NEIL PARMENTER

THE PENSION
Forum

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INTRODUCTION

This symposium of papers arose out of discussions at the Committee on Retirement Systems Practice Education several years ago. Our original goal was modest: to provide actuarial students with a modern view of actuarial adequacy in pension funding to counter what was thought to be an inappropriate emphasis in the Syllabus on traditional funding methods. It was clear that we held widely different views of how best to fund pension plans and that no attempt should be made to reconcile our views into a single paper. In fact, our only point of agreement was a pedagogical one—that the study of adequacy must precede the study of funding methods.

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WHEN IS A PENSION PLAN ADEQUATELY FUNDED?

by William Sohn

Our defined-benefit system is in decline. Old plans terminate, but no new plans are formed to take their places. Each year fewer employees participate in defined-benefit plans, and of those who do, most accrue smaller benefits than their predecessors of a few years ago. At the same time, the Pension Benefit Guaranty Corporation (PBGC) continues to grow in premium income, assets, and plans under its control, while the book of federal regulations grows ever more complex. Just as the bureaucracy of the British Empire reached its maximum size as Britain ceased to be an empire (or so Parkinson tells us), so the federal pension bureaucracy reaches its zenith as its subject matter disappears over the horizon.

The decline in our defined-benefit system is most inopportune. Social Security is under demographic pressure as benefits have already been reduced and are likely to be reduced again in the future. Personal savings rates are low compared to rates in other industrialized countries. The defined-contribution plans that are replacing defined-benefit plans appear to be less generous, in the aggregate, than their predecessors. The true size of the loss in benefits has been obscured by the increase in the number of two-worker families and the long bull market. The full impact of the loss in benefits will become clearer as the baby boom generation retires in the next century.

The causes of the decline are debatable. Some would argue that our current situation is largely the result of the obvious restructuring of the global economy. Others would point to demographic changes, changes in life styles, changes in the power of labor unions, and changes in the American public's attitude to paternalism by employers. But while such exogenous factors apply equally throughout the industrialized world, the U.S. appears to be leading in the race to dismantle its defined-benefit pension system.

What, then, makes the U.S. stand out from the rest of the industrialized world? Clearly, the primary blame must be placed on federal overregulation. Rather than attacking government as a whole, I want to concentrate on just one aspect of our system's misdirection: our regulators' frustration with the lack of a clearly articulated *actuarial* standard of adequacy in funding—that is, a standard that satisfies actuarial principles and can be understood by both plan participants and plan sponsors. Instead, we have the Internal Revenue Service, the Pension Benefit Guaranty Corporation, and the accounting profession variously regulating issues of adequacy without regard to actuaries' views of the issue.

Consequently, I think it worthwhile to address the matter of adequacy in funding from first principles, without regard to the layers of regulation now existing. I believe that we can reason our way through to a rational model of adequacy in funding and from that model deal in a systematic way with accounting, tax, and pension insurance matters. The alternative, that is, starting with the current system and seeking insight into adequacy matters, has turned out to be less than fruitful.

WHY PUT ASSETS IN TRUST AT ALL?

The first question we must ask ourselves is why do we put assets in trust at all? The usual answers are that (1) the law requires it or (2) there is a benefit to the taxpayer in the tax deduction. Both answers, of course, beg the question. There must have been some purpose to government requiring funding, and similarly, a tax deduction must be justified on some social ground or it will not long remain a tax deduction.

The correct answer clearly involves security, by which we mean that by funding the plan, we expect to promise participants more security. But then the critical question for our inquiry arises, how much in the way of assets is necessary or desirable to hold in trust?

WHAT AMOUNT OF ASSETS IS IT DESIRABLE TO HOLD?

Let's first examine the extremes, or at least the practical extremes, of funding policy.

For an extreme in well-funding, imagine an old-fashioned sort of plan that defines a benefit in terms of current pay and buys a deferred annuity from a highly rated insurance company each year to cover the increase in accrued benefit. Ancillary benefits, if any, are what can be provided according to the annuity contract on an actuarially equivalent basis. If the plan were to terminate at any point, its promised benefits would be fully secure. Such a plan, and its associated funding policy, provides as much security as can be expected in this changeable world. (Such plans were common 40 years ago. They scarcely exist today.)

At the other extreme, imagine an unfunded Supplemental Executive Retirement Plan (a SERP), in which the benefit to any participant is highly unpredictable—depending as it does on the participant's final pay, age at retirement, and reduction for benefits payable from other funded plans. To the uncertainties of benefit determination is added the lack of security to the participant because there are no invested assets behind the benefit. The participant is merely another unsecured creditor of his own employer.

Under the unfunded scheme, the participant has no security. Under the funded scheme, the participant knows that his accrued benefit is always fully funded although that accrued benefit may be limited. But this suggests an answer. Perhaps we need not set a funding level in the abstract for an ongoing plan, rather the plan itself should define the benefit that is to be secured through adequate

assets. In the case of a complex defined-benefit plan in which multiple assumptions go to measure ongoing liability, the security desired by the individual participant must be based on a benefit independent of the funding assumptions. Or, put another way, the plan must tell us what benefit is to be secured by adequate assets and what benefit, if any, might be payable from the plan only conditionally.

STANDARDS OF ADEQUACY IN PENSION FUNDING

Let us reverse our point of view again and ask what benefits might reasonably be secured. In an American plan, by custom and law, the accrued benefits available at termination of the plan are, more or less, ascertainable. On the other hand, the benefits available on an ongoing basis will depend on many factors of future experience. What if we demand that the termination benefits be funded?

As a general rule, assets are needed both to secure payment of benefits when a plan terminates and also to pay ongoing benefits in a plan that continues. An actuary needs to look at both cases to satisfy himself that funding is adequate, but, as a practical matter, a plan that has adequate assets to buy out its termination liability will usually be able to make ongoing pension payments when due. For the remainder of this argument, I am going to ignore the possibility that the ongoing benefits are *designed* to be unfunded. (See Dick Daskais' article on page 9 for an intriguing argument in favor of just such a plan design.)

Furthermore, securing the termination liability will involve us in fewer assumptions, and the resulting simplification will help enormously in communicating the plan to sponsor and participant. Apparently then, it makes sense for a plan to define a benefit payable on plan termination and then fund for that benefit. Benefits payable above the level of termination level benefits would be payable only conditionally on the plan having adequate assets at the time of payment.

In the typical case, it seems that an adequately funded plan is one in which assets exceed liabilities on a termination basis. It remains for us to consider how termination assets and liabilities are to be measured, whether the proposed standard is too strong or too weak, what consequences such a standard might have for funding and plan design, and how mismatched assets are to be dealt with.

IS FUNDING TO THE LEVEL OF TERMINATION LIABILITIES TOO STRONG A STANDARD?

What we are seeking to determine is whether a plan is adequately funded if it is funded to *less* than the level of termination liabilities. A pension plan constitutes a promise to pay a benefit if certain conditions are met. It might be possible (in the absence of law to the contrary) to define the promise so that it is conditional on assets having been accumulated. It might be possible for a collective bargaining unit and an employer to agree that certain benefits will have to be foregone if the plan ceases. But unless the individual employee is part of that decision process, it borders on the unethical to tell an employee that he will be entitled to

certain benefits on his retirement and then to deny him those benefits through deliberate lack of funding. Put another way, I doubt that one employee in a thousand could be expected to understand that the promises of the summary plan description were never intended seriously.

In fact, the PBGC, at least for insured benefits, exists to save the plan sponsor from the consequences of making promises it didn't intend to keep. If the PBGC has its way and it ceases to insure benefits that were never funded, then plan sponsors will again have to deal with the consequences of their unfulfillable promises.

The watchword here was implicit in the decision of Judge Clapp in *Vinson & Elkins v. Commissioner (99 TC 9)*: The issue is not whether an employee retires at age 55 or at age 62, say, but whether adequate funds will be on hand if, in fact, the participant chooses to retire when he is eligible to do so. In *Vinson* the taxpayer was seeking to justify a large deduction. In a large plan with special plant shutdown benefits or heavily subsidized early retirement benefits, the plan sponsor is usually seeking to minimize its contribution. But the security issue is the same: Will there be sufficient assets on hand when they are needed? Even the strongest companies can cease to be, and promises made in the flush days can come due when conditions have soured. If there is any point in funding a plan at all, it is to provide the promised benefits.

Consequently, I believe it is essential to fund toward at least the level of termination benefits unless all the parties to the pension promise understand the limitations of the plan sponsor's commitment.

SHOULD PLANS BE FUNDED TO A LEVEL HIGHER THAN THE LEVEL OF TERMINATION BENEFITS?

We are all familiar with entry-age normal, projected unit credit and related funding methods that deliberately aim towards the accumulation of assets in excess of termination liabilities. (In many cases entry-age normal funding with an optimistic retirement age assumption and weak economic assumptions will result in asset accumulations less than the level of termination liabilities on a market value basis. In general, however, common funding methods lead to the accumulation of assets in excess of termination liabilities.) Although none of these methods necessarily requires that contributions continue to be made after a certain level of assets have been accumulated, it is customary to think in terms of each method leading to accumulation of the funding method's past service liability.

Why would we want more assets than are needed at termination of the plan? A number of suggestions have been offered:

- *The IRS permits deductions up to a level higher than the termination liability and/or higher contributions match the incidence of cost demanded by the accountants under FAS 87.* We are attempting to provide a rational

basis for tax policy and accounting treatment, rather than the other way around. Accordingly, this objection begs the question.

- *By prefunding we are able to level our contributions over the years.* Contribution volatility occurs when assets and liabilities are close in value. Unless suitable averaging techniques are used, small gains or losses in assets result in large swings in contributions. Since volatility depends on the funded ratio and not on the funding goal (unless the goal is itself inherently volatile), volatility is not a valid objection to termination funding in particular.

- *By aiming towards a higher level of funding, we are able to compensate for the volatility inherent in mismatched assets.* It is asserted that, to insure assets stay above the level of termination liabilities on a market value basis, we should deliberately fund towards some level above termination liabilities. Although a margin is needed, it is not at all obvious, and probably false, that the appropriate margin can be obtained by funding towards a target unrelated to the desired level of liabilities. The problem of volatility of assets must be dealt with, but through the assumption setting process rather than through the selection of an inappropriate funding goal.

