Pension Practice Council Practice Note

May 2001

Selecting and Documenting Investment Return Assumptions

Developed by the
Pension Practice Council of
the American Academy of Actuaries

AMERICAN ACADEMY *of* ACTUARIES

PENSION PRACTICE COUNCIL PRACTICE NOTE – MAY 2001

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Introduction

This practice note was prepared by the Pension Practice Council of the American Academy of Actuaries in response to Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* ("ASOP No. 27"). It is intended to assist actuaries by describing some approaches for selecting and documenting the investment return assumption that the Council believes could be employed to comply with ASOP No. 27.

It should be recognized that the information contained in this practice note provides guidance, but is not a definitive statement as to what constitutes generally accepted practice in this area. This practice note has not been promulgated by the Actuarial Standards Board, nor is it binding on any actuary.

The focus of the practice note is the basic investment return assumption for funding valuations to comply with Internal Revenue Code ("IRC") section 412(c)(3), although the methodologies discussed may be used by actuaries for other purposes such as selecting assumptions for public plans or for accounting purposes. The practice note is intended to be illustrative and spur professional discussion on this topic. Other reasonable selection and documentation methodologies currently exist and new ones likely will evolve in the future.

The practice council recognizes that the approaches illustrated in the practice note depend largely on historical economic data and relationships. However, future investment returns may differ materially from historical results. Therefore, the approaches in the practice note should be viewed as possible ways to begin or confirm a broader selection process that considers other factors such as economic forecasts.

Unless otherwise indicated, historical values and relationships reflected in the practice note were derived from *Stocks, Bonds, Bills, and Inflation* (Ibbotson Associates 1998 Yearbook), which includes economic data through 1997. The practice council intentionally developed illustrations that are most suitable for January 1, 1998 valuations to emphasize that any process for selecting economic assumptions is time-sensitive. Accordingly, actuaries who decide to use one or more of the approaches discussed in the practice note may find it prudent to update the historical data

appropriately. Actuaries who attempt to exactly reproduce the historical values and relationships set forth herein might have some difficulty due to differences in the way the data can be assembled.

The Council welcomes any suggested improvements for future updates of this practice note. Suggestions may be sent to the pension policy analyst of the American Academy of Actuaries at 1100 Seventeenth St. NW, 7th Floor, Washington, DC 20036.

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General Impact of ASOP No. 27

The Actuarial Standards Board (ASB) adopted ASOP No. 27 on December 18, 1996, following seven years of development including the release of three exposure drafts. ASOP No. 27 introduces four key concepts in the selection of an economic assumption. When applied to the investment return assumption the ASOP provides:

a) There is a "best-estimate range," which is defined as the narrowest range within which the actuary reasonably anticipates that the actual results, compounded over the measurement period, are more likely than not to fall.

b) The investment return assumption actually used should be selected from within the best-estimate range.

c) The actuary should reflect appropriate measurement specific factors (in addition to universally available data and factors), such as (i) the purpose of the measurement, (ii) the investment policy, (iii) investment and benefit volatility, and (iv) investment expenses, to determine the range and to help decide which rate within the range is appropriate for a particular measurement.

d) The investment return assumption is to be judged on its own merits and is not to be combined with other assumptions for the purpose of demonstrating reasonableness in the aggregate.

The fourth concept goes beyond the law governing assumption selection for ERISA funding, especially for multiemployer plan valuations. Thus, ASOP No. 27 calls for the selection of individually reasonable assumptions, and permits the process of selecting economic assumptions that are reasonable only in the aggregate if the nature, rationale and effect of this deviation from the ASOP is disclosed and the actuary is prepared to justify the process. Thus, the actuary who chooses that course may have an added burden of proof in the event that his or her assumptions are questioned.

ASOP No. 27 does not apply to any prescribed assumption. Under the ASOP, an assumption is "prescribed" if it is mandated (such as the required interest rate for determining PBGC variable-rate premiums) or is selected from a specified range that is deemed acceptable by law, regulation, or other binding authority (such as the IRS current liability interest rate). Where a particular assumption is prescribed, the ASOP does not authorize the actuary to select another assumption that would not satisfy the standard on its own in order to offset the impact of using the

prescribed assumption even though the actuary believes the prescribed assumption is unreasonable, unless the deviation provisions of the standard are followed.

