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CHAPTER ONE

Statutory Basis Reserves Generally

1.1 THE NATURE AND PURPOSE OF RESERVES IN THE INSURANCE COMPANY ENVIRONMENT

Reserves are required in order to properly measure the economic income of an insurance company and to ensure the company's solvency. There are two reasons for the existence of reserves in this context.

The first reason is that most contracts issued by life insurance companies provide benefits for an extended time. Universal life, whole-life contracts, endowment contracts, annuity contracts, and non-cancellable or guaranteed renewable accident and health insurance contracts are all long-duration contracts that extend for many years into the future. The insurance policy is a "promise to pay" future benefits if and when particular events occur, and these events can occur many years later. Thus, insurance companies are required by state regulation to establish significant liabilities (reserves) according to rules that estimate those future benefits, usually discounted at interest. Reserves help to assure regulators that the company has sufficient assets to pay future claims.

The second reason relates to the timing of the premium payments. An insurance company may receive level premiums on a traditional life insurance policy, even though the cost of benefits is expected to increase by policy duration. In other types of policies, such as flexible premium universal life policies, a policy owner may pay a premium that is sufficient to fund future charges under the policy. Because premiums are recognized as revenue when received, an offsetting liability must be established in order to appropriately measure the company's income. Otherwise, a company would have too much income when it receives a premium and too little income when it pays a benefit. One purpose of a reserve, therefore, is to appropriately match income with benefits.

On asset accumulation products, such as group pensions or annuity contracts, the valuation of liabilities for these types of obligations can be similar to valuation of deposit liabilities. However, where such liabilities depend on survivorship, the valuation of such liabilities must take into account valuation approaches that involve life contingencies.

1.2 THE IMPORTANCE OF RESERVES IN DETERMINATION OF EARNINGS AND TAXABLE INCOME

Insurance has historically been regulated at a state level in the United States. Each state has its own regulatory framework, generally led by an insurance commissioner. Insurance commissioners oversee the financial condition of insurance companies doing business in their jurisdictions and therefore require meaningful financial, statistical, and operating information about the companies. This financial oversight is designed to ensure that policyholders and claimants receive the promised benefits from the policies they purchased, often years or decades prior to when the benefits are due. In recognition of these special responsibilities, statutory accounting principles (SAP) have been established by statute, regulation, and practice. Every insurance company must file an annual statement.

Effective January 1, 2001, the National Association of Insurance Commissioners (NAIC) adopted the *NAIC Accounting Practices and Procedures Manual* (APPM) to establish a comprehensive basis of accounting. All 50 states and the District of Columbia either through statute or by regulation require all companies in filing their annual statements to follow the annual statement instructions and the APPM, unless the state either permits[1] or requires different accounting standards.[2] A company must disclose in its annual statement if it follows a method of accounting that differs from that adopted in the APPM. Most states no longer require non-domiciled insurance companies to file an annual statement with the insurance department.[3] Instead, these states accept the annual statement filed in the company's domiciliary state and with the NAIC. Notwithstanding the acceptance of the domiciliary annual statement by the foreign state, if the domiciliary state permits or requires an accounting practice that differs from the APPM, a foreign state may require supplemental

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[1] The APPM preamble empowers the domiciliary state regulator to approve a request for an accounting practice that departs from the manual. Specifically, a permitted accounting practice is an accounting method requested by an insurer that departs from state prescribed accounting practices, and which has received approval from the insurer's domiciliary state regulatory authority. *See* APPM, Preamble, IX. Permitted Accounting Practices, Permitted Practices Advance Notification Requirement Implementation Questions and Answers, Q&A-2, Page P-13. Each year the NAIC publishes a *States' Prescribed Differences from NAIC Statutory Accounting Principles* booklet. This publication provides information regarding each state's prescribed differences from NAIC statutory accounting principles, including a citation of the respective state statute and/or regulation. It is updated annually.

[2] Accounting rules that are required by state rules and regulations (including the incorporation of the *Accounting Practices and Procedures Manual*) are referred to as prescribed accounting practices. More specifically, prescribed accounting practices are those practices that are incorporated directly or by reference to state laws, regulations, and general administrative rules applicable to all insurance companies domiciled in a state. *See* Preamble to APPM, ¶ 57; Permitted Practices Advance Notification Requirement Implementation Questions and Answers, Q&A 2, Preamble, Page P-13.

[3] The NAIC has adopted a standard Filing Checklist format that lists all filings required during the current year from licensed companies, both foreign and domestic. Many states have adopted the checklist. The checklist lists whether a foreign insurer must file an annual statement. The Model Insurance Holding Company System Regulatory Act specifically permits an insurance company to own and operate a subsidiary, which is permitted to operate any kind of business. The Act is generally adopted in the APPM Appendix A-440. Section 2 of the Act provides:

> A. Authorization. A domestic insurer, either by itself or in cooperation with one or more persons, may organize or acquire one or more subsidiaries. The subsidiaries may conduct any kind of business or businesses and their authority to do so shall not be limited by reason of the fact that they are subsidiaries of a domestic insurer.

The drafting note to this provision states that the section neither expressly authorizes noninsurance subsidiaries nor restricts subsidiaries to insurance related activities. It is believed that this is a policy decision which should be made by each individual state. Attached as an appendix to the Act are alternative provisions which would authorize the formation or acquisition of subsidiaries to engage in diversified business activity.

information to be filed.[4]

The valuation laws of the various states define the reserve methods, interest rate assumptions, and mortality tables to be used in computing reserves. All 50 states have adopted the Model Standard Valuation Law (SVL) promulgated by the NAIC or a similar version of the Law as promulgated by the NAIC. The SVL is adopted in the APPM through various Statements of Statutory Accounting Principles (SSAPs) as Appendix A-820.[5] The SVL is interpreted by Model Regulations and Actuarial Guidelines. In addition, the Model Actuarial Opinion and Memorandum Regulation (AOMR) requires that a company appoint an actuary to evaluate its reserves, to consider the assets backing those reserves, and to set up any additional reserves the appointed actuary deems necessary. The AOMR sets requirements for the appointed actuary and for the appointed actuary's report. Appendix A-822 to the APPM contains excerpts from the AOMR that contains the asset adequacy analysis requirement.[6] The Annual Statement Instructions also generally adopt the AOMR.

Appendix A of the APPM contains excerpts of NAIC Model Laws. In most cases, the source document for information included in Appendix A is an NAIC Model regulation or Law. These Appendices are referenced by specific SSAPs and should be used only in context of the Appendix and the SSAP that references it.[7] The relevant SSAPs for reserves are SSAP 51 (accounting for life insurance and annuity contracts), SSAP 52 (accounting for deposit-type contracts), SSAP 54 (accounting for individual and group accident and health contracts), SSAP 56 (accounting for separate accounts), and SSAP 59 (accounting for credit life and disability contracts).

The APPM generally incorporates the SVL,[8] the Accelerated Benefits Model Regulation,[9] the Interest-Indexed Annuities Model Regulation,[10] the Minimum Reserves Standards for Individual and Group Health Insurance Contracts,[11] the Separate Accounts Funding Guaranteed Minimum Benefits Under Group Contracts Model Regulation,[12] the Variable Life Insurance

[4] Changes generally require only supplemental information and do not change the basic financial information. APPM, Preamble, X. Financial Statements, A. Annual Financial Statement, ¶ 58, page P-12.
[5] *See* SSAP 51, ¶ 46; SSAP 52, ¶¶ 5, 7, and 8; SSAP 54, ¶ 37; SSAP 56, ¶ 41; and SSAP 59, ¶ 21.
[6] Appendix A-822 is adopted by SSAP 51, ¶ 46; SSAP 52, ¶ 8; SSAP 54, ¶ 37; SSAP 56, ¶ 41; and SSAP 59, ¶ 21.
[7] APPM, How to Use This Manual, p. 2.
[8] Appendix A-820 contains excerpts of the Standard Valuation Law, including mortality tables for life insurance contracts in ¶ 3 and dynamic interest rates for life insurance contracts and annuity contracts in ¶ 5. Effective with the 2012 Manual, Appendix A-820 generally adopts the 2001 CSO Table for all life insurance policies issued on or after January 1, 2004 and the 1980 CSO Table for policies issued prior to January 1, 2004. Appendix A-820, ¶ 3.
[9] Appendix A-620 contains excerpts of the NAIC Accelerated Benefits Model Regulation. ¶ 3 of Appendix A-620 provides that reserves for these benefits must be determined in accordance with Appendix A-820. ¶ 3 requires the use of mortality tables and interest for life insurance reserves as specified in Appendix A-820. Appendix A-620 is adopted in SSAP 51, ¶ 46; and SSAP 56, ¶ 41.
[10] Appendix A-235 states that in developing life insurance reserves for interest-indexed annuities, the insurer must be in compliance with the minimum requirements of A-820. See Appendix A-235, ¶ 2. Appendix A-235 is also adopted in SSAP 52 (Deposit Type Contracts), ¶ 22.
[11] SSAP 54, ¶ 37. Appendix A-010 adopts the interest rates and morbidity tables in the Minimum Reserves Standards for Individual and Group Health Insurance Contracts. The morbidity tables are the 85 CIDA or 85 CIDB Tables for contract reserves and the CIDC Table for claims incurred on or after January 1, 2002. For claims incurred prior to January 1, 2002, the company may elect to use either the standards in effect on currently issued contracts as of the date the claim is incurred or the standard on currently issued contracts. See Appendix A-010, Exhibit 1.
[12] Appendix A-200 contains excerpts of this Model regulation. Appendix A-200 is adopted by SSAP 56, ¶ 41.

Model Regulation,[13] the Synthetic Guaranteed Investment Contract Model Regulation,[14] the Long-Term Care Model Regulation,[15] the Universal Life Model Regulation,[16] the Valuation of Life Insurance Policies Model Regulation (Model Regulation XXX),[17] the Asset Adequacy Analysis Requirement,[18] the Optional smoker/nonsmoker mortality tables,[19] the Annuity 2000 Mortality Table,[20] the Actuarial Standards Board Actuarial Standards of Practice, and the Actuarial Guidelines found in Appendix C.

Generally, the rules relating to reserves in the APPM are effective for years beginning January 1, 2001 for contracts issued on or after January 1, 2001 (the effective date of the APPM). Contracts issued prior to January 1, 2001 should be accounted for based on the laws and regulations of the domiciliary state in force at that time. Because insurance companies are required to file their annual statements according to the APPM (unless there is a permitted practice or a state rule providing otherwise), insurers are required to follow the reserve standards in the model regulations adopted by the APPM through their adoption in SSAP 51, SSAP 52, SSAP 56, and SSAP 59, unless those reserve standards are in conflict with a state's rules.[21]

The state regulation of insurers' finances has a substantial impact on the federal taxation of life insurance companies. The Internal Revenue Code (Code) generally requires that the determination of the life insurance company taxable income must be made under an accrual method of accounting.[22] Under the accrual method of accounting, a deduction is not allowed for a liability until the all-events test is met. The all-events test "is met with respect to any item if all events have occurred which determine the fact of liability and the amount of such liability can be determined with reasonable accuracy."[23] Because reserves are liabilities for future events, the

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[13] Appendix A-270 contains excerpts of this Model regulation. Appendix A-270 is adopted by SSAP 56, ¶¶ 26 and 41.

[14] Appendix A-695 contains excerpts of this Model regulation. See SSAP 51, ¶ 46; SSAP 52, ¶ 22; SSAP 56, ¶ 26 and 41, as amended by SSAP 80, ¶¶ 7 and 8; and SSAP 52, ¶ 21, as amended by SSAP 80, ¶ 6. Valuation requirements are found in ¶¶ 27-35 of Appendix A-695.

[15] Appendix A-641 contains excerpts of the Long-Term Care Model Regulation, including valuation requirements at Appendix A-641, ¶¶ 7-10. Appendix A-641 is adopted by SSAP 51, ¶ 46; and SSAP 54, ¶ 37.

[16] Appendix A-585 contains excerpts of the Universal Life Model Regulation. The mortality and interest bases for calculating reserves are the minimum standards in Appendix A-820. See Appendix A-585, ¶ 10. Appendix A-585 is adopted by SSAP 51, ¶ 46; and SSAP 56, ¶¶ 26 and 41.

[17] Appendix A-830 contains Model Regulation XXX. SSAP 80, ¶ 3 says that reserves for those contracts with nonlevel premiums or benefits, or contracts with secondary guarantees, must be established in accordance with the guidance in Appendix A-830. Appendix A-830 is adopted by SSAP 51, ¶ 46.

[18] Appendix A-822 contains excerpts from the Actuarial Opinion and Memorandum Regulation that contains the asset adequacy analysis requirement. Appendix A-822 is adopted by SSAP 51, ¶ 46; SSAP 52, ¶ 22; SSAP 54, ¶ 37; SSAP 56, ¶¶ 26 and 41; and SSAP 59, ¶ 21. Among other things, the 2001 revised Model Regulation requires an asset adequacy opinion, provides criteria for acceptance of a state of domicile opinion in the state of filing, provides specific details to be included in the actuarial memorandum, and specifies details to be included in the Regulatory Asset Adequacy Issues Summary that is required to be filed separately from the annual statement and opinion by March 15. Specific interest rate scenarios are left to the judgment of the actuary, subject to revised Actuarial Standards of Practice No. 7 and No. 22.

[19] Appendix A-812 adopts the optional smoker/nonsmoker mortality tables. Appendix A-812 is adopted by SSAP 51, ¶ 46; SSAP 56, ¶ 41; and SSAP 59, ¶ 21.

[20] Appendix A-821 generally adopts the Annuity 2000 Mortality Table. Appendix A-821 is adopted by SSAP 51, ¶ 46; and SSAP 56, ¶ 41.

[21] Actuarial guidelines are often applied by their terms retroactively to contracts issued on or after January 1, 1981. However, under the APPM, the guidelines do not apply to contracts issued before January 1, 2001.

[22] I.R.C. § 811(a)(1).

[23] *See id.* § 461(h)(4).

all-events test is not met for reserve liabilities. For items to which the accrual method does not apply, the annual statement provides the basis for tax accounting.

Accounting for reserves is not an accrual method of accounting. Thus, the normal tax accrual method of accounting does not apply to reserves for insurance companies.[24] Instead, the Code generally provides that the starting point for the computation of reserves for Federal income tax purposes (tax reserves) is the NAIC annual statement. Thus, state regulations concerning policy reserves in large part define to what extent increases and decreases in reserves should be taken into account for federal income tax purposes.[25]

Publicly traded companies are also required to file Generally Accepted Accounting Principles (GAAP) financial statements. GAAP accounting often diverges from SAP accounting, which is particularly true in calculating reserves. The preamble to the APPM describes this difference and the reason for it as follows:[26]

> The objectives of GAAP reporting differ from the objectives of SAP. GAAP is designed to meet the varying needs of the different users of financial statements. SAP is designed to address the concerns of regulators, who are the primary users of statutory financial statements. As a result, GAAP stresses measurement of emerging earnings of a business from period to period (i.e., matching revenue to expense), while SAP stresses measurement of ability to pay claims in the future. This difference is illustrated by the fact that statutory policy reserves are intentionally established on a conservative basis emphasizing the long-term nature of the liabilities. Under GAAP, the experience expected by each company, generally with a lighter provision for the risk of adverse deviation, is used to determine the reserves it will establish for its policies. GAAP reserves may be more or less than the statutory policy reserves.

In the balance of this chapter, and generally elsewhere in this book, reference to regulatory requirements will be taken to mean state statutory requirements.