- *By overfunding at first we are able to contribute when cash flow is available and avoid contributions when cash is scarce.* This argument is not an objection to termination funding but to any funding regime that limits the amount of money that can be put in trust. Furthermore, contributing funds in excess of liabilities is not adjusting cash flow; it is the deliberate setting aside of money in trust that will never again be available to the plan sponsor (nor to the sponsor's creditors). Accordingly, this argument, like some others, begs the question.

- *The termination liability is an unstable funding goal that accentuates contribution volatility and can even lead to a contribution spiral in a declining company.* Of all the objections to termination funding, this is by far the most serious. However, the objection is, in fact, false for most well-designed plans as can be ascertained by a dynamic projection of the typical employee work group, assets, and liabilities.

  Changing our point of view again, if we agree that termination funding is otherwise desirable, then the plan designer and actuary will seek to create plans in which the termination liability can, in fact, be funded because it is not particularly volatile. For example, a very rich plant shutdown benefit that is also payable on plan termination would be rejected, because it would require a very high level of funding against contingencies unlikely to occur in normal operation. If not funded, there might be insufficient assets at plan termination to pay the promised benefits. On the other hand, if the full value of the plant termination benefit is funded, the size of the fund could grow to be excessive relative to ongoing benefits (possibly

to the point at which earnings on the fund are greater than ongoing benefits and the fund grows indefinitely). The lack of a funding solution is an indication that the benefit should not exist as a benefit available on plan termination. (The American solution is to not fund for "unpredictable contingent events" but for other sponsors of defined-benefit plans to pay for them on the bankruptcy of the employer through the PBGC. This is a political solution, not a funding solution, and one that has alienated many prospective plan sponsors.)

In summary, there appears to be no good argument, at least in theory, to fund to a target in excess of the level of the termination liability.

HOW ARE TERMINATION ASSETS AND LIABILITIES TO BE MEASURED?

Clearly, to be adequate at termination, assets at market value must be sufficient to purchase annuities from an insurance company. The problem is not how to measure assets and liabilities when a plan termination actually occurs, but how to measure assets and liabilities for the determination of ongoing contributions.

IMPLICATIONS FOR FUNDING

Let us consider an extreme example. Assets equal liabilities, both measured at market, and assets and liabilities are perfectly matched. Clearly no contribution should be made except with regard to future service.

Let us instead suppose that assets do not match liabilities, for example, assets are entirely in equities. Both assets and liabilities are subject to volatility and their price performances are not highly correlated. Annual "marking to market" could result in unacceptably volatile contributions (aside from the fact that it is not legal to remove assets from the pension trust merely because the plan is overfunded).

If we accept, as we must, the legitimacy of investing in unmatched securities we must also accept a risk of insolvency on a termination basis. What is needed is a contribution policy that keeps the risk of insolvency within acceptable limits.

(Methods are in use in the U.K., as well as in other countries, and the *Journal of the Institute of Actuaries* has published many articles over the last 15 years addressing just such funding issues. It would more than double the length of this article to develop here what can be found there.)

In any event, it must be recognized that mismatched assets create a possibility of insolvency on termination. The goal of actuaries is to measure and limit the risk to acceptable levels and the purpose of the PBGC is, at least in part, to cover the extraordinary circumstances in which an adequately funded plan terminates after a temporary market value fluctuation.

IMPLICATIONS FOR FUNDING METHODS

The common funding methods—projected unit credit, entry age normal and its variants—are arbitrary methods of allocating cost. Since 1987, the regulatory

stress has been on the current liability, which resembles the termination liability. What appears to be needed is a permissible method that specifically funds for the termination liability.

CONCLUSIONS

- Assets are put in trust to secure the benefit promise both if the plan continues and if the plan is terminated. Having assets sufficient to fund the termination liability will, as a practical matter, usually be sufficient to pay ongoing benefits as well. Accordingly, assets should be accumulated to the level of termination liabilities.

- If assets and liabilities are mismatched, the funding method and the actuarial assumptions need to be set so as to avoid unacceptable fluctuations in annual funding levels.

- A consequence of mismatched assets and liabilities is that a plan can never be assured to be solvent. What is desired is a funding policy that will generate solvency for an acceptable percentage of the time.

- None of the commonly used funding methods makes direct provision for the accumulation of assets to termination liability levels. Techniques for doing so have been described in the literature.

- Actuarial students need to understand the basic issue of funding adequacy before they concern themselves with the details of the common actuarial funding methods.

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PENSION FUNDING POLICY

by Richard Daskais

How much should defined-benefit pension plan assets be? Should actuaries decide the answer to this question?[1]

FUNDING POLICY IN THE PRESENT LEGAL ENVIRONMENT

ERISA provisions govern minimum required and maximum deducible contributions. Not only is there a range between minimum and maximum, but the range can be moved up or down by choices of actuarial method, asset valuation method, and actuarial assumptions.

While a single-employer nonbargained pension plan is operating (that is, it has not been terminated), funding policy is primarily a financial decision of the employer. Employees get their pensions regardless of the degree of funding in excess of pay-as-you-go. Even at plan termination, employees' benefit security is often independent of the extent of the plan's funding, because solvent employers are generally responsible for accrued benefits and the PBGC is secondarily responsible for most benefits.

Below is a list of the important questions the employer may consider in making the funding policy financial decision. Many of the questions are interrelated. Discussion of these questions is beyond the scope of this paper.

- What are the alternative uses or sources for the funds that might be contributed? Do funds earn more in the pension fund than invested in the business, with appropriate adjustment for tax, PBGC variable premium, and risk considerations? Should the company borrow to make larger pension contributions?

- How will funding affect the price of the company's stock?

- How will funding affect the company's ability to raise money in the fixed-income and equity markets? Will potential liability to provide accrued benefits or to pay PBGC make it difficult to sell an operation?

- What are the tax considerations? Are corporate income tax rates more likely to rise or to fall?

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[1] This paper is written from a U. S. perspective.

- Suppose the company terminates the plan, perhaps with replacement by a defined-contribution plan. How important is the asymmetrical treatment of a deficit and surplus? (If the company is solvent, it must pay for any unfunded accrued benefits but will have to share any surplus with employees and the Treasury.)

- Are contributions recoverable from third parties because the company has cost-based government contracts or is a rate-regulated public utility?

- Will employees (or their unions) care how well the plan is funded?

- Last, but perhaps not least, if the company goes bankrupt, how much benefit security (beyond any PBGC guarantees) does it want or need to offer?

Some of these questions have different answers for the near future than for the more distant future. Consequently, the relevant time horizon of management may influence funding policy. There is no mention above of equity between generations of shareholders, because *SFAS 87* has generally resulted in pension expense calculated on an accrual basis that is more difficult to "manage" than in the past.

For plans covering public employees, many of the questions are different. Some important aspects of most public plans are the presumption that plan termination is very unlikely, the lack of a guarantee agency like the PBGC, the closer tie between funding and financial reporting, the importance of pension cost in labor negotiations, and the greater participation of employee representatives in formulating funding policy. Some are concerned with equity among generations of taxpayers. The adequacy of pension funding is, at least in part, reflected in bond ratings. In a theoretically efficient real-estate market, prices would reflect funding adequacy.[2] In this same market, a public employer would strive to arrange its affairs to borrow to the maximum extent possible (using tax-exempt instruments) to increase funding of its pension plans because of the tax arbitrage between the tax-exempt borrowing rate and the tax-free fund earnings.

HOW HAVE THE PRESENT RULES WORKED?

Before the 1974 enactment of ERISA, the funding of defined-benefit plans was regulated much less than it is now. Employers that sponsored pension plans were free—within very broad limits that were not spelled out—to choose actuarial methods and assumptions. At plan termination, any guarantee of benefits that were not funded was extremely rare. A few large unions negotiated funding and/or guarantee requirements.

[2] Buyers should be willing to pay more for dwellings in a jurisdiction in which taxes will be lower because of lower funding requirements for public employee pensions. Often this will not require real estate buyers to be pension or municipal finance experts; jurisdictions with large costs for amortizing pension liabilities will have correspondingly higher taxes.

An employer that adopted a pension plan committed to make contributions while the plan was in effect. The employer reserved the right to terminate the plan at its option and did not commit to guarantee benefits upon plan termination.

In the present ERISA legal environment, the actions of plan sponsors have been exactly what could be expected. Defined-benefit plans have become less important and defined-contribution plans more important. Some defined-benefit plan sponsors may have reduced contributions because the PBGC guarantees some pensions or they don't want their plans to accumulate surplus that they can't recover. Plan sponsors have acted rationally. To some extent, the move to defined-contribution plans has been a move to the type of commitment that employers made under pre-ERISA defined-benefit plans—to make contributions while the plan is in effect but not to guarantee accrued benefits.

If funding requirements are considered to include PBGC premiums and deficit funding (and limited surplus reversion) at plan termination, the requirements put into place since 1974 have certainly discouraged defined-benefit plans. Although retirement promises made to employees may be better secured, employers have made fewer retirement promises. My own view is that society would be better off with more promises, not as well-secured, than with fewer promises.

VIEWS OF PARTIES INTERESTED IN THE FUNDING LEVEL OF A PLAN

The parties who are interested in the level of pension funding, not necessarily in the order of their degree of interest, are:

- Employees covered by the plan, recognizing that different types of employees have different interests
- The employer
- Any entity that is directly responsible for part or all of any pension fund inadequacy. In the U.S., this generally is limited to the PBGC, which in turn collects premiums from private defined-benefit pension plans or sponsors
- The tax collector—the federal and state treasuries that have an interest in limiting deductible contributions to those that are really necessary.
- Several parties with indirect interests, including:
  - Parties that may eventually become responsible for any pension fund inadequacy—taxpayers of a city, for example, but probably not the shareholders of a corporation
  - Parties that indirectly pay for employer contributions—ratepayers of public utilities, the federal government for defense contractors with cost-based prices, and so on

— Those who may have to support retired people with inadequate income

— Society generally, which may benefit from larger savings available for investment through pension funds (the further discussion of which is beyond the scope of this paper).

What are the best rules for funding (and related guarantees) from the standpoint of each of the parties?

Employees

In a narrow sense, the employees' interest is in maximum security provided by funding and by employer and governmental guarantees. If the employer and governmental guarantees are complete and ironclad, the employees have no real interest in funding.

