Corporate Use of Pension Overfunding

Pension plan terminations designed to provide funds for the sponsoring corporations have become relatively frequent in the last few years. Using this procedure, firms raised more than $1.5 billion between 1980 and 1983, and several additional cases are now in progress (Table 1). The main impetus for this trend seems to be the recent substantial rise in pension "overfunding," a situation in which the value of a pension fund exceeds the required level, as determined by actuaries. The boom in stock prices between August of 1982 and October of 1983, and rising interest rates from 1979 to 1981 and again in the last year, have been the major factors in producing the high levels of overfunding.

The potential for additional funds from terminations is quite significant, even when compared with other more usual sources of funds to corporations. In 1982, for example, the pension plans of only 368 large corporations were overfunded by $38.8 billion, an amount that exceeds one half the credit market funds raised by all corporations during the year.[1] Plans in several service industries (commercial banking, retailing, transportation, and utilities) did especially well, with 108 top companies showing an average overfunding level of $171.3 million per firm.

The picture might seem to be one of unmitigated gains for everyone connected with overfunded plans. On the one hand, the firm is relieved of much of the short-term pressure in the provision of employee benefits. The pension plan, to a certain extent, pays for itself. The employees, on the other hand, may feel confident that no pension benefits will be defaulted.

However, if the corporation wishes to get at the excess funds quickly and directly, it must terminate the plan. By doing so, and by purchasing annuities to cover the benefits accrued under the plan, a firm may retain the excess pension funds and use them for any purposes it deems appropriate.

Two major sets of questions arise in this context. First, what motivates firms to acquire pension assets through terminations? In particular, why has the frequency of such terminations increased markedly since 1980? Why, nevertheless, have most firms refrained from taking this route?

A second set of questions involves the fairness of the firms' actions. Which individuals or groups stand to gain and lose with the inevitable changes in the values of pension assets and liabilities? Also, is the recent phenomenon consistent with a well established government policy on pension matters?

This article looks at the principal factors behind the recent phenomenon of profit-making plan terminations and examines some of the major issues involved. The analysis starts with an overview of the structure of the financial claims that arise from the existence of a private pension plan. The technical and financial aspects of the termination decision are then examined. Once these basic elements are laid out, the phenomenon is considered from a wider perspective in order to clarify some of the policy issues now being debated.

[1]Johnson & Higgins, "Funding Costs and Liabilities of Large Corporate Pension Plans", (New York, 1983). *Flow of Funds* data, Board of Governors of the Federal Reserve System, Fourth Quarter 1983.

Pension claims and obligations

The financial claims and obligations arising from the existence of private pension plans are governed by the Employee Retirement Income Security Act of 1974 (ERISA). Many of these claims are contingent in nature and difficult to value. For this reason, only the more straightforward among them ever find their way into the financial statements of sponsoring firms, or even of the plans themselves. Nevertheless, if the alternatives that are open to the firm are to be correctly specified, all the existing claims must be properly identified.

The most straightforward of these claims is the *pension fund*—the collection of financial assets owned by the pension plan. As it presents no unusual valuation difficulties, the fund always appears on the assets side of the plan balance sheet.

On the liabilities side of a defined benefit plan,[2] the entry of primary importance is the so-called *accrued* (or *actuarial*) *liability*. It represents the expected present value of benefit payments that have already been accrued by plan participants.[3] While it is a true obligation under the tenets of ERISA, this concept is considered sufficiently nebulous so as to be relegated to the footnotes of corporate financial statements.

The main problem is that its value depends crucially on various actuarial assumptions (interest rates, mortality rates, etc.) which are not standardized across plans. Though this argument may justify the soft-pedalling of the accrued liability for accounting purposes, it certainly does not imply that it may be ignored in economic analyses. This article will examine several pension concepts which are difficult to value, yet are of central importance in the firm's pension decisions. In some cases, these items do not appear even in the footnotes of the financial statements of firms or plans.