Although the basic structure for tax reserves relies on SAP, the rules for tax reserves differ in important respects from the rules for statutory reserves. Those rules for tax reserves are found in Sections 807, 811, 817, 817A, and 846 of the Internal Revenue Code. These tax rules often are unclear in their application despite a set of specific Code rules. In addition to rules for reserve increases and decreases, other Code sections rely on reserves to compute an insurance company's taxable income. Specifically, Section 812 provides the rules that depend on reserves for determining the percentage of tax-exempt income and dividends from unaffiliated common and preferred stock that flow to the life insurance entity tax-free. Similarly, Section 816 relies on the classification of reserves to define when an insurance company is a life insurance company or a non-life insurance company for tax purposes.

There are several categories of reserves. The balance of this chapter provides a general discussion of these categories.

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[24] House Ways and Means Committee, H.R. Rep. No. 98-432, pt. 1, at 1256 (1984); Senate Committee on Finance, Deficit Reduction Act of 1984, S. Prt. No. 98-169, at 268 (1984). Also, I.R.C. § 461(h)(5) provides that the economic performance rules do not apply to any item for which a deduction is allowable under a provision that specifically provides for a deduction for a reserve for estimated expenses.

[25] *See American Financial Group v. US 6th Cir* 678-F3d 422 (6thCir.2012).

[26] APPM, Preamble, ¶ 10, page P-2.

1.3 RESERVES FOR FUTURE POLICY BENEFITS

Reserves for future policy benefits are for claims for which the events causing the claims have not yet occurred. For simplicity's sake, a traditional, level premium, level death benefit life insurance policy is used below to explain this reserve. Death protection is provided for the contractual period of the policy. Premiums, however, may be payable for a period that is the same or shorter. For this example, premiums are assumed to be payable annually and level in amount from year to year.

Because mortality generally increases with age while premium payments are level, premiums charged in early policy years must be greater than the early expected claim amounts. This initial excess of premiums over assumed claims results in the accumulation of a reserve so that premium payments in later years will be sufficient to pay future policy claims even though those premiums are insufficient to pay those claims in the later policy years. That is, the reserve generated from these extra premiums in the early policy years accumulates through the years, with interest, so that in later years it can pay for claims when the expected annual claim amounts are greater than that level annual premium.

Reserves are calculated using net premiums. Net premiums are the amounts necessary to pay mortality benefits and endowment benefits according to certain mortality and interest assumptions. Company expenses are not reflected in the net premium reserve, nor are there any explicit margins for profits or adverse experience. For life insurance products, neither cash surrender values nor other nonforfeiture benefits are taken into account in computing the reserve.[27] The difference between gross premiums (the actual premiums charged) and net premiums is referred to as loading. Generally, if a company charges a gross premium that is less than the net premium, it must test to see whether a deficiency reserve must be held.

One can view the calculation of reserves from two perspectives, which generally produce identical results:

- Under the first approach, called the retrospective approach, the reserve can be looked at as a fund accumulated by the insurance company out of the net premiums to pay for future claims. Thus, the reserve is equal to the net premiums received, accumulated with interest, less benefits assumed to have been paid.
- The second approach, called the prospective approach, sets the reserve equal to the present value of future benefits to be paid, less the present value of future premiums to be received. The prospective approach answers the question, "How much do I need today that together with future premiums and investment income will provide for the future benefits?"

Over time, with the advent of non-traditional insurance plans and individual deferred annuities, the retrospective approach has remained applicable only to traditional plans of insurance, while the prospective approach has remained applicable to all plans. Moreover, the SVL, which has been adopted in every state as the basic rule for determining reserves, requires the second (prospective) approach.

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[27] That said, as a final potential adjustment to the reserve on any contract as calculated, an additional statutory liability equal to any excess of the cash surrender value over the reserve as of the valuation date must be established. *See* SSAP 51, ¶ 38.b; SSAP 52, ¶ 16.b; and SSAP 54, ¶ 25.a.

The effect of reserves on earnings is generally a "smoothing" of income from one period to the next. See the Actuarial Breakout section, Part I, of this chapter for a mathematical demonstration of the smoothing effect of reserves on income using a traditional whole life example.

In Table 1.1 below is an example of the calculation of this type of reserve. For simplicity's sake, the table shows a five-year term policy, assuming 0% interest and assuming that premiums continue to be paid (and policyholders remain in the group) even when a claim occurs. The reserve calculation in Table 1.1 is of the type known as a net level reserve calculation. The reserve calculation is for a policy at the end of its policy year. These end-of-year reserves are called "terminal reserves."

In the definition of a net level reserve calculation, the net premium is calculated to have the following properties:

- The present value of assumed benefits at the contract's issue date is equal to the present value of net premiums at the contract's issue date. Note that the sum [present value] of column (1) equals the sum [present value] of column (3).

- The net premium is a level percentage of the contract premium (or "gross premium"). In this example, that percentage equals the present value of claims divided by the present value of gross premiums, i.e., 160/200, or 80%. Thus, each net premium in column (3) is 80% of the gross premium for that policy year, in this case 80% of 40, or 32. The difference between the 40 and the 32 is commonly referred to as the "loading." The loading is the amount that is theoretically available for expenses and profit.

TABLE 1.1

Policy Year	(1) Assumed Claim Cost	(2) Gross Premium	(3) Net Premium	(4) Reserve
1	10	40	32	22
2	15	40	32	39
3	25	40	32	46
4	40	40	32	38
5	70	40	32	0
Totals (Present Values)	160	200	160	

Column (4) [the reserve] can be seen as a retrospective accumulation of column (3) [net premiums], minus column (1) [assumed claim cost]. Thus, for example, the third policy year reserve of 46 equals (32+32+32) – (10+15+25). The reserve can also be calculated prospectively. Thus the third policy year reserve (46) also equals the present value of future benefits (40+70) minus the present value of future net premiums (32+32).

Net level reserves such as those calculated in Table 1.1 are rarely used. The reason is that the heavy first-year underwriting and sales expenses of putting a policy into force creates

significant capital strain because these acquisition costs are immediately written off (expensed) under SAP.[28] For individual life insurance plans, the SVL now permits the use of modified reserve methods, most notably the Commissioners Reserve Valuation Method (CRVM). For most traditional life insurance plans, the CRVM reserve is a one-year term reserve for the first policy year and a net level premium reserve calculated as though the policy were issued in the second year. The CRVM reserve at the end of the first policy year is zero (or nearly zero). Thus, the CRVM approach permits a lower net premium in the first contract year and a commensurately higher net premium in renewal years.

In the Table 1.1 example, a change to CRVM would decrease the first-year net premium from 32.00 to 10.00 and increase the net premium for years 2 to 5 from 32.00 to 37.50, which has the effect of decreasing reserves. Note that in the case of Table 1.1 modified to a CRVM approach, the first-year terminal CRVM reserve would equal the 10.00 net premium minus 10.00 assumed claims, or zero. [Note that the sum or present value of future net premiums must still equal the sum or present value of benefits, i.e., 160.00.]

Table 1.2 below illustrates the reserve pattern equivalent to that of Table 1.1, but shows reserves on a CRVM basis instead of on a net level basis. Under most currently issued individual life insurance plans, the CRVM defaults to a method called "full preliminary term," under which the first-year net premium equals the valuation cost of insurance for the first year.

TABLE 1.2

Policy Year	(1) Assumed Claim Cost	(2) Gross Premium	(3) Net Premium	(4) CRVM Reserve	(5) Decrease from Table 1.1
1	10.00	40.00	10.00	0.00	22.00
2	15.00	40.00	37.50	22.50	16.50
3	25.00	40.00	37.50	35.00	11.00
4	40.00	40.00	37.50	32.50	5.50
5	70.00	40.00	37.50	0	0
Totals (Present Values)	160.00	200.00	160.00		

A comparison in column (5) of the CRVM reserve to the net level reserve in Table 1.1 illustrates the large decrease in reserve requirement between the two different reserve methods. The difference between the CRVM reserve and the net level premium reserve is commonly referred to as the unamortized "CRVM allowance," or unamortized "expense allowance." At issue, the expense allowance is 27.50, which is the difference between the CRVM "modified net premium" (37.50) and the CRVM first-year net premium (10.00). This has the effect of allowing 27.50 to be used to offset acquisition costs and the remaining 10.00 to be used for first-year claims. Note that the renewal "loading" is 2.50 under CRVM (i.e., 40.00 – 37.50), vs. 8.00 under net level.[29]

[28] SSAP 71, ¶ 2. This is unlike GAAP, which generally requires a net level premium reserve but allows acquisition costs to be capitalized and amortized. *See* Mark A. Tullis and Philip K. Polkinghorn, *Valuation of Life Insurance Liabilities*, (3rd ed. 1996), n. 2 at 25, where the authors state that the deferred acquisition cost asset established under GAAP is essentially equivalent to an expense allowance.

[29] Note that the first year Net Premium ($10.00) is generally referred to in actuarial literature as the alpha (a) premium, while the renewal years premium ($37.50) is referred to as the Beta (B) premium.

Because life insurance reserves are determined using the present value of future expected death and endowment benefits, mortality tables are needed to determine the projected, respective death and endowment benefits. In addition, an interest rate must be assumed to determine the present value of those benefits. The SVL generally defines the mortality tables used to determine projected death benefits and specifies interest rates. In addition, assumptions must be made regarding when premiums and benefits are paid.

1.3.1 MORTALITY TABLES

Mortality tables can be select, ultimate, or aggregate:

- A select mortality table is based on data of newly underwritten policies. As a result, newly issued policies for a given gender and current age have lower expected mortality than other, older policies due to underwriting selection. For two males currently age 40, for example, the first policy, issued 15 years ago (at age 25) has a higher expected mortality rate in the current year than the second policy, issued one year ago (at age 39). Technically, a select mortality table is one that shows the rate of mortality by both age and by duration from issuance. The tables reflecting selection assume that the effect of selection generally wears off between 5 and 25 years after issue. Therefore, select rates are usually used only for those periods of years.
- An ultimate table excludes any selection effect and is based on the ultimate mortality among the insured lives.
- An aggregate table includes select and ultimate mortality data combined.

It is not necessarily the case that higher mortality results in a higher reserve. This is because a reserve depends not only on the expected future mortality. Rather, the reserve also depends on the slope (rate of increase) of expected deaths versus the slope of the premium pattern.

1.3.2 ASSUMPTIONS FOR TIMING OF PREMIUMS AND BENEFITS

Reserves may be curtate, semi-continuous, fully continuous, or discounted continuous:

- Curtate reserves assume that premiums are payable at the beginning of each policy year and death benefits are payable at the end of the policy year of death. Reserves computed on a curtate basis understate a company's liabilities by not reflecting the fact that death benefits are paid throughout the policy year, not necessarily at the end of the policy year. Some companies that calculated reserves using curtate assumptions held an additional "immediate payment of claims" reserve to compensate for this.
- Semi-continuous reserves are calculated reflecting the fact that death benefits are generally payable shortly after death with interest from the date of death to the payment date, and assuming that net premiums are payable annually at the beginning of each policy year. This approach eliminates the need for an immediate payment of claims reserve.
- Fully continuous reserves are those that result from the assumption that premiums are payable continuously throughout the year and the fact that death benefits are generally payable shortly after death with interest from the date of death to the payment date.
- A "discounted continuous" reserve discounts the fully continuous premium at interest only, to the beginning of the contract year. From an economic perspective, it reflects a

> premium payable at the beginning of the year, but with a pro rata return of the unearned premium at the moment of death. The assumption for discounted continuous reserves that premiums are paid at the beginning of each year enables traditional mean reserve methodologies to be used. Discounted continuous terminal reserves are identical to fully continuous terminal reserves. Most companies hold discounted continuous reserves rather than fully continuous reserves.

When curtate or semi-continuous reserves are held, a theoretical error is introduced in setting up future net premiums as an asset in the deferred premium calculation (and the analogous calculation in the case of mid-terminals), because any remaining premiums payable in the year of death will not be collected after the death occurs. To provide for this understatement, a reserve is established for the nondeduction of deferred fractional premiums. Additionally, where a company refunds the amount of any gross premiums at death, which represents payment for periods beyond the date of death, a company must establish a refund of premium reserve.

The curtate approach is now prohibited for individual life insurance.[30] If curtate assumptions are used, an immediate payment of claims (IPC) reserve is required in order to assume that death benefits are paid at the moment of death,[31] which has the effect of making the reserve equal to a semi-continuous reserve. The IPC reserve is frequently computed using rough approximations, such as $i/2$ times the basic reserve, where i is the reserve basis annual interest rate assumption.[32]

Application of $i/2$ to the basic reserve amounts to an overstatement in the case of plans that contain a maturity value at a policy duration prior to the end of the valuation mortality table (such as endowment insurance). This is now a minor issue in most companies, as issuance of policies endowing for the face amount prior to age 95 have been prohibited since 1985. However, level term insurance with a return of premium feature at expiry would be an example of where the $i/2$ approach would be an overstatement.

See Actuarial Breakout, Part II, of this chapter for a more detailed discussion of premium and claim timing assumptions (Part IIa) and of CRVM (Part IIb). Additionally, for a discussion of the adaptation of CRVM for universal life policies, see Actuarial Breakout, Part III, in this chapter.

1.3.3 MEAN RESERVES FOR INDIVIDUAL LIFE INSURANCE

Reserve standards under the SVL are generally determined based on policy anniversaries. For annual statement purposes, however, it is necessary to determine what the reserve is on the valuation date (December 31 for the annual report), and this date almost always falls between policy anniversaries. In order to simplify the reserve calculation, a company may assume that all policies have an anniversary six months prior to the statement date, rather than determining the reserve for each policy using its actual anniversary. This calculation results in what is called "mean reserves." The mean reserve equals the arithmetic average of the net (annual)

[30] Actuarial Guideline XXXII.
[31] Actuarial Guideline XXXII.
[32] Tullis and Polkinghorn, *supra* note 6, at 41. Also mentioned in Actuarial Guideline XXXII, *supra* note 7.

premium, the prior anniversary terminal reserve, and the next anniversary terminal reserve.

All mean reserve calculations assume that the premium has been paid for an entire year, which is not always true in practice because many policyholders pay premiums monthly, quarterly, or some other payment mode. For example, assume that a policyholder with a July 1 policy anniversary pays premiums semiannually (July 1 and January 1). The mean reserve at December 31 assumes that the January 1 premium due the next day has been paid. Because the reserve assumes the January 1 premium has already been paid, the company is holding a liability (the reserve) for the six months that the January 1 premium will support. Thus, in this case, the mean reserve by itself is an overstatement of the policy liability.

To balance the overstatement of the reserve, it is assumed on December 31 that the January 1 premium has already been paid as of December 31, and a gross deferred premium is reflected on the income statement in the amount of the January 1 premium. The loading attributable to the gross premium is shown as an expense. The deferred premium is held on the statutory balance sheet (Exhibit 13, line 14) on a net basis (i.e., the portion of the net annual premium that corresponds to the proportion deferred, 50% in this case).

Assume that a policy has a gross annual premium of 150 with semiannual billing and a July 1 anniversary. Also assume premiums are paid when due. Thus, only one-half of the premium (75) has been paid at the valuation date of December 31. The annual statement in calendar year 1 will reflect a total premium incurred of 150 (including the 75 deferred premium and the 75 premium actually paid). Assume the net annual premium is 100. The loading equals the difference between the gross and net premium (50). The deferred net premium is equal to the gross deferred premium minus the loading attributable to the gross deferred premium. Thus:

Gross annual premium	150	
Net annual premium	100	
Annual loading	50	
Gross deferred premium	75	(50% of 150)
Net deferred premium	50	(50% of 100)

	Annual	Semiannual
Premium paid	150	75
Gross deferred premium		75
Loading on deferred premium		(25)
Net income	150	125

The load of 25 reflects a provision for commissions, other expenses, and profit.

