



Actuaries Online

by James Weiss

Development is under way for ACTUARIES ONLINE, the Bulletin Board System (BBS) sponsored by the Society of Actuaries. This information and communication service, provided via Compuserve, will allow the global actuarial community to access information, identify resources, share ideas, and discuss issues.

Features of the system include:

- Compuserve basic services, which comprises electronic mail (private messages), data transfers, an online reference library, and so on.
- An SOA communications exchange, which will allow the Society to distribute information quickly to members via the electronic medium.
- Online, real-time discussions among subscribers.
- Message posting for others to see and respond to.
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- Data libraries, in which downloadable information is available to subscribers: preprints of *Transactions* papers, meeting session transcripts and research reports, for example.

continued on page 17, column 2

Effect of Reconciliation Account on Minimum Funding

by Andrew T. Smith

OBRA 87 and the Single Employer Pension Plan Amendment Act of 1986 made numerous changes to Internal Revenue Code Section 412. Among these were the additional funding charge, the quarterly contribution requirements and mandated interest rates for amortization of funding waiver bases. The additional funding charge and interest on delinquent quarterly contributions appear as charges to the funding standard account with no offsetting amounts elsewhere in the minimum funding balance equation. The balance equation was further upset by the prospect of interest on the outstanding amount of funding waivers at an interest rate that is different from the rate used for the valuation.

To track new charges that upset the balance equation, actuaries began informally using the reconciliation account. Each year this account is charged with interest on the prior year balance and:

- Additional funding charge
- Interest on delinquent quarterly contributions
- Interest on funding waiver bases at the required rate to the extent such amount exceeds interest at the valuation rate.

At any valuation date, the reconciliation account balance can be viewed as the portion of plan assets attributable to the accumulated value of past contributions due to the items mentioned above.

The reconciliation account gained formal acceptance by the IRS when it was incorporated into the 1989 Schedule B.

Immediate-Gain Methods

Although it is not immediately apparent, the existence of a nonzero reconciliation account balance (RAB) has an effect on the future minimum required contributions under an immediate-gain method. We examine the impact of the RAB on the present value of future contributions (PVFC).

If we let PVFNC represent present value of future normal costs and OB represent the net outstanding balance of the amortization bases, that is, charge bases less credit bases, and CB represent a credit balance in the funding standard account (or, if negative, a funding deficiency), we have:

$$PVFC = PVFNC + OB - CB. \quad (1)$$

This analysis assumes that the plan is not in full funding under the accrued liability full funding limit and does not consider future charges of the type that increase the RAB (henceforth referred to as reconciliation charges).

Using the following additional definitions,

- PVFB = Present of all future employer-provided benefits
- AL = Actuarial accrued liability
- UAL = Unfunded actuarial accrued liability.

continued on page 2, column 1

In This Issue

	<i>page</i>		<i>page</i>
Actuaries Online	1	Minutes of the Combined Meeting of the Retirement Systems Practice Education and Research Committees, April 2, 1993	15
Articles Needed for News	17	Minutes of the Retirement Systems Practice Advancement Committee Meeting, April 20, 1993	16
Continuing Education Update	18	Minutes of the Retirement Systems Practice Advancement Committee Meeting, July 13, 1993	14
Defined-Contribution Alternatives to Defined-Benefit Plans: Recent Public Sector Experience	4	A Practical Approach to Gains Analysis Revisited	8
Effect of Reconciliation Account on Minimum Funding	1	TSA 1991-92 Reports Features	
Flash! Election Results	2	Three Pension Studies	17
Letters to the Editor: "Pension Expense Calculations for Cash-Balance Plans," "Present Value of Vested Benefits"	11		

Effect of Reconciliation Account on Minimum Funding

continued from page 1

let us state the balance equation as modified to include the RAB,

$$UAL = OB - CB - RAB. \quad (2)$$

From basic principles we have,

$$\begin{aligned} PVFB &= PVFNC + AL \\ &= PVFNC + (UAL + A) \\ &= PVFNC + (OB - CB - RAB) + A. \end{aligned} \quad (3)$$

Solving for PVFNC,

$$PVFNC = PVFB - OB + CB + RAB - A. \quad (4)$$

Substituting PVFNC into Equation (1),

$$PVFC = PVFB + RAB - A. \quad (5)$$

Analysis of Equation (5) yields a surprising result. We would expect that future contributions would "pay off" the difference between PVFB and assets, but Equation (5) indicates that the RAB is being "paid off" as well! In other words, even though the money in the RAB was contributed to the plan in past years and is therefore part of the assets, it must be contributed again (along with interest).

We could surmise from this that the intention of the various reconciliation charges is to provide for a "penalty" to a poorly funded plan or one that did not make timely quarterly contributions. The penalty increases assets and would be available to participants if the plan were to terminate, but future contribution levels are not reduced. That is, the "penalties" are not used to prefund the benefits.

Spread-Gain Methods with Bases

For spread-gain methods such as frozen initial liability and attained age normal that set up bases for changes in plan, assumptions and methods (as well as for OBRA 87 full funding credits and other sources), it can be shown that Equation (5) expresses the PVFC just as it did for immediate-gain methods. Using UFAL to represent unfunded frozen accrued liability, the definition of the normal cost gives us,

$$PVFNC = PVFB - UFAL - A. \quad (6)$$

Using the balance equation to substitute for UFAL,

$$PVFNC = PVFB - (OB - CB - RAB) - A, \quad (7)$$

which implies

$$PVFC = PVFB + RAB - A. \quad (8)$$

continued on page 3, column 1

Flash! Election Results

The results of the Pension Section Council election have been tabulated. Congratulations to James G. Durfee, Donald J. Segal, and Michael M. C. Sze! They will join the Pension Section Council at the Annual Meeting in October. Their terms will expire in 1996. Remaining on the Council are Brian FlitzGerald, Ethan Kra, and Ronnie Susan Thierman (terms expiring in 1994) and Silvio Ingui, Judith E. Latta, and Neil A. Parmenter (terms expiring in 1995).

The Section would like to thank the outgoing Council members for their leadership and dedicated work on behalf of pension actuaries. We appreciate the efforts of Ronald Gebhardtshauer (Chairperson), Patrick F. Flanagan (Treasurer), and Dale B. Grant during their years of service.

Pension Section News

Issue Number 18, September 1993

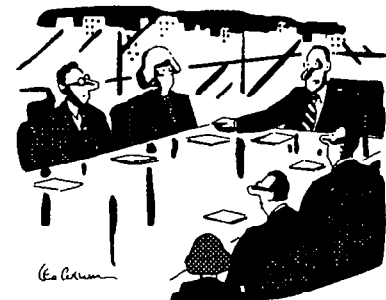
Published quarterly by the Pension Section of the Society of Actuaries,
475 N. Martingale Road, Suite 800, Schaumburg, IL 60173
Phone: 708-708-3500
Fax: 708-706-3599

This newsletter is free to Section members. A subscription is \$20.00 for nonmembers. Current-year issues are available from the Communications Department. Back issues of Section newsletters have been placed in the Society library. Photocopies of back issues may be requested for a nominal fee.

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"We can sit here all day until the person who hid the pension agenda speaks up!"

Effect of Reconciliation Account on Minimum Funding

continued from page 2

Therefore, as was the case for immediate-gain methods, reconciliation charges do not prefund plan benefits.

Aggregate Method

Under the aggregate method (as used to determine the minimum required contribution),

$$PVFNC = PVFB - OB - (A - CB). \quad (9)$$

Note that although bases are not set up for changes in plan, assumptions or methods under the aggregate method, bases may be present for OBRA 87 full funding limit credits, funding waivers, switchback from alternative minimum funding standard account, and shortfall gains and losses.

In applying Equation (9) to determine normal cost, some actuaries adjust the assets by the RAB as well as the credit balance. However, in a meeting held on February 10, 1993 between the Enrolled Actuaries Program Committee and representatives of the Internal Revenue Service, as summarized in a booklet distributed at the March 1993 Enrolled Actuaries Meeting, the IRS representatives advised that this was incorrect. They pointed to the instructions to the 1992 Schedule B, line 9p, which state, in part,

"Valuation assets should not be adjusted by the reconciliation account balance when computing the required minimum funding."

(Note that this position may be recently adopted since the 1991 Schedule B instructions contained no such statement.)

Substituting PVFNC from Equation (9) into Equation (1),

$$PVFC = PVFB - A. \quad (10)$$

Note that even if the assets consist, in part, of an RAB, the RAB does not have to be recontributed. That is, for the aggregate method only, reconciliation charges are considered to be prefunding and, as such, reduce future contribution requirements.

What's Reasonable?

IRS Regulation 1.412(c)(3)-1 describes rules for determining whether a funding method is reasonable. Section (b)(1) provides that under a reasonable funding method, the following will hold:

$$PVFB = PVFNC + OB + (A - CB), \quad (11)$$

or

$$PVFNC = PVFB - OB - (A - CB). \quad (12)$$

Note that Equation (12) is a reproduction of Equation (9). Perhaps this regulation is the basis for the position taken by the IRS representatives that assets should not be adjusted by the RAB in the aggregate method, that is, if Equation (12) does not hold, then the method is not "reasonable." However, if this is the case, then a quick comparison of Equation (12) with Equations (4) and (7) would lead to the conclusion that, if an RAB is present, then aggregate is the *only* "reasonable" funding method (with the possible exception of individual aggregate).