But looking at funding and guarantees strictly from a security standpoint ignores an important side effect, that is, strong funding requirements and guarantees discourage the adoption and liberalization of defined-benefit plans. Employees may prefer less secure, but more liberal, benefits—even if they understand that some of the benefits eventually may not be paid. Older and retired employees may get larger benefits from less secure plans.

Less secure plans will inevitably, upon the termination of some plans, result in apparent inequities as pensions are stopped, reduced, or never started. These inequities led to the funding and guarantee provisions of ERISA. These provisions, in turn, have caused some employers to discontinue their defined-benefit plans and have discouraged other employers from adopting benefit liberalizations or new defined-benefit plans.

Employers

When advantageous from tax and corporate finance standpoints, employers want maximum flexibility to establish plans and to fund heavily, with little or no residual liability at plan termination. In other words, employers want to use defined-benefit plans to accomplish their retirement and employee-relations objectives with a commitment only to pay contributions on a regular basis while the plan is in effect.

Further, employers want to be able to recover past contributions in excess of those required, either by discontinuance or reduction in contributions while the plan is in effect or by a reversion at plan termination. To the extent that such recovery is prohibited, employers will tend to reduce their commitments and their contributions to defined-benefit plans.

Employers do not want to pay PBGC premiums to subsidize other employers' plans deficiencies, nor do they want to pay PBGC premiums for unfunded liabilities that they may regard as adequately secured by their net worth.

Employers that are near or in bankruptcy will benefit from PBGC paying part of their retirement costs—but this is really a benefit for plan participants and probably of little value to employers.

Employers don't want "retroactive" changes in rules that increase their liabilities. For example, ERISA and SEPPAA made employers responsible for unfunded pensions; *TRA 1986* and subsequent legislation restricted the ability of employers to recover overfunding through reversions.

Guarantee Agency (for example, the PBGC)

A guarantee agency's solvency depends on the existence of a combination of heavy funding requirements, residual employer liability, and limits on the ability of employers to establish new liabilities without funding them. Employers can, of course, be expected to select against PBGC to the extent permitted by its rules.

U. S. Treasury

The government's ability to spread the tax burden fairly requires rigid rules (with minimum flexibility on part of employers) to prevent employers from shifting deductible pension expense between time periods to minimize taxes. Because the federal government operates on a cash (not an accrual) basis and because legislators and the elected executive are concerned with a short time horizon, the treasury generally wants to limit deductible contributions.

Indirect Guarantors (for example, Taxpayers, Society in General)

To avoid unforeseen taxes or expenses, taxpayers generally want "adequate" funding of public plans. The issue is to assign pension costs to time periods fairly. The issue is really more an accounting issue than a funding issue. But for entities that use cash (rather than accrual) accounting for pensions, funding contributions are identical to accounting costs. "Adequate" funding may be resisted by the elected officials and legislators who make decisions for the indirect guarantors. Often these officials and legislators are most concerned with the near future and are tempted to solve current budget problems in part by reducing current pension costs.

Because society generally may have to support those with meager retirement income, society should want to encourage more defined-benefit pension plans, with some responsibility on the part of employers to fund them, recognizing the trade-off between secure pensions and the encouragement of defined-benefit plans.

Indirect Contributors (for example, Ratepayers and Government for Defense Contractors)

Ratepayers and other indirect contributors are primarily concerned with accounting, but in most cases the rules and practices are such that accounting costs are virtually identical with funding contributions. The indirect contributors want "fair" costs and contributions. Their interest is generally in sufficiently rigid rules for

contributions so that the employer cannot freely shift contributions between time periods or make contributions that will not eventually be required to provide benefits. The indirect contributors have little interest in employee security.

WHAT SHOULD LAWS PROVIDE?—TWO POSSIBILITIES

One can expect that employers will continue with the same answers to the questions posed in the first section of this paper when they set funding policy.

In the present environment employers will fund heavily when their cost of funds is low. Usually a low cost of funds will be associated with employers that are financially strong and that are not likely to terminate their pension plans (other than plans for specific locations or businesses which may be closed). Conversely, weak funding usually will be associated with employers that have high costs of funds, that are not financially strong, and that are more likely to terminate their pension plans. Only with changes in the laws will there be lighter funding from strong employers and heavier funding from weak employers.

I believe we must choose between two types of systems.

GUARANTEED PENSION SYSTEM

The first, a "guaranteed pension" system, is the system now in place. This system makes pensions very secure by making employers primarily responsible for the cost of providing pensions for their employees, with a second level of protection from the PBGC. This system is shrinking and will continue to shrink. Many employers will not promise defined benefits because of the potential liability upon plan termination and the costs diverted to employees of other employers (PBGC premiums).

If the goal is for employees to continue to be secure that and receive the pensions they have been promised, society can continue to tinker with the guaranteed pension system. The PBGC can continue to guarantee pensions under terminated plans to the extent they are not funded and the employer is not solvent. The PBGC can be protected by requiring rapid funding of new pension promises and by imposing restrictions on benefit increases for poorly funded plans. In addition, the PBGC guarantees of new pension promises can be phased in over longer periods (but this is really a reduction in pension security).

If legislation continues along these lines we can expect that defined-benefit plans will cover fewer employees and provide smaller benefits, but the benefits that have been promised will be quite secure. This may be a satisfactory result.

Under the guaranteed pension system, employer and PBGC responsibility provide employees with pension security. Funding requirements primarily protect the PBGC and, in turn, keep its premiums from growing. Funding under this system has little to do with employee pension security.

GUARANTEED-FUNDING SYSTEM

A second system, a "guaranteed-funding" system, would result in more pension promises, but they would be less secure. The employers' responsibility would be limited to making regular contributions to their defined-benefit plans.

The guaranteed-funding system would, in many aspects, be a return to the pre-PBGC and pre-SEPPAA system under which funding was the sole source of benefit security (except as an employer, perhaps as a result of collective bargaining, promises benefits upon plan termination beyond those that can be provided from the fund).

The guaranteed-funding system would not repeal ERISA. By and large, the provisions of the first three titles of ERISA would remain in place, perhaps with changes in the funding requirements. But most of Title IV (Plan Termination Insurance) would be eliminated.

Why Return to a Guaranteed-Funding System?

The reason for returning to a guaranteed-funding system is to foster the growth of defined-benefit pension plans. From the standpoint of both employees and employers, these plans do a better job of providing retirement benefits. This has been written about extensively. There is no reason for this paper to recite the arguments for defined-benefit plans.

I believe the price of the present guaranteed pension system is too high—it discourages defined-benefit plans. Many of the inequities that led to the passage of ERISA have been dealt with by ERISA's participation, vesting, and similar requirements. The loss of expected benefits that results from inadequate funding at plan termination is real, but must be weighed against the shrinking of defined-benefit plans that has resulted from legislating pension guarantees. Some of the apparent unfairness can be reduced by better design of funding requirements and better allocation of assets at plan termination. Explanation to employees of the degree of benefit security would be necessary.

In considering a return to a guaranteed-funding system, we should recognize that, for the vast majority of private pension plan participants, Social Security is the primary source of retirement income and private pension plans are supplemental. Social Security is more important for lower-paid employees than for higher-paid employees. Since pension actuaries and plan sponsor managers do not generally work with Social Security and are generally higher paid, they may overlook the fact that the security of most employees' retirement income does not depend on the security of private pension plan benefits.

Funding Rules

Under a guaranteed-funding system, the purpose of funding is to secure benefits. Consequently, funding requirements should be designed to secure accrued

benefits. Funding requirements should be based on liabilities for accrued benefits, either at the valuation date or projected into the future.

Below are three possibilities for minimum funding requirements:

a. The unit credit (UC) normal cost (the value of benefits accruing during the year including increases in accrued benefits due to increases in final average pay), plus amortization of the unfunded liability for accrued benefits (initially or due to amendment) over a fixed period—perhaps 10 or 15 years

b. The projected unit credit (PUC) normal cost plus amortization of the PUC unfunded liability over a fixed period—perhaps 15 or 20 years

c. The greater of (a) or (b) above, where the amortization period is shorter under (a) than under (b). For example, if the amortization periods were 10 and 15 years, respectively, the requirement would usually be 10-year amortization of the UC unfunded liability under dollars-per-year-of-service plans and 15-year amortization of the PUC unfunded liability under final-average-pay plans.

Under any of the above requirements, losses might be required to be amortized over 5 to 10 years. Gains might also be amortized over 5 to 10 years or might be applied to reduce all remaining amortization payments pro rata. In determining gains or losses, assets should be marked to market, as are liabilities. Changes in actuarial assumptions would result in gains or losses, not in separate amortization bases. Employers who want to avoid the risk of big increases in contributions because of poor investment experience can adopt conservative investment policies that match the durations of assets and liabilities.

If funding is for benefit security, there seems to be no justification for different economic assumptions for different plans. The ability of a fund to provide benefit security at plan termination depends on the market value of the fund and the benefits that be can "settled" by that market value. The investment return should be indexed to something that can be expected to approximate real settlement prices, such as yields on long treasury bonds (at the date of the valuation, not some moving average). If assumptions on increases in general pay levels, Social Security taxable wages and the CPI are relevant (generally under the PUC method rather than the UC method), it might be desirable to have a regulator fix them.

It might even be desirable to fix mortality assumptions. Of course, assumptions that are peculiar to the plan (including most decrements) should be the best estimate of the plan's enrolled actuary.

What about maximum deductible contributions? At least since 1939, the Internal Revenue Code and regulations have provided for a range between minimum required and maximum deductible contributions for defined-benefit plans. This

certainly encourages pension funding but permits an employer to manage its taxes. If a range is desirable, should it be wider for plans with larger unamortized accrued liabilities? Should employers be able to use the entry-age-normal actuarial method to widen the range? Should employers with defined-benefit plans have a more favorable tax deductible range than employers with defined-contribution plans? (Although there is a range available under profit-sharing plans, the choice within the range affects employees' benefits.)

Should investment allocation affect funding requirements? Consider two identical pension plans. The first plan's assets are largely fixed-income instruments whose duration, and perhaps cash-flow, tracks the liabilities. The second plan's assets are 70% in common stocks (perhaps with a large unhedged foreign exchange risk) and the remainder in short-duration fixed-income instruments and real estate. If we are carefully regulating progress to a precise funding target, is it sensible to require the same contributions for both of these plans? It may be. Can funding requirements be adjusted for asset allocation using considerations similar to risk-based capital for financial institutions, without producing investment inefficiency and an administrative nightmare?

