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Differences in Actuarial Assumptions

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The question of appropriate actuarial assumptions in a pension valuation occurs often enough to make it a subject of interest. In many of these discussions, the significance of actuarial assumptions is overlooked. This is best illustrated by considering a hypothetical situation.

Actuary A has performed annual actuarial valuations of a pension plan for many years, monitoring the experience and making periodic changes in actuarial assumptions whenever such changes have seemed warranted. The Pension Committee, responsible within the company for the operation of the plan, invites Actuary B to perform an independent actuarial study including a valuation of the plan.

Given a specific set of plan provisions, a participating group and pension fund assets, pension costs are determined once the funding method, amortization period and actuarial assumptions are chosen. In this situation, the only difference is the choice of actuarial assumptions.

After Actuary B has completed the valuation, using actuarial assumptions which in the aggregate are more liberal than those used by Actuary A, the range of contributions developed by Actuary B turns out to be lower than those of Actuary A. (Alternatively, the second actuary's choice of assumptions might be more conservative, leading to a higher range.)

Both actuaries are asked to make presentations about their choice of actuarial assumptions. After explanations of the reasons for the difference in funding requirements, the Pension Committee members are puzzled and consider seeking another opinion. In most cases, this should not be necessary. What is missing is an appreciation of what actuarial assumptions are, how they are monitored and subsequently changed.

Assessing Assumptions

Neither actuary is automatically "right" or "wrong," since neither one can know precisely, in advance, the eventual costs of funding the plan. Costs are long-term, known only in retrospect, and are a function of the future experience of the plan. Such costs can be determined, but only after the cessation of the plan, once the last payment is made. However, a reasoned choice of an actuarial basis can be made: one set of actuarial assumptions might be viewed as more appropriate.

Funding a pension plan involves the gradual accumulation of assets, as company contributions are deposited into the pension fund over relatively long periods of time. The selection of actuarial assumptions has to be viewed as appropriate to measure costs over this time interval. Assumptions have to be tested regularly over this long term and relate sensibly to each other. As a further complication, the benefit formula itself will change over time.

The actuary must not only prepare the valuation but also monitor the results and suggest changes in actuarial assumptions from time to time. By measuring and analyzing the actuarial gains and losses, the actuary should be able to gauge the appropriateness of actuarial assumptions and make suitable and timely adjustments to these assumptions.

The actuarial valuation of a pension plan represents an orderly, systematic financing process. Over the years, the excess of actual benefits paid plus actual expenses over investment earnings and any employee contributions must be met by company contributions. Actuarial assumptions affect the incidence of these company contributions.

If the actuary is too optimistic in choosing assumptions, the resulting contributions to the plan will be deficient and produce actuarial losses requiring contributions larger than would otherwise emerge in later years. If the actuary is too conservative in choosing assumptions, favorable experience will produce actuarial gains resulting in smaller contributions than would otherwise emerge in the future.

Sharp swings in investment returns might be regarded as diminishing the significance of such analyses, but there are important elements in the valuation which dampen the effect on costs of such market movements. These include the use of asset valuation methods which smooth out market fluctuations and the amortization of actuarial gains and losses as well as the unfunded liability.

To decide whether Actuary A or Actuary B is more likely to achieve an acceptable pattern of emerging pension costs, the Pension Committee must consider how the actuaries arrived at their choice of actuarial assumptions and question each actuary to obtain a broad understanding of the processes of monitoring and change. If both actuaries are following the same procedures and making periodic changes in actuarial assumptions based on actual experience, but starting from different bases, costs will be drawn together over time.

Key Questions

The key questions are: How was the present set of actuarial assumptions determined? How have they fared in terms of plan experience? Is the set of assumptions internally consistent? What do the assumptions tell us about the future? What is the expected pattern of costs over the short-term and the long-term? What is the procedure for monitoring the actuarial assumptions and for making changes?

The issue is not the current realism of actuarial assumptions, but rather the appropriateness of actuarial assumptions as to future events.

There are a number of early warning signs which would suggest a change in actuarial assumptions. Successive periods of actuarial gains or losses, attributable to the normal operations of the plan, should be regarded as a warning sign signaling the need for corrective action.

There are other events which produce immediate cost changes, essentially cost dislocations, so that the level after the change occurs is permanently altered. Examples are benefit improvements, a change in investment policy leading to a substantial difference in the way assets are to be invested, a significant change in compensation policy, or a plant shutdown. These immediately indicate that the future will be different from the past and require a review of the continued appropriateness of the assumptions.

An examination of both actuarial bases and use of these considerations could establish the Pension Committee's preference for one of the two approaches.

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