

Educational Note

Future Income and Alternative Taxes

Committee on Life Insurance Financial Reporting

December 2012

Document 212096

Ce document est disponible en français

© 2012 Canadian Institute of Actuaries

Members should be familiar with educational notes. Educational notes describe but do not recommend practice in illustrative situations. They do not constitute Standards of Practice and are, therefore, not binding. They are, however, intended to illustrate the application (but not necessarily the only application) of the Standards of Practice, so there should be no conflict between them. They are intended to assist actuaries in applying Standards of Practice in respect of specific matters. Responsibility for the manner of application of Standards of Practice in specific circumstances remains that of the members in the life insurance practice area.

Memorandum

To: All Fellows, Associates, and Correspondents of the Canadian Institute of Actuaries

From: Phil Rivard, Chair
Practice Council
Edward Gibson, Chair
Committee on Life Insurance Financial Reporting

Date: December 17, 2012

Subject: **Educational Note on Future Income and Alternative Taxes**

The Committee on Life Insurance Financial Reporting (CLIFR) has updated the attached educational note, which concerns the treatment of projected tax based on income (income tax), and other taxes not based on income that interact with income tax (alternative tax) in the valuation of insurance contract liabilities under the Canadian Asset Liability Method (CALM).

This educational note applies to the insurance contract liabilities of all contracts written by life insurers, and its principles apply to the valuations of both direct written business and reinsurance received. The key topics discussed are insurance contract-related tax cash flows, insurance contract-related balance sheet items, recoverability, and tax-preferred assets.

This educational note provides supplemental information to paragraphs 42 through 48 of subsection 2320 of the Standards of Practice—Practice-Specific Standards for Insurance.

The educational note gives a practical overview (including numerical examples) on providing for income taxes in the valuation of insurance contract liabilities, and also provides the balance sheet presentation.

In accordance with the Institute's Policy on due process for the approval of guidance material other than standards of practice, this educational note has been prepared by the Committee on Life Insurance Financial Reporting, and received final approval for distribution from the Practice Council on October 3, 2012.

We would like to thank the members of the working group who were primarily responsible for the update of this educational note: Nathalie Bouchard, Alexis Gerbeau, Dale Mathews, and Leonard Pressey.

Questions may be addressed to Edward Gibson at his CIA Online Directory address: edward.gibson@empire.ca.

PR, EG

TABLE OF CONTENTS

1. Introduction and Scope 4

2. Background and Review of Standards 4

3. Development of Insurance Contract-Related Tax Cash Flows 7

4. Calculation of the Future Tax Provision 9

5. Insurance Contract-Related Balance Sheet Items 15

6. Calculation of Future Tax Carve-Out 16

7. Recoverability 17

8. Tax-Preferred Assets..... 21

Appendix A: Numerical Examples: Asset-Related Temporary Differences—CALM Testing..... 23

Appendix B: Numerical Examples: Asset-Related Temporary Differences—Discounting Approach 34

Appendix C: DFTP Recoverability and Underclaims/loss carryforwards..... 39

Appendix D: Using Microsoft Excel Goal Seek..... 44

1. INTRODUCTION AND SCOPE

This educational note concerns the treatment of projected tax based on income (income tax) and other taxes not based on income that interact with income tax, such as certain capital taxes in Canada (alternative tax), in the valuation of insurance contract liabilities under the Canadian Asset Liability Method (CALM).

This educational note applies to the insurance contract liabilities of all contracts written by life insurers. The principles described for the valuation of direct written business also apply to the valuation of reinsurance assumed.

This educational note deals only with the treatment of projected tax based on income (income tax) and other taxes not based on income that interact with income tax, such as certain capital taxes in Canada (alternative tax), and not other types of taxes.

The key topics discussed are:

- Review of relevant standards;
- Development of insurance contract-related tax cash flows;
- Calculation of the future tax provision;
- Insurance contract-related balance sheet items;
- Calculation of the future tax liability carve-out;
- Recoverability; and
- Tax-preferred assets.

This educational note does not address the:

- Allocation of income taxes and alternative taxes between participating and non-participating lines of business;
- Allocation of income taxes and alternative taxes to other non-insurance contract-related liabilities;
- Impact of policyholder taxation on insurance contract liabilities; and
- Appropriate treatment of assets outside the Canadian investment fund when those assets are used to support insurance contract liabilities in a Canadian insurance company.

2. BACKGROUND AND REVIEW OF STANDARDS

Review of standards

Prior to the adoption of International Financial Reporting Standards (IFRS) in Canada, the accounting for taxes on the Canadian Generally Accepted Accounting Principles (GAAP) balance sheet was governed by Accounting Guideline – 9 (AcG-9) Financial Reporting By Life Insurance Enterprises within the Canadian Institute of Chartered Accountants' (CICA) *Handbook – Accounting*. A key principle addressed in paragraphs 23 to 29 of AcG-9 with respect to insurance contract liabilities was that insurance contract liabilities would be adjusted for the effect of both tax timing differences and permanent differences on cash flows available to satisfy policy obligations.

With the change to IFRS in 2010, AcG-9 was replaced by IFRS 4 Insurance Contracts which effectively requires the continuation of Canadian GAAP accounting for insurance contract

liabilities until such time as the International Accounting Standards Board (IASB) completes its second phase of the development of standards specific to insurance contracts.

Subsection 2320 of the Standards of Practice amplifies the original CICA guidance, and indicates that a provision should be made in the insurance contract liabilities for:

- Future investment income tax;
- Future capital taxes not recoverable or offset by income taxes; and
- Future income taxes payable or recoverable with respect to permanent and temporary (timing) differences.

Specifically, subsection 2320 of the Practice-Specific Standards for Insurance includes the following guidance:

Income tax and alternative tax

- .42 This item deals with cash flow from tax based on income (herein called “income tax”) and other taxes not based on income but which interact with income tax; for example, certain capital taxes in Canada (herein called “alternative tax”).
- .43 The cash flow from such taxes would be limited to that in respect of the relevant insurance contracts and the assets which support their insurance contract liabilities, and thus, with the exception of the recoverability of future tax losses described below would ignore any interaction between that cash flow and cash flow in the rest of the insurer; e.g., it would ignore tax on investment income from assets that support the insurer’s capital. For a particular scenario, forecasted income before tax is equal to zero in each accounting period after the balance sheet date. That is so because that scenario assumes occurrence of the adverse deviations for which it makes provision. If income according to tax rules were equal to income in accordance with generally accepted accounting principles, and if there were no alternative tax, then the corresponding forecasted tax cash flow would also be equal to zero. In reality, however, such tax cash flow may differ from zero because of
- differences – both temporary and permanent – between income in accordance with generally accepted accounting principles and in income in accordance with tax rules,
- the operation of carry-forward and carry-back in the tax rules, and
- alternative tax and the interaction between it and income tax.
- .44 An example of a temporary difference is a difference between insurance contract liabilities and the corresponding tax liabilities.
- .45 An example of a permanent difference is a preferential tax rate on the investment income on a class of assets.
- .46 The forecast of cash flow from such taxes would therefore take account of positive or negative tax as a result of permanent and temporary differences at, and arising after, the balance sheet date, and of alternative taxes incurred after the balance sheet date.
- .47 The resulting insurance contract liabilities make appropriate provision for cash flow on account of such taxes. If the insurer’s balance sheet records a future tax asset or liability in respect of such taxes, then, in order to avoid double counting, the actuary would adjust the insurance

contract liabilities otherwise calculated upward to reflect the existence of the future tax asset and downward to reflect the existence of future tax liability.

48 The realization of negative tax depends on the simultaneous availability of income that is otherwise taxable. In forecasting such income, the actuary would

make provision for adverse deviations,

take into account the projected tax position of the company overall, but

not take account of the expected release of provisions for adverse deviations in the insurance contract liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

Application

Consistent with the above paragraphs of the Standards of Practice, the projection of tax cash flows in the valuation is based on assumptions that include margins for adverse deviations. The insurance contract liabilities would not provide for projected taxes related to the expected release of provisions for adverse deviations, but only for those taxes that would arise if the valuation assumptions (i.e., with margins for adverse deviations) materialize. Therefore, if taxable income were equal to GAAP income, there would be no need to provide for projected income taxes in the valuation, because GAAP income is projected to be zero if the valuation assumptions materialize.

However, projected taxable income may be different from projected GAAP income for a number of reasons. In general, the differences in company income as determined for GAAP reporting and for taxation purposes can be classified as being one of two types: permanent or temporary.

A permanent difference is one where differences in income in reporting periods between tax versus GAAP are not fully offset (i.e., reversed) over the lifetime of the item giving rise to the difference. Examples of permanent differences are:

- Dividends from Canadian stocks (which are not taxable in the hands of the insurer);
- Net capital gains on real estate (only a percentage of which is included in taxable income);
- Income from Canadian subsidiaries;
- Non-deductibility of investment income tax (IIT) in Québec;
- Some expenses non-deductible in taxable income; and
- Non-taxable investment income on assets outside of a Canadian investment fund.

A temporary difference (i.e., timing difference) is one for which there are period-to-period differences between tax and GAAP income which are fully offset (i.e., reversed) over the lifetime of the item giving rise to the difference. Examples of temporary differences are:

- Differences between GAAP insurance contract liabilities and the corresponding tax liabilities;
- Real estate—valued at depreciated cost for tax purposes, market value or amortized cost for GAAP purposes;
- Derivative instruments, e.g., forward starting swaps—valued at cost for tax purposes and at market for GAAP purposes;

- Accident and sickness unpaid claim reserves;
- Incurred but not reported (IBNR) reserves for both individual and group life and accident and sickness business;
- Run-off of pre-2007 deferred realized gains and losses from specified debt obligations (SDO);
- Policy loans; and
- Deferred acquisition cost (DAC) amortizations.

For business written in non-Canadian jurisdictions, there may be other differences between GAAP and taxable income.

The prospective impact of permanent and temporary differences would be fully allowed for in the calculation of Canadian GAAP insurance contract liabilities.

To determine the value of the temporary and permanent differences, the actuary would set assumed best estimate future income tax rates. Paragraph 2340.15 of the Standards of Practice requires that the best estimate scenario would consider continuation of the tax regime existing at the balance sheet date, except that the best estimate would anticipate any “definitive” or “virtually definitive” decision by the relevant tax authority to change that regime. Section 3465 of the CICA handbook states that income tax rates would be “enacted” or “substantively enacted” in order to be considered in the calculation of income tax assets or income tax liabilities. With respect to income tax rates, CLIFR would not expect the CICA’s “enacted” or “substantively enacted” criterion to be different from the CIA’s criterion.

Under the CALM, a further complication is that the provision for adverse deviations in interest rate risk is determined by scenario testing, rather than by application of a margin for adverse deviations to the projected rates of return. Theoretically, the tax cash flows would vary within each scenario; however, this is often not done in practice. This is acceptable provided the actuary can demonstrate that ignoring the variability in tax cash flows does not materially alter valuation results.

If beneficial differences (permanent or temporary) rely on a favourable tax interpretation, the actuary would consider the risk of an adverse interpretation by tax authorities (potential “limited shelf life”). This is a special circumstance where the actuary would follow the approach outlined in Standards of Practice subsection 1330 for unusual and unforeseen circumstances.

