



ACTUARIAL STANDARDS BOARD

**Proposed Revision of
Actuarial Standard of
Practice No. 27**

**Selection of Economic Assumptions for
Measuring Pension Obligations**

**Comment Deadline:
April 30, 2011**

**Developed by the
Pension Committee of the
Actuarial Standards Board**

**Approved for Exposure by the
Actuarial Standards Board
January 2011**

TABLE OF CONTENTS

Transmittal Memorandum iv

STANDARD OF PRACTICE

Section 1. Purpose, Scope, Cross References, and Effective Date	1
1.1 Purpose	1
1.2 Scope	1
1.3 Cross References	2
1.4 Effective Date	2
Section 2. Definitions	2
2.1 Inflation	2
2.2 Measurement Date	2
2.3 Measurement Period	2
2.4 Merit Scale	2
2.5 Prescribed Assumption	2
2.6 Productivity Growth	2
2.7 Real Return	2
2.8 Real Risk-Free Return	3
2.9 Risk Premium	3
Section 3. Analysis of Issues and Recommended Practices	3
3.1 Overview	3
3.2 Identifying Types of Economic Assumptions	3
3.3 General Considerations	3
3.4 General Selection Process	4
3.5 Selecting an Inflation Assumption	4
3.5.1 Data	4
3.5.2 Select and Ultimate Inflation Rates	4
3.6 Selecting an Investment Return Assumption	4
3.6.1 Data	5
3.6.2 Constructing the Investment Return Assumption	5
3.6.3 Considerations	5
3.6.4 Multiple Investment Return Rates	7
3.6.5 Form of Benefit	7
3.7 Selecting a Discount Rate	7
3.8 Selecting a Compensation Scale	8
3.8.1 Data	8
3.8.2 Measurement-Specific Factors	9
3.8.3 Multiple Compensation Scales	10
3.9 Selecting Other Economic Assumptions	10
3.9.1 Social Security	10
3.9.2 Cost-of-Living Adjustments	10
3.9.3 Growth of Individual Account Balances	11

EXPOSURE DRAFT—January 2011

3.9.4	Variable Conversion Factors	11
3.10	Individual Assumptions	11
3.11	Consistency among Economic Assumptions Selected by the Actuary	11
3.12	Prescribed Assumption(s)	11
3.13	Changing Assumptions	12
3.14	Sources of Economic Data	12
3.15	Other Considerations	12
3.15.1	Conservatism	12
3.15.2	Materiality	12
3.15.3	Cost Effectiveness	12
3.15.4	Rounding	12
3.15.5	Subsequent Events	12
3.15.6	Advice of Experts	13
Section 4. Communications and Disclosures		13
4.1	Disclosures	13
4.1.1	Economic Assumptions	13
4.1.2	Rationale for Assumptions	13
4.1.3	Changes in Assumptions	13
4.1.4	Changes in Circumstances	13
4.2	Prescribed Assumption(s)	14
4.3	Deviation from the Guidance in the Standard	14

APPENDIXES

Appendix 1—Background and Current Practices	15
Background	15
Current Practices	15
Appendix 2—Selected References for Economic Data and Analyses	17

EXPOSURE DRAFT—January 2011

January 2011

TO: Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in the Selection of Economic Assumptions for Measuring Pension Obligations

FROM: Actuarial Standards Board (ASB)

SUBJ: Proposed Revision of Actuarial Standard of Practice (ASOP) No. 27

This document contains an exposure draft of proposed revisions to ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*.

Please review this exposure draft and give the ASB the benefit of your comments and suggestions. Each written response and each response sent by e-mail to the address below will be acknowledged, and all responses will receive appropriate consideration by the drafting committee in preparing the final document for approval by the ASB.

The ASB accepts comments by either electronic or conventional mail. The preferred form is email, as it eases the task of grouping comments by section. However, please feel free to use either form. If you wish to use e-mail, please send a message to **comments@actuary.org**. You may include your comments either in the body of the message or as an attachment prepared in any commonly used word processing format. **Please do not password protect any attachments.** Include the phrase “ASB COMMENTS” in the subject line of your message. Please note: Any message not containing this exact phrase in the subject line will be deleted by our system’s spam filter.

If you wish to use conventional mail, please send comments to the following address:

ASOP No. 27 Revision
Actuarial Standards Board
1850 M Street, NW, Suite 300
Washington, DC 20036

The ASB posts all signed comments received to its website to encourage transparency and dialogue. Unsigned or anonymous comments will not be considered by the ASB nor posted to the website. The comments will not be edited, amended, or truncated in any way. Comments will be posted in the order that they are received. Comments will be removed when final action on a proposed standard is taken. The ASB website is a public website and all comments will be available to the general public. The ASB disclaims any responsibility for the content of the comments, which are solely the responsibility of those who submit them.

Deadline for receipt of responses in the ASB office: **April 30, 2011**

EXPOSURE DRAFT—January 2011

Background

The pension issues facing plan sponsors, plan participants, governments and the actuarial profession are complex and urgent. Viewpoints and constituencies are diverse. Critics of current practices contend that traditional practice has been insufficient to communicate the value of the pension obligations that plan sponsors carry or the breadth of pension risk to which plan sponsors are exposed. Underfunded pensions in both the private and public plan arenas provide a significant part of the context for the criticism and subsequent calls for action. In the private plan arena, the US Government has intervened and prescribed a significant part of actuarial practice for pension valuations.

The ASB has provided coordinated guidance through a series of ASOPs for measuring pension obligations and determining pension plan costs or contributions:

1. ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*;
2. ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*;
3. ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*; and
4. ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*.

In March 2008, the ASB issued a Request for Comments on ASOP No. 27 (http://www.actuarialstandardsboard.org/pdf/ASOP_27_RFC.pdf), seeking comments and suggestions with respect to ten sets of issues in anticipation of a comprehensive review and potential revision of that standard. Thirty-three comment letters were received and reviewed (http://www.actuarialstandardsboard.org/comments/asop_27_rfc_comments.asp). The comment letters reflected diverse viewpoints and the Pension Committee found them to be thoughtful and helpful; the ASB thanks all those who took the time to comment.

In addition, in October 2008, the Board of Directors of the American Academy of Actuaries requested that the ASB develop standards for consistently measuring the economic value of pension plan assets and liabilities. The ASB reviewed the request and concluded that examining the question was consistent with resolving issues the ASB had previously observed.