The balance sheet reflects an asset of 50 (the gross deferred premium less loading). The reserve itself, which assumes an annual premium was paid, is 50 higher than it should be, so the net deferred premium of 50 makes the appropriate correction.

1.3.4 MID-TERMINAL RESERVES

Instead of mean reserves with deferred premiums, some companies hold mid-terminal reserves. Mid-terminal reserves are based on an interpolation of terminal reserves. The mid-terminal approach consists of the sum of two components. The first component is the mid-terminal

reserve itself, i.e., the average of the previous anniversary and next anniversary terminal reserve. The second component of the approach is the net unearned valuation premium based on the billing frequency under the policy. Take, for example, a policy with a quarterly billing premium due December 1, where the annual net valuation premium equals 120. In this case the quarterly net valuation premium equals 30, two-thirds of which reflects the unearned portion (20). Under the mid-terminal approach, no net deferred premium is needed.

Mid-terminal reserves alone would significantly understate the reserve liability unless premiums are payable very frequently, such as weekly, because mid-terminal reserves assume that premiums are paid for coverage up to but not beyond the statement date. This is in contrast to mean reserves, which overstate reserves if premiums are payable more frequently than annually because the assumption made to calculate mean reserves is that the premium coverage period is to the next policy anniversary. To offset the understatement for mid-terminal reserves, a net unearned premium liability is set up as an adjustment.

For a large block of traditional life insurance policies with a reasonably smooth distribution of policy anniversaries throughout the calendar year, mean reserves, and mid-terminal reserves, with the net premium adjustments described above, reach roughly equivalent amounts.

1.4 CLAIM RESERVES, LOSS RESERVES, AND CLAIM LIABILITIES

There are two types of liability items for claims that have already occurred:

- Claim payments that will come due in the future for losses that have already occurred but for which the claim payments are not yet due, such as future disability income benefits where the disability has already occurred but the future payments will fall due over the course of the disability. In the case of medical insurance, this liability reflects the estimated costs of future hospital, medical, and surgical services. In the statutory financial statement this liability is referred to as "present value of amounts not yet due," or PVANYD). This liability is referred to as a "claim reserve."
- Payments currently due for claims that have occurred, or, in the case of disability income, for compensable months transpired. This is referred to as a "claim liability."

In the property/casualty environment, this distinction between claim reserves and claim liabilities is not made, and both types of liabilities are considered "loss reserves." Claim reserves on disability policies are generally discounted to determine the present value of expected benefit payments. Similarly, expected disability benefit payments are determined using tables that assume future rates of termination of disability [death and recovery].

A simplified example of the reserving technique for computing reserves for disability claims can be found in Part IV of the Actuarial Breakout to this chapter. As in Table 1.1, above, a zero interest rate is assumed, for simplicity of illustration.

For property/casualty insurance, and for many types of health insurance, it is common to use development table approaches to calculate claim liabilities. A development table is a statistical compilation of historical claim payments by claim incurral date, which is used to project future payments from claims that have been incurred prior to a financial close date. For example, if history indicates that a block of property damage claims that were incurred in Month 1 has

generally completed 40% of its claim payouts by Month 4, then for property damage claims incurred in September 2002, if 100 were paid by December 31, then 150 would be the loss reserve, so that 100 divided by (100 + 150) would equal 40%. Note that in this approach no attempt is made to split the 150 of loss reserve between amounts due and amounts not yet due.

Because development tables are widely used in establishing loss reserves (and often accident and health claim reserves, due to their similarity of structure), the Actuarial Breakout section (Part V) of this chapter demonstrates the development table approach to establishing claim reserves and loss reserves and discusses some alternative development table approaches. Please refer to the Actuarial Breakout, Part V, for a detailed illustration of the methodology.

1.5 ANNUITIES IN PAYOUT STATUS

Annuities in payout status can generally be separated into two broad categories: "life-contingent" and "term-certain." A life-contingent annuity (which may have one or more annuitants) stops making payments once the last annuitant dies, while a term-certain annuity continues payment for the guaranteed period, regardless of whether the annuitant dies. Pure life-contingent annuities are relatively rare; most life-contingent annuities are combined with term-certain annuities. Typically, in these cases, annuity payments may continue after the last annuitant dies, until the end of a guaranteed period.

For a given amount of proceeds applied, the longer the period for which annuity payments are guaranteed, the less the periodic payments made under the annuity. For example, if a policy owner pays $300,000 for a life annuity, the beneficiary might have the following annual payment options:

- $2,700 annual income for a pure life annuity
- $2,640 annual income for a life annuity with the first 5 years of payments guaranteed
- $2,560 annual income for a life annuity with the first 10 years of payments guaranteed.

The reserve for an annuity in payout status takes into account the present value of the future annuity payments, based on an assumed interest rate. Mortality tables are used to determine when payments are assumed to stop as the result of the annuitant's death. This reserving approach is similar in nature to those for disability income reserves, as shown in the Actuarial Breakout to this chapter, Table 1.3, except that for life annuities, mortality is the only contingency to survivorship.

In a fixed annuity contract, the insurance company agrees, for a cash consideration (in single or multiple payments), to make specified benefit payments during a fixed period or for the duration of a designated life or lives. Thus, an annuity contract does not need to be based on any life contingency.[33] The periodic benefit amounts payable under the contract must systematically liquidate the consideration paid for the contract, as well as the interest credited on the contract.[34]

[33] GCM 38378 (May 16, 1980); GCM 39270 (Aug. 2, 1984) (a deferred annuity with permanent purchase term certain annuity guarantees qualifies as an annuity contract).
[34] *Igleheart v. Comm'r*, 174 F.2d 605, 606-7 (7th Cir. 1949), *aff'g* 10 T.C. 766 (1948); *Comm'r v. Meyer*, 139 F.2d 256, 258-59 (6th Cir. 1943).

1.6 INDIVIDUAL DEFERRED ANNUITIES AND OTHER AMOUNTS ON DEPOSIT

The definition of an annuity includes an annuitization option under which a benefit amount is to be paid periodically until the fund is exhausted, but under which future payments may be more or less than determined at the annuity starting date because of earnings at a higher or lower than expected rate.[35]

A deferred annuity is an annuity contract that has not reached its annuity starting date, when the periodic benefit payout begins. The typical deferred annuity contract contains two phases: an accumulation phase and a payout phase. An immediate annuity has only a payout phase. Most immediate annuity contracts contain a refund feature in the payout phase stated either in terms of a guaranteed number of annuity payments whether the annuitant lives or dies or in terms of a refund of the purchase price (or some portion) in the event of the annuitant's early death. When the number and amount of future annuity payments are based on a contingency (e.g., the life of the annuitant), the contract contains an insurance element.

Prior to the annuity starting date, a deferred annuity contract is generally an investment contract for the accumulation of a principal sum to be applied to provide periodic payments after the annuity starting date.[36] After the annuity starting date, payments may be made to liquidate the accumulation amount together with interest (fixed-term annuity) or of the accumulation amount together with interest and mortality experience (life annuity).[37] Most individual deferred annuity contracts contain surrender charges during the accumulation phase. The surrender charge typically begins at a percentage from 8% to 11% of the account value at the contract issue date, and disappears between the seventh and tenth anniversaries.

The IRS has ruled in the context of insurance reserves under Section 807(c) that in order for a deferred annuity contract to constitute an annuity contract for tax purposes during the accumulation phase, it must provide for annuity benefits that are fixed and determinable from the contract's inception (including a term certain annuity).[38] If the benefits relate to life-contingent annuity payouts, the cost for the annuity benefits must be guaranteed during the life of the contract in order for its reserves to be treated as life insurance reserves.[39]

Reserves for annuity contracts are generally computed using the Commissioners Annuity Reserve Valuation Method (CARVM) as defined in the SVL. To calculate a reserve using CARVM, which is often a complex calculation, one begins with the current account value, calculates the present value of future guaranteed benefits at each future anniversary, and takes the greatest of those present values. For a fixed deferred annuity or a variable deferred annuity without guaranteed living benefits or minimum guaranteed death benefits, this calculation typically results in a reserve equal to or slightly greater than the net surrender value. A generic

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[35] Regulations § 1.72-2(b)(2).

[36] In recent years guaranteed minimum withdrawal benefits and guaranteed minimum death benefits (most typically on variable annuity contracts) have clouded this characteristic, as such benefits can become effective during the accumulation period.

[37] *See Background on the Taxation of Life Insurance Companies and Their Products* (May 5, 1983), Joint Committee Print, JCS-11-83. *See also* SSAP 50, at ¶ 20.

[38] *See* Rev. Rul. 77-286, Rev. Rul. 70-191, and TAM 200325001.

[39] PLR 8715038 (Jan. 13, 1987); GCM 39516 (June 10, 1986) and GCM 38378, *supra* note 11.

description of the CARVM process can be found in the Actuarial Breakout (Part VI) of this chapter.

Life insurance companies often have other liabilities on their balance sheets that do not contain life or health contingencies but are simply amounts on deposit. In general, the reserve for amounts on deposit is equal to the account balance. The only potential variance from a deposit approach is where an option exists to convert the deposit balance into a life-contingent contract, for example, when a deposit may be used to purchase an annuity with favorable purchase rates.

1.7 STATE REGULATORY LAW AND OTHER STATE REGULATORY GUIDANCE

The valuation laws of the various states define the reserve methods, interest rate assumptions, and mortality tables to be used in computing reserves. This is generally referred to as "statutory" guidance. The basic rules governing reserves are found in the SVL. The SVL defines CRVM for life insurance reserves and CARVM for annuities. The SVL does not define reserves for health insurance or for disability insurance. Guidance for reserves for these policies is found in the NAIC Minimum Reserve Standards for Individual and Group Health Insurance Contracts. Both the SVL and the Minimum Reserve Standards have been adopted in the APPM[40].

The SVL defines the minimum reserves that must be held by a company.[41] Reserves are considered in the aggregate, so that a deficiency in one block of business may be offset by an excess in another block of business within a given "category."[42] A "category" is not explicitly defined in the SVL, but the SVL has categorized product lines for reserve purposes. Those various categories are expressed in the APPM.[43]

Reserves for any category of policies, contracts, or benefits may be calculated, at the company's option, according to any standard that produces greater aggregate reserves for the category than those calculated according to the minimum standards provided in the SVL. The maximum valuation interest rate and the nonforfeiture interest rate in the Standard Nonforfeiture Law (SNFL) are related.[44] If a state requires a higher or lower reserve than the NAIC interpretation of the SVL reflected in the APPM, or if a company voluntarily chooses to hold additional reserves to those required by the APPM, the difference between the amount as reported and the reserve required by the APPM must be included in the footnote reconciliation required by Appendix A-205 and INT 01-26.[45]

The SVL is interpreted by NAIC Model Regulations and Actuarial Guidelines. Additionally,

[40] National Association of Insurance Commissioners, Appendix to APPM, at A-820 and A-010.
[41] §§ 4, 4a, 4b, and 10.
[42] *Id.* § 6.
[43] Appendix to APPM *supra* note 17, at A-820, ¶ 3.
[44] Standard Valuation Law § 7(B), *supra* note 18. The Standard Nonforfeiture Law requires companies to provide cash values on individual life insurance policies in addition to nonforfeiture benefits as soon as they are available according to a formula specified in the law that takes into account the plan of insurance, the age of the policy, and the length of the policy's premium payment period. The maximum nonforfeiture interest rate is equal to the maximum valuation interest rate multiplied by 125%.
[45] Appendix to APPM, *supra* note 17, at A-205 as illustrated in INT 01-26.

for contracts issued on or after January 1, 2001, the APPM provides further guidance through its SSAPs, Interpretations (INTs), and Appendices (APPs). SSAP 51[46] provides:

> The reserving methodologies and assumptions used in computation of policy reserves shall meet the provisions of Appendices A-820 [the SVL in certain pertinent parts] and A-822 [asset adequacy analysis, generally cash flow testing] and the Actuarial Guidelines found in Appendix C of this Manual.[47] Further, policy reserves shall be in compliance with those Actuarial Standards of Practice promulgated by the Actuarial Standards Board.

Additional actuarial liabilities are commonly held for such items as:[48]

- Deficiency reserves
- Provision for either nondeduction of deferred fractional premiums or return of premiums at death of the insured
- Surrender values in excess of reserves otherwise required
- Substandard extra premiums, extra mortality on group conversions, and guaranteed insurability options
- Additional reserves required based on cash flow testing and/or asset/liability matching requirements, and
- Additional reserves for policies that contain conversion privileges or future contingent benefits.

The SVL itself does not require a company to establish a liability where the cash surrender value of a policy exceeds the reserve for that policy, although CARVM requires reserves to take into account the present value of any future cash surrender values. This liability requirement is found in the APPM.[49] It is also is reflected in the NAIC Annual Statement Instructions and in the NAIC Statutory Annual Statement, Exhibit 5, Miscellaneous Reserves (formerly referred to as "Part G"), entitled, "for surrender values in excess of reserves otherwise required and carried in this schedule."[50] Further, the "Valuation of Life Insurance Policies Model Regulation" (Model Regulation XXX) provides that, for policies subject to the Model Regulation, in no case may total reserves (including basic reserves, deficiency reserves, and any reserves held for supplemental benefits that would expire upon contract termination) be less than the amount that the policyholder would receive (including the cash surrender value of the supplemental benefits, if any, referred to above), exclusive of any deduction for policy loans, upon termination of the policy.[51]

The requirement to hold a minimum reserve equal to the cash surrender value is generally considered to be a contract-by-contract requirement, and a contract-by-contract comparison is specifically required by Model Regulation XXX for policies subject to the regulation. Thus, a

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[46] SSAP 51, at ¶ 16.
[47] The reference to Appendix C was made in 1999. Prior to 1999, the reference was to Part 9 of the NAIC *Financial Examiners Handbook.* See discussion under § 1.7.1, "Actuarial Guidelines."
[48] SSAP 51, at ¶ 38.
[49] *See* SSAP 51, at ¶ 38.b; SSAP 52, at ¶ 16.a; SSAP 54, at ¶ 25.a.
[50] In the Preamble contained in the NAIC APPM, the Annual Statement Instructions are contained in the listed of hierarchical statutory authorities.
[51] NAIC, Valuation of Life Insurance Policies Model Regulation (Model Regulation XXX) § 6.C.

contract in which the cash surrender value is less than the CRVM reserve, for example, cannot reduce a liability for a contract in which the cash value exceeds the CRVM reserve. Some actuaries believe that an offset is allowed for policies not subject to Model Regulation XXX.

For a detailed overview of the SVL, please refer to Part I of the Appendix to this chapter.

As of this date, a new Standard Valuation Law ("new SVL") has been adopted by the NAIC but will not be effective until 42 states or other US jurisdictions and the states representing at least 75% of direct premium income have adopted it through legislation. The new statute reflects a legislated standard that allows for frequent changes in standards and assumptions, (predominantly expressed in "Valuation Manuals," or "VMs") within the provisions of that statute. It is unclear when the new Valuation Law will take effect, but 2017 is a likely effective date. The new standard for Individual Life (VM 20) will be prospective only (i.e., with respect to new issues only) and currently only effective for individual term insurance and universal life with secondary guarantees. As currently written, it will allow a company to defer compliance for up to a period of 3 years. The VMs are available at the website of the American Academy of Actuaries: www.actuary.org. Because the VM drafts are still being revised at the date of publication, the authors decided not to provide details of the pertinent provisions. Suffice it to say that the new SVL creates many interesting tax problems.