Applying ASOP No. 27 to IRS Funding Valuations

As discussed above, the standard does not apply with respect to an assumption that is prescribed. In such case, the ASOP requires the actuary to disclose the source of that assumption, but not to disclose the nature, rationale and effect of its use, nor must the actuary be prepared to justify that it is reasonable. However, if ASOP No. 27 requires a treatment that goes beyond, but is not inconsistent with, what is required by a binding authority, such as the IRC or IRS, the actuary cannot avoid the treatment required by the ASOP merely because the binding authority does not require it.

The concept of a range of possible assumptions and the prudent use of the enrolled actuary's judgment are consistent both with ERISA's (and the IRC's) requirements and the four underlying concepts of ASOP No. 27 outlined above. This is the case even though the ASOP is more definitive and goes beyond ERISA and the IRC in certain respects (e.g., the requirement that each assumption must individually satisfy the ASOP unless the deviation provisions are satisfied).

Selection Criteria

This practice note presumes that the actuary wishes to avoid using any deviation provisions of ASOP No. 27. Thus, we assume that the investment return assumption is intended to satisfy ASOP No. 27 without regard to the selection of any other assumption. The actuary still needs to bear in mind the ASOP's requirement that all economic assumptions selected by the actuary be internally consistent (e.g., have the same underlying inflation assumption). However, this practice note does not analyze the other assumptions.

The actuary might consider various historical data and different approaches for selecting or verifying the reasonableness of the investment return assumption. Set forth below are several different ways an actuary might compile and give appropriate weight to historical data and relationships to arrive at an appropriate best estimate range or the specified point within the range. It should be noted that some of these approaches are not intended to be stand-alone selection processes but steps along the way or means to verify that a selected assumption is reasonable. Accordingly, some of the approaches do not specifically develop a best estimate range, or do so but not using rigorous statistical models to develop the smallest 50% confidence range indicated in ASOP No. 27. The practice council does not intend to leave the impression that determining a range within the bounds of ASOP No. 27 is not necessary. However, the practice council does believe that a strict proof using complex statistical means (e.g., stochastic Monte Carlo simulations) is not always necessary either.

Although the analysis set forth below focuses on historical relationships and market conditions on the measurement date, ASOP No. 27 includes forecasts of inflation and of total returns for each asset class among the "data" that actuaries should review and consider. Thus, the practice council believes that it would be appropriate to consider the prospect of future changes in the economy that are likely to have a fundamental effect on future investment returns. For example, some theorize that the retirement of baby boomers will have a major impact on rates of return.

A. Examination of Long-Term Historical Trends

One logical first step in the assumption selection process might be to examine historical investment trends with the thought that, although there is no guarantee that the past will repeat itself, knowledge of the past might shed light on the future. Given that the actuary's projections may encompass 15 to 30 years (or more), one approach is to look at actual economic results over numerous 15-year and 30-year historical periods. Using longer-term averages tends to dampen the impact of normal (and not so normal) ups and downs of investment cycles, with the goal being to extract the true underlying relationships. Some actuaries might prefer to disregard certain historical periods they believe to be aberrant (e.g., periods when there were artificial price controls) or to give more weight to recent experience in the process of anticipating future economic experience.

Whereas, in the past, actuaries may have focused on long-term historical averages, the requirement of ASOP No. 27 to establish a best-estimate range will typically lead the actuary to consider the likelihood and potential magnitude of deviations from the average. A good source for historical data is *Stocks, Bonds, Bills, and Inflation* from Ibbotson Associates. (Some of this information is also available on the Society of Actuaries website: www.soa.org.) The 1998 Ibbotson Yearbook is the source of the following critical information, covering the period 1926 - 1997.