In assessing the scope of its projects, the Pension Committee determined that multiple standards would need to be reviewed, revised, and exposed for comment:

- Addressing economic value involves issues regarding both actuarial methods and actuarial assumptions, thus requiring revisions to both ASOP Nos. 4 and 27, and possibly to ASOP No. 35 as well.

EXPOSURE DRAFT—January 2011

- The ASB’s comprehensive review of all aspects of ASOP No. 27 would likely require certain parallel changes to ASOP No. 35 as well.
- The Pension Committee also believes that guidance is needed regarding the assessment, disclosure, and management of risk, and that guidance on economic value and updated guidance on assumptions would be incomplete without guidance on risk. The Pension Committee believes that an entirely new standard on risk is the best vehicle for providing such guidance.
- The Pension Committee also received informal input, and generated its own discussions, about other aspects of ASOP No. 4 that might warrant review in addition to the economic value issue. These aspects include funding methods, contribution policy, funded status, projections, terminology, and valuation of certain types of plan provisions.
- The Pension Committee also noted that a review of ASOP No. 6, *Measuring Retiree Group Benefit Obligations*, was also necessary since ASOP No. 6 incorporates by reference much of the guidance contained in the pension standards. The ASB appointed a new Retiree Group Benefits Subcommittee, under the jurisdiction of the Pension Committee, to address ASOP No. 6.

The Pension Committee has been proceeding on all of these endeavors (in addition to revising ASOP No. 35 to address assumptions regarding future mortality improvement, completed in September 2010). The Pension Committee’s initial hope had been to issue a comprehensive set of four exposure drafts: three revisions for ASOP Nos. 4, 27, and 35, and one draft for a new standard on risk. This approach would have had the advantages of (i) allowing interested parties to assess each proposed change within the most complete context, and (ii) avoiding a potentially overlapping series of outstanding exposure drafts as revisions were put forth incrementally in a series of packages. However, the Pension Committee has concluded that the breadth of its commitments, the complexity of many of the issues, and the urgency of providing updated guidance now warrant a change in approach.

The Pension Committee’s revised approach is to issue ASOP No. 27 as an exposure draft for comment and, simultaneously, to issue a discussion draft of ASOP No. 4 that contains a limited number of changes at this time. The proposed changes in ASOP No. 27 are extensive and reflect a complete set of thoughts from the Pension Committee. No further changes to ASOP No. 27 are contemplated, other than in response to comments received.

As a result of the complexity and myriad viewpoints surrounding ASOP No. 4, but in recognition of the urgency, the Pension Committee is issuing a discussion draft of ASOP No. 4 that contains a limited number of changes. The discussion draft can be found at:
http://www.actuarialstandardsboard.org/pdf/discussions/asop4_discussiondraft_2011.pdf.

The Pension Committee encourages feedback and comments on the discussion draft, but is not committing to responding to the feedback. The Pension Committee intends to incorporate the feedback from the discussion draft in its work on developing more significant changes to ASOP No. 4 in 2011.

EXPOSURE DRAFT—January 2011

The proposed new standard on risk is currently scheduled to come after the exposure of more complete changes to ASOP No. 4.

Changes to ASOP No. 35 that align with the revised ASOP No. 27 are also likely to be exposed for comment after the revised ASOP No. 27 is adopted. The Pension Committee will take into account comments received on the exposure draft for ASOP No. 27 before issuing anything for comment on ASOP No. 35.

Key Changes to ASOP No. 27

Some of the proposed changes to ASOP No. 27 introduce new concepts while others are refinements to concepts currently in the standard.

Assumptions as Estimates or as Observations

Section 3.1 has been rewritten to codify that assumptions can be based either on the actuary's estimate of future experience or on the actuary's observation of the estimates inherent in financial market data, depending upon the purpose of the measurement.

Discount Rate and Investment Return Link Broken

The proposed ASOP No. 27 makes it clear that the discount rate is not necessarily the same as an investment return assumption for assets held in a pension trust. Section 3.6 of the proposed standard discusses the selection of an investment return assumption for situations where such an assumption is needed. Section 3.7 discusses the selection of a discount rate more broadly, notes that the actuary should consider the purpose of the measurement as a primary factor in choosing a discount rate, and provides examples. In some situations, the actuary might use an investment return assumption as a discount rate, but in other situations the actuary might use other estimates or observations, such as a particular quality bond yield curve as a discount rate. The actuary's attention is drawn to the fact that different end-users may have different measurement purposes. The proposed statement also anticipates that an actuary may need to measure a pension obligation on more than one basis.

The exposure draft also removes the material in the current standard that addresses the building-block method and the cash flow matching method (section 3.6.2 of current ASOP No. 27). The Pension Committee felt that much of the material was educational and more appropriate for a practice note or other medium, and further that a proper treatment of these methods and their application, updated to reflect the evolution of conceptual thought and practice, would require substantial additional educational material.

Reasonable Assumption Standard

The proposed changes to ASOP No. 27 require economic assumptions to be reasonable. Under this proposed standard, assumptions that reflect estimates of future experience are considered reasonable if they are not anticipated to produce significant actuarial gains or losses over the measurement period. In addition, the use of an investment return assumption based on a geometric return, either by itself or in combination with an arithmetic return, is reasonable. This approach is consistent with the current definition of "reasonable" used in ASOP No. 35 –

EXPOSURE DRAFT—January 2011

although without utilizing the “assumption universe” concept of ASOP No. 35, which the Pension Committee deems unnecessary. Assumptions based on observations of financial markets are considered reasonable if they fairly reflect the financial markets as of the measurement date.

The proposed changes to ASOP No. 27 eliminate the current best-estimate range concept. The Pension Committee felt that this range was too wide in practice. The Pension Committee considered adopting a single-point best estimate standard, but felt such a standard could lead to practical difficulties. For example, the Pension Committee was concerned that such a best estimate standard could create problems in a report co-signing scenario where one actuary’s best estimate of investment return was 7.2% while another actuary’s best estimate was 7.4%. The Pension Committee felt differences of this magnitude should not create problems for practitioners following the standards. The Pension Committee also added an allowance for unbiased rounding techniques in new section 3.15.4.

The reasonableness standard is described in section 3.1, and the changes in nomenclature in moving from a best-estimate range approach to a reasonable assumption approach are reflected in many places in the proposed standard and are not enumerated here.