What should happen when minimum funding requirements are not met? Rather than requiring plan termination immediately, might suspension for three to five years be permitted? While a plan is suspended, no further benefits would accrue, but pensions would continue to be paid.

Allocation of Assets on Plan Termination

Prior to ERISA, typical asset priority allocation provisions upon plan termination of plans gave almost full preference for retirees. This has been largely continued by Section 4044 of ERISA (although this is less important because of PBGC plan-termination insurance). I believe the implicit allocation of past employer contributions by these provisions unfairly favors retirees. For many plans, a small reduction in retirees' pensions will provide a meaningful allocation to nonretired employees. While the details of what priority allocations, if any, should be required are beyond the scope of this paper, consideration should be given to allocations in proportion to all vested benefits, perhaps phasing in the effects of amendments.

After all accrued benefits have been provided, should reversion of excess assets to the employer be permitted? I think so; otherwise we unduly discourage heavy funding.

Employer Liability

While I favor no employer liability at plan termination, modest amounts might be provided. Any employer liability would, of course, move the compromise toward benefit security and away from defined-benefit plans.

How Do the Parties Fare?

Under the guaranteed-funding system, I believe employers would be better off than they are now. They give up some ability to manage contributions by managing methods, assumptions, and the choice within the minimum-maximum range. But they gain the ability to sponsor defined-benefit plans without full liability for benefits; they do not have to support other employers through PBGC premiums; and they can recover excess assets at plan termination.

Employees' benefit security will be reduced, but I believe there will be many more defined-benefit plans. If that is correct, employees on the whole will be better off, but some will find their pensions were not secure.

The PBGC will eventually disappear.

The Treasury may benefit from less flexibility on the part of employers to manage contributions, but the Treasury will suffer if there are more defined-benefit plan contributions. It will also suffer because the receipt of taxable benefits under defined-benefit plans is deferred longer than under defined-contribution plans.

The indirect guarantors will benefit if the system does result in more defined-benefit plans. The indirect contributors will be better off if employers have less ability to manage methods and assumptions.

Communication

Obviously, the different nature of their benefit security must be explained to employees.

Transition

There would clearly be many problems in phasing out the present guaranteed-benefit system. Perhaps those who gave us the original $1.00-per-year-per-participant PBGC premium can solve them.

THE ACTUARY'S ROLE

I believe that the actuary for a pension plan should not take on the responsibility of deciding on a funding policy or funding target. No one has given the actuary this responsibility, and no one should. The actuary's responsibility is to inform the client of the range of outcomes of various actions the client may choose to take and to help the client make the choice.

Actuaries, through their professional and trade associations, should not try to form a consensus on the "correct" funding target for a pension plan. Doing so prevents the parties who are interested in the level of pension funding from selecting among the wide range of possible answers, using their own sets of values together with their views of the likelihood of various future events.

Of course, where the actuary has been given a responsibility—if there is a legal or other external standard for the actuary's work—the actuary must faithfully discharge that responsibility. If, as under ERISA, the standard requires the actuary to use assumptions that are the actuary's best estimate of future experience, the actuary should use the best estimate—not choose a broad range and let the client select a point in the range. But the actuarial cost method and funding policy will be decided by the plan sponsor, except as they may be collectively bargained under some plans.

The actuary should give advice on the client's or the company's economic interest, as long as his or her role is clear. Accordingly, it is proper for an actuary for an employer to suggest a funding policy that might result in the PBGC eventually paying for pensions under the employer's plans, or for an actuary for employees in a collective bargaining unit to help bargain benefits that might result in unforeseen employer costs.

Actuaries should not shun participation in public debates on rules that govern pension funding. But we should not, citing our technical expertise, preempt the funding policy decisions from our clients, our employers, or others. Further, we should not send a message to lawmakers, regulators, and other policymakers that funding policy is so technical that they should simply leave funding policy decisions to us.

SUMMARY

Under present law, when a single-employer nonbargained pension plan is operating, funding policy is primarily a financial decision of the employer. Employees get their pensions regardless of the degree of funding in excess of pay-as-you-go. Even at plan termination, employees' benefit security is often independent of the extent of the plan's funding because solvent employers are generally responsible for accrued benefits and the PBGC is secondarily responsible for most benefits.

The responses of plan sponsors to ERISA have been exactly what could be expected. Defined-benefit plans have become less important and defined-contribution plans more important. Although retirement promises made to employees may be better secured, employers have made fewer retirement promises. My view is that society would be better off with more promises, not as well-secured, than with fewer promises.

Employees may prefer less secure, but more liberal, benefits—even if they understand that some of the benefits eventually may not be paid. Older and retired employees may get larger benefits from less secure plans.

A return to the pre-ERISA, pre-SEPPAA "guaranteed-funding" system would result in more pension promises, but they would be less secure. Employers' responsibility would be limited to making contributions on a regular basis to their defined-benefit plans. The provisions of the first three titles of ERISA would remain in

place, perhaps with changes in the funding requirements, but most of Title IV (Plan Termination Insurance) would be eliminated.

In considering a return to a guaranteed-funding system, we should recognize that, for the vast majority of private pension plan participants, Social Security is the primary source of retirement income and private pension plans are supplemental.

Three possibilities for minimum funding requirements, all based on the unit credit or projected unit credit methods, are suggested.

If funding is for benefit security, there seems to be no justification for different economic assumptions for different plans.

Under Section 4044 of ERISA, the asset priority allocation provisions give too much priority to retirees. For many plans, a small reduction in retirees' pensions will provide a meaningful allocation to nonretired employees.

After all accrued benefits have been provided, reversion of excess assets to the employer should be permitted. Otherwise, we unduly discourage heavy funding.

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FUNDING ADEQUACY—A CANADIAN PERSPECTIVE

by Malcolm Hamilton

In recommending the funding level for a pension plan, Canadian actuaries are less constrained than their American counterparts, perhaps because the actuarial profession speaks with one voice in Canada and has been able to find a larger role for professional judgment in the funding process. Most Canadian jurisdictions require an actuary to certify that the actuarial methods and assumptions are appropriate for the purposes of the valuation and that the valuation report adheres to accepted actuarial practice. Some jurisdictions have their own guidelines for actuarial assumptions, but these guidelines can usually be breached if the actuary can persuade other actuaries, and through them the supervisory authorities, that there is a good reason for the breach.

By comparison, American actuaries seem preoccupied with the requirements of the Pension Benefit Guaranty Corporation (PBGC) and the Internal Revenue Service (IRS), and have less reason to address the fundamental issue—what, in our professional opinion, is adequate funding?

THE ACTUARY'S ROLE

A successful funding policy is one that balances the conflicting interests of several groups.

- *Plan members* want to receive the benefits they have been promised in exchange for their labor. They expect the actuary to set contributions that adequately secure benefits or, in instances in which the law or the plan provisions do not require adequate funding, that the actuary clearly discloses the extent to which members are exposed to loss and the long-term implications.

- *Plan sponsors,* in deciding how much to contribute to their pension plans, are subject to fiduciary, statutory, and/or regulatory constraints. Within these constraints, they may choose to fund either conservatively or aggressively, and they expect the actuary to guide them in this choice.

- *Pension supervisory authorities* want plan members to be protected in accordance with the relevant statutes and/or regulations and expect the actuary to faithfully carry out the tasks he or she has been assigned by legislation.

- *The tax authorities,* at least in Canada, accept the need for adequate funding and rely on the actuarial profession to establish reasonable upper bounds on "adequacy" to prevent plan sponsors from exploiting tax

incentives that were designed to encourage adequate funding, but not to condone excessive funding.

If actuaries want to preserve a role for professional judgment in the funding process, we must responsibly balance the sometimes conflicting interests of these groups. Otherwise, they will lose confidence in us and seek alternatives that will, at a minimum, limit our professional freedom.

Canada's income tax legislation provides a recent example. In the 1980s, some Canadian companies established pension plans for individual executives (discrimination in favor of the highly paid is permitted in Canada). With the support and encouragement of some actuaries, many companies deliberately overfunded these plans so that the executives, to whom any surplus reverted at retirement, would get the greatest possible benefit from the tax shelter. Not surprisingly, the Canadian government lost confidence in the actuarial profession's ability to control the funding of executive pension plans and adopted regulations that overrode professional judgment by prescribing actuarial assumptions. These regulations make the adequate funding of executive pension plans impossible, especially now that interest rates have dropped to levels unforeseen at the time the regulations were adopted.

ADEQUATE VERSUS APPROPRIATE FUNDING

To conform with accepted actuarial practice, Canadian actuaries had to certify that the actuarial methods and assumptions adopted for a particular valuation are both adequate and appropriate. The most recent version of the Canadian Institute of Actuaries' *Standard of Practice for the Valuation of Pension Plans* dropped the certification of adequacy (leaving the certification of appropriateness), arguing that adequacy is usually redundant (inadequate methods and assumptions are seldom appropriate).

To say that a plan is adequately funded is to say that the pension fund's assets exceed some measure of the pension plan's liabilities or, if this is not the case, that the required contributions will cover the deficiency over a reasonable period of time. Appropriateness, in my opinion, goes further—typically requiring that the funding of the plan be adequate, but not excessive. That is, that neither the accumulated assets nor the required contributions are at levels that virtually guarantee the accumulation of large amounts of surplus.

Just as there is no clear dividing line between adequate and inadequate funding, there is none between adequate and excessive funding. Some funding levels are clearly inadequate while others are clearly excessive. Between the two is a range that can be called appropriate. At the request of the pension regulatory authorities and Revenue Canada, the Canadian Institute of Actuaries has been struggling to better define the upper and lower bounds on appropriate funding. The task is difficult and, so far, has met with little success.

THE MOTIVATION FOR FUNDING

An assessment of funding adequacy or appropriateness should proceed from an understanding of the motivation for funding. Within the constraints imposed by legislation and fiduciary duty, it is the plan sponsor, usually on the advice of the actuary, who determines the funding level for a plan. The plan sponsor's decision will usually be influenced by one of the following factors.

- *Benefit Security.* Some plan sponsors want to contribute the minimum required to adequately secure benefits and expect the plan's actuary to identify appropriate contributions subject to the requirements of applicable legislation.

- *Cost Effectiveness.* Some plan sponsors believe that they can lower the long-term cost of their pension plans by contributing more than the minimum needed to secure benefits. These plan sponsors will expect the actuary to identify an appropriate funding level, that is, one that is consistent with their focus on controlling long-term costs.