A third important concept is the *unfunded accrued liability* of the plan. It is defined as the difference between the accrued liability and the pension fund, as long as this difference is positive, and zero otherwise.[4] Under ERISA, the firm is obligated to provide this amount to the plan, though it is usually amortized over a number of years, as long as the plan is in existence. If the plan is terminated, however, the firm's outstanding pension obligation is typically less than the unfunded accrued liability. This is of major importance in the financial analysis of the firm's termination decision and is the result of two provisions of the 1974 pension legislation.

The first of these provisions establishes a rule for determining the minimum benefit level to which plan participants are entitled in case of plan termination. In general terms, only vested benefits are guaranteed. These are benefits which the employee would retain in any case, even upon leaving the firm. Although various vesting schedules are acceptable under law, a commonly used formula is that of "cliff vesting", whereby all

Table 1

Plan Terminations, 1980-83:

Plan sponsor	Funds acquired In millions of dollars	Funding ratio
12 largest reversions:		
Cities Service	237.5	1.71
Stroh Brewery	98.0	2.14
M.W. Kellogg	58.0	1.90
GAF	56.0	1.56
Occidental Chemical*	51.0	1.63
Humana	49.6	1.92
Occidental Petroleum	42.8	2.13
Occidental Chemical*	31.5	2.61
Continental Air Lines	19.6	1.42
John Crane-Houdaille	18.5	1.77
Western Air Lines	17.0	1.15
Mattel	14.0	2.15
Total† (162 plans)	1,576.8	1.71

*Some firms sponsor two or more independent plans.

†This total includes 162 plans, each of which produced a reversion of over $1 million upon termination. In addition to these cases reported by the PBGC, several terminations have been announced, but are still subject to final approval. These include A&P ($275 million), Amax ($100 million), Celanese ($300 million) and Reynolds Metals ($130 million).

Source: Pension Benefit Guaranty Corporation.

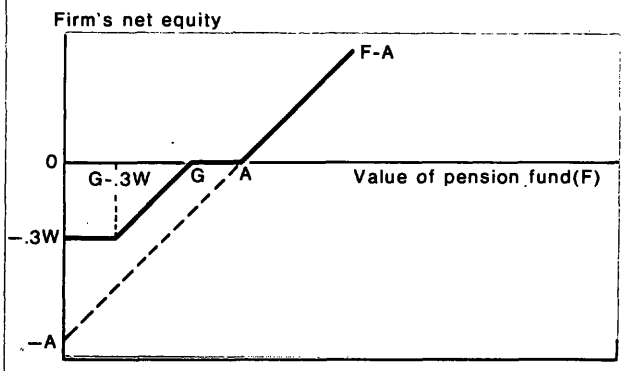
[2]In a defined benefit plan, an employee's benefit is calculated according to a predetermined formula. Contributions are then set by actuaries at a level which is expected to cover future benefit payments. Unlike defined contribution plans—in which the employee's benefit amounts to the accumulated contributions plus interest—the funds of defined benefit plans may at times be above or below the required levels. For a clear and concise introduction to pension concepts and terminology see: C.L. Trowbridge and C.E. Farr, *The Theory and Practice of Pension Funding*, (Irwin, 1976).

[3]A plan participant is essentially any employee or former employee covered by the pension plan. When calculating the accrued liability, actuaries frequently use projections of future salaries, accumulated benefits, and contributions. In the discussion that follows, it will be assumed that benefit accruals and salaries are frozen at their current levels to simplify the analysis. This is perfectly acceptable under ERISA, currently recommended for corporate disclosure by the Financial Accounting Standards Board (FASB), and not otherwise uncommon in actuarial practice.

[4]According to current FASB guidelines, the unfunded accrued liability must appear in a footnote to the corporate balance sheet. The FASB, however, is now considering a proposal to require the inclusion of this unfunded liability in the balance sheet itself. It would have as a counterpart on the assets side an intangible asset representing "enhanced future employee services".