Asset Class	Large Company Stocks		Long-Term Corporate Bonds		U.S. Treasury Bills		Consumer Price Index	
Time Horizon	15 Years	30 Years	15 Years	30 Years	15 Years	30 Years	15 Years	30 Years
Number of Overlapping Periods in the 1998 Yearbook	58	43	58	43	58	43	58	43
Rates of Return (geometric)								
Lowest	0.6%	8.5%	1.0%	1.8%	0.2%	0.9%	-1.6%	1.4%
25th Percentile	7.1%	10.1%	2.6%	2.8%	1.0%	1.4%	2.3%	2.9%
Median	10.7%	10.7%	3.7%	3.7%	3.0%	3.3%	3.9%	3.5%
75th Percentile	15.2%	12.0%	6.2%	6.2%	7.0%	6.0%	5.4%	4.8%
Highest	18.2%	13.5%	13.7%	8.9%	8.3%	6.8%	7.3%	5.4%

The CPI (inflation) column is not used to develop the numbers in this section and is shown for comparison purposes. Note that the median CPI increases over the 15-year and 30-year periods are both higher than the corresponding median Treasury Bill returns. This is caused by the fact that some years are given much more weight than others — in the 15-year periods, the years 1940 through 1983 are included in 15 of the 58 periods, the years 1939 and 1984 in 14 periods, the years 1938 and 1985 in 13 periods, and the years 1926 and 1997 in only 1 period. The early and late years had large excesses of T-Bill returns over CPI whereas for the period 1940-1983 inflation averaged 4.6% and T-Bill returns averaged 3.8% (a negative premium). This also explains why the 3.9% and 3.5% median CPI increases for the 15 and 30 year periods, respectively, exceed the 3.1% long-term inflation rate (i.e., over the entire period since 1926) shown in section B below. The practice council realizes that all of the numbers in this table (not just the CPI amounts) give more weight to some years (i.e., those in the middle years) and hardly any weight to others (i.e., the earliest and latest years). Accordingly, the actuary might consider it appropriate to adjust the amounts in the table to reflect such weighting.

Based strictly on the historical performance summarized in the above table (unadjusted for the way in which the numbers are weighted), a plan with a 15-year investment horizon which has an investment philosophy of 60% U.S. large stocks, 30% U.S. long-term corporate bonds, and 10% cash and equivalents, might expect a median return of:

$$0.60 \times 10.7\% + 0.30 \times 3.7\% + 0.10 \times 3.0\% = 7.83\%$$

One possible range, using the 25th and 75th percentile results, would be as follows:

$$\text{Upper Limits: } 0.60 \times 15.2\% + 0.30 \times 6.2\% + 0.10 \times 7.0\% = 11.68\%$$

$$\text{Lower Limits: } 0.60 \times 7.1\% + 0.30 \times 2.6\% + 0.10 \times 1.0\% = 5.14\%$$

If the time horizon were longer, the median return would be about the same, but the calculated 25^{th} to 75^{th} percentile range would narrow somewhat.

In this illustration, we have not restricted the results due to correlation considerations; in other words, the prospect that stock returns are high when treasury bill returns are low, or vice versa. Using sophisticated computer models, these types of analyses may be completed, and depending upon assumed asset class correlations, the calculated best-estimate range may be either broader or narrower than what is shown above.

Adjustments may be appropriate if different types of securities (e.g., small company stocks, foreign stock, short-term corporate bonds, long-term U.S. bonds, etc.) were included in the investment mix.

Finally, we have assumed, for the purposes of this practice note, that the narrowest range "within which the actuary reasonably anticipates that the actual results, compounded over the measurement periods, are more likely than not to fall" (i.e., the best-estimate range) is the 25th percentile to the 75th percentile. There is some evidence, particularly for lower yielding asset classes, that the best estimate range might be determined using lower percentiles, such as 10th percentile to 60th, as this may produce a narrower range. In fact, had the 30-year investment horizon rather than the 15-year horizon been reflected above, the narrowest resulting range for the portfolio mix would not have been based on the 25^{th} to 75^{th} percentile (since the lowest to median produces a narrower range). The practice council, however, believes that the intent of ASOP No. 27 is to use the 25% - 75% range unless it is inappropriate under the circumstances. In this example, it does not seem appropriate to the practice council to depart from the 25%-75% range.

Note that this process would not, in and of itself, comply with ASOP No. 27. In particular, the components of the investment return assumption have not been identified and developed – e.g., inflation, real risk-free return and risk premiums. Nevertheless, this process can be used to verify another process, or it can be expanded to develop components separately as discussed in the next section.