- *The Matching Principle.* Some plan sponsors want to match contributions to the estimated cost of benefits accruing under the plan. With the advent of *FAS 87* and its Canadian counterpart, Section 3460 of the *Canadian Institute of Chartered Accountants' Handbook,* pension contributions and expenses are no longer identical (except for a few public sector organizations who continue to account on a cash basis). The matching principle, the roots of which are more easily traced to accounting principles than to funding principles, should no longer influence funding policy as it has in the past.

If an actuary can identify a range of funding levels for a pension plan—a range bounded below by the minimum amount required to satisfactorily secure benefits on a wind-up basis and bounded above by a conservative estimate of the accrued cost of the benefits that will ultimately be paid if the plan continues as a going concern, the plan sponsor can choose an appropriate funding target within this range. Plan sponsors who are attempting to adequately secure benefits, but no more, can move to the low end of the range. Plan sponsors who believe higher levels of funding will reduce the plan's long-term cost can move to the high end of the range. Plan sponsors trying to match contributions to the cost of the benefits can find an appropriate point in the middle of the range.

FUNDING TO SECURE BENEFITS

If a plan sponsor wants to contribute the minimum amount required to secure benefits, what principles should guide the actuary?

Benefit security should be tested on a wind-up basis. Any funding method, including pay-as-you-go funding, will secure benefits as long as the plan sponsor continues the plan and makes the required contributions. It is the plan's ability to deliver the promised benefits at wind-up, when the plan sponsor's support is

withdrawn, that should be the test of benefit security. A going concern funding valuation is, in my view, a contradiction in terms. If the plan and the plan sponsor continue indefinitely, there is no need to fund the benefit to provide security (although the plan sponsor might still want to fund to lower the cost of the plan, as discussed in the next section). If the purpose of funding is to secure benefits, then funding should be directed at the event that jeopardizes benefit security, the winding up of the plan by an insolvent plan sponsor.

The actuary should therefore seek a disciplined method of setting contributions that guarantee, or virtually guarantee, that the market value of the pension fund's assets will exceed the pension plan's wind-up liabilities at some unknown future wind-up date.

One approach would be to establish a funding target at or above the plan's wind-up liabilities, that is:

Funding Target = Wind-Up Liability + Contingency Margin.

For example, the contingency margin might be 20% of the plan's wind-up liabilities. The actuary would then set contributions that keep the pension fund moving towards this target. The actuary would estimate where the funding target would be at the end of the period covered by the valuation, and where the market value of the pension fund would be, absent future contributions. Contributions could then be set to close the gap between the market value of the pension fund and the funding target at an acceptable rate. Contributions would consist of:

- The normal cost, that is, the contribution that would be required to keep the pension fund at the target level if the fund was already at the target level

- An adjustment that addresses any difference between the funding target and the value of the pension fund's assets on the valuation date.

Many Canadian jurisdictions require actuarial valuations on a going concern basis but do not give actuaries any guidance on how to choose acceptable assumptions. An actuary can link going concern valuations to a "wind-up" funding target by a judicious choice of actuarial assumptions, that is, by choosing going concern assumptions so that

Going Concern Liabilities = Wind-Up Liabilities + Contingency Margin.

The assumptions then become a means to an end, that is, they are a device for establishing an appropriate funding target, not profound and largely insupportable assertions about the plan's future experience. Justifying actuarial assumptions becomes much easier. The debate focuses on the appropriateness of the margin between the going concern actuarial liability produced by the assumptions and

the plan's wind-up liabilities. There is no need to advance unprovable theories about the relationship between inflation rates and investment returns.

To make this approach work, one must first decide how large the contingency margin should be. The margin will depend on:

- *Investment Policy.* The plan's wind-up liabilities are interest sensitive. If the investment policy immunizes the wind-up liabilities, a small contingency margin can be justified. However, if the plan sponsor chooses to invest heavily in equities, larger margins are required.

- *Period Over Which Experience Deficiencies Are To Be Amortized.* If the plan sponsor is prepared to amortize experience deficiencies quickly, margins can be kept to a minimum. However, if the plan sponsor wants stable contributions, that is, wants to amortize experience deficiencies over long periods, then larger margins are required.

  Deficiencies produced by plan amendments might be amortized over longer periods than experience deficiencies. The funding margin should not be influenced by these longer periods, because they address a separate issue, that is, how long plan sponsors should be given to fund retrospective plan improvements. This issue is not one to be decided by the actuarial profession. It should be decided by regulators, collective agreements, and/or plan sponsors.

- *Frequency of Valuations.* More frequent valuations permit lower margins, because the plan sponsor will then be forced to react more quickly to experience gains and losses.

- *Asset Valuation Method.* If assets are valued at market, smaller margins can be justified because the plan sponsor will need to react quickly to market changes. If the plan sponsor wants to use market related values, the margin should be larger.

At one extreme, a company may have a small plan providing supplementary pensions to a handful of executives whose pensions exceed the amounts that can be paid from a tax-qualified plan. From the plan sponsor's perspective, the contributions are incidental and are being made to secure benefits, not to derive a financial benefit. The plan sponsor may be prepared to do annual valuations and to immediately make up any difference between the market value of the pension fund and the plan's wind-up liabilities. The pension fund may be invested in bonds and Treasury bills and the actuary might be comfortable with a funding target that is only slightly higher than the plan's wind-up liabilities.

At the other extreme, a financially troubled employer might have a pension fund that exceeds the market capitalization of the employer's common stock. If the pension fund is invested primarily in equities, assets are valued at other than

market values, valuations are performed infrequently, and the plan sponsor amortizes deficiencies over the longest period permitted by law, then the actuary will want a funding target that is well above the plan's wind-up liabilities. Otherwise, there is a high probability that members will lose some of their benefits upon plan wind-up.

Caveat

Wind-up liabilities can change unpredictably because of legislation or changes in legislation. For example, in Ontario early retirement options vest upon wind-up for members whose age plus service exceeds 55 years. As a group ages, the wind-up liabilities can increase significantly. In circumstances such as these the actuary must make sure that the plan sponsor understands the timing and extent of future contribution increases.

Exceptions

The members of a pension plan will normally assume that, as a minimum, an adequately funded plan will have assets in excess of its wind-up liabilities. Sometimes this is not the case when:

- There are circumstances in which the company and the plan members (through their collective bargaining agent) agree that certain plan benefits need not be fully funded (for example, plant closure benefits).

- There are circumstances in which legislation permits the plan sponsor to ignore certain benefits in the funding of the plan. For example, in Ontario plan sponsors are permitted to fund cost-of-living increases on a pay-as-you-go basis, even where the plan is committed to future increases.

- There are circumstances for which plan sponsors regularly negotiate improvements to a pension plan (for example, triennial increases to a flat-benefit plan) and fund these improvements, in accordance with applicable legislation, over relatively long periods. At any point in time, there will be a series of past improvements that are not fully funded and the pension fund may never cover the plan's wind-up liabilities.

- There are circumstances in which pension plans are exempt from legislation (in some Canadian jurisdictions, plans that provide benefits in excess of the limit for tax-qualified plans are exempt). The plan sponsor and plan members are then free to establish, by contract, an appropriate funding practice.

Should an actuary try to impose funding standards that the contracting parties do not want? Should actuaries try to override a public policy that tolerates unsound funding practices and attempt to apply a higher professional standard? These issues are now being debated in Canada. Our valuation standards allow actuaries to follow the dictates of plan provisions and/or applicable legislation, as long as

the actuary discloses that the methods are not accepted actuarial practice, identifies the likely consequences, and discloses any wind-up funding deficiencies.

FUNDING TO REDUCE LONG-TERM COSTS

Not all plan sponsors want to fund a pension plan at the minimum level consistent with fiduciary duty. In an attempt to reduce the long-term cost of the plan, some want to contribute more.

If cost is measured as the present value of future contributions, then some employers believe that increasing the funding level will lower the cost of the plan as long as the rate of return on the pension fund exceeds the employer's *after-tax cost of borrowing* (this will almost always be the case for an employer who is currently taxable). Other employers believe that increasing the funding level will lower the cost of the plan only if the rate of return on the pension fund exceeds the *after-tax cost of capital* (a weighted average of the after-tax cost of equity and the after-tax cost of debt). Still others use both rates. Contributions up to the level required to fund the plan's wind-up obligations might be evaluated using the after-tax cost of debt because the pension plan's wind-up obligations are similar to the company's debt obligations. Contributions beyond this level might be evaluated using the after-tax return on capital, as these contributions support obligations that are less debt-like.

Some employers (including public sector employers who account on a cash basis) measure long-term costs as the ultimate ratio of contributions to payroll. For these employers, funding will reduce long-term costs as long as the after-tax return on the pension fund exceeds the rate of growth in payroll.

There are other circumstances in which a plan sponsor might want to increase funding levels beyond those strictly required to secure benefits. Some may have their disbursements reimbursed on a "cost plus" basis and prefer a conservative assessment of cost. Others (at least in Canada) might want to deliberately overfund executive pension plans to exploit the tax-sheltered nature of the fund for the benefit of participating executives.

When the plan sponsor is looking for ways to increase the funding level, the actuary can usually oblige by choosing conservative methods and assumptions. But how do actuaries know when they've gone too far? When do methods cross the boundary separating the creative from the misleading? How do we distinguish conservative assumptions from assumptions that are pessimistic to the point of paranoia?

If the plan sponsor wants to maximize the funding level, a conservative assessment of the going concern liabilities becomes the funding target. In Canada, these going concern liabilities can include the cost of future plan improvements in instances in which the employer has a history of making such improvements. That is, where there's a history of upgrading a career average pension plan, improving flat benefit amounts, or providing ad hoc cost-of-living increases to

pensioners, the plan actuary can assume that these improvements will continue indefinitely. The going concern liabilities are usually greater than the plan's wind-up liabilities because, unlike wind-up liabilities, they provide for the cost of future salary growth (in final average pension plans), future vesting of subsidized early retirement options and, in some instances, future upgrades.

A plan's wind-up liabilities will sometimes exceed its going concern liabilities. This typically happens in instances in which there are generous plant closure benefits or when interest rates drop to uncharacteristically low levels. When this happens, the actuary should review the going concern actuarial assumptions to ensure that they remain appropriate. If they are, and the plan is really worth more dead than alive, the actuary should fully disclose the consequences of winding up the plan.