Conclusion

Until future guidance is issued, actuaries are faced with an inconsistency between the formula underlying the aggregate method and that underlying virtually all other commonly used methods. Perhaps, if the "penalty" view of reconciliation charges is in line with the IRS thinking, the service will change the guidance with respect to the aggregate method and update the definition of reasonable funding method.

If, on the other hand, a prefunding of liabilities is the desired result, a mechanism might be worked out that would allow a plan to apply its RAB to reduce the outstanding balance of its minimum funding bases, thereby shortening the remaining amortization periods or decreasing the amortization payments. This would have the effect of decreasing the PVFC for all contributions made to the plan. Furthermore, if each new reconciliation charge was immediately used to reduce the minimum funding amortization bases, the need for the reconciliation account would be eliminated altogether.

In the meantime, if you have clients with large reconciliation account balances that want to reduce future required contributions, why not advise them to switch to the aggregate funding method? This may not produce the lowest contribution requirement for the coming plan year, but the present value of future required contributions would clearly be minimized.

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The author gratefully acknowledges Frank Bowen and James Hausmann of Coopers & Lybrand who contributed ideas for this article.

Defined-Contribution Alternatives to Defined-Benefit Plans: Recent Public Sector Experience

by Scott K. Baker and
Kathy Jenks Harm

All state governments and most units of general-purpose local government provide retirement benefits for employees in the form of qualified plans, the overwhelming majority of which are of the defined-benefit type. In such plans, benefits are determined on the basis of a formula, normally including the individual's length of service, final average salary and percentage credit per year of service. Defined-contribution plans utilize individual participant accounts to accumulate employer and employee contributions and related investment earnings to form the basis of retirement benefits.

Recent California legislation provides:

It is the intent of the Legislature that contracting agencies in conjunction with recognized local employee organizations, develop alternative retirement plans that provide benefits under a defined contribution plan.

To someone unfamiliar with current developments in California in public sector retirement, the provision may seem relatively benign, opening the door to change or choice in established retirement plans. However, recent issues of *Public Retirement Journal* and conversations with those more directly involved with the California perspective indicate that the provision is not viewed as innocuous by all parties, with an implication that a defined-contribution plan alternative will result in a takeback by the employer and a loss to the participant.

This article first looks at participation trends in defined-benefit and defined-contribution plans in both the private and public sectors. Following is an evaluation of the differences between defined-benefit and defined-contribution plans, particularly because these differences may result in relative advantages and disadvantages to employer and employees. Then the article examines several situations in which public

sector employers have either converted their defined-benefit plans to defined-contribution plans or offered a defined-contribution alternative to individual participants.

Trends in Private and Public Sector Plans

In the private sector, the number of defined-contribution plans and the assets in those plans is increasing, with defined-contribution plans increasing between 1975 and 1988 from 67 to 80 percent of the total number of plans and assets increasing from 28 percent to 39 percent of total pension assets in the same period. A significant reason for the increase is the decline in the relative importance of sectors of the economy that have traditionally relied most heavily on defined-benefit plans, such as heavily unionized and older industrial enterprises [1].

The vast majority of plans in the public sector are still defined-benefit plans. The Bureau of Labor Statistics estimates that 90 percent of full-time state and local government employees are covered by defined-benefit plans, while 9 percent are covered by defined-contribution plans [2]. The same study concludes that "public-sector defined-benefit plans generally replace a greater proportion of earnings than private-sector defined-benefit plans, but private-sector employees are more likely to have supplemental defined-contribution pension plans," citing average replacement figures of defined-benefit plans of a hypothetical worker with 20 years of service and \$25,000 per year in earnings at 20 percent in the private sector, 34.3 percent for state and local government employees with Social Security coverage, and 40.6 percent for those public sector employees without Social Security coverage [3].

Defined-Benefit Versus Defined-Contribution Plans

The single specific characteristic on which the Internal Revenue Code

bases the definition of a defined-contribution plan is the existence of individual accounts on which benefits are solely based [4]. The single most important factor in determining the relative merits of a defined-benefit versus a defined-contribution plan at the individual level is tenure with the employer, which can rarely be accurately predicted at the onset of employment.

Funding Liability

A major advantage for defined-contribution plans is that they do not have the potential for accruing unfunded liabilities. Costs are as predictable and budgetable from year to year as the salary levels on which contributions are based. The level of contributions does not fluctuate with investment returns, employee mortality or turnover rates. Even though employers directly face potential growing unfunded liability in defined-benefit plans, unfunded liability can also be adverse to employee interests. Bond ratings are affected by the unfunded liability of an employer, and higher borrowing costs to the governmental unit may lead to fewer resources available to fund increases in employee salaries.

Investment Risk

A significant difference between defined-benefit and defined-contribution plans is the nature of the employer obligation. In defined-benefit plans, the employer is obligated to pay benefits in accordance with the plan, while defined-contribution plans require payment of contributions on an ongoing basis.

The resulting investment exposure in the two plans is opposite, with investment risk undertaken by the employer in a defined-benefit plan and by the employee in a defined-contribution plan. Superior investment performance may reduce employer contributions in a defined-benefit plan, while on the other hand it will simply enhance potential retirement benefits in a defined-contribution plan.

continued on page 5, column 1

Defined-Contribution Alternatives to Defined-Benefit Plans: Recent Public Sector Experience
continued from page 4

Although not applicable to governmental qualified plans, ERISA provisions that drive the design of all private sector plans essentially require a range of investment options to be available to plan participants. Many public sector plans follow this aspect of plan design and provide several investment options with different risk/return characteristics.

Participant assumption of investment risk can lead to greater involvement and interest by employees in their retirement plans. This could be perceived either positively or negatively by an employer. Of course, a participant has no guarantee or promise of a given level of future benefits, which are the basis of the appeal of defined-benefit plans.

Portability

Portability is the ability to transfer accrued vested retirement benefits from one employer to another. The importance of portability is reinforced by the recent enactment of legislation at the federal level requiring that plan participants be permitted to directly roll over their pension plan distributions (other than annuities over life or life expectancy, installments for a period of ten years or more and required minimum distributions) at termination of employment to a subsequent employer's plan or Individual Retirement Account [5]. It is expected that all defined-contribution plans will provide portability through rollovers, while in general defined-benefit plans will be unlikely to provide a significant degree of transferability except to other public sector retirement plans within the same state where some reciprocity may be provided. Further, direct rollovers from or to California public retirement systems are not authorized under state law [6].

Vesting

Vesting refers to the rights of a participant to a portion or all of a given benefit or to a specified percentage of the employer contributions account in a defined-contribution plan. Among state and local governments, defined-benefit plans tend overwhelmingly to have cliff vesting (100 percent vesting with a certain period

of service, with no phase-in), with roughly half of all participants required to have more than five years of service for full vesting [7]. Since the employer has no need to impose strict requirements to control unfunded liabilities, vesting is frequently more liberal under a defined-contribution plan, which may lead to increased acceptance by participants.

Individual accounts in defined-contribution plans can continue to grow after termination of employment, while deferred vested benefits in defined-benefit plans are fixed at termination. As an example, a 43-year-old employee of a Council of Governments in Pennsylvania left that local government position after nine years and nine months in a position that required ten years of service for full vesting. He calculates that reinvestment of the return of his own contributions will be worth more to him in retirement benefits than the monthly benefit he could have collected at normal retirement age under the defined-benefit plan. The effect of the faster vesting and growth of account value after termination provides additional flexibility in employment opportunity to those who are in defined-contribution plans.

Disability and Death Provisions

Most defined-benefit plans provide substantial payments in the event of the disability or death of a participant. Defined-contribution plans tend to provide benefits based only on account value or incidental amounts of insurance within the plan. A major consideration in providing a defined-contribution alternative should be the provision of these benefits from some other source, such as a combination of group insurance and Social Security.

Administration

In terms of administration, defined-contribution plans have an advantage in that they do not rely on the services of an actuary to determine the amount of funding required to be made to the plan by the employer in addition to employee contribution if the plan is a contributory plan. Defined-contribution plans also face an obligation to provide for the education of plan participants in the area of investments, including the inherent potential for investment losses in defined-contribution plans. Plan staffing requirements in

defined-benefit plans tend to be more extensive than in defined-contribution plans, which frequently rely on outside providers for investment provision, employee education and plan documents. Plan costs in defined-benefit plans are normally assumed by the employer, while most defined-contribution plans assess ongoing fees to the participant.

Recruitment, Retention, Morale

Retirement benefits are often mentioned as employee benefits that can enhance the recruitment, retention and morale of employees. While prospective candidates who expect to be career employees may have a strong preference for a defined-benefit plan, those whose future plans are uncertain may be expected to be more attracted to defined-contribution plans. Clearly, defined-benefit plans promote retention, since a career move normally results in no additional accrual of retirement earnings under the plan.