3. DEVELOPMENT OF INSURANCE CONTRACT-RELATED TAX CASH FLOWS

According to the Standards of Practice, the valuation of GAAP insurance contract liabilities would include provision only for insurance contract-related tax cash flows, and not for other taxes expected to be paid by the insurer. Therefore, the actuary needs to distinguish which projected income and alternative taxes are insurance contract-related. The projected tax cash flows reflect the interactions between insurance contract-related income tax cash flows, and insurance contract-related alternative tax cash flows.

The identification of those income and alternative taxes that are insurance contract-related does not depend solely on the company’s internal practices for tax allocation. The following general rules could apply:

- Projected tax cash flows arising from the difference between maximum tax actuarial reserves (MTARs) and GAAP insurance contract liabilities are insurance contract-related. This includes:
 - Income taxes arising from the reversal of a difference that exists at the balance sheet date;
 - Income taxes arising from occurrence after the balance sheet date and later reversal of a difference; and
 - Capital taxes arising from the difference between MTARs and GAAP insurance contract liabilities.
- Projected tax cash flows from investment income on assets supporting insurance contract liabilities are insurance contract-related.
- Projected tax cash flows from investment income of assets not supporting GAAP insurance contract liabilities are not insurance contract-related.
- Projected tax cash flows related to differences between the treatment for GAAP and tax purposes of any insurance contract-related items (e.g., insurance contract-related expenses) are insurance contract-related.
- Projected tax cash flows related to differences between the treatment for GAAP and tax purposes of any items which are not insurance contract-related (e.g., intangible assets unrelated to policies) are not insurance contract-related.

Two types of projected tax cash flows that may or may not be considered insurance contract-related are:

- Projected tax cash flows arising from the difference between claimed tax liabilities on policies and MTARs (i.e., underclaims); and
- Projected tax cash flows arising from the amortization of a balance sheet loss carryforward (LCF) item.

The treatment of underclaims and LCFs varies among actuaries. The following approaches are in use:

- (a) Projected taxes associated with the reversal of underclaims and the amortization of LCFs are not insurance contract-related.
 - This approach is consistent with the view that if MTARs were equal to GAAP insurance contract liabilities, there would be no need for the actuary to make provision in the valuation for temporary differences between GAAP insurance contract liabilities and tax liabilities.
 - This methodology is simple, practical, and easy to disclose. It treats both the LCF and the underclaim as past events. The GAAP insurance contract liability is calculated prospectively not retrospectively. The future tax asset associated with the LCF or underclaim is deemed to belong to surplus.
 - The underclaims and LCFs are effectively ignored in the GAAP insurance contract liability valuation.
- (b) The original source of the underclaim/LCF determines whether the associated projected taxes are insurance contract-related or not.

- If the underclaim or the LCF arose because of an insurance contract-related item, then the projected reversal of the underclaim or amortization of the LCF is considered insurance contract-related. The actuary would assess whether the underclaim and LCF, or portions thereof, are insurance contract related. Consideration would be given to the company's tax allocation policy in determining which business segment "owns" the underclaim or the LCF (i.e., which business segment is entitled to realize the benefit when the underclaim or the LCF is utilized).
- An underclaim can be thought of as an integral part of an LCF, since underclaims are typically used to manage expiry of loss carry forwards.
- This methodology may be complicated to apply in a consistent and appropriate manner, particularly where underclaims and LCF are managed at a high level (e.g., entity level). Its use implies the future tax asset associated with the insurance contract-related portion of the underclaims or LCF belongs to the liability segment.
- This methodology requires the actuary's understanding of the company's tax position and tax management strategies to model the prospective impact of the underclaim and LCF position.

Based on company circumstances, each of these approaches can be reasonable, and consistent with current standards of practice. However, it would not be appropriate to apply the approaches inconsistently; for example, by choosing different approaches by block of business.

4. CALCULATION OF THE FUTURE TAX PROVISION

In this section, three approaches to the calculation of the discounted future tax provision are presented.

Definitions

It is useful to define terms pertaining to the calculation of future tax provisions that will be reflected in the valuation of the insurance contract liabilities. To ensure consistency in industry communications, the following terminology is proposed:

Insurance Contract Liability Ignoring Future Taxes (ICLIFT) is the insurance contract liability calculated excluding future income and capital taxes. ICLIFT includes provision for premium taxes and investment income taxes.

Discounted Future Tax Provision (DFTP) is the provision in the insurance contract liabilities for future income and capital tax cash flows related to insurance contract liabilities and supporting assets.

Insurance Contract Liability Before Carve-Out (ICLBCO) is the sum of ICLIFT and DFTP. Alternatively, the ICLBCO can be calculated directly by including tax cash flows related to insurance contract liabilities and supporting assets in the CALM testing.

Future Tax Carve-Out (FTCO) is the component of the accounting provision for future taxes related to insurance contract liabilities for in-force policies and supporting assets. It is the amount by which the ICLBCO is adjusted to arrive at the *Insurance Contract Liability After Carve-Out*. This will equal the component of the accounting future tax asset or liability that will be separately reported on the Canadian GAAP balance sheet that is related to insurance contract liabilities and supporting assets.

Insurance Contract Liability After Carve-Out (ICLACO) is the amount of insurance contract liabilities reported in the Canadian GAAP balance sheet, and is effectively the ICLBCO adjusted for the FTCCO.

Future Tax Liability (FTL) is the undiscounted provision for future taxes related to insurance contract liabilities and supporting assets determined by the accountant. The FTCCO equals the FTL as calculated by the accountant.

Net Balance Sheet Position (NBSP) is the sum of the amount of insurance contract liabilities reported by the actuary, i.e., ICLACO, and the undiscounted provision for future taxes reported by the accountant i.e., FTL, in the Canadian GAAP balance sheet. This will equal the ICLBCO as long as temporary differences are insurance contract-related.

General Principles

The paragraphs below develop general formulas related to DFTPs. The following variables will be used in the development of the formulas:

tx = tax rate

i = GAAP earned rate on assets supporting the DFTP

j = taxable earned rate on assets supporting the DFTP

P = Premium

B = Benefit

GAAP_E = GAAP expense

Tx_E = taxable expense

GAAP_InvInc_ICLIFT = GAAP investment income on assets supporting ICLIFT

Tx_InvInc_ICLIFT = taxable investment income on assets supporting ICLIFT

GAAP_InvInc_ICLBCO = GAAP investment income on assets supporting ICLBCO

Tx_InvInc_ICLBCO = taxable investment income on assets supporting ICLBCO

GAAP_InvInc_DFTP = GAAP investment income on assets supporting DFTP

Tx_InvInc_DFTP = taxable investment income on assets supporting DFTP

Tx_V = insurance contract liabilities on a tax basis

PolBefTxProfit = GAAP insurance contract-related before-tax profit

PolAfTxProfit = GAAP insurance contract-related after-tax profit

TotalPolTaxProfit = insurance contract-related taxable profit, including Tx_InvInc_DFTP

PolTaxProfit = insurance contract-related taxable profit, excluding Tx_InvInc_DFTP

T = income tax cash flow, where the tax cash flows would be determined by applying the appropriate tax rate to insurance contract-related taxable profits, i.e., tx · PolTaxProfit

k = calendar year or policy duration.

As discussed previously, the projection of tax cash flows in the valuation is based on assumptions that include margins for adverse deviations. The insurance contract liabilities would

not provide for projected taxes related to the expected release of provisions for adverse deviations, but only for those taxes that would arise if the valuation assumptions (i.e., with margins for adverse deviations) materialize. Therefore, if taxable income were equal to GAAP income, there would be no need to provide for projected income taxes in the valuation, because GAAP income is projected to be zero if the valuation assumptions materialize. As well, if the DFTP is included in the insurance contract liabilities, then the after-tax insurance contract-related income is projected to be zero. The formulas start with the insurance contract-related taxable profits to develop the relationship of the $DFTP_k$ to the future income tax cash flows T_k .

First note that the GAAP income (ignoring future income taxes), will be zero when the projection is based on assumptions that include margins as follows:

$$PolBefTxProfit_k = P_k - B_k - GAAP_E_k + GAAP_InvInc_ICLIFT_k - \Delta ICLIFT_k = 0$$

When the DFTP is included in insurance contract liabilities, the insurance contract-related after-tax income becomes:

$$PolAfTxProfit_k = P_k - B_k - GAAP_E_k + GAAP_InvInc_ICLBCO_k - \Delta ICLBCO_k - tx_k \cdot TotalPolTaxProfit_k = 0.$$

$$\text{Where } TotalPolTaxProfit_k = P_k - B_k - Tx_E_k + Tx_InvInc_ICLBCO_k - \Delta Tx_V_k$$

Since $ICLBCO = ICLIFT + DFTP$, this formula can be restated as:

$$PolAfTxProfit_k = PolBefTxProfit_k + GAAP_InvInc_DFTP_k - \Delta DFTP_k - tx_k \cdot TotalPolTaxProfit_k = 0$$

Then,

$$GAAP_InvInc_DFTP_k - tx_k \cdot TotalPolTaxProfit_k - \Delta DFTP_k = 0$$

and

$$tx_k \cdot TotalPolTaxProfit_k = GAAP_InvInc_DFTP_k - \Delta DFTP_k \quad (\mathbf{A})$$

Since $TotalPolTaxProfit_k$ includes taxable investment income from assets supporting the DFTP, it can be restated as follows:

$$\begin{aligned} TotalPolTaxProfit_k &= P_k - B_k - Tx_E_k + Tx_InvInc_ICLBCO_k - \Delta Tx_V_k \\ &= P_k - B_k - Tx_E_k + Tx_InvInc_ICLIFT_k + Tx_InvInc_DFTP_k - \Delta Tx_V_k \\ &= PolTaxProfit_k + Tx_InvInc_DFTP_k \end{aligned}$$

Then,

$$tx_k \cdot TotalPolTaxProfit_k = tx_k \cdot Tx_InvInc_DFTP_k + tx_k \cdot PolTaxProfit_k$$

So formula A can be restated as:

$$tx_k \cdot PolTaxProfit_k = GAAP_InvInc_DFTP_k - tx_k \cdot [Tx_InvInc_DFTP_k] - \Delta DFTP_k \quad (\mathbf{B})$$

This means that the GAAP investment income earned on the $DFTP_k$ less taxes payable on the taxable investment income less the release of the $DFTP_k$ equals the future income tax cash flows T_k .