Prescribed Assumptions

Section 3.12, Prescribed Assumptions (formerly section 3.11), and section 1.2 have been rewritten to refer the actuary to ASOP No. 41, *Actuarial Communications*, and to section 3.2 of ASOP No. 4 regarding the actuary’s responsibilities with regard to prescribed assumptions, and to state that the principles of ASOP No. 27 apply whenever the actuary has an obligation to evaluate a prescribed assumption.

Geometric and Arithmetic Returns

The proposed ASOP No. 27 draws the actuary’s attention to the fact that investment returns are sometimes quoted as arithmetic returns and other times quoted as geometric returns. Section 3.6.3 lists geometric and arithmetic returns as a factor that the actuary should consider in setting an investment return assumption. The proposed standard also states that basing an investment return assumption on geometric returns is reasonable.

The Pension Committee noted that there is a diversity of views on the question of basing an investment return assumption upon arithmetic versus geometric returns, and requests further input from commentators. The basis used elsewhere in this standard – “not anticipated to produce significant cumulative gains or losses over the measurement period” – fits more closely with an arithmetic assumption (i.e., the arithmetic assumption is generally equivalent to the mean of the distribution), while an alternate criterion – such as “equally likely that actual experience will be better or worse” – fits more closely with a geometric assumption (i.e., the geometric assumption is generally equivalent to the median of the distribution). The Pension Committee noted that the appropriate basis might vary depending on the purpose of the measurement. The approach taken in this exposure draft is that arithmetic and geometric returns are listed as a consideration for the actuary, with no requirement to use either type and no requirement for disclosure except as what the actuary may deem necessary in presenting the rationale for the assumption (described further below in this list of Key Changes). The Pension Committee also noted that actuaries might benefit from additional education in this area.

Expected Superior or Inferior Investment Returns

Section 3.6.3(d) of the proposed ASOP No. 27 states that in developing the investment return assumption, the actuary should not assume that an active investment management strategy will produce any superior or inferior investment performance compared to a passive management investment strategy. The proposed standard contains an exception to this rule if the actuary has reason to believe, based on supporting data, that the superior or inferior performance will be experienced over the long-term.

External Expertise

The Pension Committee spent time considering whether actuarial training and experience puts the actuary in a position to create an investment return assumption. Section 3.15.6 of the proposed ASOP No. 27 notes that the actuary may want to seek the opinions of outside experts for certain assumptions or for understanding the meaning of certain economic observations. Section 3.15.6 of the proposed standard still requires that the assumptions chosen for a measurement should reflect the actuary's professional judgment.

Conservatism

Section 3.15.1 of the proposed ASOP No. 27 permits the actuary to adjust assumptions to provide a margin of conservatism. This approach is permitted as long as the conservatism is disclosed in accordance with section 4.1.1.

Rationale for Assumptions or Assumption Changes

The proposed changes to ASOP No. 27 include a requirement for the actuary to disclose rationale for choosing or changing any material assumption that was not prescribed. The current standard requires the actuary to disclose assumptions but without any narrative regarding why the assumption was chosen for the actuarial measurement. The Pension Committee feels it is important, and reasonable, for the actuary to disclose why he or she chose to use or changed a particular assumption. The Pension Committee believes this disclosure requirement will improve the communication to end-users of the actuarial work.

This proposed change is reflected in sections 4.1.2 and 4.1.3 of the exposure draft. Section 4.1.2 also includes a requirement for the actuary to disclose external sources of advice that were used in setting assumptions under ASOP No. 27.

Significant Differences between Market Value of Assets and Smoothed Value of Assets

The Pension Committee discussed whether guidance was needed regarding the appropriateness of adjusting an investment return assumption when there is a significant difference between the market value of assets and a smoothed value of assets. The Pension Committee intends to consider this issue more fully in its future deliberations on ASOP No. 4, since ASOP No. 4 is the umbrella pension standard that ties together all pension standards and the issue involves the interaction of economic assumptions, governed by ASOP No. 27, and asset valuation methods, governed by ASOP No. 44.

Request for Comments on ASOP No. 27

EXPOSURE DRAFT—January 2011

The ASB is issuing a revised version of ASOP No. 27 as an exposure draft to provide members of actuarial organizations governed by the ASOPs and other interested persons an opportunity to comment.

The Pension Committee appreciates comments on the proposed changes and would like to draw the readers' attention to the following areas in particular:

1. Is the language in section 3.1 of ASOP No. 27, indicating that assumptions can be based either on the actuary's estimate of future experience or on the actuary's observation of the estimates inherent in financial market data, clear? Do you agree that either approach produces a reasonable assumption? If not, what change do you suggest?
2. Section 3 clarifies that there is no explicit link between an investment return assumption and discount rate. Does this create challenges for any existing actuarial processes? If so, please provide a description of the actuarial practice and how the new standard creates a problem. Is the removal of the material in section 3.6.2 of the current standard, which addresses the building-block method and the cash flow matching method, appropriate? Are the examples in section 3.7 of ASOP No. 27 sufficient to communicate the various purposes for which actuaries may need to choose a discount rate?
3. Do you agree that a reasonability standard is an appropriate way to set economic assumptions? If not, why not?
4. Do you agree that the guidance on arithmetic and geometric returns is appropriate? Should the consequences of the use of geometric or arithmetic returns be disclosed?
5. Do you agree the guidance in section 3.6.3(d) regarding active investment management is appropriate?
6. Is the guidance in section 3.15.6 on the use of expert advice clear and sufficient?
7. Do you agree that it may be appropriate for the actuary to include conservatism in his or her assumptions? Are the disclosure requirements for a conservative assumption sufficient?
8. Do you agree it is appropriate to require the actuary to provide rationale for assumptions or changes in assumptions? If so, do you agree that the proposed changes represent the appropriate approach?

The ASB reviewed the draft and voted in January 2011 to approve its exposure.

The Pension Committee thanks former committee member Tim Ryor for his contributions to this exposure draft.

EXPOSURE DRAFT—January 2011

Pension Committee of the ASB

Gordon C. Enderle, Chairperson

Mita D. Drazilov, Vice Chairperson

C. David Gustafson	A. Donald Morgan
Fiona E. Liston	Alan N. Parikh
Thomas B. Lowman	Judy K. Stromback
Tonya B. Manning	Frank Todisco

Actuarial Standards Board

Albert J. Beer, Chairperson

Alan D. Ford	Patricia E. Matson
Patrick J. Grannan	Robert G. Meilander
Stephen G. Kellison	James J. Murphy
Thomas D. Levy	James F. Verlautz

The ASB establishes and improves standards of actuarial practice. These ASOPs identify what the actuary should consider, document, and disclose when performing an actuarial assignment. The ASB's goal is to set standards for appropriate practice for the U.S.