Flexibility in Benefit Payments

An attractive feature in defined-contribution plans in part balances the guarantee of a future monthly benefit amount in a defined-benefit plan. Participants generally have the opportunity to select from a much wider range of payout options in defined-contribution plans, including lump-sum distributions, payments over a specified number of years or irregular payments to meet varying retirement needs. This flexibility is perhaps most beneficial to participants who have a guaranteed source of monthly retirement income from another source, such as an employer-provided pension or Social Security.

Summary

It is impossible for a person to determine in advance whether a defined-benefit or defined-contribution plan will provide the greater retirement payout; the relative benefit for an individual can only be calculated after the tenure of career with each employer, earnings history, length of time in retirement payment phase and investment performance are known, when it is too late to alter the outcome. A comparison of the impact of job mobility on pension amounts for equal cost pension plans projected the annual payout available in three situations and concluded that over a

continued on page 6, column 1

Defined-Contribution Alternatives to Defined-Benefit Plans: Recent Public Sector Experience *continued from page 5*

42-year career, the highest pension amount would be available to an employee in a defined-benefit plan with only one job, while the lowest pension would be available to an employee with defined-benefit plans in five separate jobs. Faring better than the employee with five jobs but not as well as the employee with one job would be an employee who had been in defined-contribution plans, *regardless* of the number of employers [8].

Since there are aspects of both defined-benefit and defined-contribution plans that are advantageous to both employers and employees, it becomes a challenge to plan administrators and employee organizations to develop new approaches to plan design that provide the greatest combination of strengths to produce the best retirement benefits possible.

Experiences from Public Employers around the Country

Three recent experiences of public employers demonstrate different approaches to the establishment of defined-contribution plans in place of or in addition to defined-benefit plans.

Littleton, Colorado

The City of Littleton, Colorado is a Denver suburb with a population of 33,000. In 1978, there was a state-wide division of fire and police personnel into two groups for retirement benefit purposes: old hires (pre-1978) and new hires. Local governments generally then maintained defined-benefit plans for each group through the Colorado Fire and Police Pension Association (FPPA), with the actuarial rates for the groups calculated separately. Thus, starting in 1978, Littleton had separate plan groups and resulting contribution rates for old and new hires in fire and police service, for a total of four pension plans.

As a result of interest from local new-hire employee groups statewide, with strong employer support, a number of fire and police new-hire groups pursued the option of withdrawing from FPPA, and in 1988

both the fire and police new-hire groups in Littleton elected to withdraw from the state-run retirement system. The sentiment and votes in Littleton were overwhelmingly in favor of a locally administered Money Purchase Plan, a defined-contribution plan. The city's funds held at that time by FPPA were returned to the city for crediting to individual participant accounts. Each participant received credit equivalent to the return of the 8 percent contribution from both employer and employee, with associated earnings, from hire date. These participants also benefited from the allocation of forfeiture funds that the city had held in the plan, which represented an additional "windfall" to participants who were in the plan at the time of conversion from defined-benefit to defined-contribution. Annual contributions are now at the level of 9 percent for both employer and employee.

A significant feature of the conversion for formerly participating local groups was the maintenance of a disability benefit through FPPA. The disability benefit is offset by an actuarial projection of benefits available from the Money Purchase Plan but does not require that any given level of benefits be actually withdrawn from the Money Purchase Plan. Health benefits are not available for purchase by retirees through a group plan, which would be the case with an FPPA plan. Employer disclosure to participants in the Money Purchase Plan alerts participants that they will be required to locate their own health care plan at retirement.

After six years experience in the Money Purchase Plan, acceptance by the officers is rated as "tremendous" by Martin Keilman, senior police officer and former chairman of the Police New Hires Pension Board. He further indicates that the form of the plan is a competitive advantage in hiring and that new people coming on board are "ecstatic" in their feelings about the benefit. The portability of assets gives substantially more flexibility in how long a participant chooses to stay, with employer contributions fully vested after five years. This is especially in contrast

to other Colorado FPPA plans that have full vesting for new hires at 10 years and full vesting for old hires at as long as 20 or 25 years.

A member relations representative from FPPA related that several retirement systems in Colorado at one time had never had to pay retirement benefits. This tended to occur in "wealthy resort communities," where police and fire rarely spent their careers, largely because the cost of living was prohibitive for raising a family. For the employees in these communities particularly, the FPPA representative thought the defined-contribution alternative worked extremely well, providing a benefit for the time the individual has served in the department. The representative also thought that those plan participants who shared in forfeiture allocations were especially well served. Further, a key to the conversions is the availability of knowledgeable resources to local participants, including provision of education in the area of investment options.

Auburn, Maine

The State of Maine has a unique statutory provision governing the portion of Maine State Retirement System (MSRS) covering local governments. Any individual who is employed by a governmental unit participating in MSRS and also the Social Security system may elect on an individual basis not to participate in MSRS.

Auburn, Maine, a city of 23,000 with a diversified economic base in southern Maine, has set up a defined-contribution plan for those general employees who opt out of MSRS. Since police and fire are not covered by Social Security, participation in the state plan for those employees is not elective but mandatory. In 1985, the city established a Money Purchase Plan with 11 percent combined employer and employee contributions and 100 percent immediate vesting. Approximately 15 to 20 employees dropped participation in MSRS and began participation in the Money Purchase Plan. Since MSRS had after-tax employee contributions,

continued on page 7, column 1

Defined-Contribution Alternatives to Defined-Benefit Plans: Recent Public Sector Experience *continued from page 6*

the contributions returned to participants on their withdrawal were not eligible for rollover to the new plan.

Personnel Director Deborah Grimmig estimates that the reasons for electing the Money Purchase Plan are thought to be so compelling that 80 percent of new hires since 1985 have chosen participation in the defined-contribution plan. She does not think that portability is a major factor in the choice of participants because most employees assume they will spend their careers with the city. She attributes the choice primarily to the more liberal vesting provision, since MSRS has 10-year cliff vesting and requires a full 30 years for half pay. She expects that a number of employees would not take MSRS even if the defined-contribution alternative were not available.

Grimmig thinks that the defined-contribution plan is important in attracting new employees but not as significant an employee benefit as the health care plan provided by the city. She also indicated that a learning curve exists; when first in the plan, the participants have tended to take the most conservative investments, and they are likely to be more sophisticated, long-term investors as plan participation has continued.

Several other local governments in Maine now offer defined-contribution plans as an alternative to participation in MSRS, and the experience has been viewed as positive for both employers and employees.

Deerfield Beach, Florida

A growing coastal community of over 45,000 north of Fort Lauderdale, Deerfield Beach adopted defined-contribution plans for all general employee and firefighters hired after inception of the Money Purchase Plan in early 1990. Existing employees were given the option of converting to the new plan, with their initial credit being the greater of the present value of their accrued benefit (assuming 100 percent vesting) or their employee contributions to date.

According to City Manager Barry Evans, the reason for requiring new hires to be in the defined-contribution plan was that defined-benefit plan accruals had been raised to 3 percent per year of service, a level that was projected to be prohibitively expensive over time. General employees could retire at age 55 with 10 years of service, and firefighters after 25 years of service with no age requirement. Contribution rates in the new plan are 8 percent employer and 4 percent employee. These contribution rates are unlikely, even given optimistic investment experience, to produce the retirement income streams guaranteed in the defined-benefit plan, particularly for firefighters who could retire with generous benefits at a relatively young age.

Evans states that there have been no complaints from the general employees, and a number of employees eligible to convert have done so, with the result that more general employees now participate in the defined-contribution plan than in the defined-benefit plan. The firefighters, however, have viewed the change in benefits more negatively, with no conversions to the new plan and the small number of affected new hires somewhat dissatisfied.

Observations

The circumstances in Deerfield Beach, particularly for firefighters, appear to be substantially different from those in Littleton and Auburn. Key factors in Littleton that appear missing in Deerfield Beach related to the substantial contribution levels to the new plan (18 percent in Littleton compared to 12 percent in Deerfield Beach) and the initiative of the officers and support of the employer in the plan conversion process. The benefit levels in the old plan in Deerfield Beach were also substantially higher than those in Littleton. One strength of Auburn's experience lacking in the other two situations is individual choice in selection of defined-benefit or defined-contribution alternative.

While public sector experience with defined-contribution plans is quite limited, the trends in the

private sector, economic realities in local governments, a more mobile public sector work force, and growing employee involvement in retirement planning suggest that defined-contribution plans will continue to become more important. Most surprising to the authors is that relatively few governmental units have pursued an approach that combines a defined-benefit plan with relatively modest but guaranteed retirement payments with a defined-contribution plan that gives the participant a truly portable benefit and encourages active involvement in planning for the future.

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A Practical Approach to Gains Analysis Revisited

by Andrew T. Smith

The analysis of actuarial gains and losses by source has long been an invaluable tool for the pension actuary in performing a defined-benefit pension plan valuation. Such analysis provides a measure of the appropriateness of each assumption and may reveal a faulty valuation technique. Of the numerous papers on gains analysis, Josiah Lynch's landmark paper, "A Practical Approach to Gains Analysis,"^{*} has probably been the most influential for its impact on the methods actually used by pension actuaries in performing gains analysis under a multiple decrement valuation model. The Lynch paper provides a very complete treatment of the subject, covering both immediate-gain and spread-gain funding methods. Furthermore, the formulas are developed such that they are practical from the perspective of a valuation system programmer yet still maintain mathematical integrity.