Assuming that $GAAP_InvInc_DFTP_k = Tx_InvInc_DFTP_k$, then

$$tx_k \cdot \text{PolTaxProfit}_k = (1 - tx_k) \cdot [\text{GAAP_InvInc_DFTP}_k] - \Delta\text{DFTP}_k \quad (\text{C})$$

It is useful to note that PolTaxProfit_k (i.e., insurance contract-related taxable profits, excluding taxes on the investment income from assets supporting the DFTP) can be expressed in term of differences between the GAAP and tax values of various elements, which makes calculations easier, as it allows one to concentrate on these differences as follows:

$$\begin{aligned} \text{PolTaxProfit}_k &= P_k - B_k - \text{Tx_E}_k + \text{Tx_InvInc_ICLIFT}_k - \Delta\text{Tx_V}_k \\ &= P_k - B_k - \text{GAAP_E}_k + \text{GAAP_InvInc_ICLIFT}_k - \Delta\text{ICLIFT}_k \\ &\quad + (\text{GAAP_E}_k - \text{Tx_E}_k) + (\text{Tx_InvInc_ICLIFT}_k - \text{GAAP_InvInc_ICLIFT}_k) \\ &\quad + (\Delta\text{ICLIFT}_k - \Delta\text{Tx_V}_k) \\ &= \text{PolBefTxProfit}_k + (\text{GAAP_E}_k - \text{Tx_E}_k) \\ &\quad + (\text{Tx_InvInc_ICLIFT}_k - \text{GAAP_InvInc_ICLIFT}_k) + (\Delta\text{ICLIFT}_k - \Delta\text{Tx_V}_k) \\ &= (\text{GAAP_E}_k - \text{Tx_E}_k) + (\text{Tx_InvInc_ICLIFT}_k - \text{GAAP_InvInc_ICLIFT}_k) \\ &\quad + (\Delta\text{ICLIFT}_k - \Delta\text{Tx_V}_k) \end{aligned}$$

This formula can also be used to demonstrate that where the GAAP and taxable values of the various elements are the same at the valuation date, future temporary tax differences can arise after the valuation date due to different accounting bases. For example, consider an asset with a GAAP value equal to market value and a tax value equal to its amortized cost with the same currently reported GAAP and tax values. For the valuation, the GAAP value of the asset will vary depending on the future yield curves for CALM prescribed scenarios while the tax value will be independent of the assumed future yield curves. This will result in future differences for $\text{Tx_InvInc_ICLIFT}_k - \text{GAAP_InvInc_ICLIFT}_k$.

The preceding development ignores the interplay between income tax and alternative tax. In practice, the interaction between the two taxes would be taken into account.

Calculation Method 1: CALM Testing

A direct way to incorporate the DFTP in the insurance contract liabilities is to project future tax cash flows along with other liability cash flows inside the CALM testing model. Paragraph 2320.02 of the Standards of Practice contains the following description of this method:

.02 *The amount of insurance contract liabilities using the Canadian asset liability method for a particular scenario is equal to the amount of supporting assets, including reinsurance recoverables, at the balance sheet date that are forecasted to reduce to zero coincident with the last liability cash flow in that scenario.*

Typically, the following steps are used to calculate the DFTP using CALM testing:

- Step 1: Develop liability data and select economic assumptions;
- Step 2: Perform CALM testing for the ICLIFT excluding future income and capital taxes;
- Step 3: Determine tax assumptions for the MTARs and corporate tax rates; and
- Step 4: Perform CALM testing for the ICLBCO by projecting future tax cash flows along with liability cash flows with margins.

The resulting liability, ICLBCO, equals the sum of the ICLIFT and DFTP.

The advantages of this approach are:

- a) The additional assets supporting the DFTP are based directly on the company's in-force assets or assumed reinvestment strategy in combination with the prescribed scenarios. Where asset/liability mismatches exist between the future tax cash flows and the cash flows from assets supporting the DFTP, these mismatches are directly reflected in the projections. For example, the inclusion of future tax cash flows in the CALM testing will change the asset liability matching compared to performing CALM testing ignoring future income taxes.
- b) Temporary or permanent tax differences between the GAAP and tax values of the assets supporting the DFTP that exist at or arise after the valuation date will be reflected in the projections. For example, where temporary tax differences exist on in-force assets, such as real estate, using a percentage of the in-force assets to support the DFTP will create additional temporary tax differences. As well, the inclusion of additional Canadian equities to support the DFTP will result in additional permanent differences related to tax-free Canadian dividends.

Note that under this approach, a requirement of the CALM model is that it can calculate and project future asset cash flows on both a GAAP and tax basis, where differences exist. Since CALM testing is often an iterative process as a change in the amount of supporting assets can in turn affect future cash flows, this requirement allows the CALM model to respond to the change in the temporary tax differences for each iteration of CALM.

Appendix A provides numerical examples of the DFTP calculation using CALM testing with various reinvestment strategies.

Calculation Method 2: Discounting Approach

This approach is an approximation to CALM, where the DFTP is calculated by discounting the future tax cash flows back to the valuation date at the after-tax GAAP earned rate on the additional assets supporting the future tax cash flows. Assuming GAAP and taxable investment income on assets supporting DFTP are equal, the formula for the discounting approach can be developed from formula C above as follows:

$$tx_k \cdot \text{PolTaxProfit}_k = (1 - tx_k) \cdot [\text{GAAP_InvInc_DFTP}_k] - \Delta\text{DFTP}_k \quad (\text{C})$$

$$T_k = tx_k \cdot \text{PolTaxProfit}_k = (1 - tx_k) \cdot [\text{GAAP_InvInc_DFTP}_k] - \Delta\text{DFTP}_k$$

$$(1 - tx_k) \cdot i_k \cdot \text{DFTP}_{k-1} - \Delta\text{DFTP}_k$$

so

$$\Delta\text{DFTP}_k = \text{DFTP}_k - \text{DFTP}_{k-1} = (1 - tx_k) \cdot i_k \cdot \text{DFTP}_{k-1} - T_k$$

and

$$\text{DFTP}_{k-1} = (\text{DFTP}_k + T_k) / [1 + i_k \cdot (1 - tx_k)]$$

Under CALM, the liability at the end of the last cash flow (in year n) is:

$$\text{DFTP}_n = 0$$

so

$$\text{DFTP}_{n-1} = (0 + T_n) / [1 + i_n \cdot (1 - tx_n)]$$

$$\begin{aligned} \text{DFTP}_{n-2} &= (\text{DFTP}_{n-1} + T_{n-1}) / [1 + i_{n-1} \cdot (1 - tx_{n-1})] \\ &= T_n / \{ [1 + i_n \cdot (1 - tx_n)] \cdot [1 + i_{n-1} \cdot (1 - tx_{n-1})] \} + T_{n-1} / [1 + i_{n-1} \cdot (1 - tx_{n-1})] \end{aligned}$$

and so on.

Thus,

$$\text{DFTP}_k = \sum_{t>k} v^{t-k} \cdot T_t$$

where

$$T_t = tx_t \cdot \text{PolTaxProfit}_t, \text{ and}$$

$$v^{t-k} = \prod_{t>k} [1 + i_{t-k} \cdot (1 - tx_{t-k})]^{-1}$$

The preceding development simplifies the relationship between GAAP and taxable investment income.

The development of the future tax cash flows and calculation of the DFTP is usually done outside the CALM model. Typically, the following steps are used to calculate the DFTP:

- Step 1: Develop liability data and select economic assumptions;
- Step 2: Perform CALM testing for the ICLIFT excluding future income and capital taxes;
- Step 3: Determine tax assumptions for the MTARs and corporate tax rates;
- Step 4: Project future tax cash flows using a separate model; and
- Step 5: Calculate the DFTP using the above formula.

This formula is an acceptable approximation to CALM under most circumstances. When using this approach, the actuary would consider whether the GAAP earned rates on assets supporting the DFTP are similar to the GAAP earned rate on assets supporting the ICLIFT. The GAAP earned rates for assets supporting the ICLIFT will depend on the company's reinvestment strategy or assumed reinvestment mix for CALM testing, such as using in-force assets, matching the future tax cash flows or investing in specific terms to maturity.

Where temporary tax differences between the GAAP and tax values of the assets supporting the DFTP exist at or arise after the valuation date, consideration would be given to the following issues:

- a) Whether the inclusion of these assets will create further asset-related temporary tax differences that would not be reflected in the discounting approach.
- b) Whether the taxable earned rate is similar to the GAAP earned rate. For example, consider an asset of \$1,000,000 with a GAAP value equal to market value and a tax value equal to its original purchase price. If market values increase by 4.0% during a reporting period, then the GAAP earned rate will be 4.0% compared to a taxable earned rate of 0%. Conversely, when the asset is sold, the GAAP earned rate will be related to the change in market value for the last reporting period while the taxable earned rate will reflect the difference between the sale price and the original purchase price.

Appendix B provides numerical examples of the DFTP calculation using the discounting approach with various reinvestment strategies. The results are also compared to the CALM testing results from appendix A.

Calculation Method 3: Iterative Approach

This approach is an approximation to CALM, where the DFTP is determined iteratively by developing future tax cash flows in a separate model and then performing CALM to determine the liability. Since CALM testing is still performed ignoring income taxes on the additional assets required to support the DFTP (i.e., other than the future tax cash flows added to the liability cash flows), several iterations are usually required to converge to an accurate result.

The initial steps are the same as for the discounting approach as follows:

- Step 1: Develop liability data and select economic assumptions;
- Step 2: Perform CALM testing for the ICLIFT excluding future income and capital taxes;
and
- Step 3: Determine tax assumptions for the MTARs and corporate tax rates.

Thereafter, the iterative approach replaces the DFTP calculations with the following steps:

- Step 4: Project future tax cash flows using a separate model based on the previous results of the CALM testing for tax cash flows and MTARs;
- Step 5: Add future tax cash flows to liability cash flows with margins; and
- Step 6: Perform CALM testing for the ICLBCO with the Step 5 future tax cash flows and liability cash flows with margins.

Steps 4 to 6 are repeated until the ICLBCO converges to a specified tolerance. The DFTP is the difference between the ICLBCO and the ICLIFT.

Consideration would be given to the following issues when using this approach:

- a) Since CALM testing is performed ignoring income taxes on the additional assets required to support the DFTP (i.e., other than the future tax cash flows added to the liability cash flows), the first iteration produces the DFTP using calculation method #2, discounting approach, with a before-tax discount rate. Additional iterations are required so that CALM testing fully reflects the impact of taxes on the additional assets supporting the DFTPs.
- b) Whether temporary tax differences between the GAAP and tax values of the assets supporting the DFTP arise after the valuation date, since this will create further asset-related temporary tax differences that are not reflected in the discounting approach.

5. INSURANCE CONTRACT-RELATED BALANCE SHEET ITEMS

According to the Standards of Practice, to avoid double-counting, the GAAP insurance contract liabilities would be adjusted for other balance sheet items (sometimes called “accounting” balance sheet items) relating to GAAP insurance contract liabilities and their supporting assets. Thus, GAAP insurance contract liabilities are adjusted for balance sheet items associated with the insurance contract-related future tax cash flows already reflected in the valuation of GAAP insurance contract liabilities. For example:

- The accounting future tax asset (liability) balance related to the difference between MTARs and GAAP insurance contract liabilities is added to (subtracted from) the GAAP insurance contract liabilities.

- The accounting future tax asset (liability) balance related to the difference between GAAP and tax values of assets backing insurance contract liabilities is added to (subtracted from) the GAAP insurance contract liabilities. This includes any future tax balances associated with deferred realized gains on assets backing GAAP insurance contract liabilities.
- The accounting future tax asset (liability) balance related to an underclaim or LCF is added to (subtracted from) the GAAP insurance contract liabilities to the extent the projected reversal of the underclaim or amortization of the LCF was considered insurance contract-related, and thus reflected in the valuation cash flows.

An accounting future tax asset (liability) balance is treated in the same manner as deferred realized capital gains, loan loss provisions on assets backing liabilities, provisions for policy dividends, recoverable deficit assets, etc. It is an insurance contract-related balance sheet item that the actuary considers in the valuation in order to avoid double-counting or omission. In Canada, the adjustment to GAAP insurance contract liabilities for accounting balance sheet items becomes complicated because the adjustment changes the difference between MTARs and GAAP insurance contract liabilities.