1.7.1 ACTUARIAL GUIDELINES

Actuarial Guidelines (AGs) are generally developed in response to a state insurance department's request to aid "in interpreting a statute dealing with an actuarial topic relative to an unusual policy form or situation not contemplated at the time of the original drafting of a particular statute." The NAIC Life Actuarial Task Force (LATF)[52], in developing its interpretation or guideline, must often consider the intent of the statute, the reasons for initially adopting the statute, and the current situation. Guidelines are published "for those situations which are sufficiently common to all states, [such] that the publishing of an Actuarial Guideline on these topics would be beneficial to the regulatory officials in each state and would promote uniformity in regulation which is beneficial to everyone." The guidelines "are not intended to be viewed as statutory revisions but merely as a guide in applying a statute to a specific circumstance."[53]

SSAP 51[54] provides generally that, "[t]he reserving methodologies and assumptions used in the computation of policy reserves shall meet the provisions of the [SVL], the [Actuarial Opinion and Memorandum Model Regulation], and the Actuarial Guidelines found in Appendix C of this Manual." SSAP 56[55] similarly provides that, for separate accounts generally, the reserving methodologies are those used to compute reserves that meet the provisions of certain appendices and the Actuarial Guidelines found in Appendix C of the APPM. Notwithstanding codification, a state may take action to opt out of a guideline. If a state adopts a different valuation standard than a guideline, a company may be required to disclose any material difference.[56]

[52] Formerly Life and Health Actuarial Task Force ["LHATF"].
[53] APPM, Preamble to NAIC Actuarial Guidelines.
[54] SSAP 51, at ¶ 16.
[55] SSAP 56, at ¶ 26.
[56] SSAP 51, ¶ 44; Appendix A-205.

The NAIC is free to adopt actuarial guidelines as long as they are consistent with the SVL or a model regulation. For example, the NAIC could not adopt a guideline requiring the use of specific mortality tables not previously adopted in a model regulation or in the SVL because such a requirement would be inconsistent with the SVL, which specifies the mortality table to be used in computing reserves and generally permits changes to the specified table only by regulation. A new model law or regulation or an amendment to the model SVL would be required in such an event. Where the SVL or regulation does not prescribe a mortality table, guidelines are free to do so. For example, Actuarial Guideline XXXIV specifies a mortality table for minimum guaranteed death benefits on variable annuities.

A new NAIC mortality table for individual life insurance reserve valuation, the 2001 CSO Table, was adopted by over half of the states in 2004.[57] For this reason, a descriptive history and analysis of this table, together with its accompanying regulation, is included in the Appendix, Part II. Also included is some commentary on the comparison of reserve values between the 2001 CSO Table and the former standard, the 1980 CSO Table.

1.8 ACCIDENT AND HEALTH TERMINOLOGY

While life insurance policies are generally sold with guaranteed premiums with no right on the company's part to cancel the coverage or raise premium charges, health insurance policies vary in the ability of policyholders to renew the policy. Renewability provisions run the continuum from cancelable to noncancellable. Some of these terms may have definitions different for tax purposes than for statutory purposes. The terms are defined below:

- Noncancellable: This is the policy condition most favorable to the policyholder. For an extended period of years the policy can neither be cancelled nor can the premium be changed.
- Guaranteed renewable: Identical to noncancellable, except that the premium scale can be changed, generally only by class of insureds, and generally subject to regulatory approval.
- Non-renewable for stated reasons only: Contracts with this type of renewability provision cannot be cancelled on a contract-by-contract basis. Thus an insured cannot be cancelled or non-renewed due to poor claims experience. Cancellation or non-renewal must be done by class of insureds, such as plan type and state.
- Renewable at the option of the company: The company may refuse to renew at the end of any premium coverage period. Thus at the end of a one-year premium period, the company may refuse to renew.
- Cancellable at the option of the company: The company may cancel the policy during a premium coverage period, typically returning a pro rata portion of the premium to the policyholder.

Long-duration accident and health policies sold by life insurance companies (typically, individual disability contracts and long-term care contracts) generally give rise to three types of reserves:

- Contract reserves: These are the reserves for future policy benefits. At a given

[57] *See* IRS Notice 2004-61 (Sept. 13, 2004).

valuation date they are often the mid-terminal reserves (average of two terminal reserves). Contract reserves are required whenever the contract is guaranteed renewable, noncancellable, or has certain restricted rights of non-renewal. Many states require contract reserves on contracts that are non-renewable for stated reasons only.

- Unearned premium reserves: These are generally valued on a gross unearned premium basis for statutory purposes. Together with contract reserves they make up what is commonly referred to as "active life reserves."
- Claim reserves: This category of reserve was discussed above in Section 1.4. This reserve is for present value of amounts payable in the future on events (such as disability or illness) that have already occurred.

Any amount due and accrued at the statement date is considered to be a claim liability held in Exhibit 8, Part 1, of the annual statement and thus not held as a claim reserve in Exhibit 6.

Actuaries are required to test health insurance reserves for adequacy. If a health insurance portfolio shows material reserve inadequacy from the perspective of the above reserve categories, a fourth reserve, in addition to those referred to above, referred to as a premium deficiency reserve, must be established. The adequacy test presented in the APPM is a gross premium valuation. See Chapter 12 for an expanded description of valuation requirements for accident and health reserves.

1.9 THE ACTUARIAL OPINION AND MEMORANDUM REGULATION AND THE ASSET ADEQUACY ANALYSIS REQUIREMENT

The Actuarial Opinion and Memorandum Regulation (AOMR) requires a company to provide for an actuarial opinion regarding, among other things, the adequacy of the reserves and related actuarial items based on an asset adequacy test. This rule was largely adopted in Appendix A-822 of the APPM. Asset adequacy analysis is defined as an aggregate reserve analysis at the legal entity level. It may take many forms, including, but not limited to, cash flow testing, sensitivity testing, or applications of risk theory. If the appointed actuary determines, as a result of asset adequacy analysis, that a reserve should be held in addition to the *aggregate* reserves held by the company and calculated in accordance with the SVL, the company must establish an additional reserve. That is, if asset adequacy analysis indicates that, in the appointed actuary's opinion, invested assets equal to the reserves otherwise held are not adequate to support a block of business, an additional reserve should be established in an amount sufficient for the actuary to render an opinion of reserve adequacy.

Appendix 1

PART I: EXECUTIVE SUMMARY OF STANDARD VALUATION LAW (NAIC, 1996)

Section 1: Title. "Standard Valuation Law"

Section 2: Reserve valuation. Commissioner will "value or cause to be valued" the reserve liabilities of life insurance companies doing business in *this state.* He may also accept a valuation made under the jurisdiction of the Commissioner of another state complying with *this state's* minimum standards. Groupings and approximations are permissible [for fractions of a year or otherwise].

Section 3: Actuarial Opinion of Reserves.

Actuarial opinion required annually.

- Opinion is that reserves are computed appropriately according to policy provisions, consistent with prior reported amounts and in compliance with laws of the state in which statement is filed. Additionally, includes an opinion that assets supporting the reserves are adequate, together with future investment income thereon and future premiums, to support the obligations plus reasonable maintenance expenses.

  Asset adequacy analysis is required to support the opinion, except where specifically exempted by regulation.
- An actuarial memorandum supporting the opinion is required.
- Commissioner shall define by regulation the specifics of the actuarial opinion. [This is the authorization for the NAIC Model Actuarial Opinion and Memorandum Regulation (AOMR).]

Section 4: Minimum Standards, Mortality, Life

Mortality standards for currently issued business include the following:

- Individual Ordinary Life Insurance: 2001 CSO Table
- Industrial Life Insurance: 1961 Standard Industrial Table

Section 4a: Minimum Standards, Mortality, Annuities.

- Individual Life Annuities: A-2000 Table, with certain exceptions
- Group Life Annuities: GAR 1994

Section 4b: Maximum Valuation Interest Rates. This is a complex section. Interest rates are dynamic, a conservative function of the composite yield on seasoned corporate bonds, as published by Moody's Investors Service, Inc.

Section 5: Commissioners Reserve Valuation Method (CRVM) for life insurance. The methodology is the net level reserve, minus an expense allowance that amortizes over time. See Chapter 4, Actuarial Breakout, Part I, for a mathematical definition of CRVM.

Section 6: Commissioners Annuity Reserve Valuation Method (CARVM) for annuities. See Chapter 4, Actuarial Breakout, Part II, for mathematical definition of CARVM and Chapter 15 for a detailed discussion of CARVM.

Section 7: A company may use a reserve method that results in higher reserves than the minimum standard for a "category." To weaken reserves that were established above the minimum standard, Commissioner approval may be required.

Section 8: Definition of life insurance deficiency reserves, and description of required calculation approach. Deficiency reserves are defined as an "Alternative Minimum Reserve," minus the policy base reserve, to be tested for a positive value whenever the future gross premium on a contract at any future duration is less than the net valuation premium.

Section 9: Calculation of reserves for non-conventional plan forms must be made in a manner consistent with the conventional plan minimum standards.

Section 10: Cross reference is made here to "Minimum Standards for Health (Disability and Accident and Sickness) Plans."

PART II: THE 2001 CSO TABLE

The 2001 CSO Table was developed using 1990-1995 Society of Actuary experience,[58] supplemented where there was insufficient data.[59] Mortality was projected to 2001 using recent mortality trends. The table was then graduated to provide the smoothness necessary for a valuation table. The resulting table is called the Valuation Basic Table (VBT). The VBT was then adjusted by a loading formula. Separate nonsmoker, smoker, and composite nonsmoker/smoker tables were developed for both males and females. Each table has values for a 25-year select period and for ultimate ages. Either the select and ultimate values or the

[58] In April 2000, the SOA Individual Life Insurance Experience Committee released the 1990-95 Basic Mortality Tables.

[59] Mortality experience above issue age 75 and attained age 90 were specifically noted as areas where experience should be supplemented.

ultimate values may be used for valuation. The Tables also include both the age-nearest-birthday and age-last-birthday bases of the mortality tables.[60] During 2004, the 2001 CSO Table was adopted by at least 26 states and became the "prevailing" table for tax purposes.[61]

The Model Regulation on the recognition of the 2001 CSO mortality table for use in determining minimum reserve liabilities and nonforfeiture benefits model regulation requires the 2001 CSO Mortality Table to be used in determining minimum reserve standards and minimum nonforfeiture values for policies issued on and after January 1, 2009. For prior years, the company may elect, for any one or more specified plans of insurance, the 2001 CSO Mortality Table as the minimum standard for policies. If the company elects to use the 2001 CSO Mortality Table, it must do so for both valuation and nonforfeiture purposes.

The 2001 CSO Preferred Class Structure Mortality Tables were adopted by the NAIC in September of 2006 in the Model Regulation Permitting the Recognition of Preferred Mortality Tables for use in Determining Minimum Reserve Liabilities. The tables were the outgrowth of an ACLI-sponsored project aimed at alleviating reserve levels for life insurance on an interim basis prior to formal adoption of a principles-based approach to reserves. The proposal introduced preferred mortality rates by splitting the 2001 CSO Table into preferred and residual standard mortality. The Model Regulation is found in Appendix A-815 of the APPM.

The Model Regulation splits the 2001 CSO Table into three nonsmoker and two smoker tables per gender. The 2001 NS VBT was split into super-preferred (SP-NS), preferred (P-NS) and residual standard (RS-NS) classes. The 2001 smoker tables were split into Preferred and Residual Smoker classes. Actuarial Guideline XLII was adopted by the MAIC in September 2007 to provide rules and guidance in the selection of the proper set of mortality tables when a company chooses to use the 2001 CSO Preferred Class Structure Mortality Table.

***Comparison of 2001 CSO Table to 1980 CSO Table* (*ultimate values*)**
In general, reserves are considerably lower under the new table. The following are excerpts from the *Report of the American Academy of Actuaries' Commissioner's Standard* (*CSO*) *Task Force*, June 2002

- For whole life, with the exception of the first duration when the reserve is a one-year preliminary term reserve, reserves based on the proposed 2001 CSO Table are generally 80% to 90% of reserves based on the 1980 CSO Table during the first 25 durations or so. The 2001 CSO Table terminal reserves gradually grade to $1,000 per $1,000 at age 121, while the 1980 CSO Table terminal reserves grade to $1,000 per $1,000 at age 100. This relationship generally holds true for both nonsmoker and composite mortality.
- For whole life reserves using smoker mortality, the same general relationship holds for males. For female smokers, however, the reserves based on the 2001 CSO Table are higher than the reserves based on the 1980 CSO Table at some ages and durations.

[60] In general, see the *Report of the American Academy of Actuaries' Commissioner's Standard (CSO) Task Force*, June 2001, and also the *SOA Report of the Individual Life Insurance Valuation Mortality Task Force*, released March 2001, and the *Report of the American Academy of Actuaries' Commissioner's Standard (CSO) Task Force*, June 2002.
[61] Notice 2004-61 and Notice 2006-95. *See also* Rev. Proc. 2010-28, Section 2.07.

This is because the slope of the 2001 CSO Table female mortality from around age 50 to age 70 is much steeper than the corresponding 1980 CSO Table female mortality.

- For 20-year level-premium term, male reserves based on the 2001 CSO Table are generally 55% to 70% of reserves based on the 1980 CSO Table for issue ages 35, 45, and 55. This reserve ratio drops down to close to 40% at some durations for issue age 25 and increases to nearly 80% for issue age 65. These same general relationships hold for smoker, non- smoker, and composite mortality.

- For female 20-year level premium term, the ratio of the proposed 2001 CSO Table reserves to the 1980 CSO Table reserves varies by issue age and duration more than for males, but is generally less than 100%. The ratio exceeds 100% for female smokers at some issue ages because the slope of the female smoker mortality is much steeper for the 2001 CSO Table than the 1980 CSO Table between ages 50 and 70.

- For Level Premium to age 100 UL, reserves based on the 2001 CSO Table range from about 60% (depending on issue age, gender and smoking status) to 100% of reserves based on the 1980 CSO Table. Generally, by the sixth or seventh policy duration, the policy's cash value takes over as the reserve. From this duration forward, the underlying valuation mortality table does not affect the reserve, so the statutory reserves based on the 2001 CSO Table equal the statutory reserves based on the 1980 CSO Table.

Comparison of Reserves on the 2001 CSO Table to Reserves on the 1980 CSO Table

	After 10 Years	After 20 Years
Overall	78.0%	81.4%
Gender		
Male	75.5%	79.3%
Female	84.6%	86.5%
Plan		
Whole Life	84.8%	86.0%
20-Year Level Premium Term	67.1%	67.5%
UL—Level Premium to Zero	94.3%	98.1%
Age		
25	80.2%	84.1%
35	74.2%	79.1%
45	76.9%	80.5%
55	78.3%	81.1%
65	81.9%	84.2%

This table shows that overall reserves will be lower under the 2001 CSO Table by about 20%. The reduction is larger for males than for females, reflecting the larger reduction in mortality rates for males. Term insurance sees the biggest reductions, followed by whole life. The level premium to 100 UL plan shows the smallest reductions because reserves cannot be less than cash values, and the cash value takes over the reserve, typically by the sixth to eighth duration

under both the old and new tables. When the cash value takes over, reserves are the same under either table. Age 35 has the biggest reductions, while ages 25 and 65 have the smallest reduction.