EXPOSURE DRAFT—January 2011

ACTUARIAL STANDARD OF PRACTICE NO. 27

**SELECTION OF ECONOMIC ASSUMPTIONS
FOR MEASURING PENSION OBLIGATIONS**

STANDARD OF PRACTICE

Section 1. Purpose, Scope, Cross References, and Effective Date

1.1 Purpose—This standard does the following:

- a. provides guidance to actuaries in selecting (including giving advice on selecting) economic assumptions—primarily investment return, discount rate, and compensation scale—for measuring obligations under defined benefit pension plans; and
- b. enhances those provisions of Actuarial Standard of Practice (ASOP) No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*, that relate to the selection and use of economic assumptions.

1.2 Scope—This standard applies to the selection of economic assumptions to measure obligations under any defined benefit pension plan that is not a social insurance program (unless ASOPs on social insurance explicitly call for application of this standard). Measurements of defined benefit pension plan obligations include calculations such as funding valuations or other assignment of plan costs to time periods, liability measurements or other actuarial present value calculations, and cash flow projections or other estimates of the magnitude of future plan obligations. Measurements of pension obligations do not generally include individual benefit calculations or individual benefit statement estimates.

To the extent that the guidance in this standard may conflict with ASOP No. 4, ASOP No. 4 will govern. If a conflict exists between this standard and applicable laws or regulations, the actuary is obligated to comply with the laws or regulations.

If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority) or for any other reason the actuary deems appropriate, the actuary should refer to section 4.

This standard does not apply to the selection of prescribed assumptions, although the actuary should use the principles set forth in this standard whenever the actuary has an obligation to assess the reasonableness of a prescribed assumption. The actuary's

EXPOSURE DRAFT—January 2011

obligations with respect to prescribed assumptions are governed by ASOP No. 41 and by section 3.2 of ASOP No. 4, which addresses prescribed assumptions and methods.

Throughout this standard, any reference to *selecting* economic assumptions also includes *giving advice on selecting* economic assumptions. For instance, the actuary may *advise* the plan sponsor on selecting economic assumptions under US GAAP or Governmental Accounting Standards, but the plan sponsor is ultimately responsible for selecting these assumptions. This standard applies to the actuarial advice given in such situations, within the constraints imposed by the relevant accounting standards.

- 1.3 Cross References—When this standard refers to the provisions of other documents, the reference includes the referenced documents as they may be amended or restated in the future, and any successor to them, by whatever name called. If any amended or restated document differs materially from the originally referenced document, the actuary should consider the guidance in this standard to the extent it is applicable and appropriate.
- 1.4 Effective Date—This standard will be effective for any actuarial work product covered by this standard’s scope produced on or after four months after adoption by the Actuarial Standards Board (ASB).

Section 2. Definitions

The terms below are defined for use in this actuarial standard of practice.

- 2.1 Inflation—General economic inflation, defined as price changes over the whole of the economy.
- 2.2 Measurement Date—The date as of which the value of the pension obligation is determined (sometimes referred to as the “valuation date”).
- 2.3 Measurement Period—The period subsequent to the measurement date during which a particular economic assumption will apply in a given measurement.
- 2.4 Merit Scale—The rates of change in an individual’s compensation attributable to personal performance, promotion, seniority, or other individual factors.
- 2.5 Prescribed Assumption—A specific assumption that is mandated or that is selected from a specified range that is deemed to be acceptable by law, regulation, or other binding authority.
- 2.6 Productivity Growth—The rates of change in a group’s compensation attributable to the change in the real value of goods or services per unit of work.
- 2.7 Real Return—The sum of the risk premium and the real risk-free return. It can also be expressed as the nominal return less inflation.

EXPOSURE DRAFT—January 2011

- 2.8 Real Risk-Free Return—The return on an investment that is completely secure as to principal and yield in an environment with no inflation.
- 2.9 Risk Premium—The portion of real return that reflects uncertainties of future payments and appreciation.

Section 3. Analysis of Issues and Recommended Practices

- 3.1 Overview—Pension obligation values incorporate assumptions about pension payment commencement, duration and amount. They also require discount rates to convert future expected payments into present values. Some of these assumptions are economic assumptions covered under this ASOP No. 27 and some are non-economic assumptions covered under ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. In order to measure a pension obligation, the actuary will need to choose or evaluate assumptions underlying the obligation. The actuary needs to use professional judgment in choosing or evaluating economic assumptions. When the actuary chooses an economic assumption, the actuary should choose a reasonable assumption.

Assumptions can be based either on the actuary's estimate of future experience or on the actuary's observation of the estimates inherent in financial market data, depending upon the purpose of the measurement. An assumption based on estimates of future experience is reasonable if it is not anticipated to produce significant cumulative gains or losses over the measurement period. An assumption based on market observations is reasonable if it fairly reflects current financial market data.

- 3.2 Identifying Types of Economic Assumptions—The types of economic assumptions used to measure obligations under a defined benefit pension plan may include the following:
- a. inflation;
 - b. investment return;
 - c. discount rate;
 - d. compensation scale; and
 - e. other economic factors (for example, Social Security, cost-of-living adjustments, growth of individual account balances, and variable conversion factors).
- 3.3 General Considerations—The actuary should consider the following factors when identifying which types of economic assumptions to use for a specific measurement and when selecting those economic assumptions that will be used:

EXPOSURE DRAFT—January 2011

- a. the purpose and nature of the measurement;
- b. the characteristics of the obligation to be measured (measurement period, pattern of plan payments over time, open/closed group, materiality, volatility, etc.);
- c. materiality of the assumption to the measurement (see section 3.15.2); and
- d. appropriate recent and long-term historical economic data.

As stated in section 3.3(d), the actuary should consider recent economic data. However, the actuary should not give undue weight to recent experience.

3.4 General Selection Process—The general process for selecting economic assumptions for a specific measurement should include the following steps:

- a. identify components, if any, of each assumption and evaluate relevant data; and
- b. develop a reasonable assumption for each economic assumption required for the measurement.

After completing steps (a) and (b) for each economic assumption, the actuary should review the set of economic assumptions for consistency (see section 3.11).

3.5 Selecting an Inflation Assumption—If the actuary is using an approach that treats inflation as an explicit component of other economic assumptions, or as an independent assumption, the actuary should follow the general process set forth in section 3.4 to select an inflation assumption.