One approach was considered but rejected as inconsistent with Standards of Practice. That approach treats accounting future tax asset balances in the same manner as invested assets, which could be chosen to support GAAP insurance contract liabilities, and has asset cash flows equal to the tax savings generated as the asset runs off. This raises the possibility of double-counting or omission (e.g., by allowing the actuary to allocate an insurance contract-related accounting future tax asset to surplus). Also, the approach is incomplete. Some insurance contract-related tax cash flows (e.g., some permanent differences) do not have a corresponding accounting future tax asset on the balance sheet.

Assuming the actuary and accountant have consistent views on future recoverability of a tax asset, the only change in the net balance sheet position due to inclusion of future taxes in the GAAP insurance contract liability calculation is due to the impact of discounting. That is, the accounting provision is the non-discounted value of net future tax versus GAAP differences, and the GAAP insurance contract liability calculation adjusts for the impact of the time value of these differences. The time value difference impact could be substantial. For example, rather than a “linear” reduction in the difference as the liabilities run off, the difference in the short term often increases before gradually reducing, leading to a much bigger impact of discounting.¹

6. CALCULATION OF FUTURE TAX CARVE-OUT

The FTL is the accounting liability established on the balance sheet in respect of the temporary difference between MTAR and GAAP insurance contract liabilities and tax and GAAP asset values. The FTL is “carved-out” of the GAAP liability so as to avoid double counting, but the FTL depends on the value of the GAAP insurance contract liability and supporting assets. Because of this circularity, the formula for the FTCL is determined as follows:

The accountant’s FTL is calculated as

$$\text{FTL} = \text{tx} \cdot [(\text{MTAR} - \text{ICLACO}) + (\text{GAAP}_A - \text{Tx}_A)]$$

¹ Indeed, it could turn a material undiscounted tax asset into a material discounted tax liability.

where GAAP_A and Tx_A are the GAAP and tax values of assets backing insurance contract liabilities respectively.

In order to avoid double counting, we need to subtract the FTL from GAAP insurance contract liabilities. However, this adjustment impacts the ICLACO. Noting that:

$$\begin{aligned}\text{ICLACO} &= \text{ICLBCO} - \text{FTCO} \\ &= \text{ICLIFT} + \text{DFTP} - \text{FTCO}\end{aligned}$$

we have

$$\text{FTL} = \text{tx} \cdot [(\text{MTAR} - (\text{ICLIFT} + \text{DFTP} - \text{FTCO})) + (\text{GAAP}_A - \text{Tx}_A)].$$

Setting the FTL equal to the FTFCO and solving for FTFCO, we obtain

$$\text{FTCO} = \text{tx} \cdot [(\text{MTAR} - (\text{ICLIFT} + \text{DFTP})) + (\text{GAAP}_A - \text{Tx}_A)] / (1 - \text{tx}).$$

Determining the FTFCO on a “grossed-up” basis in this manner is the most common approach within the industry. Other elements such as underclaims or LCF may also be reflected in the FTL. The required modifications to the formula for the FTFCO are straightforward.

Appendix C provides numerical examples of the DFTP, FTFCO, and FTL calculations for different situations with underclaims or LCFs.

7. RECOVERABILITY

In projecting insurance contract-related tax cash flows, there is the possibility of projected tax savings or projected negative tax. According to the Standards of Practice, projected tax savings would be used to reduce the value of GAAP insurance contract liabilities only to the extent the benefits of those tax losses are recoverable. That is, in order to benefit from a tax loss, there has to be an alternative source of income otherwise taxable, if not for the tax loss. The actuary needs to identify those alternative sources of taxable income allowable as sources of recovery in the valuation.

The sources of recoverability on the actuarial side are different than the sources of recoverability on the accounting side. It is recommended that the actuary discuss recoverability issues with the company’s accountant. Such discussion would likely highlight sources of revenue used or not used by each professional in their respective work on recoverability as well as avoid double counting of sources of recovery.

The actuary effectively replaces the accountant’s view of recoverability with the actuarial perspective in the same way that the actuary replaces the undiscounted provision for future taxes with a discounted provision. The value of insurance contract liabilities will depend not just on the available sources of recovery, but also on the order those available sources are applied in the valuation. For example, consider a situation where the change in the difference between insurance contract liabilities and tax liabilities results in a projected negative \$100 tax cash flow in the first year, followed by a positive \$100 tax cash flow in the next year. If liability sources of recoverability are used first, the tax provision in the insurance contract liabilities will be \$0. Losses are carried forward to shelter the gains, resulting in no net tax cash flow. But if surplus sources of recoverability are used first, the tax provision in the liabilities will be negative. The \$100 tax loss is realized one year before the \$100 tax paid.

The Standards of Practice provide the following guidance on the sources of recoverability:

2320

- .43 The cash flow from such taxes would be limited to that in respect of the relevant insurance contracts and the assets which support their insurance contract liabilities, and thus, with the exception of the recoverability of future tax losses described below would ignore any interaction between that cash flow and cash flow in the rest of the insurer; e.g., it would ignore tax on investment income from assets which support the insurer's capital. . .
- .48 The realization of negative tax depends on the simultaneous availability of income that is otherwise taxable. In forecasting such income, the actuary would
- make provision for adverse deviations,
 - take into account the projected tax position of the company overall, but
 - not take account of the expected release of provisions for adverse deviations in the insurance contract liabilities because, as noted above, their calculation implicitly assumes that those adverse deviations occur.

It is clear from the first bullet of paragraph 2320.48 that a margin for adverse deviations would be applied to the extent there is uncertainty about the ability to realize the benefit of future tax losses. If beneficial differences (permanent or temporary) rely on a favourable tax interpretation, the actuary would consider the risk of an adverse interpretation by tax authorities (potential “limited shelf life”). When there is uncertainty about the availability of allowable sources of recovery, a margin for adverse deviations is often applied by conservatively projecting allowable taxable income. Individual company circumstances and business plans (e.g., projected target surplus of the company, the valuation basis) would be considered in determining the appropriate amount of conservatism in the projection of allowable taxable income.

It is also clear from the third bullet of paragraph 2320.48 that the expected release of provisions for adverse deviations in the insurance contract liabilities cannot be used as a source of recovery because their calculation implicitly assumes that those adverse deviations occur. For a particular scenario, forecasted income before tax is equal to zero in each accounting period after the balance sheet date for the term of the liability. That is because that scenario assumes the occurrence of the adverse deviations for which it makes the provision. For this reason, the future release of provisions for adverse deviations is not a legitimate source of recovery.

The first part of paragraph 2320.43 states that the actuary would only consider future tax cash flows associated with the projection of insurance contract liabilities. Since recoverability would be considered in light of the valuation basis, taxable income can be a source of recovery if it arises if valuation assumptions (with margins for adverse deviations) materialize. Thus, projected positive tax cash flows in one line of business can be used to “recover” projected negative tax cash flows in another line of business. Carry-forward and carry-back rules can also be applied.

In addition, paragraph 2320.43 provides an exception under the second bullet of paragraph 2320.48 for the actuary to take into account the projected tax position of the company overall in forecasting such income for the recoverability of future tax losses. This exception is required so that unreasonable results do not arise in the following situations:

- Where there are future negative tax cash flows on one line of business, the actuary may not be able to recognize a future tax asset if there are no other sources of recovery. For

example, consider a line of business with no difference between insurance contract liabilities and tax liabilities at the balance sheet date (i.e., the accounting future tax balance is \$0). Suppose the projection of the difference between insurance contract liabilities and tax liabilities creates a projected tax cash flow of positive \$100 in year one, and negative \$100 in year five. If this were the only line of business, and insurance contract liabilities were the only allowable source of recovery, then the provision for taxes in the insurance contract liabilities would be \$100 (ignoring interest). No credit could be taken for the negative \$100 cash flow in year five because there is no source of recovery assuming the carry-back period is three years (with underclaims, loss-carryforward may be recognized indefinitely).

- Similarly, where there is a combination of future negative and positive tax cash flows for several lines of business, the actuary would not recognize a total net future tax asset if there are no other sources of recovery. For example, where one line of business creates a projected tax cash flow of a negative \$200 in year five, and another line of business creates a positive tax cash flow of \$100 in year five for a net negative total future tax cash flow of \$100 in year five, then the provision for future taxes in the liabilities would be \$0 unless there are other sources of recovery such as underclaims.

However, the second bullet of paragraph 2320.48 requires interpretation. Various sources of future tax cash flows associated with the projected “overall tax position of the company” can be envisaged, such as taxable investment income on surplus, income on non-insurance contract liabilities and income on future new business. In identifying appropriate recovery sources, CLIFR considered various characteristics associated with these potential sources, such as whether a source relies on extending the term of liabilities and whether it relies on new money, contracts or clients. The predictability of a potential source was also considered. CLIFR concluded that an appropriate general rule is to allow as a recovery source the future tax cash flows related to surplus assets and to the run-off of in-force contracts that are on the balance sheet as of the valuation date, and to exclude those that are associated with the entry of new money beyond the term of liabilities.

Under this approach, allowable sources of recovery include taxable income arising from assets in surplus, non-insurance contracts and their supporting assets, and rollover of in-force accumulation products, as well as from the extension of the term of liabilities. The general rule excludes as sources of recovery taxable income arising from future new deposits on in-force contracts beyond the term of liabilities, renewal of group insurance business, and future new business.

The paragraphs below discuss the various sources of recovery and provide guidance for projecting taxable income associated with them.

- Taxable investment income on surplus would consider the impact of future shareholder dividends as well as future capital repatriation. Usually, taxable income from surplus would be derived from existing resources, i.e., planned future capital injections would not be considered unless there are special circumstances. The rationale to make recoverability even partially dependent on income from future capital infusions creates an undesirable dependency on capital infusions to support the insurance contract liabilities.

Some actuaries support limiting the amount of surplus projected to some percentage of the Minimum Continuing Capital and Surplus Requirement, but this is not required by the Standards of Practice.

Economic assumptions used to project investment income on surplus assets (growth rates, asset default rates, and investment expenses) would include margins for adverse deviations consistent with valuation assumptions (including adverse interest rate scenarios).

- Non-insurance contracts would typically include daily interest accounts, term deposits, amounts on deposit, term certain annuities, and segregated fund contracts without guarantees. CLIFR views these liabilities as “like surplus”, under which future taxable income (or losses) will emerge as the business runs off.

Taxable income arising from non-insurance contracts would be projected on a “prudent” basis. Economic assumptions used to project any assets supporting non-insurance contracts and the value of segregated fund assets would include margins for adverse deviations consistent with valuation assumptions. The projection of segregated funds would take into account relevant liability assumptions such as policyholder behaviour and expense unit costs, using margins for adverse deviations consistent with the valuation.

- Taxable income beyond the term of the liabilities for segregated fund business may be considered as similar in nature to other non-insurance contract liabilities. For example, once the Allowance for Acquisition Expense (AAE) has been amortized, the allocation of future fee revenue for amortization of the allowance for acquisition expense will emerge as taxable income.

For the bifurcated valuation method, the portion of the fees allocated to the allowance for acquisition expenses would be available as a source of recovery beyond the acquisition expenses recoverability period. The fees under the whole contract valuation method and the portion of the fees allocated to the liability for the guarantee under the bifurcated approach would be available as a source of recovery only to the extent that the reserves are floored at zero. For the later valuation method, the amount of income available as a source of recovery would vary significantly with the performance of capital markets and the guaranteed benefits provided, so an appropriate margin for adverse deviations would be applied.

