



ACTUARIAL STANDARDS BOARD

**Actuarial Standard
of Practice
No. 20**

**Discounting of Property and Casualty Loss
and Loss Adjustment Expense Reserves**

**Developed by the
Subcommittee on Reserving of the
Casualty Committee of the
Actuarial Standards Board**

**Adopted by the
Actuarial Standards Board
April 1992**

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April 1992

TO: Members of Actuarial Organizations Governed by the Standards of the Actuarial Standards Board and Other Persons Interested in Discounting of Property and Casualty Loss and Loss Adjustment Expense Reserves

FROM: Actuarial Standards Board (ASB)

SUBJ: Actuarial Standard of Practice No. 20: *Discounting of Property and Casualty Loss and Loss Adjustment Expense Reserves*

This booklet contains the final version of the captioned standard of practice. It is a revised version of the second exposure draft, and reflects changes made at a meeting of the ASB Casualty Committee in September 1991 and in response to a public hearing on the standard held September 25, 1991.

Background

The purpose of this standard of practice is to define the issues and considerations that an actuary should take into account in determining discounted loss and loss adjustment expense reserves. The standard applies to practices that relate to the Casualty Actuarial Society's *Statement of Principles Regarding Property and Casualty Loss and Loss Adjustment Expense Reserves*. The standard does not address the appropriateness of discounting.

The document was developed by the Subcommittee on Reserving of the ASB Casualty Committee. The initial exposure draft was approved for exposure by the ASB in October 1989 with a comment deadline of March 15, 1990. A second exposure draft was approved in January 1991, with a comment deadline of April 30, 1991.

Thirty responses to the first exposure draft and seventeen to the second exposure draft were received. Major issues addressed by reviewers of the first and second exposure drafts, and the drafting subcommittee's responses, are discussed below. Comments received are followed by the subcommittee responses in **boldface**.

Following the second exposure period, the ASB held a public hearing on the issues raised. A report on this hearing appears at the end of this memo.

Reviewers' Comments and Subcommittee Responses on the First Exposure Draft

I. Major issues

1. Should discounting be addressed?

Many respondents questioned whether a standard on discounting should be issued. Some were concerned that the issuance of a standard would be interpreted as a de facto endorsement of discounting in inappropriate contexts. Others suggested that the disavowal of opinion on the appropriateness of discounting (subsection 1.2) be somehow emphasized, expanded, or changed to state specifically that discounting is inappropriate in some circumstances.

The subcommittee agreed with many respondents that the issue of discounting is important enough to warrant the issuance of a standard. Greater emphasis of the disavowal is not appropriate within the stylistic constraints of a standard. The subcommittee believed that the statement was clear and unlikely to be misinterpreted except intentionally. The subcommittee further believed that this standard should not address the appropriateness of discounting in any particular context.

2. Risk Margins

A number of respondents emphasized the importance of using increased risk margins when discounted reserves are used in financial statements. Some expressed the opinion that risk margins required more extensive treatment and/or more emphasis. It was suggested that this standard not be issued until a standard on risk margins is issued. On the other hand, certain respondents opined that the inclusion of any risk margin in the reserves is inconsistent with GAAP accounting.

A number of respondents objected to the endorsement of implicit risk margins.

The subcommittee agreed that risk margins are a crucial issue when considering using discounted reserves. At the same time, the subcommittee recognized that a standard of practice for risk margins had not been issued, and that risk margins might pose accounting difficulties. The subcommittee considered risk margins sufficiently important to be addressed fully on their own, and believed that it would be inappropriate to set standards for risk margins as a subsidiary issue in a standard on reserve discounting. A special subcommittee of the Casualty Operating Committee has been formed for the purpose of developing a standard on risk margins.

Accordingly, the subcommittee included an expanded discussion of the relationship between discounting and risk margins in the Background and Historical Issues section. The standard of practice was revised in subsection 5.5 to require the

actuary to consider the relationship when determining risk margins, while specifically stating that the appropriate size and treatment of risk margins are not addressed in this standard.

The references to implicit risk margins were retained. The subcommittee believed that the references represent currently common and acceptable actuarial practice.