3.5.1 Data—The actuary should review appropriate inflation data. These data may include consumer price indexes, the implicit price deflator, forecasts of inflation, yields on government securities of various maturities, and yields on nominal and inflation-indexed debt.

3.5.2 Select and Ultimate Inflation Rates—The actuary may assume select and ultimate inflation rates in lieu of a single inflation rate. Select and ultimate inflation rates vary by period from the measurement date (for example, inflation of 3% for the first 5 years following the measurement date, and 4% thereafter).

3.6 Selecting an Investment Return Assumption—The investment return assumption reflects the anticipated returns on the plan's current and future assets. This assumption is typically constructed by considering various factors including, but not limited to, the time value of money; inflation and inflation risk; illiquidity; credit risk; macroeconomic conditions; and growth in earnings, dividends, and rents.

EXPOSURE DRAFT—January 2011

In developing a reasonable assumption for these factors, and in combining the factors to develop the investment return assumption, the actuary may consider a broad range of data and other inputs, including the judgment of investment professionals.

- 3.6.1 Data—The actuary should review appropriate investment data. These data may include the following:
- a. current yields to maturity of fixed income securities such as government securities and corporate bonds;
 - b. forecasts of inflation, GDP growth, and total returns for each asset class;
 - c. historical and current investment data, including but not limited to, real risk-free returns, the inflation and inflation risk component implicit in the yield of inflation-protected securities, dividend yields, earnings yields, and real estate capitalization rates; and
 - d. historical plan performance.

The actuary may also consider historical and current statistical data showing standard deviations, correlations, and other statistical measures related to historical or future expected returns of each asset class and to inflation. Stochastic simulation models may be used to develop expected investment return ranges from this statistical data.

- 3.6.2 Constructing the Investment Return Assumption—The components of the investment return assumption can be constructed using various methods consistent with the principles set forth in this standard. Where the assumption is determined as the result of a combination of two or more factors, care should be taken to ensure that the combination of these factors is logically consistent.

- 3.6.3 Considerations—The following factors should be considered in constructing an investment return assumption in accordance with section 3.6.2.

- a. Investment Policy—The plan's investment policy may include the following: (i) the current allocation of the plan's assets; (ii) types of securities eligible to be held (diversification, marketability, social investing philosophy, etc.); (iii) a target allocation of plan assets among different classes of securities; and (iv) permissible ranges for each asset class within which the investment manager is authorized to make investment decisions. The actuary should consider whether the current investment policy is expected to change during the measurement period.
- b. Reinvestment Risk—Two reinvestment risks are associated with traditional, fixed income securities: (i) reinvestment of interest and normal maturity values not immediately required to pay plan benefits, and

EXPOSURE DRAFT—January 2011

- (ii) reinvestment of the entire proceeds of a security that has been called by the issuer.
- c. Investment Volatility—Plans investing heavily in those asset classes characterized by high variability of returns may be required to liquidate those assets at depressed values to meet benefit obligations. Other investment risks may also be present, such as default risk or the risk of bankruptcy of the issuer.
- d. Investment Manager Performance—Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary has reason to believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the long term.
- e. Investment Expenses—Transaction, custodian, and management fees may be paid from plan assets. Such investment expenses expected to be paid from plan assets may be reflected by a reduction in the investment return assumption.
- f. Cash Flow Timing—The timing of expected contributions and benefit payments may affect the plan’s liquidity needs and investment opportunities.
- g. Benefit Volatility—Benefit volatility may be a primary factor for small plans with unpredictable benefit payment patterns. It may also be an important factor for a plan of any size that provides highly subsidized early-retirement benefits, lump-sum benefits, or supplemental benefits triggered by corporate restructuring or financial distress. In such plans, the untimely liquidation of securities at depressed values may be required to meet benefit obligations.
- h. Expected Plan Termination—In some situations, the actuary may expect the plan to be terminated at a determinable date. For example, the actuary may expect a plan to terminate when the owner retires, or a frozen plan to terminate when assets are sufficient to provide all accumulated plan benefits. In these situations, the investment return assumption may reflect a shortened measurement period that ends at the expected termination date. The form of benefit (see section 3.6.5) may reflect anticipated annuity purchase rates or lump-sum distribution interest rates at the expected plan termination date, if these forms are available.

EXPOSURE DRAFT—January 2011

- i. Tax Status of the Funding Vehicle—If the plan’s assets are not kept in a tax-exempt fund, income taxes may reduce the plan’s investment return. Taxes may be reflected by an explicit reduction in the total investment return assumption or by a separately identified assumption.
- j. Arithmetic versus Geometric Return—Arithmetic return for an asset class is the arithmetic average of observed returns for that asset class over several periods of time (usually several one year periods). Geometric return for an asset class is the periodic return that, if compounded over the observed period of time, reflects the actual asset growth over the observed time period. The use of an investment return assumption based on a geometric return, either by itself or in combination with an arithmetic return, is reasonable.

3.6.4 Multiple Investment Return Rates—The actuary may assume multiple investment return rates in lieu of a single investment return rate. Two examples are as follows:

- a. Select and Ultimate Investment Return Rates—Assumed investment return rates vary by period from the measurement date (for example, returns of 8% for the first 10 years following the measurement date, and 6% thereafter). When assuming select and ultimate investment return rates, the actuary should consider the relationships among inflation, interest rates, and market appreciation (depreciation).
- b. Obligations Covered by Designated Current Assets—One investment return rate is assumed for obligations covered by designated current plan assets on the measurement date, and a different investment return rate is assumed for the balance of the obligations and assets.

3.6.5 Form of Benefit—The amounts of some benefit forms, such as lump-sum benefits and early-retirement benefits, may be based on interest rates defined by the plan that are unrelated to the assumed investment return. The actuary should reflect such required interest rates in determining the amount of benefits expected to be paid, rather than as an adjustment to the investment return rate used to measure the obligation. (See section 3.9.4 regarding variable conversion factors.) Similarly, if the actuary expects the plan to purchase annuities when participants retire or upon expected plan termination, the interest rates implicit in expected annuity purchase rates should be reflected in determining the expected annuity purchase price rather than as an adjustment to the investment return rate.