The projection of taxable income would take into account policyholder behaviour, expense unit costs, and other cash flow assumptions, including margins for adverse deviations, to conservatively project allowable taxable income. In addition, the projected taxable income would not be double counted with other sources of recovery for deferred acquisition expenses or hedging costs.

- Taxable income beyond the term of the in-force liabilities would include rollovers at maturity of individual and group term deposits by the policyholders at current market interest rates. Rollovers of in-force business would be projected on a “prudent” basis, taking into account expected rollover rates, growth and inflation rates, price-competitive market premium or credited rates, additional acquisition and issue expenses and expected claim costs, including margin for adverse deviations to recognize the uncertainty about the realizing the future taxable income.

- Taxable income beyond the term of the in-force liabilities would exclude renewals on group life and health business, i.e., expected future premiums and claims as employers continue (i.e., renew) coverage with their current insurer. This source of recovery is excluded as it involves future premium beyond the term of liabilities.

Taxable income beyond the term of the in-force liabilities would also exclude future additional deposits on group pension plans and individual accumulation products.

Recovery sources associated with the entry of new money beyond the term of liabilities were excluded because of the uncertainty regarding the future volume of new money and the profitability of this business. The same concerns expressed below for future new business apply for future new money on in-force contracts. CLIFR has considered making an exception for future deposits on defined contribution pension plans that employees and employers are obligated to make under the terms of their pension plans. CLIFR finally preferred to maintain a clear dividing line between recovery sources and to exclude any new money beyond the term of liabilities.

- Future new business is usually defined as that arising from the sale of new contracts, such as individual life and health insurance policies issued on new insured, group life and health benefits for new employer groups and additional coverages to existing groups, and individual and group annuity contracts issued to individual policyholder or employer groups. Future new business has been excluded as a source of recovery as taxable income arising from new business is subject to uncertainty regarding the volume of sales, the age and face amount distribution, the product mix, the premium or credited rates available in the market, future pricing assumptions, etc. In some situations, tax losses may have occurred due to inadequate pricing in competitive markets. In addition, there are concerns about the company restricting future new business or exiting product lines, which would impact the ability to realize these earnings.

There is a concern about the practicality of this approach since taxable income would not usually be projected in this manner for any other purpose. For example, Dynamic Capital Adequacy Testing includes new business projections and Embedded Value reporting is not based on valuation assumptions. However, it might not be necessary to explicitly project each source of recovery, as the actuary is only concerned with the sufficiency of allowable sources of recovery rather than the precise amount. Approximations would be adequate. Any explicit projection of taxable income would use conservative assumptions that would include margins for adverse deviations. These margins for adverse deviations would be consistent with the valuation where applicable.

8. TAX-PREFERRED ASSETS

Tax cash flows associated with assets supporting GAAP insurance contract liabilities are insurance contract-related tax cash flows. When the assets supporting GAAP insurance contract liabilities are tax-preferred instruments, the projected income tax cash flows are lower. Assuming sufficient sources of recovery, the value of insurance contract liabilities is lower when tax-preferred assets are chosen to support insurance contract liabilities.

Some actuaries disagree with this approach, characterizing it as holding assets on the balance sheet at an inflated value that reflects the anticipated future tax benefits. However, the approach is consistent with GAAP for life insurance enterprises as it was defined by the CICA under AcG-9, *Financial Reporting by Life Insurance Enterprises* prior to the adoption of IFRS.

As stated above, AcG-9 has been replaced by IFRS 4 Insurance Contracts, which effectively requires the continuation of Canadian GAAP accounting for insurance contract liabilities until such time as the IASB completes its second phase of the development of standards specific to insurance contracts.

APPENDIX A**NUMERICAL EXAMPLES: ASSET-RELATED TEMPORARY DIFFERENCES — CALM TESTING**

Under the CALM method, the ICLBCO is determined directly from CALM testing as the statement value of the supporting assets such that the amount of assets backing the liability plus the future tax cash flows reduces to zero at the last liability cash flow. CALM testing is often an iterative process, which solves for the initial amount of assets required to support the insurance contract liabilities. The CALM model will directly respond to the change in the temporary tax differences for each iteration of CALM.

This example illustrates the situation where the tax asset values are lower than the GAAP asset values. This situation is not common for the valuation of policies written in Canada since the tax value of assets generally equals the GAAP asset value (with the exception of assets such as real estate, some derivatives and some private equity investments). However, this situation occurs frequently in non-Canadian jurisdictions where tax regimes usually differ from the GAAP reporting basis. These temporary differences result in future taxable charges and hence future tax payments, which can be supported by income within the insurance contract liabilities.

The CALM testing is performed assuming four different reinvestment strategies for the additional assets supporting the DFTP. For the first three strategies below, temporary tax differences are assumed for all invested assets, i.e., in-force assets supporting the ICLIFT, additional assets supporting the DFTP and future reinvestments created by mismatches with future tax cash flows. For the last strategy, the difference is assumed to arise from in-force assets supporting the ICLIFT only, so the GAAP and tax values of assets are the same for additional assets supporting the DFTP and future reinvestments created by mismatches with future tax cash flows. The four reinvestment strategies are as follows:

- A. **Percentage of in-force assets.** This strategy assumes that the additional assets supporting the DFTP are a percentage of the in-force assets supporting the ICLIFT, i.e., have the same cash flows and GAAP and tax values as in-force assets in the asset segment. This approach is usually appropriate when in-force assets in the asset segment are greater than 100% of the ICLIFT so assets in excess of the insurance contract liabilities are available in the asset segment to support the future tax cash flows.
- B. **Match future tax cash flows.** This strategy assumes that additional assets are purchased to match future tax cash flows. The purchase of additional assets at current market values is usually required when in-force assets in the asset segment are less than or equal to 100% of the ICLIFT. For the additional assets supporting the DFTP, the GAAP and tax asset values are initially the same. However, temporary tax differences arise after the valuation date since the GAAP market values reflect changes in future yield curves while tax asset values are reported on amortized cost basis.
- C. **Fixed term to maturity with future temporary tax differences on additional assets.** This strategy assumes that additional assets are purchased with a fixed term to maturity according to the company's reinvestment strategy. For simplicity, strip bonds are purchased or sold maturing in 2014. The purchase of additional assets at current market values is usually required when in-force assets in the asset segment are less than or equal to 100% of the ICLIFT. For the additional assets supporting the DFTP, the GAAP and tax asset values are initially the same. However, temporary tax differences arise after the

valuation date since the GAAP market values reflect changes in future yield curves while tax asset values are reported on amortized cost basis.

- D. Fixed term to maturity without future temporary tax differences on additional assets.** This strategy is the same as reinvestment strategy C. Note that no further temporary tax differences are created by this reinvestment strategy since the GAAP and tax asset values are assumed to be the same.

The sections of this appendix are organized to follow the steps that an actuary would typically use for CALM testing:

- Step 1: Develop liability data and select economic assumptions;
- Step 2: Perform CALM testing for the ICLIFT excluding future income and capital taxes;
- Step 3: Determine tax assumptions for the MTARs and corporate tax rates; and
- Step 4: Perform CALM testing for the ICLBCO by projecting future tax cash flows along with liability cash flows with margins.

The table below summarizes the DFTPs at year-end 2010 for the different reinvestment strategies as follows:

- a. Reinvestment strategy A results in the largest DFTP since the difference in the GAAP and tax values of the in-force assets creates additional temporary tax differences for the additional assets supporting the DFTP.
- b. For reinvestment strategies B and C, the DFTPs are less than those for reinvestment strategy A since the GAAP and tax values are the same at the time of purchase for the additional assets supporting the DFTP. For reinvestment strategy B, the DFTP is higher than that for reinvestment strategy C since the duration of the additional assets purchased for reinvestment strategy B is shorter than that for reinvestment strategy C.
- c. For reinvestment strategy D, the DFTP is slightly higher than that for reinvestment strategy C since future taxes on investment income for assets supporting the DFTP are higher in the earlier duration and lower in the later durations.

**Table A – DFTP Summary – Asset-Related Temporary Differences
CALM Testing**

Reinvestment Strategy	ICLIFT	ICLBCO	DFTP	Diff
A. Percentage of in-force assets	1,313.65	1,353.18	39.53	n/a
B. Matching future tax cash flows	1,313.65	1,352.27	38.62	-0.91
C. Fixed term to maturity with future temporary tax differences on additional assets	1,313.65	1,350.97	37.32	-2.21
D. Fixed term to maturity without future temporary tax differences on additional assets	1,313.65	1,351.07	37.42	-2.11

The sections below provide details on the DFTP calculations using the CALM approach.

Step 1: Development of Liability Data and Economic Assumptions

The following liability, asset and economic assumptions are assumed for this example:

- Liability cash flows with margins of \$128.0, \$324.7, \$458.5 and \$532.5 in years 2011, 2012, 2013 and 2014 respectively are assumed to occur at the end of the year.
- Cash flows from in-force assets are assumed to match exactly the timing of the liability cash flows with margins.
- GAAP asset values (for in-force assets, additional assets supporting the DFTP and future reinvestments created by mismatches with future tax cash flows) are projected on a market value basis based on future yield curves assumed below.
- Tax asset values projected on an amortized cost basis. For in-force assets, a book yield of 6.5% is assumed. For reinvestment strategies A, B, and C, the book yield is determined by the year and term to maturity of the investment at its time of purchase or sale. For reinvestment strategy D, tax asset values for these assets are projected on a market value based on future yield curves assumed below (i.e., no further temporary tax differences are assumed to be created).
- The current yield curve is assumed to be 1%, 2%, 3% and 4% for terms to maturity of one, two, three, and four years respectively. Future yield curves are assumed to be a continuance of the current yield curve (i.e., similar to CALM prescribed scenario #9 where the 1% interest rate applies to one-year investments purchased or sold in 2010, 2011, 2012, and 2013). For this example, the slope of the assumed yield curve was steepened to emphasize the impact on the DFTP and associated earned rates over the four-year projection period. In practice, projection periods are typically over 50 years, so impact of changes in yield curves on the future tax cash flows would be more significant.

Table A1 – In-Force Data and Economic Assumptions					
	2010	2011	2012	2013	2014
Liability Cash Flows with Margins		128.0	324.7	458.5	532.5
In-Force Asset Cash Flows		128.0	324.7	458.5	532.5
Yield Curve by Calendar Year and Term to Maturity					
2010		1%	2%	3%	4%
2011			1%	2%	3%
2012				1%	2%
2013					1%
GAAP Asset Values (In-Force Only)					
GAAP Asset Value = Market Value	1,313.65	1,249.5	965.8	527.2	0.0
GAAP Investment Income		63.9	41.0	19.9	5.3
GAAP Earned Rates		4.86%	3.28%	2.07%	1.00%
Tax Asset Values (In-Force Only)					
Tax Asset Value = Amortized Cost	1,200.00	1,150.0	900.0	500.0	0.0
Taxable Investment Income		78.0	74.7	58.5	32.5
Tax Book Yield		6.50%	6.50%	6.50%	6.50%

Step 2: ICLIFT Calculation

The ICLIFT is determined by CALM testing so that the amount of assets supporting the liabilities reduces to zero at the last liability cash flow. For this example, no reinvestments are required as cash flows from in-force assets are assumed to exactly match the timing of the liability cash flows with margins as discussed in the assumption section. Taxes are not included in the calculation of the ICLIFT. The ICLIFT equals the GAAP value of the in-force assets.