B. Evaluation of Investment Return Components

Many actuaries are aware of the classic economic theory of long-term investment returns, which states that the rate of return is made up of the following three components:

a) real risk-free rate of return;

b) inflation; and

c) investment premium (for risk or lack of liquidity).

The classic economic theory maintains that at any point in time the real risk-free rate of return is relatively stable, but the inflation component and the degree of risk assumed will cause the total investment return to fluctuate. Again, we will consider historical data in the Ibbotson 1998 Yearbook. When we refer to "long term" that includes the entire 1926-1997 period; "recent years" or "more recent" experience refers to the 10-year period 1988-1997. These historical periods were selected for illustration purposes only. The actuary may conclude that other periods are more appropriate.

Inflation, based on increases in the CPI, has averaged about 3.1% over the long-term, although the rates have been closer to 3.4% in recent years (1988-1997).

The real risk-free rate of return is often measured by the difference between U.S. Treasury Bill rates of return and rates of inflation and has averaged about 0.6% over the long term, although more recently this spread has been closer to 2.0%.

Now, let us examine measures of risk. An initial level of risk is often referred to as the "bond horizon premium." The bond horizon premium is the premium that investors demand for holding long-term government bonds, whose values are subject to interest rate fluctuations, instead of U.S. Treasury bills. If this premium is determined by merely taking the differences between the historical total returns on long-term government bonds and U.S. Treasury bills, we get an average differential of around 1.4% over the long-term and about 5.6% over recent years. However, in the case of the 1926-1997 period, the long-term bond returns have a capital depreciation component

caused by an increase in those bond yields from the beginning to the end of the measurement period. The opposite result occurs with respect to the 1988-1997 period. The practitioner might not believe it is appropriate to anticipate the effect that changing yields would have on bond returns in setting an investment return assumption. In that case, the bond horizon premiums might be adjusted to remove that effect, resulting in a premium of 1.6% over the long-term and 2.3% over recent years.

Combining the 2.0% real risk-free return and the 2.3% bond horizon premium for recent years experience, results in a 4.3% real return on long-term government bonds for the 1988-1997 period. It can be useful to compare this return with the yields on inflation indexed bonds that the U.S. Treasury began issuing in March 1997. These bond yields were about 3.6% during 1997 for commitments of 10 to 30 years.

A second level of risk is often referred to as the "bond default premium." The bond default premium is the premium that investors demand for holding long-term corporate bonds rather than long-term government bonds because of a possibility of default on corporate bonds. This premium has averaged about 0.5% for high quality bonds over the long-term. However, during the recent period (1988-1997), government bonds outperformed high-quality corporate bonds by an annual amount of about 0.5%.

A third level of risk is the risk of equity exposure, which over the long term has tended to add about 5% to the corporate bond rate and about 6.5% over the 1988-1997 period, assuming investment in large company stocks.

Thus, depending upon the degree of risk that the actuary deems appropriate for a given plan (and the anticipated investment mix of plan assets), and assuming that future inflation and asset returns will be at their long-term historical averages (adjusting the bond horizon premium to remove the effect of changing yields), under this approach we would anticipate rates of return in the following range: for a relatively risk-free portfolio (i.e., all long-term government bonds), 5.3% (3.1% inflation + 0.6% risk-free + 1.6% bond horizon); for a portfolio with relatively high equity exposure (i.e., 60% equities and 40% high quality corporate bonds), 8.8% (3.1% inflation + 0.6% risk-free + 1.6% bond horizon + 0.5% bond default +3.0% for equity exposure). If this range were based on more recent experience, its values would be about 2.4% higher (7.7% to 11.1%). Note that these ranges are based on a variable investment mix, whereas the range developed in section A above is based on one particular investment mix but taking into account the historical variations in total returns.

Again, to satisfy ASOP No. 27 the actuary would need to be able to demonstrate that this range is the appropriate range in which it was more likely than not that the selected assumption fell. This demonstration would require other techniques such as combining the analysis with that in section A above or by setting ranges for each of the various components along with an appropriate allowance for correlation between components. Moreover, the practice council believes that it would be appropriate for the actuary to consider the prospect of future changes in the economy that are likely to have a fundamental effect on future investment returns. For example, some theorize that future returns on equities (over the returns on long-term corporate

bonds) are likely to be lower than recent returns (e.g., the 6.5% annual return in the 1988-1997 period) or even lower than the long-term average of 5%.