3.7 Selecting a Discount Rate—The discount rate is used to measure the present value of expected future plan payments. The discount rate may be a single rate or a series of rates, such as a yield curve. The actuary should consider the purpose of the measurement as a primary factor in choosing a discount rate. Examples of measurement purposes are as follows:

EXPOSURE DRAFT—January 2011

- a. **Contribution Budgeting**—An actuary evaluating the sufficiency of a plan’s contribution policy may choose among several discount rates. The actuary may use a discount rate that reflects the anticipated investment return from the pension fund. Alternatively, the actuary may use discount rates appropriate for defeasance, settlement or market measurements.
- b. **Defeasance or Settlement**—An actuary measuring a plan’s present value of benefits on a defeasance or settlement basis may use a discount rate equal to rates implicit in annuity prices or other settlement options.
- c. **Market Measurements**—An actuary making a market measurement may use a set of discount rates based on market yields for a hypothetical bond portfolio whose cash flows reasonably match the pattern of benefits that are expected to be paid in the future. The type and quality of bonds in the hypothetical portfolio may depend on the particular type of market measurement.
- d. **Pricing**—An actuary measuring the price of plan amendments may use a discount rate implicit in the prices for obligations with similar characteristics in financial markets. An actuary who wants to determine a plan sponsor’s future contributions that are expected to support the plan amendment may use rates described in section 3.7(a) above.

The present value of expected future pension payments may be calculated from the perspective of different parties, recognizing the different parties may have different measurement purposes. For example, the present value of expected future payments could be calculated from the perspective of an outside creditor or the entity responsible for funding the plan. The outside entity may desire a discount rate consistent with other measurements of importance to the creditor even though those other measurements may have little or no importance to the entity funding the plan.

3.8 **Selecting a Compensation Scale**—Compensation is a factor in determining participants’ benefits in many pension plans. Also, some actuarial cost methods take into account the present value of future compensation. Generally, a participant’s compensation will change over the long term in accordance with inflation, productivity growth, and merit scale. The assumption used to measure the anticipated year-to-year change in compensation is referred to as the *compensation scale*. It may be a single rate; alternatively, it may vary by age or service, consistent with the merit scale component; or it may vary over future years, consistent with the inflation component.

3.8.1 **Data**—The actuary should review available compensation data. These data may include the following:

- a. the plan sponsor’s current compensation practice and any anticipated changes in this practice;

EXPOSURE DRAFT—January 2011

- b. current compensation distributions by age or service;
- c. historical compensation increases and practices of the plan sponsor and other plan sponsors in the same industry or geographic area; and
- d. historical national wage and productivity increases.

The actuary should consider available plan-sponsor-specific compensation data, but the actuary must carefully weigh the credibility of these data when selecting the compensation scale. For small plans or recently formed plan sponsors, industry or national data may provide a more appropriate basis for developing the compensation scale.

3.8.2 Measurement-Specific Factors—The actuary should consider factors specific to each measurement in selecting a specific compensation scale assumption. Examples of such factors are as follows:

- a. Compensation Practice—The plan sponsor’s current compensation practice and any contemplated changes may affect the compensation scale, at least in the short term. For example, if pension benefits are a function of base compensation and the plan sponsor is changing its compensation practice to put greater emphasis on incentive compensation, future growth in base compensation may differ from historical patterns.
- b. Competitive Factors—The level and pattern of future compensation changes may be affected by competitive factors, including competition for employees both within the plan sponsor’s industry and within the geographical areas in which the plan sponsor operates, and global price competition. Unless the measurement period is short, the actuary should not give undue weight to short-term patterns.
- c. Collective Bargaining—The collective bargaining process impacts the level and pattern of compensation changes. However, it may not be appropriate to assume that future contracts will provide the same level of compensation changes as the current or recent contracts. For example, if the current contract provides for a compensation freeze, it would generally be inappropriate to assume that such a policy would continue indefinitely after the contract expires.
- d. Compensation Volatility—If certain elements of compensation, such as bonuses and overtime, tend to vary materially from year to year, or if aberrations exist in recent compensation amounts, then volatility should be taken into account. This may be accomplished by adjusting the base amount from which future compensation elements are projected (for example, the current bonus might be replaced by the average of bonuses over the last 3 years).

EXPOSURE DRAFT—January 2011

- e. Expected Plan Termination—In some situations, as stated in section 3.6.3(h), the actuary may expect the plan to be terminated at a determinable date. In these situations, the compensation scale may reflect a shortened measurement period that ends at the expected termination date.

3.8.3 Multiple Compensation Scales—The actuary may use multiple compensation scales in lieu of a single compensation scale. Three examples are as follows:

- a. Select and Ultimate Scale—Assumed compensation increases vary by period from the measurement date (for example, 4% increases for the first 5 years following the measurement date, and 5% thereafter) or by age or service.
- b. Separate Scales for Different Employee Groups—Different compensation scales are assumed for two or more employee groups that are expected to receive different levels or patterns of compensation increases.
- c. Separate Scales for Different Compensation Elements—Different compensation scales are assumed for two or more compensation elements that are expected to change at different rates (for example, 5% bonus increases and 3% increases in other compensation elements).

3.9 Selecting Other Economic Assumptions—In addition to inflation, investment return, discount rate, and compensation scale assumptions, the following are some of the other types of economic assumptions that may be required for measuring certain pension obligations. The actuary should follow the general process described in section 3.4 to select these assumptions. The selected assumptions should also satisfy the consistency requirement of section 3.11.

3.9.1 Social Security—Social Security benefits are based on an individual's covered earnings, the OASDI contribution and benefit base, and changes in the cost of living. Changes in the OASDI contribution and benefit base are determined from changes in national average wages, which reflect the change in national productivity and inflation.

3.9.2 Cost-of-Living Adjustments—Plan benefits or limits affecting plan benefits (including the Internal Revenue Code section 401(a)(17) compensation limit and section 415(b) maximum annuity) may be automatically adjusted for inflation or assumed to be adjusted for inflation in some manner (for example, through regular plan amendments). However, for some purposes (such as qualified pension plan funding valuations), the actuary may be precluded by applicable laws or regulations from anticipating future plan amendments or future cost-of-living adjustments in IRC limits.