1 Actuarial Breakout

PART I: DEMONSTRATION OF THE SMOOTHING EFFECT OF RESERVES ON EARNINGS ON A WHOLE LIFE POLICY

Definitions:

x	=	Issue age
${}_tV_x$	=	Terminal reserve, issue age x, end of contract year t
P_x	=	Net level premium, Whole Life (for CRVM, this is the net level reserve for issue age $x-1$)
c_x	=	Claim cost in year, discounted to beginning of year
p_x	=	$1-q_x$
$\ddot{a}_{x+t}$	=	A life annuity due.
*	=	The multiplication sign (as opposed to "x").

Theorem: If experience equals valuation assumptions, the book profit in each financial period will equal zero.

Proof:

$$ {}_tV_x \;=\; A_{x+t} - P_x\ddot{a}_{x+t} \tag{1}$$

$$ {}_{t+1}V_x \;=\; A_{x+t+1} - P_x\ddot{a}_{x+t+1} \tag{2}$$

Therefore,

$$ {}_{t+1}V_x \;=\; \left(A_{x+t} - c_{x+t}\right)\cdot(1+i)/\,p_{x+t} - \left(P_x\right)\cdot\left(\ddot{a}_{x+t}-1\right)\cdot(1+i)/\,p_{x+t},$$

and therefore,

$$ \left(p_{x+t}\right)*\left({}_{t+1}V_x\right) \;=\; \left({}_tV_x - c_{x+t} + P_x\right)*(1+i) \tag{3}$$

Valuation basis book profit equals:

a) Insurance cash flows, i.e., net premiums less claims, $P_x - c_{x+t}$ less

b) Increase in reserve, i.e., $\left(p_{x+t}\right)\cdot\left({}_{t+1}V_x\right) - {}_tV_x$ plus

c) Interest on prior year reserve plus net premiums, less claims, i.e.,

$$\left({}_tV_x + P_x - c_{x+t}\right)\cdot(i)$$

$$ (a)+(b)+(c) \;=\; \left({}_tV_x + P_x - c_{x+t}\right)\cdot(1+i) - \left(p_{x+t}\right)\cdot\left({}_{t+1}V_x\right) \tag{4}$$

Formula (4) equals zero. See formula (3), above. QED

PART IIA: FURTHER ANALYSIS OF CURTATE VS. CONTINUOUS FUNCTIONS

To calculate the increase from curtate reserves to immediate payment of claims (IPC) reserves, one can generally multiply the curtate reserve by any of the following factors per $100 of reserve (all of which reflect the average one-half year of interest time value difference between payment of death benefit at the moment of death vs. at the end of the contract year of death.)

(a) $\frac{i}{2}$;

(b) $\frac{i}{\delta} - 1$; or

(c) $(1+i)^{1/2} - 1$

where i equals the interest rate, and δ is the "force of interest," i.e., $\ln(1+i)$. Formula (b) is the most theoretically accurate. This adjustment reflects the movement of payment of the death benefit from the end of the policy year to at the moment of death.

[This adjustment amounts to an overcorrection whenever the plan of insurance contains an endowment, retirement income, or coupon benefit. The component of the reserve for such non-death benefits should not be affected by a change from curtate to semi-continuous.]

The higher the interest rate, the higher the IPC reserve increment is as a percentage of the curtate reserve.

Semicontinuous Functions

For life insurance reserves with semicontinuous functions one need only make the death benefit continuous to obtain a semicontinuous Beta premium (B_x). It is permissible to use either a curtate expense allowance (EA) or to make the death benefit continuous to obtain a continuous EA. That is done for life and term forms by multiplying the curtate beta premium by i/δ, where i is at the valuation interest rate and $\delta = \ln(1+i)$. For endowment insurance plans, the endowment portion of benefits and premiums is not multiplied by i/δ.

Thus, for whole life and term plans, semicontinuous CRVM terminal reserve, anniversary $t = (i/\delta)\cdot(A_t) - B_x\ddot{a}_{x+t}$.

Fully Continuous Functions

The increment from semicontinuous to fully continuous or discounted continuous functions is more complex. When reserves are positive, such change results in an increase in reserves. One cannot multiply an entire group of reserves by the same factor to obtain the increment. As a simple example, the appropriate formula to use to adjust net valuation premiums for whole life is the following:

$$\frac{\ddot{a}_x}{(\delta - d)/(\delta^2)\cdot(\ddot{a}_x) + (i-\delta)/(\delta^2)\cdot(\ddot{a}_x - 1)},$$

where $\ddot{a}_x$ is a life annuity due.

An approximation to that formula is

$$\frac{\ddot{a}_x}{[.50\cdot(\ddot{a}_x)]+[.50\cdot(\ddot{a}_x-1)]}$$

For life insurance reserves with fully continuous functions, the formula for the whole life expense allowance takes the following form (a bar indicates continuous functions):

$$\left(\bar{P}_{x+1}-\bar{c}_x\right)\left(\bar{a}_{x:1}\right),$$

where $\bar{a}_{x:1}$ equals the present value of a one-year life continuous annuity of $1.00 per year from age x to $x+1$.

$$\bar{B}_x = \overline{NLP}_x + \frac{\overline{EA}}{\bar{a}_x}$$

Here again, it is permitted to use either a curtate EA or fully continuous $\overline{EA}$.

Formula Legend for Fully Continuous Functions

Under a uniform distribution of deaths assumption, ignoring any endowment benefits,

$$\bar{A}_x = A_x\cdot\frac{i}{\delta}$$

$$\bar{a}_{x:1} = AFAC + BFAC\cdot({}_1E_x)$$

where

$$AFAC = \frac{\delta-d}{\delta^2},$$

and

$$BFAC = \frac{i-\delta}{\delta^2}.$$

In general, curtate reserve < semicontinuous reserve < fully continuous reserve. The reasoning is as follows:

- Comparing the semicontinuous reserve to the curtate reserve, because a semicontinuous reserve assumes the death benefit is paid at the moment of death rather than at the end of the policy year, there is no reduction due to the discounting of the death benefit payment from the moment of death to the end of the year.
- Comparing the fully continuous reserve to the semicontinuous reserve, the fully continuous reserve assumes the premiums are paid uniformly throughout the year, instead of annually in advance. The time value associated with the assumed delay of those premiums necessitates a higher reserve.

PART IIB: DISCUSSION OF COMMISSIONERS RESERVE VALUATION METHOD (CRVM) FOR TRADITIONAL LIFE INSURANCE CONTRACTS

The tax basis life insurance reserve must follow CRVM as the NAIC defines it, as of the issue date of the contract. Thus it is important to understand the basic CRVM principles for conventional life insurance products.

The calculation methodology is to establish an expense assumption [expense allowance, or EA] at the issue date of the policy to reflect the initial expense of selling, underwriting, and issuing the policy. To the net level premium (NLP_x), an expense premium (EP) is added which in effect pays for the EA. Thus the net valuation premium for any contract year equals $NLP_x + EP$.

EA is defined as the lesser of (i) or (ii), where:

(i) equals the net level premium for the policy at one year higher than the issue age (x) of the insured (NLP_{x+1}), minus a one-year term insurance premium at the issue age (c_x).

(ii) equals quantity (i), above, for a 20-payment life policy.

Thus it is not permitted for EA for any plan to exceed the EA for 20-payment life. Additionally, Actuarial Guideline XXI stipulates that (i) cannot be negative.

In general, in the current environment, except for Option 2 Universal Life and certain funeral [pre-need] business, criterion (ii) rarely ever comes into play.

Thus, in international actuarial notation, except where otherwise noted, using curtate functions, we have the following:

A_x = Present value of future benefits (can represent whole life, limited payment life, term, or endowment, as long as plan is level premium and level benefit) at the issue date. Similarly, $\ddot{a}_x$ equals present value of $1.00 of future yearly premiums from the issue date for the balance of the premium-paying period.

A_{x+t} = Present value of future benefits at end of year *t*. Similarly, $\ddot{a}_{x+t}$ equals present value of $1.00 of future yearly premiums from anniversary *t* (i.e., beginning of year $t+1$) for the balance of the premium-paying period.

$$EA = P_{x+1} - c_x$$

$$B_x = \text{Beta Premium}$$

$$B_x = NLP_x + EA / \ddot{a}_x$$

Thus terminal reserve, anniversary $t = A_{x+t} - B_x \ddot{a}_{x+t}$.

If we ignore the 20-Pay Life limitation in (ii), above, it can be shown that $B_x = NLP_{x+1}$.

Proof:

$$B_x = \frac{A_x + EA}{\ddot{a}_x} \quad \text{where} \quad EA = B_x - c_x$$

$$B_x = \frac{A_x}{\ddot{a}_x} + \frac{B_x - c_x}{\ddot{a}_x}$$

$$B_x\,\ddot{a}_x - B_x = A_x - c_x$$

$$B_x(\ddot{a}_x - 1) = A_x - c_x$$

$$B_x\,{}_1E_x\ddot{a}_{x+1} = {}_1E_xA_{x+1}$$

$$B_x = \frac{Ax+1}{\ddot{a}_{x+1}} = P_{x+1}$$

Note here that, given this definition of B_x, the first-year terminal reserve is zero. That is,

$${}_1V = A_{x+1} - B_x \cdot \ddot{a}_{x+1} = A_{x+1} - \frac{A_{x+1}}{\ddot{a}_{x+1}} \cdot \ddot{a}_{x+1} = 0. \qquad \text{QED}$$

For an application of these formulas to a numerical example, please refer to Part VII, below.

PART III: DISCUSSION OF COMMISSIONERS RESERVE VALUATION METHOD (CRVM) FOR FLEXIBLE PREMIUM UNIVERSAL LIFE INSURANCE CONTRACTS

The Universal Life Model Regulation accommodates flexible premium universal life insurance CRVM reserve calculations as follows:

Calculate the Guaranteed Maturity Premium (GMP). The GMP is the premium that, under the base policy guarantees, will provide death benefits for the life of the policy and mature the policy for its guaranteed maturity amount.

Calculate the Guaranteed Maturity Fund (GMF) as of the valuation date. The GMF is the Account Value (Policy Value) that would be in effect if the GMP were paid on schedule and the policy performed according to its guarantees to date.

Calculate "R", equal to the ratio of Policy Value (PV) to the GMF at the valuation date, not to exceed 1.000. The reserve is then calculated in one of two ways, depending on the value of *R*:

- If $R < 1$, the reserve equals $(V) \times (R)$, where *V* equals the reserve for the policy under its underlying traditional plan of insurance (for example, endowment at 95). The underlying traditional plan of insurance is that plan that provides the death benefits

and maturity value under which the GMF and GMP values are calculated.

- If $R = 1$, then $PV \geq GMF$. Beginning with PV at the valuation date, accumulate it forward under the guaranteed interest rate, cost of insurance charges, and expense charges, and assume future GMPs are all paid on schedule. That will result in a pattern of future death benefits and maturity benefits that can then be present valued into a Present Value of Future Benefits (PVFB). The final reserve takes the following form:

$$Reserve = PVFB - PV(NVP's),$$

where NVP = the CRVM net valuation premium under the underlying traditional plan of insurance.

PART IV: CLAIM RESERVE TABLE CALCULATION

Table 1.3, below, illustrates how a disability income reserve for a disabled life is calculated. A zero interest rate is assumed for simplicity's sake. The claim reserve is for amounts not yet due (Annual Statement, Exhibit 6, Claim Reserve), while the claim liability is for amounts already past due (Annual Statement, Exhibit 8, Part 1).

Column (1) would generally come from a published table or from company experience. The 1,000,000 at "Month Zero" reflects those initially becoming disabled. Column (2) is the resultant by dividing survivors in a given month by the original 1,000,000 disabled lives, i.e., $\frac{col(1)}{1{,}000{,}000}$.

We generate a reserve for Present Value of Amounts Not Yet Due (PVANYD) beginning in col (3). Col (3) is the sum of col (2) from a given month to the end of the table (i.e., month 12). It reflects, for a person who has just become disabled, the expected value of monthly disability payments beginning at a given month (m) and ending at month 12. For example, $col(3)_{10} = col(2)_{10} + col(2)_{11} + col(2)_{12}$.

In col (4), to obtain the final reserve for PVANYD, divide col (3) by col (2) and subtract 100% (for benefits already paid in the current month). For example, if claimant is at the beginning of month 10, then $col(4)_{10} = \frac{col(3)_{10}}{col(2)_{10}} - 1$.

TABLE 1.3

PVANYD Per $1.00 Per Month Disability Income
12-Month Disability Monthly Income Benefit

Months (M) From Disablement	(1) Surviving Disableds	(2) Survivorship Rate	(3) Sum From Mo. To 12 Months	(4) Reserve
0	1,000,000	100.00%	853.42%	753.42%
1	880,000	88.00%	753.42%	756.16%
2	810,000	81.00%	665.42%	721.51%
3	760,000	76.00%	584.42%	668.97%
4	714,400	71.44%	508.42%	611.68%
5	671,536	67.15%	436.98%	550.72%
6	631,244	63.12%	369.83%	485.87%
7	593,369	59.34%	306.70%	416.88%
8	557,767	55.78%	247.37%	343.49%
9	524,301	52.43%	191.59%	265.42%
10	492,843	49.28%	139.16%	182.36%
11	463,272	46.33%	89.87%	94.00%
12	435,476	43.55%	43.55%	0.00%

PART V: DEVELOPMENT TABLE METHODOLOGY FOR ESTABLISHING RESERVES

Tables 1.4 and 1.5 below illustrate the technique of establishment of reserves by the development table (or lag) method. This is a widely used approach in the property/casualty loss reserve establishment area, for claims where loss expenses of policyholders may not be precisely determinable at time of incurral or are incurred over an extended time period beyond the incurral date, and thus claim payments from the insurance company tend to be incurred over a similar, or more extended, period. Table 1.4 shows the claim data assembled in a manner so as to make the reserve calculation straightforward. Thus, for example, for a claim incurred in January, the company paid 10.00 in January. In February an additional 15.00 was paid for that same January claim incurral, so that total payments by February 28 were the 25.00 shown.

The development table shown below illustrates the loss payment pattern where the claim payment pattern is reasonably "complete" by the 12th month from the incurral date. That is, virtually no additional claim payments are expected beyond that point. The length of the "claim tail" varies considerably by the type of risk insured.

TABLE 1.4

Inc Mo	Paid Month												(1) Sum Of Diagonals	(2) Remove December
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1	10	25	60	80	100	120	140	155	180	195	200	200		
2		12	30	72	96	120	144	168	186	216	234	240	200	0
3			14	36	86	115	144	173	202	223	259	281	440	200
4				17	43	104	138	173	207	242	268	311	710	429
5					21	52	124	166	207	249	290	321	966	655
6						25	62	149	199	249	299	348	1153	832
7							30	75	179	239	299	358	1390	1042
8								36	90	215	287	358	1550	1192
9									43	107	258	344	1650	1292
10										52	129	310	1664	1320
11											62	155	1557	1247
12												74	804	649
													396	322

Given the input in the "Paid Month" columns, we then proceed to compile the information in such a form as to generate factors for loss reserve calculation purposes.

Column (1) equals the "diagonal sum" of accumulated payments that represent claims paid by "*n*" months from the incurral date. For example, the sum of the above shaded numbers represents the sum of payments made by the fifth month from incurral (1,650). Thus column (1) collects the total payments made to date in the order of months from incurral date. Thus for example, 396 was the total of payments made in the month of incurral; 804 was the total of payments made by the month following the month of incurral (incurral month plus 1); 1,557 by incurral month plus 2, etc.

