.38%	0.04%	2.65%		0.99%	0.17%	136.80%	4.32%	3.73%
30		0.02%	1.37%		2.71%		1.04%		146.53%		
31			1.36%		2.72%		1.09%		157.92%		
32			1.35%		2.72%		1.15%		172.17%		
33			1.34%		2.73%		1.21%		190.23%		
34			1.33%		2.72%		1.28%		212.71%		
35			1.31%		2.72%		1.35%		241.19%		
36			1.29%		2.70%		1.44%		277.97%		
37			1.28%		2.67%		1.54%		328.13%		
38			1.26%		2.65%		1.71%		397.34%		
39			1.24%		2.62%		2.18%		490.92%		
40			1.22%		2.59%				620.83%		
41			1.20%		2.56%				801.03%		
42			1.18%		2.52%				1057.27%		
43			1.16%		2.48%				1426.08%		

44			1.15%		2.44%				1960.80%		
45			1.11%		2.39%				2736.52%		
46			1.08%		2.34%				3845.64%		
47			1.06%		2.27%				5368.12%		
48			1.03%		2.22%				7264.86%		
49			1.00%		2.18%				9064.52%		
50			0.98%		2.13%				9086.29%		
51			0.95%		2.09%						
52			0.92%		2.04%						
53			0.90%		1.99%						
54			0.91%		1.93%						
55			0.80%		1.87%						
56			0.77%		1.79%						
57			0.73%		1.68%						
58			0.69%		1.63%						
59			0.65%		1.59%						
60			0.61%		1.55%						
61			0.57%		1.50%						
62			0.53%		1.44%						
63			0.49%		1.38%						
64			0.52%		1.31%						
65			0.29%		1.22%						
66			0.22%		1.11%						
67			0.16%		1.01%						
68			0.10%		0.92%						

69			0.04%		0.83%					
70			0.04%		0.74%					
71					0.66%					
72					0.62%					
73					0.58%					
74					0.56%					
75					0.58%					
76					0.67%					
77					0.94%					
78					1.67%					
79					3.63%					
80					8.95%					
81					27.10%					
82					91.59%					
83					338.24%					
84					1574.72%					
85										

Risk Adjustment Factors (Smoothed)

Risk Adjustment Factors (Smoothed)											
Driver	Face	Face	Face	Face	Face	BEL	BEL	BEL	Premium	Premium	Premium	AV
Duration	UL	VUL	Par WL	Term	ULSG	SPDA	FIA	SPIA	LTC	Cancer	MedSupp	VA
0	0.60%	0.60%	1.00%	0.35%	1.20%	0.20%	0.60%	1.50%	70.00%	35.00%	12.00%	1.50%
1	0.61%	0.61%	1.02%	0.36%	1.25%	0.20%	0.60%	1.50%	70.00%	35.00%	12.00%	1.50%
2	0.61%	0.61%	1.04%	0.36%	1.30%	0.20%	0.60%	1.49%	70.00%	35.00%	12.00%	1.50%
3	0.62%	0.62%	1.06%	0.37%	1.35%	0.20%	0.60%	1.49%	70.00%	35.00%	12.00%	1.50%
4	0.62%	0.62%	1.08%	0.37%	1.40%	0.20%	0.60%	1.48%	70.00%	35.00%	12.00%	1.50%
5	0.63%	0.63%	1.10%	0.38%	1.45%	0.20%	0.60%	1.48%	70.00%	35.00%	12.00%	1.50%
6	0.63%	0.63%	1.12%	0.38%	1.50%	0.20%	0.60%	1.47%	70.00%	35.00%	12.00%	1.50%
7	0.64%	0.64%	1.14%	0.39%	1.55%	0.20%	0.60%	1.47%	70.00%	35.00%	12.00%	1.50%
8	0.64%	0.64%	1.16%	0.39%	1.60%	0.20%	0.60%	1.46%	70.00%	35.00%	12.00%	1.50%
9	0.64%	0.64%	1.18%	0.40%	1.65%	0.20%	0.60%	1.46%	70.00%	35.00%	12.00%	1.50%
10	0.63%	0.63%	1.20%	0.39%	1.70%	0.20%	0.60%	1.45%	70.00%	35.00%	12.00%	1.50%
11	0.62%	0.62%	1.22%	0.39%	1.75%	0.20%	0.60%	1.40%	70.00%	35.00%	12.00%	1.50%
12	0.61%	0.61%	1.24%	0.38%	1.80%	0.20%	0.60%	1.35%	70.00%	35.00%	12.00%	1.50%
13	0.60%	0.60%	1.26%	0.38%	1.85%	0.20%	0.60%	1.30%	70.00%	35.00%	12.00%	1.50%
14	0.59%	0.59%	1.28%	0.37%	1.90%	0.20%	0.60%	1.25%	70.00%	35.00%	12.00%	1.50%
15	0.58%	0.58%	1.30%	0.37%	1.95%	0.20%	0.60%	1.20%	70.00%	35.00%	12.00%	1.50%
16	0.57%	0.57%	1.32%	0.36%	2.00%	0.20%	0.60%	1.15%	70.00%	35.00%	12.00%	1.50%
17	0.56%	0.56%	1.34%	0.36%	2.05%	0.20%	0.60%	1.10%	70.00%	35.00%	12.00%	1.50%
18	0.55%	0.55%	1.36%	0.35%	2.10%	0.20%	0.60%	1.05%	70.00%	35.00%	12.00%	1.50%