If we assume that the plan's going concern liabilities exceed its wind-up liabilities, then any funding method that adequately funds the going concern liabilities will also secure benefits on a wind-up basis. If the plan sponsor has decided that increasing the funding level is a good thing, how should the actuary establish a reasonable upper bound on the funding level? Often, the plan sponsor will guide the actuary in establishing this upper bound. The amount that the plan sponsor is prepared to contribute in any given year may be limited. The plan sponsor might also be worried about surplus ownership or concerned that large surpluses will inevitably lead to pressure for plan improvements. If the plan sponsor has any of these concerns, the actuary can, through modeling or less sophisticated analyses of the long-term implications of a particular funding policy, establish appropriate upper bounds on the funding level.

Sometimes the actuary is faced with a plan sponsor who puts no upper bound on the funding level, and the actuary must supply one. The issue is difficult because there is no concrete test of adequacy. A plan's wind-up liabilities are clearly defined and can be accurately estimated, but its going concern liabilities are arbitrary (that is, not uniquely defined) and the accuracy of the underlying assumptions cannot be assessed for decades.

The factors that determine the cost of a pension plan are difficult to predict. Inflation, interest rates, and pension fund rates of return do not behave predictably or cyclically. They are governed by no law of nature. Pension costs do not fluctuate randomly about some long-term "true" cost. They meander, changing from one generation to the next in unpredictable ways, driven by forces that we neither control nor understand.

So what establishes an upper bound on adequacy? There is a wide range of plausible assumptions that produces an equally wide range of plausible answers. It's not easy to say where adequacy starts and stops within this range. In the final analysis, most plan sponsors have their own reasons to avoid excessive funding and actuaries help them set appropriate caps.

The absolute upper limit on funding adequacy is of interest primarily to the tax authorities and is a concern (in Canada) primarily for plans covering executives and/or shareholders. Any limit will be arbitrary. As long as it allows us to fund most plans reasonably, it can be tolerated.

CONCLUSIONS

When I became a pension actuary in the early 1980s, a pension plan's liabilities were usually valued on a single going concern basis. Valuation results were used for both accounting and funding. One set of numbers had to simultaneously protect members, disclose the cost of the plan to shareholders, and establish reasonable tax deductions. Since a single valuation was trying to do three things, it was difficult, if not impossible, to define the concepts of adequacy or appropriateness.

Today, actuaries typically perform several valuations to describe the financial condition of a pension plan:

- A going concern valuation to determine the plan sponsor's expense
- A second going concern valuation to fairly present the financial position of the plan in its financial statements
- A third going concern valuation to establish the contributions that are required by statute and/or regulation
- A solvency valuation, similar to a wind-up valuation, to test the adequacy of contributions.

The funding valuations are more clearly focused on benefit security. Funding adequacy, while difficult to quantify, is easier to articulate.

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ADEQUATE FUNDING FOR A PENSION PLAN

by Michael M.C. Sze

The very word "funding" suggests a process whereby contributions are made to a trust to cover pension obligations. Because pension payouts may not begin for a number of years, a plan must be worked out to ensure that this asset build up process conforms to certain preset criteria. For these criteria to be applicable to the entire process, such a plan must include an ultimate funded goal and interim measures of progress. Such a plan can be regarded as the funding policy.

In setting the funding policy, the fact that the assets being accumulated are earmarked to cover pension obligations must be recognized. Thus, both the ultimate goal and the interim measure must involve an asset plan, a liability plan, and a contribution plan that are fully integrated with each other. To set up a funding policy that only includes a liability and contribution plan is to lose sight of half of a balance sheet. To set up asset and liability plans that are independent of each other is not enough because of the impact of asset and liability performance on each other.

Once a funding policy has been established, assets and liabilities should be compared at regular intervals to determine whether the relationship between the two, typically referred to as the funded status of the pension plan, meets the expectation of the funding policy. A plan is adequately funded if:

- At each point of measurement, the interim funded status equals or exceeds that anticipated in the funding policy
- On a projected basis, if all the expected economic scenario materializes, the ultimate funding goal will be achieved.

SETTING FUNDING POLICY

The first step of the process is to establish a funding policy.

A funding policy must include an *ultimate* goal and an *interim* measure plan. The ultimate goal defines the target for the funding process. The interim measuring plan provides reference points at regular intervals to gauge the progress of the funding process.

ESTABLISHING THE ULTIMATE GOAL

The ultimate goal of a funding policy is to ensure that there will be adequate assets to cover the accrued liability at some projected time.

The time horizon of the ultimate goal depends on the nature of the pension plan. For a plan that may terminate in an expected number of years, the time horizon should be the expected termination date. For a plan that is expected to continue indefinitely, the time horizon may be the date when a matured situation is expected to occur. A plan is usually considered matured if the plan population becomes stable, that is, when the decrease in the number of active participants as a result of terminations and retirements is made up by the number of new entrants to the plan such that the characteristics of the active population remain stable in regard to age and service. Similarly, for a matured population, the ratio of active to inactive participants also remains stable.

For funding to be considered adequate with respect to the ultimate goal, the funded status at the target time horizon must show an asset level that will, under normal situations, be enough to cover all accrued liabilities. Furthermore, for periods beyond the target time, the expected future increase in assets is likely to cover the expected future increase in liabilities.

During the process of establishing the ultimate goal, a plan is also drawn up for systematic accumulation of pension funds. This plan consists of an investment policy and a contribution policy. Both of these policies need to reflect the financial constraints and planning of the plan sponsor. Some sponsors need to reflect the financial constraints and planning of the plan sponsor. Some sponsors require a more stable contribution pattern. For these sponsors on the liability side, level cost methods may be appropriate. On the asset side, duration matching of assets and liabilities should be considered. Other sponsors desire smaller initial cash layouts, with the understanding that there will be steeper cost escalation in later years. For such sponsors, on the liability side, accrued-benefit cost methods may be more appropriate. On the asset side, investments with greater growth potential should be considered. In any case, it is important that there be a planned system of accumulation of funds so that the funding goal will be achieved at the ultimate time horizon under the expected economic scenario.

A common method for establishing the ultimate goal is the forecast valuation method. Under this method, based on a realistic projection of the population statistics and future obligations of the pension plan, a target liability level is estimated at the projected ultimate time horizon. The target level of asset buildup is a certain percentage (for example, 110%) of the target liability. Using an interest rate reflecting a realistic expectation of investment return, level contributions as a percentage of pay are calculated for future years. With proper modifications, the method can be extended to reflect the actual contribution pattern desired by the plan sponsor. The assumptions used in this method are all based on the best

estimates of the planners. A margin of error should be included in the choice of the target funded percentage. While this method is useful in establishing the theoretical funding pattern of a plan, it lacks control over interim measures of funding progress. The forecast method is not an acceptable funding method under government regulations in the U.S. or Canada.

ESTABLISHING AN INTERIM MEASURING PLAN

In addition to a sound ultimate funded goal, a reasonable policy to ensure adequate funding must also incorporate a well-planned system to monitor the progress of fund accumulation on a regular basis. Because gradual and adequate funding is so important for public policy, governments also impose various requirements on contribution policies. Most government regulations provide for a comparison between pension assets and liabilities. The assumptions used in such calculations are the actuary's best estimate of future plan experience but may tend to be conservative and overstate the liabilities. If the funded status of the plan under such a regulatory basis is deemed deficient, additional contributions are required. The funding regulations in some jurisdictions in Canada require calculations be performed under both an ongoing basis, assuming the plan will continue indefinitely, and on a plan termination basis, assuming the plan is terminated on the valuation date. Under each basis, a funding deficiency attracts separate additional funding requirements.

On the one hand, regulatory funding requirements do provide a necessary interim measure of the funding progress of the plan. On the other hand, a contribution policy set strictly in accordance with the minimum requirements of these regulations has several undesirable effects. First and foremost, it does not focus on the ultimate funding goal of the plan. Strict adherence to minimum funding requirements may cause the plan to deviate substantially from the preset funding policy. Furthermore, the assumptions used in the regulatory calculations may be conservative, whereas the funding policy should be based on realistic assumptions. The funding patterns that emerge from the two sets of calculations are different. Finally, the regulatory funding contributions are calculated only for the valuation year. No insight into the future pattern of asset and liability accumulation is provided. Without such a projection, the planner may be at a loss as to where the entire process is heading.

A proper interim measure funding policy should provide a trend of the asset/liability accumulation and show the expected funded status at regular intervals. This policy must recognize the security needs of the participants, financial needs of the sponsor, and the demographics of the population. This policy will ideally govern both the pace of contributions, as well as asset investment policy. Furthermore, it must provide a means of monitoring progress, as well as a mechanism for corrective actions.

DETERMINATION OF THE ADEQUACY OF FUNDING

A well-formulated funding policy provides a yardstick for measuring *adequacy* of funding at any specific point of calculation. Such a calculation must compare actual liability, contribution, and investment experience against the expectations set in the funding policy. A plan is considered adequately funded if actual experience measures favorably against the original policy set.

Under this criterion, at a point of measurement, even when a plan is fully funded on a plan termination basis, if the funded status falls short of expectation, corrective actions may be required.

For example, consider a pension plan providing final average pay benefits to young employees with high expected pay increases in the future. The plan termination liability on a valuation date is substantially smaller than the ongoing funding actuarial liability based on projected pay. Adequate funding would require plan assets to exceed plan termination liability in such circumstances.

On the other hand, for an hourly plan that provides substantial plant closure benefits and is expected to terminate in the near future, it is also inadequate to provide funding in accordance with the minimum funding rules. The pension plan would be considered adequately funded if there is a systematic plan to fully fund all plan termination and plant closure benefits by the target date. Such a plan must involve both assets and liabilities. It is inadequate merely to try to contribute towards the termination liability. The plan must include asset policy to ensure against the deterioration of the funded status of the plan as well. Asset/liability matching may be required. Where evolving experience of the pension plan deviates from the funding policy, the planner must decide whether some adjustments are needed. If the actual experience deviates from expectation only as a result of temporary fluctuation in investment performance or in liability development, then a small adjustment in the contribution pattern is usually considered sufficient. If there are radical changes in the population demographics, financial position of the sponsor, or investment climate, then major adjustments to the funding policy may be called for. At its most extreme, a complete restatement of the funding policy may be required.