Column (2) equals column (1) minus the December number. For example, 1,292 equals 1650 minus 358. Thus column (2) removes the most recent experience month (December, in this case), in order that col (2) can serve as a denominator to obtain a weighted average of the percentage increase in accumulated claim payments in Table 1.4, versus the 1550 accumulated payments for the sixth month of incurral by the next month end. Thus 1550 divided by 1292, minus 1.00 (i.e., 19.97%) is a historical volume-weighted average of the estimated percentage growth in accumulated claim payments from end of month 5 to end of month 6.

In Table 1.5, col (1) equals col (1) from Table 1.4, inverted to be in descending order of "*n*" months from incurral date. Similarly, Table 1.5 col (2) equals Table 1.4 col (2), inverted to be in descending order of "*n*" months from incurral date.

Thus Table 1.5 is taking columns (1) and (2) from Table 1.4 and inverting them, so as to put them in the reverse order of incurral.

Next we obtain the col (3) completion factor to "connect" accumulated claims from "*k*" months from incurral date to "$k+1$" months from incurral date. This represents the estimated percentage increase in accumulated claim payments from end of month k to end of month

$k+1$. "Completion factor (k)" $= \frac{col(1)_{k+1}}{col(2)_k}$.

For example, the quotient of 804 over 322, shown in column (3) as 2.497, reflects claims paid in the month incurred, for incurrals of January through November (322), relative to the claim payments on that same block of January through November incurrals by the end of "incurral month plus 1", i.e., 804. The resulting quotient in column (3) is 2.497, i.e., the estimated total accumulated claim payments by end of month 2 per dollar of accumulated claim payments by end of month $k = 1$.

Column (4) represents the total estimated "claim payments to completion" as a percentage of current accumulated claims from end of month "k" to the end of the "claim tail." That is, column (4) is a cumulative product from the "complete month (month 11 in this case)" going backward in time to the incurred month, to obtain the ratio of estimated total eventual claim payments to claim payments to date. Expressed in formula form:

$$Col\ (4)_t\ =\ Col\ (4)_{t+1} \times Col\ (3)_t$$

That "final" set of factors in column (4) can then be applied to claim payments to date by incurral month (col (6)), to get the estimate of total eventually expected claims (col (7)). That is, $col(7)\ =\ col(4) \times col(6)$. Subtracting col (6) from col (7) gives us the reserve in col (8). The total reserve for that product line is the sum shown over all incurral months, or $4,606.

TABLE 1.5

Months Since Incurral	Compilation of Completion Factors Reserve Calculation @ Dec. 31							
	(1)	(2)	(3) Completion Factors	(4)	(5) Month Incurred	(6) Paid To	(7) Total Expected	(8) Reserve For PVANYD
			MO/MO					
1	396	322	2.497	19.965	Dec	74	1,477	1,403
2	804	649	2.399	7.996	Nov	155	1,239	1,084
3	1557	1247	1.334	3.333	Oct	310	1,033	723
4	1664	1320	1.250	2.498	Sep	344	859	515
5	1650	1292	1.200	1.998	Aug	358	715	357
6	1550	1192	1.166	1.666	Jul	358	596	238
7	1390	1042	1.107	1.428	Jun	348	497	149
8	1153	832	1.161	1.291	May	321	414	93
9	966	655	1.084	1.112	Apr	311	346	35
10	710	429	1.026	1.026	Mar	281	288	7
11	440	200	1.000	1.000	Feb & Prior	240	240	–
12	200	0				3,100	7,706	4,606

The above volume-weighted approach is by no means the only approach to the use of development tables to obtain a reasonable loss reserve level. It is widely accepted that there is no purely mechanical methodology for establishing loss reserves. One other approach to obtaining the completion factors in column (3), for example, is to take the middle three of the most recent five months of quotients. [Example: As Table 1.4 illustrates, the most recent

quotient for month 2 divided by month 1, for example, is 155/62. Take the five most recent quotients: 155/62, 129/52, 107/43, 90/36, and 75/30. Their respective decimal equivalents are 2.500, 2.481, 2.488, 2.500, and 2.500. Throw out both the highest and the lowest results, and take the average of the middle three (i.e., the average of 2.488, 2.500, and 2.500, or 2.496). Place the 2.496 in column (3), month 1.] This "middle three of latest five" approach would reflect the actuary's sense that:

- Recent experience is relatively more credible
- It is reasonable to reject "outliers" as aberrations, and therefore use more middle-ground factors.

Development tables must be used with care. Some items that would tend to distort the pure application of results would be:

- A change of method, for example, a change in the definition of "incurred date" in the input records
- A slowdown or speedup of claim payment processing due to employee turnover, change of computer systems, etc.
- The most recent experience being statistically sparse, showing very small numbers, and not amenable to being grossed up by a very large factor (such as the factor of 19.965 in Table 1.5, above). Other techniques exist for such recent incurrals. One such method is a historical loss ratio applied to premiums on the most recent claim incurral months. Further, to a great extent, for the most recent incurral month many claims that have been incurred may be as yet unreported as of the valuation date, which makes the accuracy of a development table somewhat questionable in this particular segment of the business.

Note: On this last point, the term "IBNR," or "incurred but not reported" reserve, merits discussion. The term "IBNR" is commonly used in the industry and can have different meanings depending on who uses the term. In the property/casualty industry it can sometimes refer to virtually the entire loss reserve; at other times it can refer to those claims not yet reported to the insurance company.

PART VI: DISCUSSION OF COMMISSIONERS ANNUITY RESERVE VALUATION METHOD (CARVM) FOR TRADITIONAL FIXED ANNUITY CONTRACTS

The tax basis annuity reserve must follow CARVM as the NAIC defines it, for most annuity products, as of the issue date of the contract. Thus it is important to understand the basic CARVM principles. A simplified description of the CARVM calculation is below.

The application of CARVM under the Standard Valuation Law on a simple fixed deferred annuity typically takes place in several steps, as follows:

Step 1: Accumulate the current fund value at the valuation date to the next anniversary (anniversary 1), subtract surrender charges, and discount that value back to the valuation date to get the present value. Call this "Value 1."

Step 2: Do the same for the anniversary following the anniversary used in Step 1

(anniversary 2). That is, take the current fund value at the valuation date and accumulate it to anniversary 2, subtract surrender charges, and discount that value back to the valuation date to get the present value. Call this "Value 2."

Step 3: Repeat this process for subsequent anniversaries, so that you have a series of values, "Value 1" to "Value *n*." Take the greatest of those present values, and that is the CARVM reserve.

Step 4: Compare the Step 3 value to the net surrender value, and take the greater value.

Detailed discussion of CARVM for other annuity products is beyond the scope of this book. Refer to the respective actuarial guidelines.

PART VII: NUMERICAL EXAMPLE OF CRVM

This example additionally illustrates how traditional mortality tables have been constructed.

Table 1.6: Five-Year Level Term example
Assumes Curtate Functions

- Death benefits payable at end of year (End Yr)
- Premium payments beginning of year (Beg.Yr)

This table consists of several sub-tables A through F.

TABLE 1.6 – Subtable A

Mortality Table Face Amount = $1,000

Attained Age	(1) Survivors, Beg.Year	(2) Number Dying	(3) Mortality Rate Per 1000	(4) Survivors, End Year	Remarks
50	1,000.00	2.51	2.51	997.49	
51	997.49	2.63	2.64	994.86	
52	994.86	2.79	2.80	992.07	
53	992.07	2.99	3.01	989.08	
54	989.08	3.21	3.25	985.87	
55	985.87				
(1) Given (2) Equals (1) – (4) (3) Equals (2)*1000/(1)					
Valuation Interest Rate: 4.50%					Given
Equivalent Discount Factor (D) 0.956938					Equals 1/(1.045)

TABLE 1.6 — Subtable B

Calculation of "Annuity Due" of $1.00 Per Year

Attained Age	(1) Survivors Beg. Year	(2) Discount Factor	(3) Present Value	Remarks
50	1,000.00	1.00000	1.0000	
51	997.49	0.95694	0.9545	
52	994.86	0.91573	0.9110	
53	992.07	0.87630	0.8693	
54	989.08	0.83856	0.8294	
Present value of $1.00 per year			4.5643	"Annuity Due"

(1) From Subtable A

(2) Equals $D*\left(\text{col}(2)_{\text{yr}-1}\right)$

(3) Equals col(1) * col(2)

TABLE 1.6 — Subtable C

Calculation of Net Single Premium (Nsp) for the Plan

Attained Age	(1) Survivors Beg. Year	(2) Number Dying	(3) Discount Factor	(4) PV(Death Benefits)	Remarks
50	1,000.00	2.51	0.95694	2.4019	
51	997.49	2.63	0.91573	2.4084	
52	994.86	2.79	0.87630	2.4449	
53	992.07	2.99	0.83856	2.5073	
54	989.08	3.21	0.80245	2.5759	
55	985.87				
Net Single Premium				12.3383	"NSP"
(1) & (2) Equal cols (1) & (2) From Subtable A (3) (Subtable B, col(2))*D (4) Equals col(2)*col(3)					

TABLE 1.6 – Subtable D

Net Level Annual Premium (NLP)

$$= \frac{C}{B} = \frac{12.3383}{4.5643} = 2.7032 \qquad \text{Equals } \frac{NSP}{Annuity\ Due}$$

TABLE 1.6 – Subtable E

CRVM Renewal Premium (CRVP)

$$= \frac{12.3383 - 2.4019}{4.5643 - 1.0000} = 2.7877 \qquad \text{Equals } \frac{NSP - (4)_1 \text{ (from subtable C)}}{Annuity\ Due - 1}$$

TABLE 1.6 — SUBTABLE F

Reserves: Per 1,000 In Force

Policy Year	Attained Age	(1) Net Level Reserve	(2) CRVM Reserve
0	50	–	–
1	51	0.32	–
2	52	0.52	0.28
3	53	0.56	0.40
4	54	0.40	0.32
5	55	(0.00)	(0.00)

(1) Equals $\left[\left((\text{col 1})_{yr-1} + \text{NLP}\right) \times (1.045) - \text{Subtable A, col(3)}\right] \Big/ \left(1 - .001 \times \left(\text{Subtable A, col (3)}\right)\right)$

(2) Equals $\left[\left((\text{col 2})_{yr-1} + CRVP\right) \times (1.045) - \text{Subtable A, col(3)}\right] \Big/ \left(1 - .001 \times \left(\text{Subtable A, col (3)}\right)\right)$

except that, in year 1, (2) = 0

CHAPTER FIFTEEN

15

Modified Guaranteed Annuities

15.1 DESCRIPTION OF PRODUCT

Modified guaranteed annuities (MGAs), also known as market-value-adjusted (MVA) annuities (MVAs), are a variation of a traditional single premium deferred annuity. Under the terms of a typical modified guaranteed annuity contract, a policyholder selects a period for which interest rates are guaranteed (Guarantee Period). At the end of a Guarantee Period, a new period can be chosen or, if a new period is not actively chosen, the same period is automatically renewed. Based on the duration of the guarantee, an interest rate is fixed for the guarantee period. In addition, the contract guarantees a minimum interest rate that applies on renewal.

If the contract holder keeps the MGA in force for the entire Guarantee Period, the account value at the end of the Guarantee Period is equal to the single premium accumulated at the guaranteed interest rate. Typically no surrender charge is imposed if a contract is surrendered at the end of the Guarantee Period (except for some relatively short Guarantee Periods, such as 1 or 2 years).[1]

However, if a surrender takes place prior to the end of the Guarantee Period, the account value is subject to a market value adjustment (either positive or negative), and the net surrender value will equal the adjusted account value minus a surrender charge, if any.

These market value adjustments to the account value do not depend directly on the value of the underlying assets, although the investment department of an insurer will generally attempt to manage the investments to have about the same volatility as the market value adjustments of the account values in the MGA block of business. The market value adjustment formula used in MGA contracts to adjust the account value to market value approximates the change in market value of a zero coupon, non-callable bond that matures at the end of the MGA Guarantee Period.

[1] Assume a contract with a surrender charge of 7% in the first year declining 1% annually. For a typical MVA contract, if the initial guarantee period is 5 years, and the contract is surrendered at the end of the 5th year, no surrender penalty applies during the "window period" (typically 30 days) surrounding the 5th anniversary. If the contract is renewed for an additional 5 years, a 2% surrender charge (corresponding to the 6th contract year) is reinstated beginning when the window period ends, even though, had the contract been surrendered at the 5th anniversary, no surrender charge would have applied.

However, the typical market value adjustment formula is simpler. See the Actuarial Breakout, Part I, for a typical formula. In any event, under a market value adjustment formula, if interest rates rise over the Guarantee Period, the surrender value will fall. Conversely, if interest rates fall over that period, the surrender value will increase. The market value adjustment allows a company to mitigate the losses in assets that must be sold to pay surrender benefits if a policy is surrendered prior to the end of the Guarantee Period. The advantage of a contract with an MVA feature is that the company can more readily invest in longer duration supporting assets and thereby earn a greater yield rate, which in turn can be at least partly passed on to the contract holder.

MVA annuities can be issued either in the General Account or Separate Account. If issued in the Separate Account they are Modified Guaranteed Contracts (MGCs) subject to the provisions of Section 817A. The balance of this chapter refers to MGCs unless otherwise noted.

15.2 NATURE OF STATUTORY RESERVES ESTABLISHED FOR MGA CONTRACTS (MGCS) AND MVA FUND OPTIONS

The NAIC Model Regulation on Modified Guaranteed Annuities (MGA Model Regulation) applies to MGAs whose assets are held in a separate account. The NAIC Accounting Practices and Procedures Manual (APPM) generally adopts the MGA Model Regulation in SSAP Appendix A-255.[2] Under the MGA Model Regulation, liabilities are valued using market rates of interest in the separate account. The MGA Model Regulation further provides that investments of the separate account must be valued at their market value on the date of valuation or at amortized cost if it approximates market value.[3] Excerpts from the MGA Model Regulation can be found in the Appendix to this chapter.

Some states may allow a company to value liabilities (and assets) in a separate account at book value. Assets and liabilities supporting MGAs held in the general account are valued at book. The MGA Model Regulation does not address the treatment of MGAs held in the general account, and there is no special NAIC guidance on how, under CARVM, to compute general account reserves on MGAs.

Section 817A, as discussed below, does not apply to MGAs that are not held in a separate account or to MGAs that use book value accounting in a separate account.

15.2.1 GENERAL ACCOUNT RESERVES

As noted above, there is no NAIC method for reserves for MGAs accounted for in the general account (or at book value in the separate account). An example of a state regulation for accounting for these contracts in the general account or at book value is New York Regulation 127. Under this regulation, the reserve for these contracts is generally the greater of:

- The cash value *excluding* the effect of the market value adjustment, or

[2] *See* 56, ¶ 26.
[3] Model Regulation, § 9(C).

- The present value of the contract benefits that are guaranteed using Type B interest rates.[4]

Market value adjustments for general account contracts should be ignored in calculating the reserve both at the date of valuation and when calculating future values because the assets supporting the reserve are not revalued to market under statutory accounting principles. Adjusting the liabilities to take into account interest rate changes without also adjusting the assets would be inconsistent.