Lynch's approach to gains analysis involves stating each type of gain or loss in terms of the difference between actual release of liability occurring during a given year and the expected release of liability during the same period. In the discussion of liability gain or loss arising from an individual immediate-gain funding method, an expression for the expected release of liability is developed that, under certain circumstances, produces values that are only approximations of the true releases. This article presents an intuitive formulation of expected release, examines the difficulties in using such a formula in the programming of a pension valuation system, and, finally, derives an alternative expression for expected release that is both practical and precise. The introduction of an unexpected approximation into Lynch's formula and the magnitude of the error involved in using this approximation also are addressed.

Notation

Throughout this article we examine a single plan participant, active at time 0, and the gains or losses arising from the valuation performed at time 1 as compared to expected values based on the valuation at time 0. This article is not intended to provide a complete development of gains and losses due to all possible sources; it concentrates solely on the gain or loss due to decrement (or survival) during the year. Gains and losses caused by data corrections, salary experience, asset return, and other causes are covered in Lynch's paper. The special case in which the probability of decrement during a year is equal to 1 is also not considered.

The notation comprises standard life contingency symbols, pension-specific symbols used in the Lynch paper and a few symbols invented or modified specifically for this article. The nonstandard notation is described below:

- $\int AL_t$ = Accrued liability at time t for a single participant
 $\int NC$ = Normal cost at time 0 for a single participant
 V = Accrued liability (reserve) at time 1 for a single participant. $V = \int AL_1$; see Lynch's equation (48).

EV = Expected accrued liability (reserve) required at time 1 for a single participant (as calculated from information available at time 0). $EV = (\int AL_0 + \int NC)(1 + \theta)$; see Lynch's Equation (10).

V' = Expected liability (reserve) at time 1 assuming participant has survived in active status to that time (as calculated from information available at time 0).

NL_k = Expected year-end value of new liabilities should the participant be subjected to decrement from cause k during the year (as calculated from information available at time 0).

\overline{NL} = Expected new liability given that decrement due to some cause has occurred. (This is a weighted average of the NL_k 's using the $q_0^{(k)}$'s as weights.)

AR_k = Actual release of liability, if any, arising from decrement k . (Release is determined as the difference between the expected liability at time 1 assuming no change in status, that is, assuming an active participant is still active, and the actual liability at time 1.)

ER_k = Expected release of liability arising from decrement k .

ER'_k = Lynch's expression for ER_k ; this is stated in his Equation (47) as $d_0^{(k)}(EV - NL_k)/l_t$

e_k = Error involved in using ER'_k in lieu of ER_k . $e_k = ER_k - ER'_k$

Note that the standard actuarial symbols l_t , d_t , $q_t^{(k)}$, and p_t are used with subscripts that represent times rather than ages. That is, a subscript of t represents the appropriate value for the given participant corresponding to his or her age at time t .

Intuitive Definition of ER_k

Let the actual release of liability at time 1 due to cause k (AR_k) be defined as:

$$AR_k = \begin{cases} V' - V, & \text{decrement due to } k \\ 0, & \text{otherwise.} \end{cases} \quad (1)$$

We can view AR_k as a random variable that assumes the value $(V' - V)$ with probability $q_0^{(k)}$ and the value 0 with probability $(1 - q_0^{(k)})$. The expected release (ER_k) must then be defined as:

$$ER_k = E[AR_k]. \quad (2)$$

V' , which is not affected by any event occurring during the year, is a constant in Equation (1). In contrast, V assumes the value of an accrued liability if the participant survives in active status to time 1 and is the present value of the appropriate benefit if decrement occurs during the year. However, as NL_k is defined as the expected value of V should decrement from cause k occur, we can write:

$$NL_k = E[V | \text{decrement due to } k]. \quad (3)$$

Then

continued on page 9, column 1

^{*}Lynch, Josiah M., Jr., "A Practical Approach to Gains Analysis," *Transactions of the Society of Actuaries* XXVII (1975): 423-439.

A Practical Approach to Gains Analysis Revisited
continued from page 8

$$ER_k = E[AR_k] = q_0^{(k)} E[(V' - V) | \text{decrement due to } k] + (1 - q_0^{(k)}) 0 \quad (4)$$

$$= q_0^{(k)} (V' - NL_k)$$

This statement of ER_k [Equation (4)] was also suggested by Paulette Tino in comment 2 of her discussion of Lynch's paper. Lynch's formula for ER_k , which is referred to as ER'_k in this article, can be found in his Equation (47) and is stated below:

$$ER'_k = \frac{d_0^{(k)}(EV - NL_k)}{l_1} \quad (5)$$

The Problem

In calculating liability gains and losses, a valuation computer program typically makes at least three "passes" through the data (additional passes are required to recognize the effects of data corrections, plan changes, assumption changes, and so on). The three basic passes are described in Table 1.

TABLE 1

Pass	Description	Purpose
1	Valuation at time 0	Reproduce values actually used at time 0, compute EV, compute ER _k 's
2	Valuation at time 1	Compute V', compute liability recognizing actual status at time 1 but using expected salaries
3	Valuation at time 1	Using actual salaries, compute V (final liability), AR _k 's, various gains or losses.

The calculation of V' in pass 2 bears special attention. If V' is calculated directly from its definition, an additional pass performing a valuation at time 1 with the assumption that all time 0 active participants remain active would be called for. To avoid this additional pass, V' must be calculated from other values obtained during pass 1.

Note that once the time 0 accrued liability and normal cost have been reproduced in pass 1, EV can be calculated from:

$$EV = ({}_jAL_0 + {}_jNC)(1 + i) \quad (6)$$

V' can then be calculated during pass 2 by using the following formula given by Lynch as Equation (43) (thereby meeting our objective of avoiding an additional pass through the data):

$$V' = EV + \sum_k ER_k \quad (7)$$

Unfortunately, this procedure gives rise to a problem if we intend to use Equation (4) to calculate ER_k . Namely, ER_k depends upon V' , but V' cannot be calculated until all ER_k 's are known. It was this problem that forced Lynch to bypass the obvious statement of ER_k shown in Equation (4) in favor of the approximation ER'_k (which does not involve V') shown in Equation (5). However, we demonstrate that by restating V' in terms of certain values (all of which are available during pass 1) and substituting the result into Equation (4), we can derive a precise yet "computationally friendly" expression for ER_k .

Note that EV is the expected reserve required at time 1. Because we are not considering data corrections, salary experience different than assumed, partial years of service, and other complicating factors, we have:

$$EV = E[V] = p_0^{(k)} V' + \sum_k q_0^{(k)} NL_k \quad (8)$$

Defining the expected new liability given that decrement from some cause has occurred (\overline{NL}) as

$$\overline{NL} = \frac{\sum_k q_0^{(k)} NL_k}{\sum_k q_0^{(k)}} = \frac{\sum_k q_0^{(k)} NL_k}{(1 - p_0^{(k)})} \quad (9)$$

we have

$$EV = p_0^{(k)} V' + (1 - p_0^{(k)}) \overline{NL} \quad (10)$$

Now, solving for V' ,

$$V' = \frac{EV - (1 - p_0^{(k)}) \overline{NL}}{p_0^{(k)}} \quad (11)$$

(Note that Equations (8) and (11) are presented in very similar forms by Lynch in his Equations (44) and (45).)

Substituting V' as stated in Equation (11) into Equation (4),

$$ER_k = q_0^{(k)} (V' - NL_k) = q_0^{(k)} \left[\frac{EV - (1 - p_0^{(k)}) \overline{NL}}{p_0^{(k)}} - NL_k \right] \quad (12)$$

$$= \frac{q_0^{(k)}}{p_0^{(k)}} [EV - p_0^{(k)} NL_k - (1 - p_0^{(k)}) \overline{NL}]$$

We now have, in Equation (12), a precise formula for ER_k that can be completely evaluated during valuation pass 1.

The Error Involved in ER'_k

At this point it may not be obvious what error (if any!) is introduced by using ER'_k in lieu of ER_k . To examine this issue more easily, we restate Equation (5) by using:

$$\frac{d_0^{(k)}}{l_1} = \left[\frac{d_0^{(k)}}{l_0} \right] \left[\frac{l_0}{l_1} \right] = \frac{q_0^{(k)}}{p_0^{(k)}} \quad (13)$$

as

$$ER'_k = \frac{q_0^{(k)}}{p_0^{(k)}} (EV - NL_k) \quad (14)$$

(Note that in the special case where $NL_k = \overline{NL}$, Equation (12) simplifies to Equation (14). We would conclude that this is the assumption underlying the derivation of ER'_k as an approximation to ER_k .)