EXPOSURE DRAFT—January 2011

- 3.9.3 Growth of Individual Account Balances—Certain plan benefits have components directly related to the accumulation of real or hypothetical individual account balances (for example, so-called floor-offset arrangements and cash balance plans).
- 3.9.4 Variable Conversion Factors—Measuring certain pension plan obligations may require converting from one payment form to another, such as converting a projected individual account balance to an annuity, converting an annuity to a lump sum, or converting from one annuity form to a different annuity form. The conversion factors may be variable (for example, recalculated each year based on a stated mortality table and interest rate equal to the yield on 30-year Treasury bonds).
- 3.10 Individual Assumptions—Each economic assumption selected by the actuary should individually satisfy this standard.
- 3.11 Consistency among Economic Assumptions Selected by the Actuary—With respect to any particular measurement, each economic assumption selected by the actuary should be consistent with every other economic assumption selected by the actuary over the measurement period, unless the assumption, considered individually, is not material, as provided in section 3.15.2. Often this requirement can be met by using the same inflation component in each of the economic assumptions selected by the actuary. For example, if the actuary has chosen to use select and ultimate inflation rates, the actuary should ordinarily choose select and ultimate investment return rates, discount rates, and compensation scales, and both the periods and levels of select and ultimate inflation rates should be consistent within each assumption. If different inflation components are used (or implicitly included) in two or more economic assumptions selected by the actuary for a particular measurement, the actuary should be satisfied that such assumptions are consistent.

Consistency is not necessarily achieved by maintaining a constant difference between one economic assumption and another. If one particular economic assumption changes from one measurement to another (for example, from year to year or from funding to financial accounting) due to a change in the inflation component, the actuary should review the impact of inflation on all other economic assumptions and make appropriate adjustments. But if an assumption change is due to a factor that is unique to that assumption (for example, a change in the investment return rate reflecting a change in investment policy), modifying other economic assumptions merely to maintain constant differences would not be appropriate.

Assumptions selected by the actuary need not be consistent with prescribed assumptions, which are discussed in section 3.12 below.

- 3.12 Prescribed Assumption(s)—The actuary should use the principles set forth in this standard whenever the actuary has an obligation to assess the reasonableness of a prescribed assumption. The actuary's obligations with respect to prescribed assumptions

EXPOSURE DRAFT—January 2011

are governed by ASOP No. 41 and by section 3.2 of ASOP No. 4, which addresses prescribed assumptions and methods.

- 3.13 Changing Assumptions—An actuary’s assumption with respect to a particular measurement of pension obligations may change from time to time due to changing conditions or emerging plan experience. Even if assumptions are not changed, the actuary should be satisfied that each of the economic assumptions selected for a particular measurement complies with this standard.
- 3.14 Sources of Economic Data—The actuary should consider the possibility that some historical economic data may not be applicable for the future because of changes in the underlying environment. Appendix 2 lists some generally available sources of economic data and analyses the actuary may wish to consider in selecting economic assumptions.
- 3.15 Other Considerations—The following issues may also be considered when selecting economic assumptions:
- 3.15.1 Conservatism—Depending on the purpose and nature of the measurement, the actuary may determine that it is appropriate to adjust the economic assumptions to provide a degree of conservatism. Any such adjustment made should be disclosed in accordance with section 4.1.1.
- 3.15.2 Materiality—The actuary should establish a balance between refined methodology and materiality. The actuary is not required to use a type of economic assumption or to select a more refined economic assumption when it is not expected to produce materially different results.
- 3.15.3 Cost Effectiveness—The actuary also should establish a balance between refined methodology and cost effectiveness. While all material economic assumptions must be reflected, more refined methodology is not required when it is not expected to produce materially different results. For example, actuaries working with small plans may prefer to emphasize the results of general research to comply with this standard. However, they are not precluded from using relevant plan-specific facts.
- 3.15.4 Rounding—Taking into account the purpose and nature of the measurement, materiality, and cost effectiveness, the actuary may determine that it is appropriate to apply an unbiased rounding technique to the selected economic assumption.
- 3.15.5 Subsequent Events—The economic assumptions selected to measure pension obligations should reflect the actuary’s knowledge base as of the measurement date. However, the actuary may learn of an event that is unique to a plan or plan sponsor (for example, plan termination or death of the principal owner) occurring after the measurement date that would change the economic assumption selected. If appropriate, the actuary may reflect this change as of the measurement date.

EXPOSURE DRAFT—January 2011

- 3.15.6 Advice of Experts—Economic data and analyses are available from a variety of sources, including representatives of the plan sponsor and administrator, investment managers, economists, accountants, and other professionals. The actuary may benefit from becoming familiar with a range of views on the factors underlying each chosen assumption. When the actuary is responsible for selecting or giving advice on selecting economic assumptions within the scope of this standard, expert advice may be considered, but the selection or advice must reflect the actuary's professional judgment.

Section 4. Communications and Disclosures

- 4.1 Disclosures—In addition to the disclosures required by ASOP No. 41, *Actuarial Communications*, pension actuarial communications should contain the following disclosures:
- 4.1.1 Economic Assumptions—The actuary should describe each economic assumption used in the measurement, including whether the assumption represents an estimate of future experience or the estimates inherent in financial market data. Sufficient detail should be shown to assess the level and pattern of each assumption.
- Depending on a particular measurement's circumstances, the actuary may give information about specific interrelationships among the assumptions (for example, investment return: 8% per year, net of investment expenses and including inflation at 3%). The description should also include a disclosure of any explicit adjustment for conservatism made in accordance with section 3.15.1.
- 4.1.2 Rationale for Assumptions—The actuary should describe the information and analysis used in selecting each significant economic assumption that was not prescribed. Items to disclose could include any specific approaches used, sources of external advice, and how past experience and future expectations were considered.
- 4.1.3 Changes in Assumptions—The actuary should describe any changes in the economic assumptions from those previously used for the same type of measurement. For assumptions that were not prescribed, the actuary should include an explanation of the information and analysis that led to those changes. The general effects of the changes should be disclosed in words or by numerical data, as appropriate.
- 4.1.4 Changes in Circumstances—The actuary should describe any significant event that has occurred since the measurement date that would change the economic assumption selected and about which the actuary has knowledge. The likely effect of any such change should be described.

EXPOSURE DRAFT—January 2011

- 4.2 Prescribed Assumption(s)—The actuary should refer to section 4.2 of ASOP No. 4 for communication and disclosure requirements regarding prescribed assumptions.
- 4.3 Deviation from the Guidance in the Standard—If the actuary departs from the guidance set forth in this standard, the actuary should include the following where applicable:
- 4.3.1 the disclosure in ASOP No. 41, section 4.2, if any material assumption or method was prescribed by applicable law (statutes, regulations, and other legally binding authority);
 - 4.3.2 the disclosure in ASOP No. 41, section 4.3, if the actuary states reliance on other sources and thereby disclaims responsibility for any material assumption or method selected by a party other than the actuary; and
 - 4.3.3 the disclosure in ASOP No. 41, section 4.4, if, in the actuary’s professional judgment, the actuary otherwise deviated materially from the guidance of this ASOP.