15.2.2 SEPARATE ACCOUNT RESERVES

The MGA Model Regulation defines reserves for an MGA held in a separate account.[5] The MGA Model Regulation defines an MGA contract as a deferred annuity (individual or group) the underlying assets of which must be held in a separate account, and the values of which are guaranteed if held for specified periods. The contract contains nonforfeiture values that are based on a market-value-adjustment formula if held for shorter periods. The formula may or may not reflect the value of the assets held in the separate account.[6]

The Commissioners Annuity Reserve Valuation Method (CARVM) defines reserves as the greatest present value of future guaranteed benefits. Actuarial Guideline XXXIII principles as modified by the MGA Model Regulation apply to determine the CARVM reserve for MGAs.[7] The MGA Model Regulation gives only broad guidance on how to calculate MGA reserves. There is no specified interest rate in the MGA Model Regulation to determine the present value of future benefits. Instead, the MGA Model Regulation provides that the separate account liability must take into account actuarial procedures that recognize:

- That assets of the separate account are based on market values
- The variable nature of the benefits provided, and
- Any mortality guarantees.

In addition, the MGA Model Regulation requires that the market value adjustment formula, the interest guarantees, and the degree to which projected cash flows of assets and liabilities are matched must also be considered.[8]

Typically, the resulting CARVM reserve for an MGA is equal to the present value of the projected guaranteed net surrender value at the earliest policy anniversary date that the surrender charges expire. If there are no surrender charges, the reserve is typically equal to the fund value (account value), unless the guaranteed interest rate exceeds the valuation interest rate. To

[4] Under this regulation the ability of a company to use the above approach is contingent on its submission to the New York Insurance Department of other information, including evidential reserve adequacy information, and approval by the Department. Absent such submission and approval, the primary required adjustment is the substitution of the Type C interest rate for the Type B interest rate.
[5] Section 8.
[6] Section 4.A.
[7] Revised Actuarial Guideline XXXIII states that it applies to "all annuity contracts subject to CARVM" but further clarifies that in the event an actuarial guideline or regulation dealing with reserves is developed for a specific annuity product design, the product-specific guideline or regulation takes precedence.
[8] Section 8.

determine the greatest present value, a current assumption valuation interest rate is used. The current assumption valuation interest rate varies among companies. Some of the interest rates used include the annual market yield of the underlying assets, the yield as adjusted for expenses or adverse deviation, the Moody's Corporate Bond Yield Average for the month preceding the valuation date, the current credited rate, or some other rate.

As an example of interest rates used to measure separate account liabilities, New York requires that reserves for contracts with underlying assets held in a separate account and valued at market be valued using one of the following two rates, which must be consistently applied:[9]

- The annual market yield of the underlying assets, reduced by (i) investment expenses, (ii) 2.5% for high-yield obligations, and (iii) .25% for adverse deviation.
- The Moody's Corporate Bond Yield Average for the month ending on or immediately preceding the valuation date.

A company is required to hold the greater of the CARVM (formula) reserve and the market-value-adjusted net surrender value of the policy. Some companies do the comparison of the net surrender value to the contract reserve on an aggregate basis rather than contract-by-contract because of the aggregate nature of the interest rate that is used to determine reserves. See the discussion in Subsections 15.3.5 and 15.3.6.

Since assets are marked to market and liabilities are determined by formula, there may be net income or net loss in the separate account. This difference may also cause the value of the CARVM liability (or market-value-adjusted surrender value) to exceed the value of the assets. If the value of liabilities exceeds the value of assets, the company must contribute additional assets into the separate account.[10]

The reasons that the value of assets and liabilities do not move in a 1:1 relationship vary. First, the market-value-adjustment formula to the cash surrender value may not reflect the value of assets held in the separate account.[11] Even if the formula reflects the value of the assets, in all likelihood it will not do so perfectly. Second, the value of the bonds may change as the result of credit risks. Third, the interest rate used to calculate reserves applies to all contracts in the separate account, regardless of the issue date because the pool of investments supports all of the reserves. Assets, however, are valued individually. Fourth, the duration of the assets and liabilities will differ.[12] Thus, a change in interest rates affects the value of the liabilities and assets in different amounts. Fifth, the interest rate used to determine the reserve may take into account factors other than the interest rate of the bond portfolio supporting the liabilities. Finally, liability values may be a function of an interest rate that lags the valuation date. For example, a

[9] Consistent with the NAIC Model Regulation, the reserve cannot be less than the cash surrender value at the date of valuation *including* the effect of the MVA.
[10] NAIC Model Regulation, § 8.
[11] NAIC Model Regulation, § 7.A.3.
[12] Duration measures the sensitivity of the value of an asset to changes in interest rates (i.e., duration is the negative of the slope of the price function centered at the current price and divided by the price). A positive duration means that when interest rates go up, the market value of the instrument goes down. For example, a bond priced at 100 and with duration of 5 would be worth approximately 105 if rates fell by 1%. There are a number of variations on the general definition of duration.

company may use a Moody's corporate bond index rate as of 30 days prior to the valuation date for liability valuation purposes. However, asset values in the separate account would be valued using current market values.

The CARVM tax reserve may use a different interest rate than that used for statutory valuation. Therefore, the federally prescribed reserve (FPR, i.e., the tax reserve prior to comparison with the net surrender value or statutory reserve) may be less than or greater than the corresponding CARVM statutory reserve. To this extent, the income (or loss) resulting from marking assets and liabilities to market may be different for tax purposes than for statutory purposes.

15.3 TAX RESERVE ISSUES

15.3.1 SECTION 817A GENERALLY

Section 817A[13] provides special rules for modified guaranteed contracts (MGCs), effective for years after December 31, 1995.[14] An MGC is defined for tax purposes as an annuity, life insurance, or pension plan contract (other than a variable contract described in Section 817) under which all or parts of the amounts received under the contract are allocated to a segregated account. Assets and reserves in the segregated account must be valued from time to time with reference to market values for annual statement purposes. Further, an MGC must provide either for a net surrender value or for a policyholder's fund (as defined in Section 807(e)(1)). If only a portion of a contract is not described in Section 817, that portion is treated as a separate contract for purposes of applying Section 817A.[15]

Like reserves for variable annuity contracts, reserves under MGAs that qualify as MGCs (other than MGAs issued to pension plans) generally qualify as life insurance reserves.[16] To qualify as a life insurance reserve, a reserve, among other requirements, must use an assumed rate of interest.[17] If the interest rate used for reserves depends on the market value of the underlying assets, an issue may arise as to whether that interest rate constitutes an assumed rate of interest. Section 817A(c) resolves this issue by providing that, for purposes of defining whether a reserve on an MGA is a life insurance reserve, an interest rate determined with reference to a market rate of interest is an "assumed rate of interest."

Since the reserves under most MGCs are life insurance reserves, the rules in Section 807(d) apply to determine the tax reserve amount, except as modified by Section 817A. Therefore, even

[13]Because a modified guaranteed contract does not reflect the actual investment return of the assets in the separate account but rather is based on a formula, the contract does not qualify as a variable annuity under § 817(d) even if accounted for in a separate account.

[14] Section 817A was enacted as part of the Small Business Job Protection Act passed in August 1996. P.L. 104-188, § 1612. Neither the House bill nor the Senate version contained the MGC legislation. Rather, the provision was added to the legislation during conference. As such, there is no explanation in either the House or Senate Report, although the Conference Report virtually repeats the explanation of the provision from earlier attempts at enactment. H.R. Conf. Rep. No. 737, 104th Cong., 2d Sess., 312-316 (1996).

[15] I.R.C. § 817A(d); § 1.817A-1(a)(1) flush language.

[16] Treas. Reg. § 1.801-4(d)(2) provides that the reserves held with respect to annuity contracts (including variable annuity contracts) qualify as life insurance reserves provided that the requirements of current § 816(b) are met. *See also* Treas. Reg. § 1.801-7(a)(2).

[17] I.R.C. § 816(b)(1)(A).

though an MGC falls within the scope of Section 817A, the tax reserve method prescribed by Section 807(d)(3)(A)(ii) applies to these contracts. Section 807(d)(3)(A)(ii) provides that CARVM applies in the case of an annuity contract covered by CARVM. CARVM is the method prescribed by the NAIC in effect at the date of the issuance of the contract.[18] Thus, the NAIC method in the MGA Model Regulation applies to determine the method for computing a tax reserve for an MGA held in a separate account and valued at market value. As noted above, the MGA Model Regulation gives only broad guidance on how to calculate MGA reserves. If there are no permanent life annuity purchase rates (for example, as in some group pension contracts), the reserves may be computed under Section 807(c)(3) or Section 807(c)(4).

15.3.2 INTEREST RATE UNDER SECTION 817A FOR TAX RESERVES AND FOR COMPANY SHARE

Section 817A(e)(2) gives the IRS the authority to issue regulations to determine the interest rates for computing reserves under Section 807(c)(1) or 807(c)(3), and for computing required interest to determine the company share of tax-exempt interest and dividends under Section 812 "in a manner appropriate for MGCs."[19]

15.3.3 PROPOSED AND FINAL REGULATIONS

The Treasury first issued guidance on Section 817A in Notice 97-32,[20] discussed below, which was revoked as of May 7, 2003. However, the Notice was permitted to continue to be used by taxpayers, if they wished, through the effective date of the final regulations (2003).

On June 3, 2002, the IRS published proposed regulations that defined the interest rate insurance companies use to determine tax reserves and required interest for MGCs. Final regulations, which were issued May 7, 2003,[21] generally adopt the provisions in the proposed regulations. Under the final regulations, taxpayers have the right to apply the final regulations retroactively for all tax years beginning after December 31, 1995, the effective date of Section 817A. Otherwise the regulations are effective May 7, 2003. It is not clear how to apply the interest rates retroactively if 1996, for example, is closed for tax purposes. The regulations do not address this. Presumably, a company would go back to the earliest open year and apply the corresponding reserve interest rates for that year.

The regulations define the interest rate for reserves and for required interest for non-equity-indexed MGCs. The proposed regulations do not take a position as to the appropriate interest rate for an equity-indexed MGC. An equity-indexed modified contract is an MGC that provides a return during or at the end of the temporary guarantee period based on the performance of stocks, other equity instruments, or equity-based derivatives.

For a non-equity-indexed MGC during the temporary guarantee period, the applicable interest rate for computing reserves under either Section 807(c)(1) or 807(c)(3) is the "current market

[18] I.R.C. § 807(d)(3)(B)(ii).
[19] 1996 Blue Book, at 69. A similar explanation appeared in the Technical Explanation of the Tax Simplification Act of 1993, Joint Committee Print, explaining an earlier version of § 817A that was not, however, enacted into law. JCS-1-93 (Jan. 8, 1993), at 195-198.
[20] 1997-1 C.B. 420.
[21] TD 9058 (May 6, 2003).

rate." Thus it is a rate reflecting the interest rate environment as of the valuation date. This is an exception to the general rule in Section 807(d) that the valuation interest rate be based on the contract's issue year.

The "current market rate" (whether a contract was issued in that tax year or a previous one) is the "appropriate Treasury constant maturity (TCM) interest rate" published by the Federal Reserve Board for the month containing the last day of the insurer's taxable year. The "appropriate rate" is that rate published for Treasury securities with the shortest published maturity that is greater than (or equal to) the remaining duration of the current temporary guarantee period under the MGC. For periods after the end of the temporary guarantee period (beyond the "window"), the interest rate is not modified by the use of the TCM rate. Thus, for periods beyond the window, the reserve interest rate is the applicable federal interest rate (AFR), since there is no prevailing state assumed interest rate (PSAR). For reserves calculated under Section 807(c)(3), the greater of the AFR or pricing interest rate (i.e., the rate used in guaranteeing the benefit) must be used.

The regulations provide the following examples.[22]

Example 1

Insurance Company (IC) issues an MGC on August 1 of 1996 that gives rise to life insurance reserves. The Contract guarantees that interest will be credited at 8 percent per year for the first 8 contract years and 4 percent per year thereafter. During the 8-year temporary guarantee period, the Contract provides for a market value adjustment based on changes in a published bond index and not on the performance of stocks, other equity instruments or equity-based derivatives. IC has elected application of the regulations for 1996 and after. The 10-year Treasury constant maturity interest rate published for December of 1996 was 6.30 percent. The next shortest maturity published for Treasury constant maturity interest rates is 7 years. As of the end of 1996, the remaining duration of the temporary guarantee period for the Contract was 7 years and 7 months.

IC must use a discount interest rate of 6.30 percent for the temporary guarantee period. The interest rate beyond the window to be used in computing required interest under Section 812(b)(2)(A) for 1996 issues (i.e., the AFR for 1996) is 6.63% percent. This 6.63 percent discount rate applicable to periods outside the 8-year temporary guarantee period is determined under Sections 807(c)(3), 807(d)(2)(B), and 812(b)(2)(A), without regard to the current market rate.

Example 2

Assume the same facts as in Example 1 except that it is now the last day of 1998. The remaining duration of the temporary guarantee period under the Contract is now 5 years and 7 months. The 7-year Treasury constant maturity interest rate published for December of 1998 was 4.65 percent. The next shortest duration published for Treasury constant maturity interest rates is 5 years. A discount rate of 4.65 percent is used for the remaining duration of the temporary guarantee period for the purpose of determining a reserve under Section 807(d) and for the purpose of determining required interest under Section 812(b)(2)(A).

[22] Treas. Reg. § 1.817A-1(b)(5).

Example 3

Assume the same facts as in Example 1 except that it is now the last day of 2001. The remaining duration of the temporary guarantee period under the Contract is 2 years and 7 months. The 3-year Treasury constant maturity interest rate published for December of 2001 was 3.62 percent. The next shortest duration published for Treasury constant maturity interest rates is 2 years. A discount rate of 3.62 percent is used for the remaining duration of the temporary guarantee period for the purpose of determining a reserve under Section 807(d) and for the purpose of determining required interest under Section 812(b)(2)(A).

Although the regulations do not specifically provide, the use of a different interest rate in subsequent years should not be considered as subject to Section 807(f) to require a 10-year spread. This is implicit in the use of a current interest rate to calculate reserves. It is also consistent with the treatment of variable annuities.[23]

Please refer in the Actuarial Breakout, Part II, to the numerical example of a tax basis CARVM reserve for an MGA under the final regulations.

The examples do not speak to how to calculate the present value at an anniversary beyond the end of the temporary guarantee period. For example, Example 2 gives a 4.65% CMT rate for the duration of the temporary guarantee period and the AFR beyond that. Does that mean, for example, that for an anniversary one year beyond the temporary guarantee period the AFR should be used for 1 year and CMT rate used to discount back from the end of the temporary guarantee period to the valuation date, or should the AFR be the only discount rate used from valuation date to that anniversary? The better argument would be the first alternative, which is the more mathematically correct answer.

15.3.4 SECTION 811(d)

Section 817A(e)(2) gives the IRS the authority to issue regulations, "to the extent appropriate for such a contract, to modify or waive the applicability of Section 811(d)." Section 811(d) provides that interest in excess of the greater of the PSAR or the AFR is taken into account only as if such interest was guaranteed until the end of the taxable year. Section 811(d) is discussed in more detail in Chapter 4. The IRS did not adopt any modifications to Section 811(d) in the June 2002 proposed regulations but in the preamble did ask for comments. The final regulations waive Section 811(d) for non-equity-indexed annuities. A cross-reference was added in the regulations in Sections 1.811-3 to 1.817A-1. Thus the interest guarantee assumption for purposes of the tax reserve calculation (the assumed "forward rate") is no longer limited by Section 811(d).