3. Should a specific portfolio of assets be considered in selecting the interest rate?

Several respondents commented that the evaluation of liabilities should be independent of specific assets and that discounting should reflect the theoretical time value of money rather than any particular investment return. It was further noted that the value of a liability should not change with a change in an investment portfolio. The current accounting literature on present value was cited as stating that the rate used to discount any item be appropriate for that item. Furthermore, it was noted that the exposure draft as written placed an unrealistic burden on the reserving actuary to act as valuation actuary.

Other respondents and members of the subcommittee continue to be concerned that inconsistent valuations of assets and liabilities in the same financial statement could lead to significant misstatements of surplus.

The subcommittee agreed that reserve estimates should be able to stand on their own, and that the interest rate for discounting should normally be selected to reflect the time value of money. The subcommittee further agreed that valuation calculations may be unrealistically burdensome in a reserving context. However, the subcommittee also believed that the actuary should take responsibility, to the extent practicable, to prevent the use of a discounted reserve in a misleading context.

The standard was revised to base discounting calculations on a “selected interest rate” rather than a “rate of investment return.” In most cases, the selected interest rate would reflect the time value of money rather than any particular investment return. The actuary remains responsible for being aware of the valuation basis of assets, but may now satisfy that responsibility by a clear disclosure of any inconsistency between the valuations of assets and liabilities. The actuary retains the option of using a portfolio-based rate, but in that case more complex valuation-type calculations may be necessary. Furthermore, the actuary should use a low-risk rate of return; thus, a portfolio-based rate may require adjustment.

4. Should investment returns used to determine the interest rate for discounting be before or after federal income taxes?

A number of respondents interpreted the words “investment returns . . . after the payment of income taxes” to imply that before-tax investment returns are necessarily reduced by income tax rates.

In fact, the subcommittee intended the statement to require consideration of the overall taxation of the entity. In that context, the before-tax return could approximate the after-tax return if the investment income were sheltered by the accrual of discount in the tax-basis reserves.

Several respondents who accurately discerned the subcommittee's intent were concerned that consideration of the complexities of insurance company taxation is unduly burdensome for the reserving actuary. Furthermore, it may be inappropriate for this liability item to vary with a company's tax position.

The subcommittee agreed that the original language was unclear and potentially misleading. Furthermore, the subcommittee agreed that a burden of detailed tax calculations should not be placed on the reserving actuary.

Accordingly, the subcommittee changed the language from "after" income taxes to "before" income taxes. This will frequently approximate the after-tax situation, since investment income will often be substantially sheltered by the accrual of discount in the tax-basis reserves. Furthermore, the before-tax approach is more consistent with the interpretation of discounting as a reflection of the theoretical time value of money. The revised language allows the actuary to make an adjustment to reflect imperfection in the sheltering of investment income, but does not require such an adjustment.

5. Discounting calculations required by statute or regulation (e.g., IRS calculations) may differ from this standard.

A number of respondents were concerned that discounting procedures prescribed by the IRS, specifically those related to payment pattern calculation and interest rate selection, do not meet the requirements of the proposed standard. Those respondents requested a more clearly delineated "safe harbor" for calculations required by statute or regulation.

The subcommittee believed that required calculations which do not meet this standard can be readily accommodated with a relatively simple disclosure statement per subsection 6.4. The subcommittee did not change the language of the proposed standard.

6. Many respondents recommended various changes in the definitions.

The subcommittee made a number of changes in the definitions section. Notably, the definition of *discounted reserve* was changed to refer only to the use of an *interest rate*, rather than *investment income*. The definition of *default risk* was broadened to *credit risk*, and a definition of *market risk* was added, along with definitions of *present value* and *time value of money*.

The subcommittee chose not to include definitions of *interest rate* and *liquidity*, since these terms are used in accordance with their common meanings.

II. Other issues

1. Several respondents disapproved of giving the actuary the option of disavowing opinion on the appropriateness of the interest rate.

The subcommittee believed that the actuary should not be prohibited from performing calculations requested by a client or employer, as long as there are clear disclosures intended to prevent the actuary's work from being misused. The subcommittee recognized that actuaries sometimes do work according to specifications provided by others.

2. Several respondents were concerned that the requirement to consider the timing of reinsurance recoveries is unduly burdensome.

Appropriate "consideration" may be achieved by a relatively simple approximation in many cases. The need for detailed, complicated calculation varies with the materiality of the issue. If the issue is very significant for a particular reserve evaluation, more detailed calculations may be necessary.