19	0.54%	0.54%	1.38%	0.35%	2.15%	0.20%	0.60%	1.00%	70.00%	35.00%	12.00%	1.50%
20	0.53%	0.53%	1.40%	0.34%	2.20%	0.20%	0.60%	1.00%	70.00%	35.00%	12.00%	1.50%
21	0.48%	0.48%	1.40%	0.34%	2.20%	0.20%	0.60%	0.95%	70.00%	35.00%	12.00%	1.50%
22	0.43%	0.43%	1.40%	0.33%	2.20%	0.20%	0.60%	0.90%	70.00%	35.00%	12.00%	1.50%
23	0.38%	0.38%	1.40%	0.33%	2.20%	0.20%	0.60%	0.85%	70.00%	35.00%	12.00%	1.50%
24	0.33%	0.33%	1.40%	0.32%	2.20%	0.20%	0.60%	0.80%	70.00%	35.00%	12.00%	1.50%
25	0.28%	0.28%	1.40%	0.32%	2.20%	0.20%	0.60%	0.75%	70.00%	35.00%	12.00%	1.50%
26	0.23%	0.23%	1.40%	0.31%	2.20%	0.20%	0.60%	0.70%	70.00%	35.00%	12.00%	1.50%
27	0.20%	0.20%	1.40%	0.31%	2.20%	0.20%	0.60%	0.65%	70.00%	35.00%	12.00%	1.50%
28	0.20%	0.20%	1.39%	0.30%	2.20%	0.20%	0.60%	0.60%	70.00%	35.00%	12.00%	1.50%
29	0.20%	0.20%	1.38%	0.30%	2.20%	0.20%	0.60%	0.55%	70.00%	35.00%	12.00%	1.50%
30	0.20%	0.20%	1.37%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
31	0.20%	0.20%	1.36%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
32	0.20%	0.20%	1.35%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
33	0.20%	0.20%	1.34%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
34	0.20%	0.20%	1.33%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
35	0.20%	0.20%	1.31%	0.30%	2.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
36	0.20%	0.20%	1.29%	0.30%	2.15%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
37	0.20%	0.20%	1.27%	0.30%	2.10%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
38	0.20%	0.20%	1.25%	0.30%	2.05%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
39	0.20%	0.20%	1.23%	0.30%	2.00%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
40	0.20%	0.20%	1.21%	0.30%	1.95%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
41	0.20%	0.20%	1.19%	0.30%	1.90%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
42	0.20%	0.20%	1.17%	0.30%	1.85%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
43	0.20%	0.20%	1.15%	0.30%	1.80%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%

44	0.20%	0.20%	1.13%	0.30%	1.75%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
45	0.20%	0.20%	1.11%	0.30%	1.70%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
46	0.20%	0.20%	1.09%	0.30%	1.65%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
47	0.20%	0.20%	1.07%	0.30%	1.60%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
48	0.20%	0.20%	1.05%	0.30%	1.55%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
49	0.20%	0.20%	1.03%	0.30%	1.50%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
50	0.20%	0.20%	1.01%	0.30%	1.45%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
51	0.20%	0.20%	0.96%	0.30%	1.40%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
52	0.20%	0.20%	0.91%	0.30%	1.35%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
53	0.20%	0.20%	0.86%	0.30%	1.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
54	0.20%	0.20%	0.81%	0.30%	1.25%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
55	0.20%	0.20%	0.76%	0.30%	1.20%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
56	0.20%	0.20%	0.71%	0.30%	1.15%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
57	0.20%	0.20%	0.66%	0.30%	1.10%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
58	0.20%	0.20%	0.61%	0.30%	1.05%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
59	0.20%	0.20%	0.56%	0.30%	1.00%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
60	0.20%	0.20%	0.51%	0.30%	0.95%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
61	0.20%	0.20%	0.46%	0.30%	0.90%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
62	0.20%	0.20%	0.41%	0.30%	0.85%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
63	0.20%	0.20%	0.36%	0.30%	0.80%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
64	0.20%	0.20%	0.31%	0.30%	0.75%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
65	0.20%	0.20%	0.30%	0.30%	0.70%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
66	0.20%	0.20%	0.30%	0.30%	0.65%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
67	0.20%	0.20%	0.30%	0.30%	0.60%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
68	0.20%	0.20%	0.30%	0.30%	0.55%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%

69	0.20%	0.20%	0.30%	0.30%	0.50%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
70	0.20%	0.20%	0.30%	0.30%	0.45%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
71	0.20%	0.20%	0.30%	0.30%	0.40%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
72	0.20%	0.20%	0.30%	0.30%	0.35%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
73	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
74	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
75	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
76	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
77	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
78	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
79	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
80	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
81	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
82	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
83	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
84	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%
85	0.20%	0.20%	0.30%	0.30%	0.30%	0.20%	0.60%	0.50%	70.00%	35.00%	12.00%	1.50%