C. Examination of Current Yields on Long-term Investments

The actuary could also examine current yields (i.e., at the measurement date) for long-term government or corporate obligations. The thought here is that the plan's investment return should usually exceed the relatively risk-free rate currently available on government obligations (at least for funded benefits) which is easily attainable by immunization. While this may be the trustee's expectation, the actuary still has a duty under ASOP No. 27 to make a prudent assumption selection.

The fact that this approach considers current yields does not necessarily imply that the actuary will change the investment return assumption each year as these yields change. At the very least, looking at these current yields provides the actuary a means to verify that the selection process (which may be based primarily on historical data) is not way out of line with current conditions. If the actuary intends to use this method as the primary basis for selecting the investment return assumption and plans to redetermine the assumption each year based on current yields, consideration might be given to making an adjustment where there are substantial unfunded benefits, especially when current rates differ substantially from their historical averages.

Yield rates on longer-term government bonds were about 6.0% at the end of 1997. This approach would have 6.0% as the bottom of the range, and a premium for bond default risk and equity risk would be added, resulting in a range of 6.0% - 10.0% with typical equity exposure.

This range is not too different from those developed in sections A and B above, which is not surprising given that the 6% yield on long-term government bonds at the end of 1997 was close to its historical average returns which are as follows:

60-year average of 5.3%

50-year average of 5.7%

40-year average of 6.7%

Note that yield rates at the end of each of these periods were higher than they were at the outset. This means that each of these historical results contains a negative capital appreciation component causing the results to be slightly understated, assuming the trustee would hold bonds until maturity.

Another interesting relationship is the difference between the current yields on traditional government bonds and inflation indexed government bonds with similar durations. Such difference is a current measure of inflation anticipated by investors over the life of these securities. The actuary might compare that rate with the inflation component of the investment return assumption.

The actuary is once again obligated under ASOP No. 27 to be able to demonstrate that the selected range is the appropriate one in which it is more likely than not that the selected assumption will occur.

D. Actual Plan Experience and Characteristics

For plans that have meaningful past experience, some actuaries think that it is important to consider asset gains and losses and compare the results with reasonable industry norms. This experience generally is averaged out over a sufficient period of time to make sure market cycles are fully considered. There is a school of thought that actual plan experience is irrelevant (bad managers will be fired, and good ones will become average over time), but as long as the "actual plan experience" language remains in the IRC, the actuary might want to be cautious in this area.

Furthermore, ASOP No. 27, in Section 3.4(c), allows an actuary to evaluate measurement-specific factors to either help determine the best estimate range, or to select the appropriate point within the range. Some specific items for consideration are as follows:

a. Size of Trust

Historical data have shown that smaller trusts have tended to have both lower expected rates of return and lower actual returns than larger trusts. It is important to recognize that these differences usually exist regardless of what the causes might be (e.g., overly conservative investment philosophy, lack of investment opportunity, etc.).

b. Stability of Investment Policy and Investment Volatility

While many plans adopt an investment policy (such as 60% stocks, 40% fixed income), the prospect that the mix might change from time to time, with the potential to have either a positive or negative impact on investment results, might be considered. In addition, the possibility that the plan will need to liquidate assets at a time when the market is in a down cycle in order to provide benefits might be considered.

c. Investment and Other Expenses

The treatment of plan investment related expenses can affect the chosen investment return assumption, since the calculation of a net rate of return is permitted under both ASOP No. 27 and the IRC. Investment related expenses might be implicitly deducted in determining the investment return assumption, to the extent that the actuary does not anticipate that active investment management will "pay for itself" with higher than average returns. However, ASOP No. 27 seems to require actuaries who wish to anticipate administrative (i.e., non-investment-related) expenses as a reduction to the

investment return assumption, to do so explicitly – by disclosing the specific reduction that has been made for such expenses.

d. Investment Horizon

As shown above under the historical results, the investment horizon can have a significant bearing on the width of a best estimate range. Actuaries who are unsure as to a plan's future or who suspect that an employer intends to terminate the plan fairly soon may wish to consider the expected impact of changes in investments to reflect the shorter investment horizon.

e. Purpose of Measurement

The ASOP provides that the actuary should consider the purpose of the measurement in selecting the investment return assumption. For example, for ERISA funding valuations it might be appropriate to select an investment return assumption that is lower in the best estimate range in order to enhance the security of benefits – i.e., to raise the probability to above 50% that assets will accumulate to levels needed to provide all plan benefits.