A Practical Approach to Gains Analysis Revisited

continued from page 9

If we define the error involved in using ER'_k as $e_k = ER_k - ER'_k$, we can subtract Equation (14) from (12) to obtain:

$$e_k = \frac{q_0^{(k)}}{p_0^{(k)}} (1 - p_0^{(k)})(NL_k - \overline{NL}). \quad (15)$$

From Equation (15), $e_k=0$ (implying $ER_k=ER'_k$), if and only if $NL_k=\overline{NL}$ or $q_0^{(k)}=0$. Therefore, assuming that a participant is subjected to decrement k and at least one other decrement between time 0 and time 1, it is very unlikely that ER'_k will produce exact expected releases.

We would expect that the size of e_k would be relatively small compared to ER_k , or at least that e_k does not "blow up" under any special case. Note that if $q_0^{(k)}$ is large relative to the other probabilities of decrement acting on the participant, then NL_k will necessarily be close to \overline{NL} , causing the $(NL_k - \overline{NL})$ term to be small. If $q_0^{(k)}$ is relatively small, then e_k is easily seen to be small as well.

The real question for those who have used one of the popular valuation systems that employs ER'_k to calculate expected releases is: "How much have past gains and losses been skewed due to the use of this approximation?" The answer, of course, depends upon such factors as the actual employee data, the funding method, the decrements, the actuarial assumptions, and the plan formula. However, initial (though limited) trials conducted by the author showed the error, as a percentage of expected release, to be less than 2 percent if multiple retirement ages are not used, and less than 10 percent otherwise. The greatest degree of distortion seems to occur in the situation in which a large retirement decrement and a death decrement are both acting on a given participant during the year.

Note that while each individual ER'_k may be only an approximation of the corresponding ER_k , the sum of the ER'_k 's produces the precise total expected release! This can be verified by showing the e_k 's sum to 0:

$$\begin{aligned} \sum_k e_k &= \sum_k \frac{q_0^{(k)}}{p_0^{(k)}} (1 - p_0^{(k)})(NL_k - \overline{NL}) \\ &= \left[\frac{1 - p_0^{(k)}}{p_0^{(k)}} \right] \left(\sum_k q_0^{(k)} NL_k - \overline{NL} \sum_k q_0^{(k)} \right) \\ &= \left[\frac{1 - p_0^{(k)}}{p_0^{(k)}} \right] \left(\sum_k q_0^{(k)} NL_k - \sum_k q_0^{(k)} NL_k \right) \\ &= 0. \end{aligned} \quad (16)$$

This property is a direct result of the way in which approximation was introduced into Lynch's derivation of expected release. In going from Equations (46) to (47) in his paper, Lynch's implicit assumption was:

$$\sum_n f(n) = \sum_n g(n) \text{ implies } f(n) = g(n) \text{ for all } n,$$

which clearly need not be true in all cases.

Summary

Although the number of defined-benefit plans may be, for the time being, declining, there is still a place for the study of gains analysis. Because *FASB Statement 87*

requires the use of the projected unit credit funding method for calculation of pension expense and because this has prompted many plan sponsors to adopt this cost method for funding as well, the analysis of gains and losses under individual immediate-gain methods may be an especially timely topic.

This article is not intended to replace or criticize the Lynch paper. Rather, in presenting Equation (12) as a precise yet practical method of calculating expected releases, it aspires to present a small refinement to the breakthrough techniques developed by Lynch. Certainly nothing said herein should diminish the stature of the Lynch paper or in any way detract from the important contributions he has made to the development of the modern valuation system and to the field of actuarial science.

Andrew T. Smith, ASA, is a Consultant at Coopers & Lybrand in Louisville, Kentucky.

Discussion of Preceding Paper

by Josiah Lynch

Actuarial gain and loss theory is enriched by Andrew Smith's paper "A Practical Approach to Gains Analysis Revisited," which sets forth a detailed analysis of the mathematics of expected releases. His conclusions are correct and well presented and are a welcome addition to the actuarial literature.

The "Smith" and "Lynch" approaches produce identical total expected releases. Smith derives the total by computing actuarially correct expected releases for individual decrements and summing the results as shown in Equation (12) of his paper. His method is clearly definitive.

My approach, on the other hand, is to compute the individual releases by a reasonably close approximate method, shown in Equation (5) of his paper. As his paper notes, the two methods produce the same total expected releases. For my purposes, the computational convenience and speed gained by my method make up for the small deviations in individual releases. Programming simplicity and computing speed arise from bypassing the need to calculate the decrement-weighted expected new liability at time 0 defined in Smith's Equation (9).

Smith's paper describes the differences between the two methods and quantifies the precise amount of the error in the approximation for each expected release in his Equation (15). As he noted, the errors are offsetting and sum to 0.

Smith is the first actuary to discover and chronicle the approximation to individual expected releases in the 18 years since the publication of my original paper. The profession is indebted to him for his contribution to the actuarial gain and loss literature.

Josiah Lynch, ASA, is President of Lynchval Systems Incorporated in Reston, Virginia.

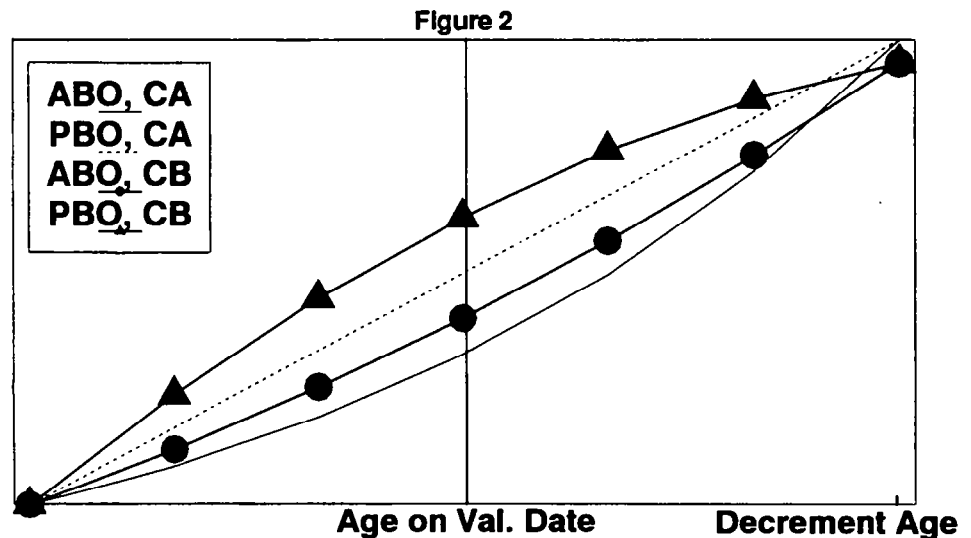
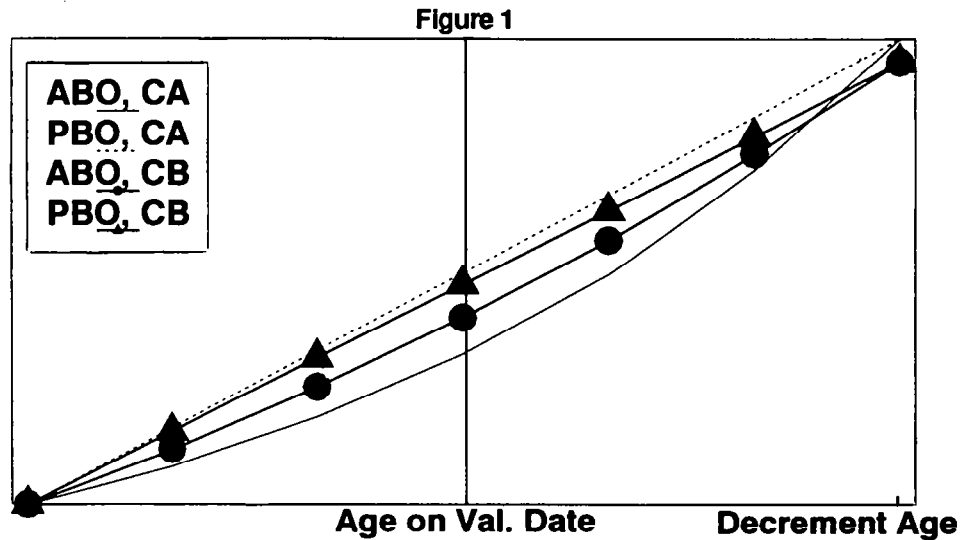
Letters to the Editor

"Pension Expense Calculations for Cash Balance Plans"

Dear Dan:

In the June 1993 issue of *The Pension Forum*, Ning Yuen Chen and Stephen Fernstrom present a well-written paper that proposes rules for determining the PBO benefit under the projected unit credit actuarial cost method for cash balance plans. They conclude that a pro rata allocation of the projected benefit at decrement age is reasonable for cash balance plans as long as the interest rate to be used to determine the projected account balance at decrement age is greater than or equal to the assumed salary scale. If this condition does not hold, the authors propose to use the traditional unit credit actuarial cost method. They also conclude that approaches used by actuaries to reflect the front-loading of benefits generally found in cash balance plans (regardless of the relationship between the interest rate and the salary scale referred to above) produce excessively accelerated allocation to past service relative to the pro rata allocation approach. I am uncomfortable with these conclusions. Figure 1 illustrates my concern.