3. Several respondents were concerned that the "whenever possible" language of subsection 6.3 was too severe, since the calculation will always be "possible" even when highly impractical.

The subcommittee changed the language to "whenever the full-value reserve has been calculated. . . ."

4. Several respondents advocated a requirement for disclosure of the amount of risk margin.

As previously noted, the subcommittee increased the emphasis on the relationship between discounting and risk margin, but specifically avoided establishing a standard for risk margin. Disclosure of the amount of risk margin may be a requirement of a risk-margin standard.

5. One respondent noted that the NAIC has taken a more specific (generally unfavorable) view of discounting than implied by section 3 of the draft.

The proposed standard was revised to include language suggested by the respondent.

6. One respondent noted that the proposed standard states that the calculation of a full-value reserve may not be required, but that subsequent sections appear to imply that such a calculation is required.

The subcommittee did not intend to imply that the calculations of a full-value reserve is required in every case, but the subcommittee recognized that the calculation of a full-value reserve will most commonly be performed. Certain sections of this standard may be inapplicable if a different approach is taken.

The subcommittee carefully reviewed all responses received, and made numerous other changes suggested by respondents. Many of these were editorial in nature. The above discussions cover issues considered to be most in need of discussion.

Reviewers' Comments and Subcommittee Responses on the Second Exposure Draft

I. Major issues

1. Possible Misinterpretation of Standard as an Endorsement of Discounting in Inappropriate Circumstances

The subcommittee made several changes after the second exposure draft to discourage potential misinterpretation. First, a new subsection 5.1 makes the actuary responsible for the context in which the discounted reserves are to be used. Second, there is an expanded discussion of the relationship between discounting, risk margins, and economic value of reserves. This is further discussed below.

2. Risk Margins

A number of respondents to the second exposure draft disagreed with the statement that discounting and risk margins are closely related. Adherents of financial theory noted that the proper interest rate for discounting is a function of both the time value of money and the riskiness of the cash flows. One respondent noted that use of the term *risk margins* was unclear, and suggested that some categories of risk should be compensated for in reserves, and other categories should not.

Some respondents repeated the views that a discounting standard should not be issued prior to a risk margin standard; that the standard's admonitions regarding risk margins were not strong or clear enough, and that regardless of these admonitions, issuance of this standard would lead to unsound practices and/or weaker financial statements.

The subcommittee made several changes after the second exposure draft. In response to specific comments, the standard now notes that the close relationship between discounting and risk margins is historical rather than theoretical. The approach of using an interest rate based on the risk-free rate adjusted to reflect the

risk associated with uncertainty in loss reserve estimates was acceptable in the previous draft; the language was further clarified by adding a new subsection 5.4.6, in which it is noted that a risk adjustment of the interest rate is allowable. However, the standard does not specify this method as the only acceptable means of reflecting risk.

Finally, the subcommittee believed that more precise definitions of categories of risks to be included in risk margins should be in a risk margins standard, rather than a discounting standard.

In response to more general concerns, the subcommittee expanded the discussion in section 3, Background and Historical Issues, noting that discounting and risk margins are both considerations in estimating the economic value of loss reserves. The added language went so far as to caution that undiscounted reserves may approximate economic value better than discounted reserves without risk margin. In subsection 5.5, which gives the recommended practices concerning risk margins, the following sentence was inserted: “The actuary should be aware that a discounted reserve is an inadequate estimate of economic value unless appropriate risk margins are included.”

With the above changes, the subcommittee believed that the standard was unlikely to be misinterpreted. The expanded statements on the relationship between discounting, risk margins, and economic value should act as a positive force to prevent irresponsible use of discounting.

3. Returns on Assets

In the comments on the second draft, there was some concern expressed with reference to returns on assets (old subsections 5.3.2 and 5.3.3, now numbered 5.4.2 and 5.4.3). One respondent objected to the apparent obligation of the reserving actuary to value assets. Some respondents said that the interest-rate subsection as a whole needed clarification.

The requirement to consider assets does not require the actuary to value assets, but to be aware of their valuation basis and to disclose material inconsistencies between the valuation basis for assets and that for loss reserves. This is part of the actuary’s general obligation to be responsible for the context in which the discounted reserves are to be used. Under the portfolio interest rate approach (now 5.4.3), the actuary has greater obligations regarding assets.