SOLVENCY REQUIREMENTS

Because of fiduciary responsibility towards participants, most actuaries would include the solvency requirement as an integral part of funding adequacy. However, the amount of funding needed to ensure solvency of the plan may be subject to interpretation. Some actuaries may equate the requirement to an asset accumulation that keeps pace with the accrued benefit value as suggested by *FAS 35*. Others equate the requirement to an asset buildup that exceeds the plan termination liability at every point in time. Some actuaries even want the assets to cover all plant closure benefit enhancements upon a plan termination, as implied in the Pension Guaranty Fund calculations of Ontario, Canada.

I believe that funding adequacy should reflect both the solvency requirements on a plan continuation basis, as well as the solvency requirement under the drastic plan termination and plant closure scenario. However, each scenario should be reckoned to the probability of occurrence of the event. Thus, recognizing such a solvency requirement does not mean building up an enormous amount of assets in excess of benefit security needs *under all circumstances*, since it is impossible that all possible economic events will each have 100% probability of occurrence. To require funding to fully cover all liabilities under any circumstance would lead to inappropriate use of the financial resources of the plan sponsor, which may result in deficient funding for other projects and an undesirable impact on plan participants.

Responsible funding policy should assess the probability of occurrence of each extraordinary event in addition to the plan continuation scenario. Based on the probability of each occurrence, the solvency requirement under such circumstances should be accounted for. This probabilisitic solvency requirement must further be tested at each interim measure to ensure continuous secured position for the participants.

ADEQUATE FUNDING HAS DIFFERENT MEANINGS FOR DIFFERENT GROUPS

Funding adequacy is not a static concept. Rather, it must stay focused on the plan participants at each point of measure, reflecting the benefit needs of the participant group and the economic reality of the time.

For a group of young participants, the emphasis may be on future benefit improvements to keep pace with inflation. The asset policy and funding policy then must reflect such projected needs. The time horizon for the funding adequacy measurements should be considerably longer than for a more matured group. The funding policy should also be geared toward measuring the potential asset increase to cater to the growth needs of the group.

On the other hand, the need for a matured group is more toward benefit security. Funding and asset policies must reflect a steady cash-flow requirement. Funding adequacy for such a group must also place considerably more emphasis on the solvency of the plan on both plan continuation and plan termination bases.

In addition to reflecting the characteristics of the underlying population, funding policy requirements are also affected by the economic reality of the plan sponsor. For a plan sponsor with ample resources, the benefit security of the participants is further guaranteed by the financial strength of the company. For a plan sponsor undergoing financial retrenchment, even the ability to provide future contributions may be restricted to a limited level. In such circumstances, tolerance for fluctuating contribution patterns is minimal. Asset and liability funding policies must fully recognize such constraints. Funding adequacy measurements must also reflect such

immediate needs and the lack of tolerance for any severe deterioration in the funding status of the plan at any point of measurement.

Furthermore, the concept of funding adequacy is dynamic in the sense that it changes as either the characteristics of the population or the economic outlook changes. As the group matures, the time horizon for funding adequacy measurement shortens. As the economic outlook improves, the solvency constraints relax.

CONCLUSION

Funding adequacy of a pension plan is of paramount importance to both plan participants and the plan sponsor. It requires careful planning at the inception of the plan as well as diligent monitoring at each interim measurement point. It must reflect the characteristics of the plan population and the economic outlook of the plan sponsor. It is dynamic and changes as the underlying population or the economic environment changes. It is the responsibility of the plan sponsor to perform studies at regular intervals to ensure the funding adequacy of the plan.

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A Framework for Establishing Corporate Retirement Funding Policy

by Christopher M. Bone

How should a corporate plan sponsor view the funding of pension promises? This paper recommends the following four criteria for measuring the adequacy of proposed funding policies.

I. **Management Review and Commitment.** Management must be informed of the probable future contribution requirements resulting from the adoption of a recommended funding policy and should commit to making such contributions. In committing to making contributions on the basis of a recommended funding policy, management should also be apprised of the impact of possible adverse actuarial experience on the level and pattern of future contributions.

There should also be a commitment to periodically review the funding policy in a comprehensive manner. It is recommended that such periodic review should be undertaken when major shifts in investment policy or anticipated benefit provision are made. In any event, review should occur at least once every five years.

II. **Adequacy of Plan Assets/Benefit Security.** For purposes of ensuring benefit security, management should have a plan for and commit to a high probability that plan assets will be equal to or in excess of the present value of the accrued benefit liability on a plan termination basis as of the (five-year) planning horizon. In effect, this criterion requires that, should a pension plan (or plans) be terminated, retirees would be secure in their pensions and active employees would find an equity in the fund assets commensurate with their accrued pensions for service rendered through the date of plan termination.

In addition, there should be reasonable assurance that the funding policy would not be expected to result in any significant reduction in benefit security over a longer time horizon.

III. **Reasonable Stability in and Understanding of Anticipated Contribution Patterns.** The pattern of contributions generated by the recommended funding policy should exhibit volatility and direction consistent with the corporation's regulatory and financial environment and ability to absorb changes in contribution requirements.

- Depending on industry and regulatory constraints, volatility may be avoided or accepted as a cost of business.

- The effect of funding method on the size and direction of contributions should be evaluated carefully, with particular attention to scenarios reflecting poor economic environments.

IV. **Adoption of a Rational and Systematic Actuarial Method.** The actuarial cost method selected should be acceptable under ERISA and should be consistently applied year to year.

MANAGEMENT REVIEW AND COMMITMENT

The Need for Management Information

How does the sponsor of a corporate pension plan review the adequacy of a particular funding policy? What are the considerations that apply in choosing one funding policy over another? This paper sets up a framework for plan sponsors to review alternative pension funding policies and decide on the appropriateness of a proposed policy.

Management is responsible for establishing the plan, for negotiating and/or approving the commitment of the firm to provide future benefits, and for determining that sufficient safeguards are in place so that these commitments are met. However, the extended timeframe and extensive uncertainty surrounding the payment of pensions can serve to obscure requirements for current financial support. Thus the need for management to receive good information on the risk of additional future contributions is imperative.

From the earliest studies of "What is a soundly funded pension plan?" the need to inform management has been strongly emphasized. The following statement is from a classic early monograph by consultant and actuary Dorrance Bronson written for publication by the Pension Research Council,

> "An actuarially sound plan is one where the employer is well informed as to the future cost potential and arranges for meeting the costs through a trust fund or insured contract on a scientific, orderly program of funding under which, should the plan terminate at any time, the then pensioners would be secure in their pensions and the then active employees would find an equity in the fund assets commensurate with their accrued pensions for service from the plan's inception up to the date of termination of the plan."[1]

[1]Dorrance Bronson. *Concepts of Actuarial Soundness in Pension Plans*, Homewood, Ill.: Richard D. Irwin, Inc., 1957, p 171.

How Often Should Information Be Reviewed?

If the need for adequate management information and review has once been established, how often should policy be reevaluated? Many items compete for management attention; thus, policy must establish the frequency of review as well as its nature.

Any rational and systematic method of accumulating funds for pensions must entail periodic review of assumptions and status of the funding program.[2] Historically, the past ten years have seen changes in many areas that directly affect pension funding. Among those changes that may be easily quantified are the following.

- *Legislative Changes*
  - Tax Reform Act of 1986
  - Omnibus Budget Reconciliation Act of 1987
  - Technical and Miscellaneous Amendments Act of 1988
  - Omnibus Budget Reconciliation Act of 1989
  - Older Workers Benefit Protection Act of 1990
  - Unemployment Compensation Amendments of 1992
  - Omnibus Budget Reconciliation Act of 1993
  - Retirement Protection Act of 1994
  - Proposed Comprehensive Tax Reforms and changes to Social Security.

  Note also that the effect on funding of a change in the law is often felt during several subsequent years due to delays in issuance of regulations on key portions of the law. For instance, nondiscrimination and coverage regulations were proposed and reproposed over several years and not final (for the presumably last time) until 1993, seven years after the Tax Reform Act of 1986 changed the law.

- *Benefit Policy.* The above legislative changes are likely to have caused multiple changes in benefit policy for pension plans. Changes in contribution limits and employer contributions to related plans (savings and ESOP) also have an effect on the relative importance of and ability to prefund pensions. Trends of the past include:

  - The move away from indefinite promises to more clearly defined commitments (for example, from final pay plans to cash balance plans)

  - New vesting rules

[2] "It would be well to emphasize again, in this chapter, that a position of accomplished actuarial soundness or funded ratio, to be maintained, requires a periodic review of the assumptions on which it is based." Ibid., p. 117.

- Changes in how private pension plans integrate with government plans

- Increasing integration of pension, savings, retiree health and other employee programs.

- *Investment Return Projections.* Examination of historical returns on the assets of particular pension funds may not be valid because of environmental changes in corporate attitudes and policy on the range of acceptable investments. In addition, there may be changes in the range of investment products available. Nevertheless, an examination of the changes in the market view of future rates of return may be estimated by looking at the yields that borrowers are required to pay on long term debt. For example, as shown below, yields on long-term Treasury Bonds have shown significant differences in the past[3]:

Year	Yield
1982	12.76%
1983	11.18
1984	12.39
1985	10.79
1986	7.80
1987	8.58
1988	8.96
1989	8.45
1990	8.61
1991	8.14
1992	7.67
1993	6.60
1994	7.37

Changes have also occurred in accounting practice and in the relative importance of regulatory authorities.

Analysis of the historical changes in the pension plan environment appears to indicate significant changes on almost a yearly basis. Certainly, taking any five year period above, the outlook at the beginning and the end of the period will be different when viewed from any of a legislative, benefit policy, or investment standpoint.

Other considerations also call for review of the funding status at intervals. As with any projection model, future scenarios that may be analyzed are based upon a multitude of assumptions on future experience. The passage of time will

[3]Table 12A, *Statistics for Employee Benefits Actuaries*, Society of Actuaries, Schaumburg, Ill., April 1996.

invariably prove that some of these assumptions were incorrect and the divergence of the scenarios from the realized experience may safely be assumed to increase over time. Of particular importance is the degree of confidence in assumptions in the long-term future. In setting a funding policy, it is important to steer the policy by a long term view of the future. However, looking at past experience, it is clear that current assumptions on long-term future events can change significantly over a time as short as five years; deterioration in the view of the long-term future, in particular, may require action soon if financial commitments are to be kept. Thus, once again, there is a need to review the funded status at intervals less than or equal to five years apart.