Assume an employer sponsors a traditional career average plan with the same rate of benefit accrual for each year of service. Figure 1 illustrates the pattern of the accrued benefit (ABO, CA) and the PBO benefit (PBO, CA) for an active participant in such a plan. Further, assume that on the valuation date the plan is changed to a cash balance plan. The new cash balance plan provides a 5 percent lower projected benefit at decrement age, but the new accrued benefit pattern (ABO, CB) is more front-loaded than the old traditional career average plan. Under the approach suggested by Chen and Fernstrom, the PBO for this participant (PBO, CB) would be decreased by 5 percent as a result of the plan change, even though the participant's accrued benefit is increased



by 24 percent. I don't find this result to be necessarily reasonable or consistent with paragraph 40 of FAS 87.

In the December 1986 issue of *The Pension Forum*, I presented a generalized approach for determining the actuarial accrued liability under the projected unit credit actuarial cost method. The approach was revisited in the September 1991 issue of *The Pension Forum*. Under this approach (which I refer to as the adjusted accrued benefit method),

the PBO benefit equals the accrued benefit under the plan multiplied by the ratio of average pay at the expected decrement age to the average pay at the valuation age. For a career average plan, average pay at decrement age would be the average of all pays from entry age to decrement age, while average pay at the valuation date would be the average pay from entry age to the valuation date. This

continued on page 12, column 1

Letters to the Editor
continued from page 11

ratio can be simplified by making assumptions for historical pay.

For the traditional career-average pay formula with the same rate of benefit accrual for each year of service, the adjusted accrued benefit method produces a pro rata allocation of the projected benefit. As I indicated in the September 1991 issue of *The Pension Forum*, "if you like the difference [between the PBO and the ABO] for a plan with no changes in rates of benefit accrual, then you'll love it for plans with changes in accrual rates."

Figure 2 illustrates the same example as described above, except the adjusted accrued benefit method is used for determining the PBO benefit. Under this method, both the accrued benefit and the PBO benefit as of the valuation date are increased by 24 percent as a result of the plan change.

Presumably, Chen and Fernstrom would argue that the adjusted accrued benefit method produces an "excessively accelerated expensing rate" for the example illustrated in Figure 2. By definition, however, the allocation between past service and future service under this method is no more "excessively accelerated" than when a pro rata allocation is used for a plan that has the same rate of benefit accrual for each year of service. Further, I find the method produces results that clients with cash balance plans (or any kind of career average plan) can easily understand.

Kenneth A. Steiner, FSA
Consulting Actuary
The Wyatt Company
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Authors' Response:

We would like to make several points in response to Ken Steiner's comments on our recent article in the June 1993 issue of *The Pension Forum*. First, our analysis of other approaches to expensing cash value plans was limited to a single method that has been presented at actuarial conferences. We do not presume to pass judgment on all methods currently used in the actuarial community. In fact, because we perceive this to be a very "gray area," our intent in publishing the article was to put forth an approach we consider to be reasonable while pointing out a concern (that is, "excessively accelerated allocation") that might result under some methods of dealing with the problem.

We acknowledge the anomalous result (increased ABO with decreased PBO) that results from the conversion of a career-average plan to a more front-loaded cash balance plan. However, we note that the same result would occur under both the regular projected unit credit method and Steiner's method if a final-average pay plan was converted to a career-average plan intended to deliver slightly lower projected benefits. We think there is widespread acceptance of this result and do not consider it to be a conflict with paragraph 40 of FAS 87.

Whether we would consider Steiner's method to produce "an excessively accelerated expensing rate" could be a function of the underlying interest crediting and salary assumptions in the cash balance plan. Steiner's method works very well for final-average salary and

career-average salary plans. The method may, however, produce anomalous results for some unit accrual designs, including cash balance plans.

For example, consider a cash balance plan with a 4 percent-of-pay annual allocation, a 10 percent interest crediting rate, and an annual age 65 annuity conversion factor of 10. Assume the annual historical and expected salary increase is 5 percent, and assume a participant hired at age 35 is expected to retire at age 65. Table 1 shows the projected progression of career average pay relative to accrued benefits.

Note that at age 55, the ratio of projected career average pay at retirement to current career average pay is 134 percent. However, the projected age 65 benefit is only 124 percent of the current (age 55) accrued benefit. Under Steiner's method, the PBO for the participant would be based on an attributed benefit that exceeds the projected normal retirement benefit. In this situation, we would consider the allocation to past service to be excessively accelerated.

Ning Y. Chen, FSA
Vice President and Consulting Actuary
Stephen C. Fernstrom, ASA
Senior Technical Consultant
W.F. Corroon
St. Louis, Missouri

continued on page 13, column 1

TABLE 1

Age	Annual Pay	Career Average Pay (CAP)	Projected CAP	CAP Ratio: Proj./Cur.	Accrued Benefit	Projected Benefit	Ben. Ratio: Proj./Accr.
35	\$10,000	--	--	--	--	--	--
45	15,513	\$12,578	\$22,146	1.76	\$5,193	\$10,502	2.02
55	25,270	16,533	22,146	1.34	8,454	10,502	1.24
65	41,161	22,146	22,146	1.00	10,502	10,502	1.00

Letters to the Editor
continued from page 12

Present Value of Vested Benefits

Dear Dan:

I am writing in response to your editorial in the June 1993 issue of *Pension Section News* and to Mary Adams' comments in the May 1993 issue of *The Actuary* about the calculation of the value of vested benefits in U.S. pension plans.

First, I think it is interesting that Adams says that the value of vested benefits should not just be the value of accrued benefits for vested employees. Although *Actuarial Standards of Practice No. 4 (ASOP 4)* includes many specific examples in which this is not the case, the definition of the actuarial present value of vested benefits in Section 11.4 of the standard states that "... the actuary should calculate the accrued benefit as of the calculation date. This benefit should then be multiplied by the vesting percentage defined under the plan."

In the public sector, the value of vested benefits is reported only in connection with the disclosures required by the Governmental Accounting Standards Board (GASB). Practice regarding the calculation of vested benefits has evolved based on two viewpoints. One is that the vested benefits are valued using a "private sector" approach as in SFAS 35 and 36 and detailed in ASOP 4. The other is that this type of measurement is meaningless in the public sector and that the value of vested benefits (actually the vested portion of the PBO) should simply be reported as the PBO (which includes salary projection) for employees who are vested. Either approach is acceptable to the GASB, as long as the actuary discloses which method is used. In my opinion, the GASB is a "higher authority" than the ASB in this instance; that is, the procedures in ASOP 4, Section 11.5(a) are not applicable.

In addition to differences between public and private sector practices, I believe there can be valid differences in calculating the value of vested benefits with respect to areas that are not discussed in the ASOP. For example, many actuaries believe that disability and death benefits are not

vested until a member is disabled or dead, but this is not specifically stated in the ASOP. In a quick reading of the statement, the only reference I found that would indicate that death benefits might not be considered vested is a footnote on page 23. The examples of vested benefit calculations do not refer to death or disability benefits. To imply that there is a clear standard detailing how every type of benefit should be valued for vested or accrued benefit purposes is, in my opinion, an overstatement.

In summary, I fear Adams' criticisms may have been too sweeping. There could have been good reasons for the calculations she reviewed to have been done as they were.

*Jane D. Pacelli, FSA
Consulting Actuary
Milliman & Robertson, Inc.
Washington, D.C.*

Author's Response:

Perhaps there has been some misunderstanding about the point I was making the "Tsk, tsk" addition to my editorial in the May issue of *The Actuary*. The point is that we have ASB Standards of Practice that we must follow under our Code of Professional Conduct. When a Standard of Practice defines a term, an actuary, presenting a measurement labeled as that defined term, should understand the term. The reader of a report should be able to assume that the actuary is following the definition in preparing the measurement, because if something else were used, the description would be different.

With respect to the specific term "actuarial value of vested benefits," it should be noted that the underlying concept in ASOP 4 was developed in the mid-1960s when the Accounting Principles Board issued its Opinion No. 8. Over the years there has been no change from the original concept that, for active employees, the employees' vested benefits are included, and any benefits to which an employee may become entitled through advancement of age or service are excluded. Because they are forfeited when the employee terminates service, benefits in excess of the vested benefit, which may become payable upon disability and death in active service, are also excluded. In ASOP 4, this concept

is not assigned to either private or public sector plans.

I think it is not necessary to come to the "higher authority" question that Ms. Pacelli has noted. I cannot see how the GASB can be a higher authority in a situation in which the GASB has made it clear that no definition is in effect or even contemplated. I think it would be fairer to say that the professional judgment of some actuaries indicates that for public sector plans, disclosures of projected values, different from those described in Section 11.5(a) of ASOP 4, are appropriate, particularly in view of the fact that the GASB was well aware of ASOP 4 and made no attempt to disavow the Section 11.5(a) concept. Other actuaries have used the value of accrued benefits without salary projection (why?).

In any event, there is no intention of attempting to stifle any actuary's exercise of professional judgment. As Ms. Pacelli noted and ASOP 4 (Section 13.3(i)) indicates, all that is needed is disclosure of what methods have been used.