Table A2 – ICLIFT Calculation					
	2010	2011	2012	2013	2014
CALM Cash Flows					
Liability Cash Flows with Margins		128.0	324.7	458.5	532.5
In-Force Asset Cash Flows		128.0	324.7	458.5	532.5
Reinvestment Cash Flows		n/a	n/a	n/a	n/a
GAAP Asset Values					
Asset Value	1,313.65	1,249.5	965.8	527.2	0.0
Investment Income		63.9	41.0	19.9	5.3
Earned Rate		4.86%	3.28%	2.07%	1.00%
ICLIFT	1,313.65	1,249.5	965.8	527.2	0.0

Step 3: Determination of Tax Assumptions and Corporate Tax Rates

The MTARs are assumed to equal the ICLIFTs. As a result, there are no temporary differences between GAAP and tax liabilities. The corporate tax rates are assumed to decrease from 40.0% to 33.5% over the projection period.

	2010	2011	2012	2013	2014
MTAR	1,313.65	1,249.5	965.8	527.2	0.0
Corporate Tax Rate		40.0%	37.0%	34.5%	33.5%

Step 4: Perform CALM Testing for the ICLBCO

Under the CALM method, the ICLBCO is determined directly from CALM testing as the statement value of the supporting assets such that the amount of assets backing the liability plus the future tax cash flows reduces to zero at the last liability cash flow.

CALM testing is performed assuming the four different reinvestment strategies discussed above. The cash flows arising from the additional assets assumed to support the DFTP are shown in the table below. The duration of the cash flows on the additional assets varies from shortest to longest for reinvestment strategies, B, A, and C/D respectively. The GAAP earned rate on the additional assets for each reinvestment strategy also differs by calendar year based on the impact of the change in yield curves on the GAAP value of the assets.

The impact of mismatches of the additional asset and future tax cash flows on future reinvestments is directly reflected in CALM testing. For reinvestment strategies A and C/D, additional reinvestments will be required in subsequent years, since these cash flows do not match the future tax cash flows. For reinvestment strategy B, even though the strategy matches the initial future tax cash flows, additional reinvestments/disinvestments are required for taxes payable on taxable investment income.

	2010	2011	2012	2013	2014
Reinvestment Strategy					
A. Percentage of in-force assets		3.9	9.8	13.8	16.0
B. Matching future tax cash flows		5.8	12.8	13.7	9.4
C. Fixed term to maturity with future temporary tax differences on additional assets		0.0	0.0	0.0	43.7
D. Fixed Term to maturity without future temporary tax differences on additional assets		0.0	0.0	0.0	43.7

Future tax cash flows are projected as the corporate tax rate times the taxable investment income on both in-force assets and additional assets for each year of the projection. As an example, the table below shows the future taxes and the taxes payable on investment income related to the additional assets for reinvestment strategy A.

Table A4.2 – Future Tax Cash Flows – Reinvestment Strategy A

	2010	2011	2012	2013	2014
Investment Income Differences		2.3	2.2	1.6	0.9
Taxes Payable on Investment Income		0.9	0.8	0.6	0.3
Total with Taxes Payable on Inv Income		0.9	0.8	0.6	0.3

For reinvestment strategy A, further asset-related temporary tax differences are created for the additional assets supporting the DFTP since temporary tax differences exist between the GAAP and tax values of the in-force assets. For reinvestment strategies B and C, there are no initial temporary tax differences for the additional assets supporting the DFTP, since the GAAP and tax value of the assets are the same at the time of purchase. In subsequent years, additional temporary tax differences will be created as the GAAP asset value reflects changes in future yield curves while the tax asset value is reported on amortized cost basis. For reinvestment strategy D, no further temporary tax differences are assumed to be created.

As an example, the table below summarizes the asset-related temporary tax differences for reinvestment strategy A.

	2010	2011	2012	2013	2014
GAAP Asset Values	39.53	34.9	22.7	9.3	0.0
GAAP Asset Values – Change		4.7	12.2	13.4	9.3
Tax Asset Values	36.11	31.9	20.77	8.54	0.0
Tax Asset Values – Change		4.2	11.1	12.2	8.5
Difference of the Changes = Tax – GAAP		0.4	1.0	1.2	0.8

Results

The results for the three reinvestment strategies are summarized in the tables below. The tables provide the projected CALM cash flows, GAAP asset values (asset values, investment income and earned rates for the in-force assets, reinvestments and in total), tax asset values, ICLBCO, and DFTP. The ICLBCO equals the GAAP value of the total assets. The DFTP is calculated as the difference between the resulting ICLBCO and the ICLIFT.

Reinvestment Strategy A – Percentage of In-Force Assets

For reinvestment strategy A, additional assets are a percentage of the in-force assets supporting the insurance contract liabilities, i.e., have the same cash flows and GAAP and tax values as in-force assets in the asset segment. Reinvestments in subsequent years are assumed to have the same cash flows as the additional assets (except that there are no cash flows beyond 2014).

Table A4.4 – Reinvestment Strategy A – Percentage of In-Force Assets					
	2010	2011	2012	2013	2014
CALM Cash Flows					
Liability Cash Flows with Margins		128.0	324.8	458.5	532.5
Future Tax Cash Flows		6.6	13.3	13.9	9.4
Total Cash Flows		134.6	338.1	472.4	541.9
GAAP Asset Values					
Asset Value (In-Force Assets)	1,313.65	1,249.5	965.8	527.2	0.0
Asset Value (Reinvestment Account)	39.53	34.9	22.7	9.3	0.0
Asset Value (Total Assets)	1,353.18	1,284.4	988.5	536.6	0.0
Investment Income (In-Force Assets)		63.9	41.0	19.9	5.3
Investment Income (Reinvestments)		1.9	1.1	0.5	0.1
Investment Income (Total Assets)		65.8	42.1	20.4	5.4
Earned Rate (In-Force Assets)		4.86%	3.28%	2.07%	1.00%
Earned Rate (Reinvestments)		4.86%	3.28%	2.07%	1.00%
Earned Rate (Total Assets)		4.86%	3.28%	2.07%	1.00%
Tax Asset Values					
Asset Value (In-Force Assets)	1,200.00	1,150.0	900.0	500.0	0.0
Asset Value (Reinvestment Account)	36.11	31.9	20.8	8.5	0.0
Asset Value (Total Assets)	1,236.11	1,181.9	920.8	508.5	0.0
Investment Income (In-Force Assets)		78.0	74.7	58.5	32.5
Investment Income (Reinvestments)		2.3	2.2	1.6	0.9
Investment Income (Total Assets)		80.3	76.9	60.1	33.4
Earned Rate (In-Force Assets)		6.50%	6.50%	6.50%	6.50%
Earned Rate (Reinvestments)		6.50%	6.87%	7.91%	10.51%
Earned Rate (Total Assets)		6.50%	6.51%	6.53%	6.56%
ICLBCO	1,353.18	1,284.4	988.5	536.5	0.0
DFTP	39.53	34.9	22.7	9.3	0.0

Reinvestment Strategy B – Match Future Tax Cash Flows

For reinvestment strategy B, additional assets are purchased to match future tax cash flows. Reinvestments in subsequent years are assumed to have the same cash flows as the additional assets (except that there are no cash flows beyond 2014).

Table A4.5 – Reinvestment Strategy B – Match Future Tax Cash Flows					
	2010	2011	2012	2013	2014
CALM Cash Flows					
Liability Cash Flows with Margins		128.0	324.8	458.5	532.5
Future Tax Cash Flows		6.0	12.8	13.6	9.2
Total Cash Flows		134.0	337.6	472.1	541.7
GAAP Asset Values					
Asset Value (In-Force Assets)	1,313.65	1,249.5	965.8	527.2	0.0
Asset Value (Reinvestment Account)	38.62	34.2	22.3	9.1	0.0
Asset Value (Total Assets)	1,352.27	1,283.7	988.1	536.4	0.0
Investment Income (In-Force Assets)		63.9	41.0	19.9	5.3
Investment Income (Reinvestments)		1.6	0.9	0.4	0.1
Investment Income (Total Assets)		65.5	41.9	20.3	5.4
Earned Rate (In-Force Assets)		4.86%	3.28%	2.07%	1.00%
Earned Rate (Reinvestments)		4.21%	2.77%	1.80%	1.00%
Earned Rate (Total Assets)		4.85%	3.27%	2.06%	1.00%
Tax Asset Values					
Asset Value (In-Force Assets)	1,200.00	1,150.0	900.0	500.0	0.0
Asset Value (Reinvestment Account)	38.62	33.6	21.7	8.9	0.0
Asset Value (Total Assets)	1,238.62	1,183.6	921.7	508.9	0.0
Investment Income (In-Force Assets)		78.0	74.7	58.5	32.5
Investment Income (Reinvestments)		1.0	1.0	0.7	0.4
Investment Income (Total Assets)		79.0	75.7	59.2	32.9
Earned Rate (In-Force Assets)		6.50%	6.50%	6.50%	6.50%
Earned Rate (Reinvestments)		2.59%	2.88%	3.41%	4.03%
Earned Rate (Total Assets)		6.38%	6.40%	6.43%	6.46%
ICLBCO	1,352.27	1,283.7	988.1	536.4	0.0
DFTP	38.62	34.2	22.3	9.1	0.0

Reinvestment Strategy C – Fixed Term to Maturity with Future Temporary Tax Differences on Additional Assets

For reinvestment strategy C, strip bonds are purchased or negative assets created maturing in 2014.

	2010	2011	2012	2013	2014
Table A4.6 – Reinvestment Strategy C – Fixed Term to Maturity with Future Temporary Tax Differences on Additional Assets					
CALM Cash Flows					
Liability Cash Flows with Margins		128.0	324.8	458.5	532.5
Future Tax Cash Flows		6.2	13.0	13.7	9.5
Total Cash Flows		134.2	337.8	472.2	541.0
GAAP Asset Values					
Asset Value (In-Force Assets)	1,313.65	1,249.5	965.8	527.2	0.0
Asset Value (Reinvestment Account)	37.32	33.7	22.4	9.4	0.0
Asset Value (Total Assets)	1,350.97	1,283.3	988.2	536.6	0.0
Investment Income (In-Force Assets)		63.9	41.0	19.9	5.3
Investment Income (Reinvestments)		2.6	1.7	0.7	0.1
Investment Income (Total Assets)		66.5	42.7	20.6	5.4
Earned Rate (In-Force Assets)		4.86%	3.28%	2.07%	1.00%
Earned Rate (Reinvestments)		7.06%	5.03%	3.01%	1.00%
Earned Rate (Total Assets)		4.92%	3.33%	2.09%	1.00%
Tax Asset Values					
Asset Value (In-Force Assets)	1,200.00	1,150.0	900.0	500.0	0.0
Asset Value (Reinvestment Account)	37.32	32.6	20.9	8.4	0.0
Asset Value (Total Assets)	1,237.32	1,182.6	920.9	508.4	0.0
Investment Income (In-Force Assets)		78.0	74.7	58.5	32.5
Investment Income (Reinvestments)		1.5	1.4	1.2	1.1
Investment Income (Total Assets)		79.5	76.1	59.7	33.6
Earned Rate (In-Force Assets)		6.50%	6.50%	6.50%	6.50%
Earned Rate (Reinvestments)		4.00%	4.19%	5.55%	12.83%
Earned Rate (Total Assets)		6.42%	6.44%	6.48%	6.60%
ICLBCO	1,350.97	1,283.3	988.2	536.6	0.0
DFTP	37.32	33.7	22.4	9.4	0.0

Reinvestment Strategy D – Fixed Term to Maturity Without Future Temporary Tax Differences on Additional Assets

Reinvestment strategy D is the same as reinvestment strategy C except that no further temporary tax differences are assumed to be created by the additional assets supporting the DFTP.