To clarify the interest-rate subsection, the subcommittee introduced the term *risk-free interest rate*, and made clear that the reference to rates of return on low-risk investments is included only as an acceptable approximation of the risk-free interest rate.

II. Other issues

1. One respondent suggested that the standard specify that the full-value reserve be calculated in accordance with the *CAS Statement of Principles*. Another suggested that language be included to caution the actuary against discounting full-value reserves that are inadequate.

The standard states that all principles and consideration for calculating full-value reserves apply. The subcommittee believed that provision was sufficient, and that to knowingly discount inadequate full-value reserves would violate that provision.

2. One respondent expressed concern that the requirement to use interest rates “likely to prevail over the life of the cash flows” placed an unrealistic burden on the actuary to predict future interest rates. Another suggested that consistency between interest and inflation assumptions be required.

The adjustment of current interest rates to anticipated future levels was made optional, and a requirement for consistency with inflation assumptions was introduced. Thus, if a change in future conditions is assumed, the assumptions for both inflation rates and interest rates should be consistent.

3. One respondent noted that the subsection on the effect of reinsurance should also include salvage and subrogation.

The subsection was broadened to include salvage and subrogation. The subcommittee noted that paid loss data net of salvage and subrogation usually credit salvage and subrogation when received, but paid loss data net of reinsurance often credit reinsurance before it is received. Thus the reinsurance provision is more likely to require an additional calculation.

4. One respondent commented that incorporating risk margins should have been included among the common approaches (section 4).

The approaches listed are for discounting. The subcommittee concluded that common approaches for incorporating risk margin should be part of a risk margin standard.

5. One respondent noted that the standard continued to include too many unnecessary references to full-value reserves, and too much implication that calculating full-value reserves is the preferred approach.

The subcommittee deleted a number of references to full-value reserves, and attempted to remove any remaining implication that full-value reserves will

necessarily be calculated. However, because starting from full-value reserves is by far the most common approach, some focus on that approach is unavoidable.

6. One respondent asserted that a proper definition of *present value* does not allow a selected interest rate, but rather is based on a market-determined rate reflecting the risk-free rate and the riskiness of the cash flows.

The subcommittee felt that the broader definition of *present value* in the standard is clear and in close correspondence with widespread usage.

7. One respondent said the phrase *low investment risk* was too imprecise.

The language was changed to make clear that an approximation of the risk-free interest rate was intended. With that clarification, the phrase “assets with low investment risk” has been retained to allow reasonable flexibility to the practitioner.

Comments Received at the September 25, 1991 Public Hearing, and Subcommittee Responses

Nine witnesses testified at the hearing. Several testified as representatives of various actuarial bodies and other interested groups. In addition, four witnesses submitted only written testimony. A number of the witnesses had previously submitted comment letters.

Most witnesses supported issuance of the standard with little modification. The additional language added subsequent to the second exposure draft, strengthening the risk margin requirements, was reviewed with several witnesses in the course of the hearing. Reaction was generally favorable.

Two witnesses objected to issuance of the standard. Both were previous respondents.

One maintained that issuance of a standard on discounting would be viewed as a de facto endorsement of discounting, regardless of specific disclaimers in the standard. **The subcommittee believes that the language of the standard is clear on the issue and made no further change.**

The other objecting witness asserted that the standard was inconsistent with financial theory, in both terminology and substance. In particular, this witness expressed the view that both present value and discounted value, as used in financial theory, necessarily reflect a discount rate that incorporates both the time value of money and the market perception of risk. **The subcommittee believed that the more general usage in the standard of the terms *present value* and *discounted value* is consistent with financial theory. The more general definitions also correspond with widespread usage. The subcommittee believed that using the narrower definitions would be more likely to lead to confusion.**

As to matters of substance, the financial theory approach is intended to be allowed within the standard. Specifically, the selected interest rate may initially approximate the risk-free interest rate (per subsection 5.4.1) and then be further adjusted to reflect risk (per subsection 5.4.6) as a means of incorporating an explicit risk margin. A discounted reserve so calculated with a risk-adjusted interest rate includes the “appropriate risk margin” required by subsection 5.5 as a condition for an adequate estimate of economic value.

Adoption

The final version of the standard was prepared by the subcommittee after careful review of all comments received. It was approved by the parent Casualty Committee in March 1992 and adopted by the ASB at its April 1992 meeting, with an effective date of August 15, 1992.