In spite of the concerns noted, I feel that "Tsk, tsk" accomplished its intent to remind actuaries that it is their responsibility to understand the Standards of Practice (how many did not know the difference between the value of vested benefits and the value of vested employees' accrued benefits?) and to follow them, with appropriate disclosure of any deviation from the Standard.

Other agencies (governmental or quasi governmental) may call for the disclosure of actuarial values. In such case, it could be expected that an actuary would use the procedures of the appropriate Standard. (If an agency should require a methodology to determine values that are different from that under a Standard, this should be disclosed when communicating these values.)

I trust that any time we see the "actuarial value of vested benefits," or any other defined term with any necessary notes, there will be no problem in knowing exactly what is there.

*Mary Hardiman Adams, ASA
Consulting Actuary
West Orange, New Jersey*

Minutes of the Retirement Systems Practice Advancement Committee Meeting

July 13, 1993
Washington, D.C.

Attending the meeting were: Harry Garber (SOA Vice President), Mary Riebold (SOA Board Representative), Pat Scahill (SOA Board Representative), Mary Adams (Chairperson, Pension Committee of the ASB), Joe Applebaum for Mike Sze (Chairperson, SOA Retirement Systems Research Committee), and Judy Anderson (SOA Staff).

Harry Garber reviewed the discussion on SOA services that was held at the last Executive Committee meeting. He listed the following four points for the Committee to consider:

1. SOA must be part of the structure in each country. This relates to maintaining close ties with the Academy in the U.S. and the CIA in Canada.
2. We must pay attention to the cost of providing services and manage it. Along with direct costs, volunteer time should also be included. In addition, we should consider who is paying the cost (for example, employers paying for time spent by volunteers).
3. We should individualize services to meet the needs of different groups within the SOA membership.
4. We should take advantage of the advanced technology that is available.

We discussed a vision for the practice area and the services it can provide. The Professional Development Committee will be asked to concentrate on the format used for providing formal continuing education. The Practice Education Committee will be asked to continue to

concentrate on the creation of "informal" continuing and basic education materials.

In addition, we discussed the possibility of a committee to concentrate on the uses of advanced technology and the delivery of SOA services to retirement systems actuaries (that is, the electronic bulletin board). This new group would also have responsibility for indexes of published materials.

Finally, we discussed statistics derived from a database of pension actuaries created from the SOA's computer files. The database information on meeting attendance shows that only a small percentage of the SOA-member pension actuaries attend meetings. Work will proceed on meetings but with recognition of the small numbers that take advantage of them.

For the afternoon meeting, the Committee was joined by members of the Pension Practice Council of the American Academy of Actuaries. Both groups reviewed their purpose within each organization's structure. We then discussed the retirement systems-related projects that the Academy and SOA committees are currently working on.

For the Pension Practice Council, these include the following:

- PBGC reform: submitted comments and testified at hearing
- Budget reconciliation: submitted comments on proposed 401(a)(17) changes
- Mertens decision: submitted comments and background paper on proposed legislation to overturn the decision
- Working on a standard on social insurance programs to present to the ASB
- Considering update of a mid-1980s study of pension funding methods and assumptions.

For the Practice Advancement Committee, these included the following:

- Producing the UP-94 and GAM-94 mortality tables
- Compiling an experience analysis of employee turnover, retirement and disability
- Producing a symposium of papers on funding adequacy and related issues
- Researching defined-contribution plans and benefit adequacy
- Working with the Pension Section on a revised meeting format
- Distributing a Pension Section member survey
- Revising *Economic Statistics for Pension Actuaries* to include quarterly updates and, possibly, health statistics.

After this overview, the discussion focused on meetings and continuing education. There was a consensus that both groups should work together to promote cooperation and avoid overlap.

At least one joint meeting per year between the Committee and the Council is anticipated for the future.

Respectfully Submitted,
Joseph Applebaum, FSA

Minutes of the Combined Meeting of the Retirement Systems Practice Education and Research Committees

April 2, 1993
Washington, D.C.

Editor's Note: Meetings of the Retirement Systems Practice Education and Research Committee are held jointly in the morning session and separately in the afternoon session. The separate (afternoon) session of the Practice Education Committee was reported in the June 1993 issue of Pension Section News.

In attendance were: Joe Applebaum, Chris Bone, Bill Farquhar, Rick Kaye, Ed Husted, Rita Lawlor (Co-chairperson), Dave Lesueur, Lindsay Malkewich, Bill Sohn, Mike Sze (Co-chairperson), and Henry Winslow. Also attending was Judy Anderson, Society representative.

1. The minutes of last meeting were approved as amended.
2. The need for new members was discussed. The need for members with Canadian experience and small-plan experience was observed, and possible candidates were mentioned. Interest expressed by other actuaries was also discussed.
3. The next meeting will be on July 9 in New York City at Ernst and Young. The fall meeting will be in New Orleans on October 23.
4. Mike Sze and Rita Lawlor discussed the December 3 meeting of the Retirement Systems Practice Committee. Mike Sze reported on a conference call on pensioner mortality and a conference call of the Research Coordination Committee. Bill Sohn reported on the last meeting of the American Academy of Actuaries' pension committee.
5. Chris Bone and Bill Farquhar discussed the Retiree Health Task Force's deliberations. The focus has been on the shape of the incidence of claims curve. An important implication of this is whether the benefit should be thought of as essentially an annuity or a life

insurance type of benefit. The Retiree Health Task Force should be encouraged to perform sensitivity analyses for this issue. A number of issue identification and budget issues were discussed. The need for coordination with the Health Research Committee and the FAS 106 Task Force, as well as the need for claims data, was noted. Bill Farquhar discussed his issues memorandum on post-retirement health topics. Mike Sze noted that health trend rates should be published. There was also a brief discussion of the impact of national health plans on trend rates.

6. Bill Sohn discussed the progress on the funding adequacy symposium. A number of potential contributors have come forward, and some people whose contributions might be of particular interest have been contacted. Plans for publication by mid-summer look good. A half-day editorial meeting was scheduled for April 19 at the Equitable Life Assurance Society in New York City.

Afternoon Meeting of the Retirement Systems Research Committee

In attendance were: Joe Applebaum, Chris Bone (Vice-Chairperson), Ed Husted, Dave LeSueur, Lindsay Malkewich, Mike Sze (Chairperson), and Henry Winslow.

1. Lindsay Malkewich discussed the work of the GAM 94 Table Committee. A basic table has been developed and will be sent to the UP 94 Table Committee. There will be a strong relationship between the two tables—the UP 94 table will be the basis for the GAM 94 basic table. Lindsay Malkewich noted that to develop age-specific safety margins, both stochastic modeling and basic statistical

analysis were used. He also discussed the development of age-specific mortality improvement factors. Among other things, results in *Social Security Actuarial Note 107* indicate that recently there has been smaller mortality improvement at ages above 85. Finally, he noted that the table will not have a terminal mortality rate of 1; instead the mortality rate will be 0.5 at ages 110 through 115 inclusive.

2. Ed Husted discussed the work of the UP 94 Table Committee, which is working from the GAM 94 data. This, with potentially minor variations, will be used to produce the UP 94 Table.
3. Joe Applebaum and Ed Husted discussed the task force on termination/retirement experience. An organizational meeting was held on March 9. Richard Joss and Barthus Prien have joined the task force. The task force plans to solicit plan experience on pension plan decrements other than mortality from consulting firms and actuaries serving large public plans. Henry Winslow noted that the retirement incidence rates among John Hancock's terminated vested participants was much lower than expected and suggested that the studies separate the experience of terminated vesteds.
4. Dave LeSueur discussed a study on defined-contribution plans and retirement income adequacy. This would be done by a survey of retirees from defined-contribution plans of large sponsors.
5. Mike Sze discussed budget issues for projects. He noted that there was a need to submit budgets by April 15.

*Respectfully Submitted,
Joseph Applebaum, FSA*

Minutes of the Retirement Systems Practice Advancement Committee Meeting

April 20, 1993
New York City

In attendance were: Pat Flanagan (Chairperson, CIA Committee on Pension Plan Financial Reporting), Harry Garber (Society Vice-President), Jeffrey Groves (Chairperson, Pension Track Education Objectives Committee, U.S.), Ethan Kra (Vice-Chairperson, Pension Section Council; Co-chairperson, FAS 106 Task Force), Rita Lawlor (Chairperson, Retirement Systems Practice Education Committee), Bob McKay (Board Representative), Curt Morgan (Chairperson, Retirement Systems Specialty Guides Committee), Mary Riebold (Board Representative), Pat Scahill (Board Representative), Susan Smith (Chairperson, Retirement Systems Professional Development Committee), and Michael Sze (Chairperson, Retirement Systems Research Committee). Also attending were Judy Anderson (Society Staff Representative) and Barbara Choyke (Society Staff Representative).

1. Report from the Pension Section Council

The Pension Section Council will again include a member survey with ballots this year. Survey questions will include feedback on SOA services, for example, which meetings were attended and why. The number of questions should be limited to a manageable size.