EXPOSURE DRAFT—January 2011

Appendix 1

Background and Current Practices

Note: This appendix is provided for informational purposes, but is not part of the standard of practice.

Background

Economic assumptions have a significant effect on any pension obligation measurement. Small changes of 25 or 50 basis points in these assumptions can change the measurement by several percentage points or more. Assumptions such as compensation increases or cash balance crediting rates are often used to determine projected benefit streams for valuation purposes. The discount rate assumption, arguably the most critical economic assumption in determining a pension obligation, is used to determine the discounted present value of all benefit streams that are part of such obligation measurement.

Historically, actuaries have used various practices for selecting economic assumptions. For example, some actuaries have looked to surveys of economic assumptions used by other actuaries, some have relied on detailed research by experts, some have used highly sophisticated projection techniques, and many actuaries have used a combination of these.

The first decade of the 21st Century contained a significant amount of debate inside and outside the actuarial profession regarding the measurement of pension obligations. Much of the debate centered on the economic assumptions actuaries use to measure these obligations. The decade also saw the emergence of a financial economic viewpoint on pension obligations. Applying financial economic theory to the measurement of pension obligations has been controversial and has produced a significant amount of debate in the actuarial profession.

Current Practices

The actuary's discretion over economic assumptions has been curtailed in many situations. In the private, single-employer plan arena, the IRS, PBGC, and FASB have promulgated rulings that have limited or effectively removed an actuary's judgment regarding the discount rate used for current year funding or accounting. Actuaries can still set other economic assumptions, such as compensation increases, inflation or fixed income yields.

For plans other than private, single-employer plans (for example, church plans, multi-employer plans, public plans), the discount rate for current year funding requirements may or may not be prescribed by other entities. Funding valuations for these types of plans often use a discount rate related to the expected return on plan assets. In practice, this discount rate (return on asset) assumption may be set by the legislative body, plan sponsor, a governing board of trustees, or the actuary. The actuary may advise the plan sponsor about the selection of the discount rate.

EXPOSURE DRAFT—January 2011

As in the single-employer situation, the actuary may have discretion over other economic assumptions used to measure obligations for plans other than private single-employer plans. Alternatively, the actuary may be in an advisory position, helping the legislative body, plan sponsor, or governing board of trustees select the assumption.

The focus on solvency in the private, single-employer plan arena has come along with prescribed economic assumptions that are linked to capital market indices. Actuaries practicing in this area are becoming accustomed to changing assumptions frequently. In non-prescribed situations, practice is still dependent upon the individual actuary. Many actuaries change assumptions infrequently while other actuaries reevaluate the assumptions as of each measurement date and change economic assumptions more frequently. In the public plan arena, many entities perform assumption reviews every few years and the reviews may or may not lead to assumption adjustments.

In preparing calculations for purposes other than current year plan valuations, actuaries often use economic assumptions that are different from those used for the current year valuation.

Arithmetic return for an asset class is the arithmetic average of observed returns for that asset class over several periods of time (usually several one year periods). Geometric return for an asset class is the periodic return that, if compounded over the observed period of time, reflects the actual asset growth over the observed time period. For example, consider the following observed returns for 4 consecutive years.

	Year 1	Year 2	Year 3	Year 4
Observed Return	20%	-10%	20%	-10%

The geometric return compounded for 4 years reflects the growth of one dollar over the 4-year period. Thus, the arithmetic return over this period of time is 5.0% while the geometric return is 3.9%.

EXPOSURE DRAFT—January 2011

Appendix 2

Selected References for Economic Data and Analyses

The following list of references is a representative sample of available sources. It is not intended to be an exhaustive list.

1. General Comprehensive Sources
 - a. Kellison, Stephen G. *The Theory of Interest*. 2d ed. Homewood, IL: Irwin, 1991.
 - b. *Statistics for Employee Benefits Actuaries*. Committee on Retirement Systems Practice Education, and the Pension and Health Sections, Society of Actuaries. Updated annually.
 - c. *Stocks, Bonds, Bills, and Inflation (SBBI)*. Chicago, IL: Ibbotson Associates. Annual Yearbook, market results 1926 through previous year.
2. Recent Data, Various Indexes, and Some Historical Data
 - a. *Barron's National Business and Financial Weekly*. Dow Jones and Co., Inc. Available on newsstands and by subscription.
 - b. U.S. Bureau of the Census. *Statistical Abstract of the United States*. Published annually.
 - c. U.S. Department of Labor, Bureau of Labor Statistics. *Consumer Price Index*. Monthly updates of CPI-U and CPI-W by expenditure category and commodity and service group. Available by subscription from the U.S. Government Printing Office, Washington, DC 20402.
 - d. U.S. Federal Reserve Monthly Statistical Release G.13. Interest rate information for selected Treasury securities. Federal Reserve Board, Publications Services, Washington, DC 20551. Available by subscription.
 - e. U.S. Federal Reserve Weekly Statistical Release H.15. Interest rate information for selected Treasury securities. Available as above.
 - f. U.S. House of Representatives, Committee on Ways and Means. *Green Book: Background Material and Data on Programs within the Jurisdiction of the Committee*. Washington, DC: Government Printing Office. Published annually.

EXPOSURE DRAFT—January 2011

- g. U.S. Social Security Administration. *Social Security Bulletin*. Annual Statistical Supplements, Trustee Reports, and quarterly Bulletin. Available by subscription from the U.S. Government Printing Office, Washington, DC 20402.
- h. *The Wall Street Journal*. Daily periodical. Money and Investing (section 3); and stocks (6 indexes), bonds (4 indexes), and interest (4 indexes). Available on newsstands and by subscription.

3. Forecasts

- a. *Blue Chip Financial Forecasts*. Published by Capital Publications, Inc., P.O. Box 1453, Alexandria, VA 22313-2053. March and October issues contain long-range forecasts for interest rates and inflation.
- b. Congressional Budget Office's 5-year economic forecast. The forecast projects three-month Treasury Bill rates, 10-year Treasury Note rates, CPI-U, gross domestic product, and unemployment rates. Prepared annually. Washington, DC: Government Printing Office.