Table A4.7 – Reinvestment Strategy D – Fixed Term to Maturity Without Future Temporary Tax Differences on Additional Assets

	2010	2011	2012	2013	2014
CALM Cash Flows					
Liability Cash Flows with Margins		128.0	324.8	458.5	532.5
Future Tax Cash Flows		6.7	13.1	13.5	9.2
Total Cash Flows		134.7	337.9	472.0	541.7
GAAP Asset Values					
Asset Value (In-Force Assets)	1,313.65	1,249.5	965.8	527.2	0.0
Asset Value (Reinvestment Account)	37.42	33.4	21.9	9.1	0.0
Asset Value (Total Assets)	1,351.07	1,282.9	987.7	536.3	0.0
Investment Income (In-Force Assets)		63.9	41.0	19.9	5.3
Investment Income (Reinvestments)		2.6	1.7	0.7	0.1
Investment Income (Total Assets)		66.5	42.7	20.6	5.4
Earned Rate (In-Force Assets)		4.86%	3.28%	2.07%	1.00%
Earned Rate (Reinvestments)		7.06%	5.03%	3.01%	1.00%
Earned Rate (Total Assets)		4.92%	3.33%	2.09%	1.00%
Tax Asset Values					
Asset Value (In-Force Assets)	1,200.00	1,150.0	900.0	500.0	0.0
Asset Value (Reinvestment Account)	37.42	33.4	21.9	9.1	0.0
Asset Value (Total Assets)	1,237.42	1,183.4	921.9	509.1	0.0
Investment Income (In-Force Assets)		78.0	74.7	58.5	32.5
Investment Income (Reinvestments)		2.6	1.7	0.7	0.1
Investment Income (Total Assets)		80.6	76.4	59.2	32.6
Earned Rate (In-Force Assets)		6.50%	6.50%	6.50%	6.50%
Earned Rate (Reinvestments)		7.06%	5.03%	3.01%	1.00%
Earned Rate (Total Assets)		6.52%	6.46%	6.42%	6.40%
ICLBCO	1,351.07	1,282.9	987.7	536.3	0.0
DFTP	37.42	33.4	21.9	9.1	0.0

APPENDIX B**NUMERICAL EXAMPLES: ASSET-RELATED TEMPORARY DIFFERENCES — DISCOUNTING APPROACH**

This example is the same as appendix A except that the DFTP is calculated using the discounting approach. The DFTP is calculated by discounting the future tax cash flows back to the valuation date at the after-tax earned rate on the additional assets supporting the future tax cash flows. This appendix illustrates the situation where the tax asset values are lower than the GAAP asset values. These temporary differences result in future taxable charges and hence future tax payments, which can be supported by income within the insurance contract liabilities.

Similarly to appendix A, the CALM testing is performed assuming four different reinvestment strategies for the additional assets supporting the DFTP as follows:

- A. Percentage of in-force assets;
- B. Match future tax cash flows;
- C. Fixed term to maturity with future temporary tax differences on additional assets; and
- D. Fixed term to maturity without future temporary tax differences on additional assets.

The sections of this appendix are organized to follow the steps that an actuary would typically use to calculate DFTPs.

- Step 1: Liability data are developed and economic assumptions are selected;
- Step 2: CALM testing is performed for the ICLIFT;
- Step 3: Tax assumptions for the MTARs and corporate tax rates are determined;
- Step 4: Future tax cash flows are projected in a separate model; and
- Step 5: The DFTP is calculated using calculation method #2, discounting approach.

The table below compares the DFTPs at year-end 2010 to the corresponding CALM result for the different reinvestment strategies as follows:

- a. Reinvestment strategy A results in the largest difference to the CALM result since further temporary tax differences are created by the additional in-force assets supporting the DFTP, which are not recognized by the discounting approach.
- b. For reinvestment strategies B and C, the differences are smaller than for reinvestment strategy A since the GAAP and tax values for the additional assets supporting the DFTP are the same at the time of purchase. However, further temporary tax differences are created in future years as the GAAP asset value reflects changes in future yield curves while the tax asset values are reported on an amortized cost basis. These differences are not reflected in the discounting approach.
- c. For reinvestment strategy D, the DFTP is the same as the CALM results since there are no further temporary tax differences created by the additional in-force assets supporting the DFTP.

Reinvestment Strategy	DFTP	CALM	Diff
A. Percentage of in-force assets	38.38	39.53	-1.15
B. Matching future tax cash flows	38.67	38.62	+0.05
C. Fixed term to maturity with future temporary tax differences on additional assets	37.42	37.32	+0.10
D. Fixed term to maturity without future temporary tax differences on additional assets	37.42	37.42	=0.00

The sections below provide details on the DFTP calculations using the discounting approach.

Steps 1 to 3:

See appendix A for a detailed discussion of the assumptions. The table below summarizes the key assumptions.

Calendar Year	2010	2011	2012	2013	2014
Liability Cash Flows with Margins		128.0	324.7	458.5	532.5
In-Force Asset Cash Flows		128.0	324.7	458.5	532.5
Yield Curve by Calendar Year and Term to Maturity					
2010		1%	2%	3%	4%
2011			1%	2%	3%
2012				1%	2%
2013					1%
GAAP Asset Values (In-Force Only)					
GAAP Asset Value = Market Value	1,313.65	1,249.5	965.8	527.2	0.0
GAAP Investment Income		63.9	41.0	19.9	5.3
GAAP Earned Rates		4.86%	3.28%	2.07%	1.00%
Tax Asset Values (In-Force Only)					
Tax Asset Value = Amortized Cost	1,200.00	1,150.0	900.0	500.0	0.0
Taxable Investment Income		78.0	74.7	58.5	32.5
Tax Book Yield		6.50%	6.50%	6.50%	6.50%
ICLIFT	1,313.65	1,249.5	965.8	527.2	0.0
MTAR	1,313.65	1,249.5	965.8	527.2	0.0
Corporate Tax Rate		40.0%	37.0%	34.5%	33.5%

Step 4: Projection of Future Tax Cash Flows

The future tax cash flows are determined outside of the CALM model. The taxable income related to the temporary tax differences is calculated as the difference between the change in the GAAP and tax asset values for each projection year (or equivalently, the difference between the GAAP and tax investment income). The future tax cash flows are calculated as the corporate tax rate times the projected temporary tax difference.

	2010	2011	2012	2013	2014
Asset Related Temporary Differences					
GAAP Asset Values	1,313.65	1,249.5	965.8	527.2	0.0
GAAP Asset Values – Change		-64.1	-283.8	-438.6	-527.2
Tax Asset Values	1,200.00	1,150.0	900.0	500.0	0.0
Tax Asset Values – Change		-50.0	-250.0	-400.0	-500.0
Difference of the Changes = Tax – GAAP		14.1	33.8	38.6	27.2
Investment Income-Related Temporary Differences					
GAAP Investment Income		63.9	41.0	19.9	5.3
Tax Investment Income		78.0	74.7	58.5	32.5
Difference		14.1	33.8	38.6	27.2
Liability Related Temporary Differences					
Change in MTAR – Change in ICLIFT		0.0	0.0	0.0	0.0
Total Temporary Tax Differences		14.1	33.8	38.6	27.2
Corporate Tax Rate		40.0%	37.0%	34.5%	33.5%
Future Tax Cash Flows		5.6	12.5	13.3	9.1

Step 5: Calculate the DFTP Using the Discounting Method

The DFTP is calculated by discounting the future tax cash flows back to the valuation date at the after-tax earned rate on the in-force assets. The after-tax earned rate will depend on the reinvestment strategy assumed for the additional assets supporting the DFTP. The cash flows arising from the additional assets assumed to support the DFTP are shown in the table below. The duration of the cash flows on the additional assets varies from shortest to longest for reinvestment strategies, B, A, and C respectively. The GAAP earned rate on the additional assets for each reinvestment strategy also differs by calendar year based on the impact of the change in yield curves on the GAAP value of the assets.

Table B5.1 – Cash Flows from Additional Assets Supporting the DFTP					
	2010	2011	2012	2013	2014
Reinvestment Strategy					
A. Percentage of in-force assets		3.74	9.49	13.39	15.56
B. Matching future tax cash flows		5.81	12.86	13.69	9.39
C/D. Fixed term to maturity		0.00	0.00	0.00	43.78

Results

The results for the four reinvestment strategies are summarized in the tables below. The tables show the projected earned rates for additional assets and the DFTP calculation.

Reinvestment Strategy A – Percentage of In-Force Assets

For reinvestment strategy A, additional assets are a percentage of the in-force assets supporting the insurance contract liabilities, i.e., have the same cash flows and GAAP and tax values as in-force assets in the asset segment.

Table B5.2 – Reinvestment Strategy A – Percentage of In-Force Assets					
	2010	2011	2012	2013	2014
Earned Rate for Additional Assets					
Asset Cash Flows		3.74	9.49	13.39	15.56
GAAP Asset Value	38.38	36.50	28.21	15.40	15.56
GAAP Investment Income		1.87	1.20	0.58	15.71
Earned Rate		4.86%	3.28%	2.07%	1.00%
DFTP Calculation					
Future Tax Cash Flows		5.6	12.5	13.3	9.1
Discount Rates		4.86%	3.28%	2.07%	1.00%
Corporate Tax Rates		40.0%	37.0%	34.5%	33.5%
After-Tax Discount Rates		2.92%	2.07%	1.35%	0.66%
DFTP	38.38	33.9	22.1	9.1	0

Reinvestment Strategy B – Match Future Tax Cash Flows

This reinvestment strategy assumes that additional assets are purchased to match future tax cash flows.

Table B5.3 – Reinvestment Strategy B – Match Future Tax Cash Flows					
	2010	2011	2012	2013	2014
Earned Rate for Additional Assets					
Asset Cash Flows		5.81	12.86	13.69	9.39
GAAP Asset Value	38.67	34.48	22.58	9.30	9.39
GAAP Investment Income		1.63	0.96	0.41	9.48
Earned Rate		4.21%	2.77%	1.80%	1.00%
DFTP Calculation					
Future Tax Cash Flows		5.6	12.5	13.3	9.1
Discount Rates		4.21%	2.77%	1.80%	1.00%
Corporate Tax Rates		40.00%	37.00%	34.50%	33.50%
After-Tax Discount Rates		2.52%	1.75%	1.18%	0.67%
DFTP	38.67	34.0	22.1	9.1	0.0

Reinvestment Strategies C and D – Fixed Term to Maturity With and Without Future Temporary Tax Differences on Additional Assets

This reinvestment assumes that additional assets are purchased according to the company's reinvestment strategy. For simplicity, this example assumes that strip bonds are purchased or negative assets created maturing in 2014. The calculations are the same for reinvestment strategies C and D since the discounting approach does not reflect the impact of mismatches with future tax cash flows on the after-tax earned rates.