Case Studies

To illustrate the concepts presented above, this practice note works through the details of two case studies with a January 1, 1998 measurement date. In both situations current inflation expectations are assumed to be 3.0%/yr. And current long-term government bond yields are assumed to be 6.0%. These case studies are presented solely for illustrative purposes and are not intended to exclude other approaches or techniques that may be in common use.

A. Large Defined Benefit Plan

This large plan covers 10,000 active workers and 4,000 retirees. It has plan assets of $700 million, which are spread among four different professional investment advisors. The plan administrative committee has retained the services of a professional investment consulting firm to monitor actual plan performance, and to make recommendations concerning asset allocation. Over the last 10 years the plan's asset allocation has been fairly consistent: 55% in equities, 40% in high quality corporate bonds, and 5% in short-term instruments. Plan investment expenses, which are paid from the trust, have been about 0.2% of plan assets.

Assumption Selection Process

The actuary first determined that the time horizon for the plan is fairly long-term. The industry appears to be fairly stable, and the employee population covered by the plan has grown slightly over the past 10 years. Using a 30-year time horizon, the actuary first computed a 25th percentile to 75th percentile range based on historical data, and the plans asset mix as shown above.

25th Percentile:	0.55 x 10.1% + 0.40 x 2.8% + 0.05 x 1.4% = 6.75%
Median:	0.55 x 10.7% + 0.40 x 3.7% + 0.05 x 3.3% = 7.53%
75th Percentile:	0.55 x 12.0% + 0.40 x 6.2% + 0.05 x 6.0% = 9.38%

The actuary then compared the above-determined 6.75% - 9.38% range with potential investment return assumptions developed using other methodologies. The actuary developed an estimated rate of return using the component method as follows:

Based on Long-term Historical Averages (1926-1997)

Component	Value of Component	Percent of Portfolio	Weighted Component
Inflation	3.1%	100%	3.10%
Real Return	0.6%	100%	0.60%
Horizon Premium	1.6%	95%	1.52%
Default Premium	0.5%	95%	0.48%
Equity Exposure	5.0%	55%	2.75%
Total			8.45%

Based on More Recent Historical Averages (1988-1997)

Component	Value of Component	Percent of Portfolio	Weighted Component
Inflation	3.4%	100%	3.40%
Real Return	2.0%	100%	2.00%

Horizon Premium	2.3%	95%	2.19%
Default Premium	-0.5%	95%	-0.48%
Equity Exposure	6.5%	55%	3.58%
Total			10.69%

The actuary also compared the above results with current existing yields on long-term Treasury bonds of 6.0% and concluded that the component analysis based on long-term historical results was actually more in line with the 6.0% bond yield. The actuary also compared the actual trust fund performance with industry norms. For the 5-year period studied, the trustee had earned an average annual rate of return of 17.3%. While on the surface this result seems quite high, the actuary compared this result with a 55% equity, 40% bond, and 5% cash weighting of standard performance measures. The comparison result was an average annual return of 17.1%. The actuary decided that this difference was not significant enough to be a factor in the assumption selection process.

Finally, the actuary selected a rate of return assumption of 8.0%. That rate was derived first by taking the 8.45% rate (based on components – average of long term experience), less 0.2% for investment expenses, to arrive at 8.25%. Next, the actuary considered the purpose of the measurement, which was to provide a funding level that will secure the benefit promises with a high probability of success. That led the actuary to select a point within the best estimate range that is closer to the 25th percentile rather than the 50th percentile. That objective was met by reducing the rate to about 8.0%.