15.3.5 NET SURRENDER VALUE

For tax purposes, a company holds the greater of the formula reserve or the net surrender value. Generally, surrender charges must be taken into account in determining the net surrender value of a contract[24] but market-value adjustments are not taken into account in determining net

[23] For example, Treas. Reg. § 1.801-7(b)(1) provides that any change in the rate of interest assumed by a company in calculating the reserve on a variable annuity contract is not a change in basis.
[24] I.R.C. §§ 807(e)(1)(A)(i) and (e)(1)(B).

surrender value.[25] Section 817A provides a special exception to that rule for computing the net surrender value for an MGA. Under this exception, the net surrender value of a contract (other than a pension contract) is determined by taking into account the market value adjustment.[26] For pension plan contracts subject to Section 817A, however, the policyholder fund is determined by ignoring market value adjustments. The IRS has authority to provide for the treatment of market value adjustments for pension contracts.[27] It has not to date exercised its authority to provide for the treatment of pension contracts.

Because of the rule in Section 817A(a), the net surrender value for contracts other than pension contracts is the same for tax purposes and statutory purposes. For pension plan contracts, the tax net surrender value (without market value adjustments) and the statutory net surrender value (with market value adjustments) are different. As illustrated in the subsection below, in a declining interest rate environment, the tax net surrender value for a pension plan contract is less than the statutory net surrender value. In an increasing interest rate environment, the net surrender value for tax purposes is greater than the net surrender value for statutory purposes.

15.3.6 STATUTORY CAP

Both life insurance reserves and annuity reserves computed under Section 807(c)(3) are subject to a statutory cap.[28] The inability to use the market value adjustment in determining the net surrender values for pension contracts creates a potential mismatch. For example, assume a contract that has a fund value of $100. Interest rates decline and the market value of the assets increases from $100 to $105. There are no surrender charges, and the true net surrender value becomes $105. For a pension contract, the tax basis net surrender value is $100, and no deduction is allowed for the $5 increase in net surrender value (except to the extent the increase is reflected in the CARVM reserve calculation). On the other hand, assume that interest rates increase and the market value of the assets (and the statutory reserve) decreases to $95. The net surrender value for tax purposes is $100 but is limited to the statutory cap of $95.

Another situation that might cause the FPR to exceed the statutory reserve occurs when the tax basis interest rate is lower than the statutory rate. The final regulations define the tax basis interest rate as the TCM rate for benefits during the temporary guarantee period and the AFR beyond such period. There is no requirement to use the statutory interest rate for tax reserves if the statutory interest rate is higher than the TCM rate. Thus, it is possible that the tax basis interest rate (the TCM) could be lower than the statutory valuation rate. In contrast, under Notice 97-32, a company was required to use the greater of the statutory valuation rate or Moody's rate in determining the present value of future benefits during the guarantee window. In that event, the interest rate differential would never cause the tax reserve to exceed the statutory reserve.

There is a separate issue of whether such a statutory capping results in a 10-year spread, and the better argument appears to be that this should not be treated as a Section 807(f) event. See the discussion in Chapter 7.

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[25] I.R.C. §§ 807(e)(1)(A)(ii) and 807(e)(1)(B).
[26] I.R.C. § 817A(a).
[27] I.R.C. § 817A(e)(1).
[28] I.R.C. § 807(d)(1). The Committee Reports to the 1986 Tax Reform Act (amending § 807(c)(3) to provide as a floor the net surrender value) state that the statutory cap applies to § 807(c)(3). *Explanation of Technical Corrections to the Tax Reform Act of 1984 and Other Recent Tax Legislation*, Joint Committee on Taxation, at 82 (May 13, 1987).

15.3.7 REQUIRED INTEREST

During the temporary guarantee period of a non-equity-indexed MGC, the applicable interest rate to be used to determine required interest under Section 812(b)(2)(A) for purposes of computing the company share for dividends-received deduction and tax-exempt interest is the current market rate that applies for that period for purposes of Section 807(c)(3) or 807 (d)(2)(B), currently the TCM rate.[29] At the time the final Section 817A regulations were adopted, Section 1.812-9 was added to provide a cross-reference to Regulations Section 1.817A-1. Few non-equity indexed MVAs invest in equities or tax-exempt bonds, however, and thus the company share is generally irrelevant for these contracts.

15.4 TAX TREATMENT OF ASSETS UNDER SECTION 817A

The enactment of Section 817A essentially converts the MGA FPR into a function of the current yield curve. To avoid inconsistency in values between the reserves and the supporting separate account assets, and to mitigate the distortions in income that would result, Section 817A includes a mechanism to treat current asset appreciation and depreciation in a manner similar to how changes in current interest rates affect reserves.

Under the special rule in Section 817A, assets in a separate account that support MGAs are treated as if they are sold at the end of the tax year and repurchased at the beginning of the next tax year.[30]

In effect, assets are marked to market for tax purposes. Any appreciation or depreciation is treated as ordinary income, rather than as capital gains, and a correlative adjustment to cost basis of those assets is also made.[31] The wash sale rules of Section 1091 that disallow a loss on the sale of an asset if a substantially similar asset is bought within 30 days of the sale do not apply to any loss that is taken into account solely by reason of the mark-to-market rules.[32]

If tax reserves are less than the assets in the separate account, an allocation may have to be made between capital gains and losses and ordinary gains and losses. For example, assume that mean reserves are $900, mean assets are $1,000, and that there has been $50 in unrealized appreciation during the year. The entire $50 is taxed currently. It may be that only $45 is taxed as ordinary income (90% of the appreciation) and $5 is capital gain.[33]

The Code provides authority to the IRS to issue regulations to provide appropriate treatment of transfers of assets to and from the segregated account.[34] Prior to the issuance of these regulations, the following rules apply:[35]

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[29] Treas. Reg. § 1.817A-1(a)(5).
[30] I.R.C. § 817A(b)(1)(B).
[31] I.R.C. § 817A(b)(1).
[32] 1996 Blue Book, at 68, n. 176, and Conf. Comm. Rep., n. 58.
[33] *See* I.R.C. § 817A(e)(3). *See* 1996 Blue Book, at 69.
[34] I.R.C. § 817A(e)(4).
[35] Conf. Comm. Rep., Small Business Job Protection Act of 1996. H.R. 3448, at 157. *See also* 1996 Blue Book, at 69-70.

- If an asset is transferred *to* a segregated account, gain or loss attributable to the period during which the asset was not in the segregated account is taken into account when the asset is actually sold and retains the character (as ordinary or capital) properly attributable to that period. Appropriate adjustments are made to the basis of the asset to reflect gain or loss attributable to that period.
- If an asset is transferred *out of* a segregated account, the transfer is deemed to occur on the last day of the taxable year, and gain or loss with respect to the transferred asset is taken into account as of that day. Loss with respect to such transferred asset is treated as ordinary to the extent of the lesser of (1) the loss (if any) that would have been recognized if the asset had been sold for its fair market value on the last business day of the taxable year (or the date the asset was actually sold by the taxpayer, if earlier) or (2) the loss (if any) that would have been recognized if the asset had been sold for its fair market value on the date of the transfer out of the segregated account. A similar rule applies for gains. Proper adjustment is made in the amount of any gain or loss subsequently realized to reflect gain or loss under the provision.

For example, assume that a capital asset in the segregated account that is worth $1,000 at the beginning of the year is transferred out of the segregated account in July at a value of $900, is retained by the company, and is worth $950 on the last business day of the taxable year. A $50 ordinary loss is taken into account with respect to the asset for the taxable year (the difference between $1,000 and $950). The asset is not marked to market in any subsequent year under the provision, provided that it is not transferred back to the segregated account.

As an additional example, assume that a capital asset in the segregated account that is worth $1,000 at the beginning of the year is transferred out of the segregated account in July at a value of $900, is retained by the company and continues to decline in value to $850 on the last business day of the taxable year. A $100 ordinary loss ($1,000 less $900) and a $50 capital loss ($900 less $850) are taken into account with respect to the asset for the taxable year.

15.4.1 TRANSITION RULES UNDER SECTION 817A

Any adjustment required because of the enactment of Section 817A is taken into income or loss as a single net adjustment (and there is no 10-year spread to the extent reserves are recalculated).[36] If an MGA reserve was held in the general account and then changed into the separate account, the transition rule should not apply. In the event there is a loss, a seven-year spread is required.[37]

[36] I.R.C. § 817A(c).
[37] I.R.C. § 817A(c)(3).

15 Appendix

Excerpts from NAIC Modified Guaranteed Annuities

TABLE OF CONTENTS

SECTION 1. PURPOSE

The purpose of this regulation is to provide rules for a modified guaranteed annuity, a variable annuity whose assets are placed in a separate account.

SECTION 3. APPLICABILITY AND SCOPE

This regulation shall apply to:

A. The qualifications of agents who sell modified guaranteed annuity contracts in this state;

B. The qualification of insurers who issue such contracts;

C. The required contract form and provisions for issue of such coverage in this state; and

D. The manner in which separate account assets, supporting such issued contracts, are to be maintained and reported.

SECTION 4. DEFINITIONS

As used in this regulation, the following terms and phrases shall mean:

A. A "Modified Guaranteed Annuity" is a deferred annuity contract, the underlying assets of which are held in a separate account, and the values of which are guaranteed if held for specified periods. The contract contains nonforfeiture values that are based upon a market-value adjustment formula if held for shorter periods. This formula may or may not reflect the value of assets held in the separate account. The assets underlying the

contract must be in a separate account during the period or periods when the contract holder can surrender the contract.

B. "Interest Credits" means all interest that is credited to the contract.

C. "Separate Account" means a separate account established pursuant to Section [insert section], or pursuant to the corresponding section of the insurance laws of the state of domicile of a foreign or alien insurer.

D. "Commissioner" means the Insurance Commissioner of [insert state].

SECTION 8. RESERVE LIABILITIES

Reserve liabilities for modified guaranteed annuities shall be established in accordance with actuarial procedures that recognize:

A. That assets of the separate account are based on market values;
B. The variable nature of benefits provided; and
C. Any mortality guarantees.

As a minimum, the separate account liability will equal the surrender value based upon the market- value adjustment formula contained in the contract. If that liability is greater than the market value of the assets, a transfer of assets will be made into the separate account so that the market value of the assets at least equals that of the liabilities. Also, any additional reserve that is needed to cover future guaranteed benefits will also be set up by the valuation actuary.

The market-value adjustment formula, the interest guarantees, and the degree to which projected cash flow of assets and liabilities are matched must also be considered. Each year, the valuation actuary must provide an opinion on whether the assets in the separate account are adequate to provide all future benefits that are guaranteed.

SECTION 9. SEPARATE ACCOUNTS

The following requirements apply to the establishment and administration of modified guaranteed annuity separate accounts by any domestic insurer:

A. *Establishment and Administration of Separate Accounts.*
Any domestic insurer issuing modified guaranteed annuities shall establish one or more separate accounts pursuant to Section [insert section providing for separate accounts].

B. *Amounts in the Separate Account.*
The insurer shall maintain in each separate account assets with a market or other value comporting to standards set out in Section [insert section] at least equal to the valuation reserves and other contract liabilities respecting such account.

C. *Valuation of Separate Account Assets.*
Investments of the separate account shall be valued at their market value on the date of valuation, or at amortized cost if it approximates market value, or pursuant to standards contained in Section [insert section].

D. *Investment Laws.*
Unless otherwise approved by the Commissioner, separate accounts relating to modified guaranteed annuities will be subject to investment laws applicable to the insurer's general asset account.

15 Actuarial Breakout

PART I: EXAMPLE OF TYPICAL MARKET VALUE ADJUSTMENT FORMULAS AND HOW THEY MIGHT OPERATE

An example of a typical market value adjustment formula is: $(K) \times [(1+i) / (1+j)]^{n/12}$ where:

- i = interest rate guaranteed at the issue date for the Guarantee Period.
- j = current rate applicable to new similar contracts issued on the current date, but for a Guarantee Period from surrender date to the end of the original Guarantee Period.[38]
- n = number of months from the surrender date to the end of the current Guarantee Period.
- K = a constant percentage. For example, some companies use a factor of K=90%. Another typical product design is to define i and j as Treasury rates:
  - At the issue date for a period equal to the Guarantee Period (i)
  - At the surrender date for a period from surrender date to the end of the Guarantee Period (j)

Example 1

Assume a deposit of $100 is made on December 31 on a contract with 5-year guarantee promising 10% interest ($161.05 at the end of 5 years). The contract has a 7% surrender charge at the end of the first policy year.

Example 2 *Index drops to 8% at the end of year 1.*

At the end of the year, the fund value is $110 ($100 fund plus $10 interest credited during the year). The market value adjustment formula results in a market value adjustment factor of 1.0762, $\left(\text{i.e.,} \left(\frac{1.10}{1.08}\right)^4\right)$. The unadjusted net surrender value is $102.30. This is the $110 fund value less a surrender charge of $7.70 (7% of fund value). The market value adjusted net surrender value is $102.30 multiplied by a factor of 1.0762. Thus the market value adjusted net surrender value is $110.09.

Example 3 *Index increases to 11% at the end of year 1.*

The market value adjustment results in a market value adjustment formula of .9644 $\left(\text{i.e.,} \left(\frac{1.10}{1.11}\right)^4\right)$. The unadjusted net surrender value is the same as in Example (2). The market value adjusted net surrender value is the unadjusted surrender value of $102.30 multiplied by a factor of .9644. This is a market value adjusted net surrender value of $98.66.

[38] Note: This example contains a built-in upward bias, since shorter-term spot rates are generally lower. Other common forms might define the duration of j equal to the duration used in the i term, but with a rate as of the statement date.

PART II

TABLE 15.1

TAX CARVM RESERVE FOR A MODIFIED GUARANTEED ANNUITY
Assume no partial withdrawals or death benefit beyond the Net Surrender Value.

Facts:

Premium	$100,000
Guarantee Period (GP, in Years)	5
Guaranteed Interest Rate	
- During GP	5.00%
- Thereafter	3.00%

Surrender Charge Scale	Contr.Yr	Surr. Charge
	1	5%
	2	5%
	3	5%
	4	4%
	5	4%
	6	5%
	7	5%

At window (for 30 days beginning 1 day after anniversary 5)	0%
Contract Duration at Valuation Date (in years)	1.5
Account Value (AV) at Val Date	$107,593
Net Surrender Value (NSV) @ Val Date	102,213
Interest Environment	
- TCM** Rate for 4 years [TCM(4)]	3.50%
- TCM** Rate for 3 years	3.00%
- TCM** Rate for 2 years	2.80%
- AFR#	5.71%

Federally Prescribed CARVM Reserve

	(1)	(2)	(3)
TRA*	Future AV	Future NSV	Discounted Value
2	110,250	104,738	102,951
3	115,763	109,974	104,443
4	121,551	116,689	107,072
5	127,628	122,523	108,624
6	131,457	124,884	104,737
7	135,401	128,631	102,052
		Reserve equals Maximum Value	108,624

(1) = $107{,}593 \cdot (1.05^{TRA-1.5})$

(2) = (1) · [1 – Surrender Charge]

(3) = $(2) / (1+TCM(4))^{TRA-1.5}$ for $TRA \le 5$. $\left[= (2) / (1+TCM(4))^{3.5} \times (1+AFR)^{TRA-5}) \text{ for } TRA > 5\right]$

Note 1: The TCM of the lowest period exceeding the period to the "Window" was used during the guarantee period. Thereafter the AFR was used.

Note 2: Curtate CARVM was used in this example, since the "Window" begins one day after the 5th anniversary.

Note 3: The TCM values form a reasonable proxy for changes in market value. However, if the NSV exceeds the Federally prescribed CARVM reserve, due to an increase in the NSV caused by the contractual MV adjustment, the NSV becomes controlling for statutory and tax purposes.

* Tentative Reserve Anniversary
** Treasury Constant Maturity
# Applicable Federal Interest Rate