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ACTUARIAL STANDARD OF PRACTICE NO. 20

**DISCOUNTING OF PROPERTY AND CASUALTY
LOSS AND LOSS ADJUSTMENT EXPENSE RESERVES**

PREAMBLE

Section 1. Purpose, Scope, and Effective Date

- 1.1 Purpose—The purpose of this standard of practice is to define the issues and considerations that an actuary should take into account in determining discounted property or casualty loss and/or loss adjustment expense reserves.
- 1.2 Scope—This standard applies to practices that relate to the *Statement of Principles Regarding Property and Casualty Loss and Loss Adjustment Expense Reserves*, as adopted by the Casualty Actuarial Society. The standard does not address the appropriateness of discounting reserves in specific contexts.
- 1.3 Effective Date—The effective date of this standard is August 15, 1992.

Section 2. Definitions

The following terms are used in this standard as defined below:

- 2.1 Asset Valuation Basis—The method used to determine the stated value of a particular asset.
- 2.2 Book Value—The value of an asset or assets, as included in a financial statement or other financial reporting contest.
- 2.3 Credit Risk—Risk associated with the possibility of a loss on an investment security, either in whole or in part.
- 2.4 Discounted Reserve—The present value, calculated at selected interest rate(s), of the payment of outstanding losses and/or loss adjustment expenses in the anticipated future settlement amounts.
- 2.5 Full-Value Reserve—An undiscounted provision for the payment of outstanding losses and/or loss adjustment expenses in the anticipated future settlement amounts.

- 2.6 Investment Risk—Uncertainty surrounding the realization of a specified investment income stream. Elements of investment risk include credit risk, market risk, reinvestment risk, and liquidity risk.
- 2.7 Market Interest Rates—Interest rates that are available on funds invested at a particular date.
- 2.8 Market Risk—Uncertainty regarding the future market value of an asset.
- 2.9 Market Value—The price for which an asset could be sold at a particular date.
- 2.10 Portfolio Interest Rate—Interest rate on an investment portfolio, calculated relative to current book values or on other asset valuation bases.
- 2.11 Present Value—The value at a point in time of cash flows at other points in time, calculated at selected interest rates.
- 2.12 Reinvestment Risk—Uncertainty regarding the yields that will be available on reinvestment of proceeds from current investments that are subject to reinvestment in the future.
- 2.13 Risk-Free Interest Rate—The interest rate that reflects only the time value of money. (It is understood that the time value of money includes inflation expectations.) The risk-free interest rate is lower than rates of investment return on asset portfolios subject to greater investment risk.
- 2.14 Risk Margin—An amount to make some provision for the uncertainty in a reserve estimate.
- 2.15 Rate of Investment Return—Investment income earned on funds held over time, generally expressed as an annualized percentage of the amount invested.

Section 3. Background and Historical Issues

The appropriateness of discounting loss and loss adjustment expense reserves in various financial reporting contexts is a controversial topic. Traditionally, casualty loss and loss adjustment expense reserves have not been discounted except in certain narrowly defined circumstances. However, the issue of discounting reserves has been discussed for many years. For example, the issue appeared in the 1927 *Proceedings of the Casualty Actuarial Society*, in an article by Benedict D. Flynn. In 1986, the U.S. Congress passed legislation prescribing discounting procedures for income-tax purposes. In the past, most state insurance departments prohibited discounting; some departments have permitted discounting for some lines of business. The National Association of Insurance Commissioners has consistently been opposed to discounting except in certain specific circumstances. The accounting profession is studying the issue as it relates to financial reporting.

Historically, the issue of reserve discounting has been closely related to the issue of risk margins. Full-value reserves are often considered to contain a needed implicit risk margin in the difference between full-value reserves and discounted reserves. If discounted reserves were incorporated into financial statements, many would argue that an explicit risk margin would become necessary. Suggestions for the treatment of that risk margin include treatment as a liability item, a segregated surplus item, or an off-balance-sheet item.

Reserve discounting and risk margins are both important elements in estimating the economic value of loss reserves, yet neither is explicitly included in most current financial reporting. Much of the rationale for reserve discounting is related to the issue of economic value; however, some believe that discounted reserves without risk margin may be a poorer estimate of economic value than undiscounted reserves.