Table B5.4 – Reinvestment Strategies C and D – Fixed Term to Maturity with Future Temporary Tax Differences on Additional Assets					
	2010	2011	2012	2013	2014
Earned Rate for Additional Assets (Scale)					
Asset Cash Flows		0.00	0.00	0.00	43.78
GAAP Asset Value	37.42	40.06	42.08	43.34	43.78
GAAP Investment Income		2.64	2.01	1.27	44.21
Earned Rate		7.06%	5.03%	3.01%	1.00%
DFTP Calculation					
Future Tax Cash Flows		5.6	12.5	13.3	9.1
Discount Rates		7.06%	5.03%	3.01%	1.00%
Corporate Tax Rates		40.0%	37.0%	34.5%	33.5%
After-Tax Discount Rates		4.24%	3.17%	1.97%	0.67%
DFTP	37.42	33.4	21.9	9.1	0

APPENDIX C**DFTP RECOVERABILITY AND UNDERCLAIMS/LOSS CARRYFORWARDS**

This appendix analyzes the impact of recoverability, underclaims and loss carryforwards on the DFTP calculations. In this simple example, we assume the only difference between the GAAP future income and taxable future income is due to the temporary difference between the GAAP insurance contract liabilities and the tax liabilities. Here we consider the situation where the MTAR is less than the ICLIFT. This temporary difference leads to future tax benefits over the remaining term of the liabilities. These future tax benefits are discounted back to the valuation date at the after tax valuation interest rates. The total GAAP balance sheet provision for 2010, including the discounted future tax provision is $ICLIFT + DFTP = 1,200 + (63.4) = 1,136.6$. GAAP and tax asset values are determined on an amortized cost basis. A book yield of 6.5% is assumed for all GAAP and tax asset values.

Example C1: DFTP Without Underclaims or Loss Carryforwards

The following table summarizes assumptions, ICLIFT calculation, DFTP calculation, and GAAP balance sheet items for the example assuming that there are no underclaims or loss carryforwards. The calculation assumes that the future tax benefits are realizable, otherwise the DFTP would have to be decreased or eliminated altogether.

Example C1 – Without Underclaims or Loss Carryforwards					
	2010	2011	2012	2013	2014
Tax Assumptions					
MTAR	1,000.0	975.0	775.0	425.0	0.0
Corporate Tax Rate		40.0%	37.0%	34.5%	33.5%
Liability Cash Flows with Margins		128.0	324.8	458.5	532.5
ICLIFT Calculation –					
GAAP Asset Value	1,200.0	1,150.0	900.0	500.0	0.0
Investment Income		78.0	74.7	58.5	32.5
Earned Rate		6.50%	6.50%	6.50%	6.50%
ICLIFT	1,200.0	1,150.0	900.0	500.0	0.0
DFTP Calculation					
Discount Rate		6.50%	6.50%	6.50%	6.50%
After-Tax Discount Rate		3.90%	4.10%	4.26%	4.32%
Taxable Income Re. Temporary Difference		-25.0	-50.0	-50.0	-75.0
Future Tax Cash Flows		-10.0	-18.5	-17.3	-25.1
DFTP	-63.4	-55.9	-39.6	-24.1	0.0
GAAP Balance Sheet Liabilities					
ICLBCO	1,136.6	1,094.1	860.4	475.9	0.0
FTCO*	91.1	70.0	45.0	25.6	0.0
ICLACO	1,227.7	1,164.1	905.3	501.6	0.0
FTL*	-91.1	-70.0	-45.0	-25.6	0.0
NBSP	1,136.6	1,094.1	860.4	475.9	0.0

* Based on current year's tax rate

Example C2: DFTP is Not Recoverable

Let us assume that we require the DFTP (an asset in this case) to be self-sheltered, i.e., must be recoverable from within the insurance contract liabilities (without considering other possible sources of taxable income in the company). Then, for valuation purposes, the future tax asset would be “worthless” because it cannot be recovered, and the ICLBCO = ICLIFT = \$1,200. However, assuming that the accountant's view is that other sources of taxable income can be used, a Future Tax Asset (FTA) will be set-up on the balance sheet, and the 2010 balance sheet presentation would be as follows:

Example C2 – DFTP is Not Recoverable

	2010
GAAP Balance Sheet Liabilities	
ICLBCO	1,200.0
FTCO	133.3
ICLACO	1,333.3
FTL/(FTA)	(133.3)
NBSP	1,200.0

In the above example, there was a difference of view between the accountant and the actuary on the recoverability of the insurance contract-related future tax asset, so the actuary's reported insurance contract liabilities (ICLACO) are adjusted (increased) to offset the accountant's recognition of the future tax asset.

Example C3: Underclaim or Loss Carryforward Not Insurance Contract-Related

Adding an underclaim or loss carryforward (LCF) would only make recoverability of the future tax asset more difficult. Let us assume that we deem the underclaim/LCF to be not insurance contract-related and that other sources of taxable income can be used to realize the future tax benefits. Also assume that both the actuary and accountant feel that no more than \$100 of taxable income from other sources can be used for each of the next four years. Then the ICLACO calculations look as follows:

Example C3 – Underclaim or Loss Carryforward Not Insurance Contract-Related

	2010	2011	2012	2013	2014
Underclaim/Loss Carryforward	200.0				
ICLBCO	1,136.6	1,094.1	860.4	475.9	0.0
Utilization of Underclaim/LCF		75.0	50.0	50.0	25.0
Future Tax Benefit		30.0	18.5	17.3	8.4
FTA Re. Underclaim/LCF (Surplus Asset)	74.1 ²	44.1	25.6	8.4	0.0
Revised ICLACO	1,062.5	1,050.0	834.7	467.5	0.0

The impact on future taxes of this underclaim/LCF can be layered on top of the results of the original example. The “starting” ICLBCO is therefore the result without underclaim or loss carryforwards. Note that the “Taxable income re. temporary difference” less the “Utilization of underclaim/LCF” in the above table yields the \$100 taxable loss in each future year. The “FTA re. underclaim/LCF” is not discounted because it is deemed to be not insurance contract related.

The 2010 balance sheet presentation would be as follows, which simply adds the accounting FTA in respect of the underclaim/LCF:

² This is the undiscounted sum of the future tax benefit from utilization of underclaim/LCF.

Example C3 – Underclaim or Loss Carryforward Not Insurance Contract-Related

	2010
GAAP Balance Sheet Liabilities	
ICLACO	1,227.7
FTL	(91.1)
FTA (Re. Underclaim/LCF)	74.1
Reported Net FTL	(165.2)
Total Revised NBSP	1,062.5

Example C4: Underclaim or Loss Carryforward Is Insurance Contract-Related

If, on the other hand, the underclaim/LCF is deemed to be insurance contract related but other sources of income are permitted, then the entire future tax asset is discounted, as the calculations look as follows:

Example C4 – Underclaim or Loss Carryforward

	2010	2011	2012	2013	2014
Underclaim/LCF	200.0				
Taxable Income Re. Temporary Difference		(25.0)	(50.0)	(50.0)	(75.0)
Utilization of Underclaim/LCF		75.0	50.0	50.0	25.0
Taxable Income (Loss)		(100.0)	(100.0)	(100.0)	(100.0)
Future Net Tax Cash Flows		(40.0)	(37.0)	(34.5)	(33.5)
DFTP	(131.8)	(96.9)	(63.9)	(32.1)	0.0
ICLBCO	1,068.2	1,053.1	836.1	467.9	0.0

In the above table, the annual taxable loss is again capped at \$100.

For this example, the FTCO is calculated as

$$\text{FTCO} = [\text{MTAR} - (\text{ICLIFT} + \text{DFTP} - \text{FTCO})] \cdot \text{tx} - \text{FTA_Underclaim},$$

Solving for FTCO,

$$\text{FTCO} = \{ [\text{MTAR} - (\text{ICLIFT} + \text{DFTP})] \cdot \text{tx} - \text{FTA_Underclaim} \} / (1 - \text{tx})$$

The 2010 balance sheet presentation would be as follows:

Example C4 – Underclaim or Loss Carryforward

	2010
GAAP Balance Sheet Liabilities	
ICLBCO	1,068.2
FTCO	169.0
ICLACO	<u>1,237.2</u>
FTL	(94.7))
FTA (Re. Underclaim/LCF)	<u>(74.1)</u>
Reported Net FTL	<u>(169.0)</u>

Note that, in this case, discounting the future tax provision is more conservative than not discounting it.

APPENDIX D

USING MICROSOFT EXCEL GOAL SEEK

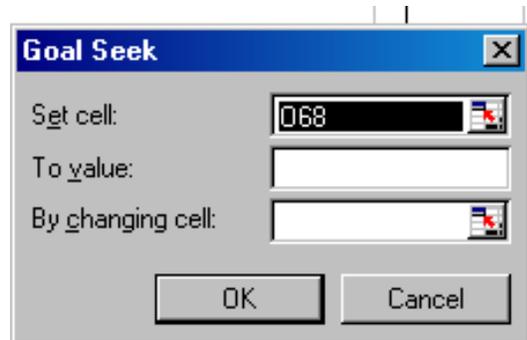
Microsoft Excel Goal Seek is part of a suite of commands sometimes called what-if analysis, where instead of a trial and error process, Excel changes the input value of a cell so that the final result of another (series of) calculation(s) matches a specified target result, i.e., when you know the desired result of a (series of) formula(s) but not the input value.

For our appendices, we need to determine the initial percentage of the in-force assets required for CALM testing in reinvestment strategy B as follows:

	A	B	C	D	E	F	G	H	I	J	
1	Reinv Strategy B										
2											
3											
4											
74											
75											
76	Table A4.4 - CALM Testing (with Income Taxes)						2010	2011	2012	2013	2014
77											
78		CALM Cash Flows									
79		Taxable Investment Income		from below Investment Income (Total) Tax basis		79.0	75.7	59.2	32.9		
80		Liability Cash Flows with Margins		from input		128.0	324.8	458.5	532.5		
81		ΔMTARs		= change in MTARs		-64.1	-283.8	-438.6	-527.2		
82		Taxable Income		= taxable investment income - liability cash flows - ΔMTARs		15.1	34.7	39.3	27.6		
83		Future Tax Cash Flows		= corporate tax rate * taxable income		6.0	12.8	13.6	9.2		
84		Total Cash Flows		= liability cash flows + future tax cash flows		134.0	337.6	472.1	541.7		
85		CALM Cash Flows									
86		Asset Cash Flows (Inforce)		from input		128.0	324.8	458.5	532.5		
87		Cash Flows from Additional Assets (Reinvestments)		= Net Cash Flows to Reinvest / Market Value of Additional Assets							
88		2010				5.8	12.8	13.7	9.4		
89		2011					-0.1	-0.1	-0.1		
90		2012						-0.1	0.0		
91		2013							0.0		
92		2014									
93		Total Asset Cash Flows		Solve for % so that asset value 2014 = 0		133.8	337.5	472.0	541.7		
94		Net Cash Flows to Reinvest		102.83%		-0.2	-0.1	0.0	0.0		
95		GAAP Asset Values									

Use the following instructions for MS Excel Goal Seek:

1. On the **Tools** menu, click **Goal Seek**. The following window will open:



2. In the **Set cell** box, enter the reference for the cell that contains the target result of the CALM calculation. (In the example, this is cell J94.)
3. In the **To value** box, type the result you want. (In the example, this is 0.)
4. In the **By changing cell** box, enter the reference for the cell that contains the input value you want to adjust. (In the example, this is cell D94.)
5. Click **OK**. The initial percentage of 102.83% will show in cell D94 with net cash flows to reinvest of \$0 in cell J94.