2. Meetings and Speaker Recruitment

The Society meetings are within weeks of the Conference of Consulting Actuaries and Enrolled Actuaries meetings. Therefore, the Pension Section requests later dates and western sites for the Society Spring Meeting that it cosponsors. The Pension Section has also experienced some difficulty in recruiting speakers.

It was suggested that the meeting format be changed from the traditional four or five tracks of 90-minute sessions to two or three parallel tracks using a full or half-day seminar format. Under the proposed format, fewer topics would be presented but with much more depth, and there would be fewer speakers to

recruit. However, speakers would be required to do more work and planning. A seminar format could also be another way to distinguish Society meetings from the other organizations' meetings.

This suggestion was also presented at the Pension Section Council meeting in April. The Section Council and the Retirement Systems Practice Advancement Committee concurred that we should try to implement the seminar format at the 1994 Spring Pension Meeting. Ethan Kra will prepare a memo for the Society Task Force on Program Site Selection.

ASB Standards and Specialty Guide topics (for example, mergers and acquisitions) were mentioned as possible topics for the seminar format.

Under a seminar format, publication of a full transcript, like the *Record*, would be extremely difficult. It may also be less useful. It was suggested that copies of the seminar handouts replace transcripts in the *Record* and that tape recordings of the sessions be available to those interested in additional detail.

It was suggested that *Pension Section News* publish a list acknowledging the speakers at the pension sessions at the San Diego meeting. Judy Anderson will discuss this idea with the Editor of the *Pension Section News* and forward the list of speakers.

It was also suggested that we keep a record of past speakers and their topic, particularly those that were well received. Even if the same speakers do not have the time to volunteer again, they can often suggest others and perhaps act as mentors.

3. Database on Actuaries in the Retirement Systems Practice Area

We will be using the Society database to profile the retirement systems actuaries and their activities. To identify actuaries in the Retirement Systems Practice area, we will include all Pension Section members, all EAs and all actuaries who selected the pension specialty as the area of practice.

4. Society Services to Retirement Systems Actuaries

There was a lengthy discussion on services the Society provides to retirement systems actuaries and on the priorities assigned to the resources for these activities.

- **Job Opportunities.** The committee was supportive of the Society's becoming more involved in identifying alternative career paths and new areas for the pension actuary's skills. We should work to expand the definition of the pension actuary. We should also encourage those that have gone into nontraditional work to publicize their activities.
- **Continuing Education.** There was a sentiment to continue to emphasize seminars.
- **Publications.** A more consolidated approach to the various Society publications, including indexes, PASCs and the *Record*, was discussed. There was interest in the possibilities that the electronic bulletin board and new technology will provide.
- **Research.** There was support for the demographic studies (mortality, turnover, retirement) that the Retirement Systems Research Committee is preparing. There was also support for continued publication of *Economic Statistics for Pension Actuaries*.

It was suggested that we try to open communications with the Employee Benefits Research Institute (EBRI). They may be interested in joint research and would be in a position to protect the anonymity of sources for the data collected.

Mike Sze provided a list of Retirement Systems Research Committee projects.

There was support for the work on postretirement health and analysis of claim incidence. One suggestion was that the Practice Education Committee publish an article on the implications of the FAS 106 research. This should be done together with the Health Systems Practice Education Committee.

continued on page 17, column 1

Minutes of the Retirement Systems Practice Advancement Committee Meeting
continued from page 16

The retirement systems practice area issues will be discussed at the June meeting of the Society Executive Committee. Harry Garber will distribute his notes, based on this discussion, before the Executive Committee meeting.

The next meeting of the Retirement Systems Practice Advancement Committee will be held in July.

*Respectfully Submitted,
Judy F. Anderson, FSA
Education Actuary*

Actuaries Online
continued from page 1

Subscribers can also contribute to the libraries to share reports, data, etc. with other professionals.

- Online searchable databases for locating actuarial resources, actuarial programs and fellow actuaries from around the world.

From the general Society perspective, members will be able to use the service to order books and study materials, notify the SOA office of *Directory* changes, view meeting and seminar programs, register for them online, and see examination pass lists.

Other proposed uses include the posting of employment opportu-

nities, providing online access to the *Directory* and using the BBS as a central distribution point for regulatory notices and updates.

Other actuarial organizations will be invited to participate in the service. Its success depends on its usefulness to actuaries in all businesses. Information and expertise will be available that until now has been limited to meetings or other specialized programs.

The Society staff is on target for a 1993 implementation of the service. Further information will be sent to members as it becomes available.

James Weiss is Director of Information Services at the Society of Actuaries in Schaumburg, Illinois.

TSA 1991-92 Reports Feature Three Pension Studies

About October 1, the *Transactions of the Society of Actuaries, 1991-92 Reports* will be mailed to members. Contained in this volume are three experience studies of particular interest to pension actuaries:

- "Mortality among Members of Uninsured Pension Systems," from the Retirement Plans Experience Committee
- "Mortality under Individual Immediate Annuities, Life Income Settlements, and Matured Deferred Annuities between 1976 and 1986 Anniversaries," from the Individual Annuity Experience Committee
- "Mortality under Structured Settlement Annuities," also from the Individual Annuity Experience Committee.

The Retirement Plans Experience Committee was chaired by Ed Hustead, and the Individual Annuity Experience Committee was headed by Phil Bieluch.

Articles Needed for News

Your help and participation are needed and welcomed. All articles will include a by-line (name, with title and employer, if you wish) to give you full credit for your effort. *News* is pleased to publish articles in a second language if a translation is provided by the author. For those of you interested in working on the *News*, several Associate Editors are needed to handle various specialty areas such as meetings, seminars, symposia, continuing education meetings, teleconferences, and cassettes (audio and video) for Enrolled Actuaries, new pension study notes, new research and studies by Society committees, and so on. If you would like to submit an article or be an Associate Editor, please give me a call at 203-521-8400.

News is published quarterly as follows:

<i>Publication Date</i>	<i>Submission Deadline</i>
December	November 10
March	February 10
June	May 10
September	August 10

As in the past, full papers will be published in *The Pension Forum* format, but now only on an ad hoc basis.

Pension Section News—Preferred Format

In order to efficiently handle articles, please use the following format when submitting articles.

Mail articles on 5 1/4" diskette using either ASCII or WordPerfect 5.1 files, or send scannable copy, i.e., typed copy that is single-spaced with 72-character lines. Headlines are typed upper and lower case. Carriage returns are put in only at the end of paragraphs. The right-hand margin is not justified.

If this is not clear or you must submit in another manner, please call Barbara Simmons 708-706-3562 at the Society of Actuaries for help.

Please send original hard copy of article and diskette to:

Barbara Simmons
Society of Actuaries
475 N. Martingale Road
Suite 800
Schaumburg, IL 60173-2226

Please send a copy of article (hard copy only) to:

Daniel M. Arnold, FSA, FCIA
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65 LaSalle Road
West Hartford, CT 06107

Thanks for your help.

Dan Arnold, Editor
Phone: 203-521-8400
Fax: 203-521-3742

Continuing Education Update

by Barbara S. Choyke

The following list identifies pension programs that the Society of Actuaries has scheduled (to date) for Fall 1993. Several other opportunities are being planned, and information regarding these and other programs will be sent to the membership in the coming months.

Seminars

September 23, 1993

Teleconference: Qualified Retirement Plans—Final Nondiscrimination Rules, Legislative Update and Participant-Directed Plans	220 min.	C
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Cosponsored with the American Bar Association and telecast live across the U.S.

Pension Sessions at the Annual Meeting

October 17-20, 1993

New York City

Monday, October 18

9PD	Late Breaking Developments	90 min.	C
13WS	Computer-Assisted Learning	90 min.	C

Tuesday, October 19

31PD	Another World: FASB	90 min.	NC
41WS	Computer-Assisted Learning (Repeat of 13WS)	90 min.	C
48PD	Discrimination Issues—Here Today, Gone Tomorrow F/U 76WS	90 min.	C
58WS	Computer-Assisted Learning (Repeat of 13WS and 41WS)	90 min.	C
68PD	Dying Young—Not!	90 min.	C/NC
76WS	Nondiscrimination Issues	90 min.	NC

Wednesday, October 20

89PD	GIC Alternatives and Synthetics	90 min.	NC
95WS	Small Plan Topics	90 min.	C/NC
98WS	Computer-Assisted Learning (Repeat of 13WS, 41WS, and 58WS)	90 min.	C
108PD	Canadian Pension Regulatory Environment		
109PD	Role of the PBGC	90 min.	C
117WS	Computer-Assisted Learning (Repeat of 13WS, 41WS, 58WS and 98WS)	90 min.	C
127PD	Defined-Contribution Plan Compliance	90 min.	NC
128PD	Professional Ethics	90 min.	C



Just a reminder!

For those actuaries who need to keep track of EA credit, I strongly urge you to prepare a file folder in which you place descriptions of the seminars, sessions, speakers, articles, or any other materials that will serve as documentation for your activity. Be sure materials include dates and locations to help you track your progress. If you have any questions about these programs, continuing education in general, or enrolled actuary credit, please call the Continuing Education Department, 708-706-3545. Watch your mail for brochures on programs for 1993-94.

Barbara S. Choyke is Director of Continuing Education of the Society of Actuaries.