Loss reserve discounting calculations are commonly performed in conjunction with valuations of insurance companies for purposes such as acquisition or merger, or with transfers of portfolios or reserves. In these instances and for other reasons, there are increasing numbers of circumstances where actuaries are asked to determine or evaluate discounted loss and loss adjustment expense reserves.

Section 4. Current Practices and Alternatives

Common approaches to loss and loss adjustment expense reserve discounting typically include these steps:

- a. Estimate full-value reserves
- b. Estimate future loss and loss adjustment expense payment patterns
- c. Apportion the full-value reserves to the future payment periods, using the estimated payment patterns
- d. Select the interest rate(s) for discounting
- e. Calculate the present value, as of the valuation date, of the projected payments for each future payment period, using the selected interest rate(s)
- f. Sum the present values for all future payment periods

There are many variations on this process. In fact, the initial calculation of a full-value reserve is not always necessary. Some approaches are based on an assumed difference between future claim cost trend and future interest rates without specification of the interest rates.

Selected interest rates vary with the business context. They may be based on market interest rates, portfolio interest rates, or a combination thereof, sometimes adjusted to reflect risk, and adjusted to reflect investment expenses and taxes as appropriate.

STANDARD OF PRACTICE

Section 5. Analysis of Issues and Recommended Practices

- 5.1 Appropriateness in Context—The actuary should be aware of the context in which the discounted reserves are to be used. The actuary should use assumptions and methodology in the discounting process that are appropriate for that context.
- 5.2 Determination of Full-Value Reserve—The determination of a full-value reserve is generally, though not necessarily, the first step in the determination of a discounted reserve.
- 5.2.1 Principles and Considerations—All principles and considerations that apply to the calculation of a full-value reserve as an end product should also apply to the calculation of a full-value reserve that will form the basis of a discounted reserve.
- 5.2.2 Specification by Components—The actuary should give special attention to the specification of the reserve provision by its components (e.g., line of business, accident year, etc.), to the extent such specification has a material effect on the amount of reserve discounting.
- 5.2.3 Consistency of Assumptions and Considerations—The actuary should be aware of the assumptions and considerations underlying the selection of the full-value reserve, in order to ensure that material assumptions and considerations are consistent throughout the process of calculating the discounted reserve.
- 5.2.4 Relative Materiality of Considerations—The actuary should be aware of the differences between full-value and discounted reserves in the relative materiality of various considerations. For example, a development factor at an advanced maturity (i.e., a “tail factor”) is less material to a discounted reserve than to a full-value reserve. Conversely, a change in the timing of loss payments may be more material to a discounted reserve. To the extent that the materiality of a reserve consideration determines the amount of analysis that an item receives, the evaluation of a discounted reserve may require a change in emphasis on the items analyzed.
- 5.3 Payment Timing for Discounting—In order to derive a discounted reserve, the actuary necessarily projects the timing of future payments. A range of payment-timing estimates may be reasonable.
- 5.3.1 Data Sources—The actuary should use the entity’s own historical payment data to project the timing of payments, to the extent that credible data are available. Any supplementary data that are used should reflect the payment-timing characteristics of the category of business under consideration, to the extent possible.

- 5.3.2 Reconciliation of Estimates—The actuary should reconcile payment-timing estimates with the estimates of ultimate amounts to be paid, even if the latter have not been derived by techniques based on paid losses and loss adjustment expenses.
 - 5.3.3 Consistency of Assumptions and Considerations—When a full-value reserve has been estimated, the actuary should use assumptions and considerations in developing payment-timing estimates that are consistent with the assumptions and considerations used in developing the full-value reserve estimates.
 - 5.3.4 Consistency with Expected Future Conditions—Payment-timing estimates should be consistent with internal and external conditions expected to prevail during the future payment period. If such conditions are expected to be different from those prevailing during the historical evaluation period, the actuary should make appropriate adjustments.
 - 5.3.5 Data Organization—The actuary should determine whether better payment-timing estimates are obtained by treating various data components separately or in some combination. Examples are losses, allocated loss adjustment expenses, and unallocated loss adjustment expenses. This determination typically is influenced by the nature of the available data.
 - 5.3.6 Effect of Reinsurance, Salvage, and Subrogation—In estimating discounted reserves net of ceded reinsurance, salvage, and subrogation, the actuary should consider the timing of the expected reinsurance, salvage, and subrogation recoveries.
- 5.4 Selected Interest Rates for Discounting—A discounted reserve may be used in a variety of contexts, and the appropriate selected interest rates are a function of the context. The selected interest rates may reflect the time value of money without reference to particular assets (see 5.4.1) or may be based on the rate of investment return from a particular portfolio (see 5.4.3).
- 5.4.1 Time Value of Money Approach—The selected interest rate in this approach should approximate the risk-free interest rate. The risk-free interest rate can be approximated by rates of investment return available on assets having low investment risk. Such rates should reflect the market interest rates at the valuation date and may be adjusted to reflect those rates that are likely to prevail over the life of the cash flows. Such rates should be consistent with the inflation rates assumed in the reserve calculation.
 - 5.4.2 Consistency with Asset Valuation Basis—If the discounted reserve is used in a context which includes the reporting of assets, the actuary should be aware of the relationship between the selected interest rate and the basis used in valuing the assets. If assets are included at an overall value significantly different from