Note that by selecting a point within the best estimate range other than the mid-point, the actuary did not deviate from the requirement to select the best estimate assumption. Rather, the actuary acknowledged that the selection of the range itself is by no means an exact process and that the actual average return on plan assets over the measurement period might reasonably fall anywhere within the selected range. The actuary selected a point within the range that was below the mid-point because in this case the consequence of being wrong would undermine the very purpose of the measurement.

B. Small Defined Benefit Plan

This is a new plan covering a single participant currently aged 40 who is expected to retire at age 55, taking a lump sum distribution from the plan. The plan has no investment experience, and the plan sponsor anticipates making investments in a conservative portfolio of stocks and bonds using his current broker. Given the capital gain advantage of holding stocks outside the plan, the sponsor anticipates plan investments could be 65% high quality corporate bonds

and 35% stocks. There is no anticipated cash flow need for the estimated 15-year time horizon for the plan. Plan investment expenses, including brokerage commissions, are estimated to be 1.0% of plan assets.

Assumption Selection Process

The actuary first determined that the historical range based on the 25th to 75th percentile results is as follows:

25th Percentile:	0.35 x 7.1% + 0.65 x 2.6% = 4.18%
Median:	0.35 x 10.7% + 0.65 x 3.7% = 6.15%
75th Percentile:	0.35 x 15.2% + 0.65 x 6.2% = 9.35%

The actuary then verified that the range determined by this process, 4.18% - 9.35%, was consistent with his expectation for inflation, 3.0%, and current government bond yields of 6.0%. Finally, given that all of the plan liability is tied to a single participant and the volatility of the plan benefits caused by interest rate fluctuations, as well as the anticipated level of investment expense, the actuary adopted a 5.0% investment return assumption.

In either case study, A or B, the actuary maintained documentation in his or her valuation file that indicated the process (like the above calculations) used to select the assumption. It is anticipated that the actuary will update the analysis periodically, perhaps as frequently as annually, at least on a generalized basis.

Comparison Criteria

While ASOP No. 27 only deals with selection criteria, such as the guidance provided above, it is natural for the actuary to want to "confirm" his or her selected assumption. This may lead an actuary to compare his or her assumptions with those used by other actuaries in similar situations, not as justification for the selected assumptions, but as a check to be sure that the underlying assumption determination process is reasonable and consistent with the application of actuarial science to pension funding by the actuarial community.

Public statements, private letter rulings, court proceedings and other informal pronouncements by government agencies, which could provide insight as to current government positions on reasonable assumptions for IRC funding valuations, are important factors in helping the actuary confirm that the selected assumptions are appropriate (and are consistent with the law).

In addition, many actuaries will likely want to "check" selected assumptions by reference to published surveys. For example, Watson Wyatt routinely publishes a Survey of Actuarial Assumption and Funding for Pension Plans with 1,000 or more Active Participants. The 1997

survey showed that median cash funding rates have remained fairly stable, averaging about 8.2% over the past 6 years. What is now more critical is the actual distribution of assumptions.

The last several years have shown that approximately 85% of the surveyed plans have assumptions falling in the 7% - 9% range. Once again, this result is in keeping with the basic range determination methodologies outlined above. It shows that the vast majority of actuaries for larger plans, at least at the time this practice note is being written, are selecting assumptions that fall within a reasonably determined best estimate range. This range also helps "confirm" the selected 8.0% assumption in Case Study A.

In the early 1990's, the Tax Court heard three cases involving actuarial assumptions: *Vinson & Elkins v. Commissioner, Wachtel Lipton v. Commissioner,* and a group of cases collectively referred to as the Phoenix cases. In all three cases the Tax Court declined to determine that 5.0% was not a reasonable assumption for small plans. Given, that the current economic climate seems to be characterized by lower expected return rates than was the case at the periods of time studied by the Tax Court, 5.0% would still appear to be a reasonable assumption for a new one-person plan. This fact helps "confirm" the selected 5.0% assumption in Case Study B.

Summary

This practice note has been written both to provide specific guidance in the assumption selection process, and to spur further discussion on this important topic. It currently is a good time to have intellectual discussions on the topic, since most of the historically recognized methodologies produce consistent results. The challenge we face as a profession is to be able to reconcile the methodologies when they produce different results.

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