On the other hand, there are arguments against frequent changes in funding policy. First, changes in funding policy may disrupt business planning for other processes such as investment management, cash flow analyses, and so on. Second, changes in actual funding *method* (including changes in methods of valuing assets) require IRS approval; where changes are frequent, automatic approval of the changes may not be available.[4] Finally, the effectiveness of a particular funding strategy may not be meaningfully measured over a period as short as one year; in this situation random fluctuations may easily explain deviations from expected results. Meaningful analysis of the effectiveness of a particular funding policy requires the examination of the policy over a several year period.

In conclusion, sound funding of pension plans requires a commitment to periodically review the status of funding under the plan. Historical experience and the methods and assumptions used to examine projected funded status make clear the necessity for review at frequent intervals, certainly not to exceed five years. On the other hand, there is a need for stability in the funding process in order to allow for efficient use of funds and personnel and also for meaningful analysis of funding policy. This argues for review at less frequent intervals.

ADEQUACY OF PLAN ASSETS/BENEFIT SECURITY

Our second criterion is that the projected asset accumulation should be targeted to be greater than the liability for accrued benefits. Again, this is not a new conclusion.[5] When this target has currently been reached, the criterion should be

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[4]IRS Rev. Rul. 95–51 sets forth current standards for approval of changes in funding method.

[5]"Assuming that the principal concern of pension funding is employee security and that the two principal guarantees of such security under a retirement plan are (1) the accumulation of funds to back accrued (or vested) benefits and (2) the stabilization of long-range costs, the following logical long-range funding objective may be postulated. Such a long-range objective, to be reached over a reasonable period of time, would be the larger of (a) a fund sufficient to provide in full all accrued (or vested) benefits if the plan were to terminate or (b) a fund sufficient (in the absence of further benefit increases) to maintain a stable contribution level if the plan were to continue." pp. 48–49 Frank L. Griffin, Jr., "Concepts of Adequacy in Pension Plan Funding," *Transactions of the Society of Actuaries*, Vol. XVIII, pp. 46–63, 1966.

replaced with the equivalent statement that assets should remain in excess of accrued benefits. Even this may not provide complete protection to plan participants in case of a plan termination. This is because the liability for accrued benefits is measured on the basis of the firm's continuance; thus pensions are deferred to the expected date of retirement. In the case of a plan termination, layoffs and voluntary terminations of employment may occur on or about the plan termination date; these occurrences would tend to increase the number of early retirements above the expected number. Where early retirement is heavily subsidized, the liability upon plan termination may easily be greater than that for accrued benefits. Thus, the value of accrued benefits should be reviewed as a minimum measurement of benefit security.

The next point to be considered is whether this criterion is to be satisfied each year or on an average basis. Three items argue powerfully that the test should be applied on a year-to-year basis:

- The primary argument is made from the viewpoint of the plan participant. The purpose of maintaining an actuarially sound fund is to ensure benefit security. Security is imperiled should the test be failed in any year.

- From the viewpoint of the plan sponsor, avoidance of increased plan insurance premiums may be a factor. Currently PBGC premiums, which represent compensation to the PBGC for assuming the risk of paying guaranteed benefits in case of a plan termination, are charged in part based on the relative amount of exposure to the PBGC for unfunded benefits. In essence, underfunded plans are taxed at a higher rate than well-funded plans.

- The value of accumulated plan benefits as measured for accounting purposes, while different from the value of accrued benefits, is nevertheless a closely related measure. Under *SFAS 87*, companies whose assets are less than the value of accumulated plan benefits must recognize a liability on the balance sheet. To the extent that this underfunding is not attributable to unamortized effects of plan amendments, no intangible asset may be set up to offset this liability. For an employer that has been contributing in excess of the *SFAS 87* expense, this will generate a large swing in equity, because of the fact that recognition of a liability where there is no offsetting intangible asset will also cause the cancellation of any *prepaid* pension asset. This could cause inadvertent violation of debt covenants and other bargaining arrangements and increase the company's cost of borrowing. Should a subsequent upswing in the market value of the fund cause the asset value to once again exceed the value of accumulated plan benefits, the prepaid pension asset is restored, generating another large change in the balance sheet. Thus testing that the assets exceed the accumulated plan benefit obligation in each year would appear to be the course of prudence.

Having seen the arguments that assets should remain in excess of accrued benefit liabilities once they have attained this status, it remains to translate this statement

into a practical application of this criterion. This is to say that we must determine an acceptable probability that represents reasonable certainty of this event's occurrence. For this analysis, we will assume that this *confidence interval* is such that an event with a probability of 90% or greater will represent reasonable certainty of the occurrence of that event. Thus if there is a 90% chance that assets will be in excess of $20 million on January 1, 2000, we will accept the assumption that assets actually do exceed $20 million. In actual experience, management would determine the appropriate level of certainty.

Our criterion should then be testable as follows:

- Stochastic modeling of assets and liabilities can be performed using Monte Carlo or other techniques, based on proposed investment allocation choices, actuarial funding methods, asset valuation methods and legal restraints on funding the plan, so that ranges of future financial numbers can be evaluated.

- Among the products of the study should be the range and probability of contributions, expense and the ratio of market value of assets to present value of accrued benefit.

- The test of the criterion will then be to ensure that market value of assets exceeds the present value of accrued benefits at least 90% of the time. Assets should meet this test in each projected valuation year.

  To gain management's acceptance of the responsibility for committing to the results of the study, it is imperative that the underlying population and salary data reflect management's business plan. However, useful information may be produced by analyzing the sensitivity of various other assumptions.[6] Most importantly, what are the effects of a different population growth assumption? Soundly funded private plans should not depend on contributions from new entrants.

REASONABLE STABILITY IN AND UNDERSTANDING OF ANTICIPATED CONTRIBUTION PATTERNS

Our third criterion calls for the adoption of a funding policy that produces stable contributions. This may conveniently be broken into two subcriteria, the first of which is that the funding policy chosen should not produce significant year to year increases unless management is explicitly informed and accepts the likely effects of this arrangement. There are several reasons for this:

- Deviations of actual from expected experience over the projection period will vary actual funding from the pattern generated by the projection

[6]McGinn, Daniel F. "Actuarial Forecasts of Pension Plan Costs for Corporate Management," *Proceedings of the Conference of Actuaries in Public Practice*, pp. 141–152, xxviii 1979.

model; a projected pattern that produces increasing costs may be aggravated by future deviations in experience leading to unreasonable and excessive costs and therefore to termination or curtailment of the plan. Thus the adoption of a significantly increasing cost pattern may be seen to directly affect benefit security.

The question remains, What constitutes a significant pattern of increases? The employer must be shown the implications of alternative cost patterns and indicate an acceptable level of cost increase. Many employers would be unwilling to accept a pattern showing increases that would double the contribution requirement over the period of study. Depending on the degree of risk assumed in the investment portfolio, annual contributions may be shown typically to fluctuate from 10% to 50% due to investment risk alone. If random deviations due to all experience are assumed to raise the contributions by 50%, then this would argue that for this type of employer, the cost pattern should not show an increase over the projection period in excess of 50%. This is equivalent to an average annual increase of 4% or less.

- The environment in which the company operates is also important. For regulated entities, use of a funding method that develops a level pattern of contributions with minimal opportunity for company initiation in varying contributions from year to year is usually preferred. Typically, rate commissions want to ensure that each generation of ratepayers bears its own costs—as opposed to deferring or accelerating charges. Companies in cyclical industries may prefer funding methods that generate a large range of contributions, to maximize tax effectiveness of contributions.

The above considerations may directly affect the choice of actuarial funding method used under ERISA. All legal funding methods under ERISA may be divided into two separate families. One family of methods allocates funding for active employees based on the cost to purchase the benefit that actually accrues during the year; the other family spreads funding for the total projected benefit as either a level amount or a level percentage of pay. Members of the first cost family generally show a rising pattern of cost as the population of a plan matures. Thus members of the first cost family have been criticized as requiring greatest contributions when the plan sponsor is least likely to be able to afford the contributions (that is, when the plan population is super-mature). On the other hand, the level funding method family has been criticized as requiring initial contributions that are too large and lead to an excessive level of assets for an ongoing plan. Note, however, that overall contributions under level funding methods are lower (if not adjusted for the time value of money), as a relatively greater percentage of benefits are funded through investment returns (since a greater amount of money is invested over a longer period).

Our second subcriterion under stability of contribution is that the contribution should not demonstrate a great degree of volatility; a large amount of volatility in

pension contributions may interfere with the other business planning processes such as projected cash flow, budgeting, and so on. Similarly, volatile pension expense may be difficult to defend to shareholders, financial rating agencies or regulators. Several methods exist to induce lessened volatility in contributions. These include:

- Asset-smoothing techniques, which use an average value of assets rather than the most recent value

- Infrequent changes in funding and benefit policy.

Other methods for restricting volatility could include the use or avoidance of various asset classes. However, the sponsor's fiduciary duties may conflict with the use of asset investment strategies that are targeted solely at stabilizing costs, as opposed to strategies that are aimed at other goals that might be viewed as equally or more important to plan participants. Within these limits, however, many sponsors have joined investment selection criteria with other criteria in determining funding and investment policy.

ADOPTION OF A RATIONAL AND SYSTEMATIC ACTUARIAL METHOD

Management must operate tax-qualified plans within the constraints of ERISA and the Internal Revenue Code. Thus, funding methods chosen must comply with the requirements of ERISA. Periodic reevaluation of the method is important, but frequent changes in methods destroy the ability to measure progress along the previously chosen plan.

As with any long-term plan and commitment, the ability to measure progress along previously identified goals is a key indicator of likely success or failure. Given the extremely long time horizon of the pension process, ability to measure progress on a comparable basis over extended time periods becomes even more important. Any decision to change methods should not be undertaken lightly—management should not only look at the cost pattern for a predetermined scenario, but also examine realistic projections of the chances of good and bad experience under a funding method.

CONCLUSION

This paper recommends criteria for measuring the adequacy of proposed funding policies. The proposed criteria utilize stochastic analyses of the funding process as well as an analysis of the firm's management approach to pension funding. By combining management review and commitment to the pension program with stochastic decision support analysis, management and, in the end, participants, can be adequately informed about the financial support needs of the pension program.

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