market value, the actuary should clearly disclose any inconsistency between the selected interest rate for discounting and the asset valuation basis.

- 5.4.3 Portfolio Interest Rate Approach—If portfolio interest rates are used, the actuary should consider the relationships between the book and market values of assets, between the portfolio interest rates and market interest rates, and between the maturities of the assets and the estimated timing of loss and loss adjustment expense payments. The actuary should adjust the portfolio rates, if necessary, to be consistent with assets having low investment risk. The portfolio rates should be net of investment expenses.
 - 5.4.4 Effect of Income Taxes—The actuary normally should use an interest rate or rates consistent with investment returns that are available before the payment of income taxes. The actuary may consider adjusting this rate if the amount of discount for tax purposes differs significantly from the amount of discount determined in accordance with this standard.
 - 5.4.5 Selected Interest Rates Supplied by Another—In certain contexts, the actuary may provide a discounted reserve estimate without providing an opinion on the appropriateness of the selected interest rates. In these cases, the actuary should clearly disclose the selected interest rates, the source of or basis for the selected interest rates, and the fact that the actuary is expressing no opinion on the appropriateness of the rates.
 - 5.4.6 Incorporating Risk Margin through Interest Rate Reduction—The actuary may reduce the selected interest rate as a means of incorporating a risk margin.
- 5.5 Risk Margins—The actuary should be aware of the historical relationship between reserve discounting and risk margins and include appropriate risk margins. Discounting a reserve diminishes the risk margin implicit in a full-value reserve by the difference between the full-value and the discounted reserve. The discounting process itself introduces additional uncertainties. The actuary should be aware that a discounted reserve is an inadequate estimate of economic value unless appropriate risk margins are included.

Considerations with regard to the inclusion of risk margins follow. It is not intended that this standard address the amount of risk margin necessary, nor the appropriate treatment of risk margin in a particular context.

- 5.5.1 Considerations in Determining the Amount of Risk Margin—In determining the amount of risk margin, the actuary should consider the increase in uncertainty associated with the discounting calculation, as well as the decrease in the margin implicit in the full-value reserve.
- 5.5.2 Implicit and Explicit Margins—Implicit margins may be introduced at one or more steps in the discounting process, including the estimation of the full-value reserve and the selection of the payment pattern from a range of reasonable

estimates. Explicit margins may be included as an absolute amount and/or through an explicit adjustment to the selected interest rate(s).

Section 6. Communications and Disclosures

- 6.1 Documentation and Disclosure Standard Applies—All documentation and disclosure requirements contained in Actuarial Standard of Practice No. 9, *Documentation and Disclosure in Property and Casualty Insurance Ratemaking, Loss Reserving, and Valuations*, apply to actuarial calculations and communications involving discounted reserves.
- 6.2 Disclosure of Assumptions as to Selected Interest Rates—The actuary should give emphasis to the disclosure of the assumptions as to selected interest rates, and the basis for those assumptions. In particular, the actuary should clearly identify those instances where the actuary expresses no opinion as to the appropriateness of the rates used.
- 6.3 Disclosure of Amount of Discount—Whenever the full-value reserve has been calculated, the actuary should disclose the amount of the difference between the full-value reserve and the discounted reserve.
- 6.4 Deviation from Standard—An actuary must be prepared to defend the use of any procedure that departs materially from this standard and must include, in any actuarial communication disclosing the result of the procedure, an appropriate and explicit statement with respect to the nature, rationale, and effect of such use.