Chart 1

Net Equity of the Sponsoring Firm in a Private Pension Plan under ERISA



F=value of pension fund.
A=accrued liability.
G=guaranteed benefit liability.
W=net worth of firm.

This chart illustrates the level of the firm's equity in a pension plan for various levels of the pension fund. The shaded area represents the net liability that arises whenever the value of the fund falls below the guaranteed benefit liability.

of an employee's accrued benefits become fully vested after ten years of service.

Technically, each employee's vested benefits are guaranteed only up to a certain maximum level. Few participants, however, have vested benefits in excess of the allowable limit, and the vested and guaranteed benefit liabilities are very close in practice. On average, the vested benefit liability is about 90 percent of the accrued liability of large corporate plans.[5]

Whenever a plan is underfunded, the accrued liability overstates the true termination liability of the firm. If the value of the fund falls short of the accrued liability, plan participants are only entitled to the benefits covered by the fund or to the guaranteed benefits, whichever are smaller. The firm has no obligations over and above the value of the fund, unless the latter is insufficient to cover the guaranteed level of benefits.

A second provision in the law establishes plan termination insurance under the Pension Benefit Guaranty Corporation (PBGC), an agency of the Federal Government. If the value of a pension fund is so low upon termination that even the addition of 30 percent of the firm's net worth does not cover the guaranteed benefit liability, the PBGC makes up the remaining difference. The firm's net pension liability is thereby limited to 30 percent of its own net worth. In exchange for this service, the firm must pay a flat annual premium (currently $2.60) for each plan participant.

The effects of these provisions are illustrated in Chart 1. When the value of the fund (F) exceeds the accrued liability (A), the firm is liable for all the accrued benefits. It has a claim, nonetheless, on the net overfunding of the plan (F minus A). When the value of the fund is sufficient to cover the guaranteed benefits (G), but not the accrued liability, the firm's net equity in the plan is zero. It is only liable for the value of the fund.

As the value of the fund falls below the guaranteed benefit liability, the firm's net equity in the plan becomes negative—it must make up any further funding deficiencies. The PBGC insurance, however, imposes a limit of 30 percent of the company's net worth (.3W) on the net value of this obligation.

The mechanics of plan termination

While the termination of an overfunded pension plan may not be accomplished overnight, there is nothing in the law to suggest that it should involve a long and difficult process. The basic procedure, commonly known as a plan termination with a reversion (of funds to the sponsoring firm), is simple.

First, the firm must notify the PBGC of its intention to terminate the plan at least 10 days in advance of the proposed termination date. If the PBGC finds that the plan is indeed overfunded, it issues a "notice of sufficiency" within 90 days of the original notification, and the termination proceeds as scheduled. Annuities are purchased from insurance companies, which assume the future payments of accrued benefits.

In practice, some terminations take much longer to complete. Two types of problems may arise. The first involves the question of the sufficiency of the fund. If it is difficult to determine whether a plan is truly overfunded, the PBGC may request an extension on its allotted time. In the event that the PBGC finds a plan to be underfunded, the chances of a reversion of funds to the firm become very slim. It is unlikely, however, that an attempt to terminate a plan with a reversion would lead to either of these circumstances.

Since it is in the firm's interest to provide full and accurate information to the PBGC in a timely fashion, informational issues should not cause any major delays. Furthermore, the procedures and assumptions used by the PBGC to calculate pension liabilities are public knowledge. Hence, firms may obtain fairly accurate estimates of subsequent PBGC determinations.

The major source of delays in the completion of

[5]Johnson & Higgins, *op. cit.*

pension terminations has been the filing of lawsuits on behalf of plan participants. In some cases, the latter have claimed a right to at least a share of the pension plan overfunding. One of the most publicized cases is that of A&P, which initiated its termination proceedings in October of 1981. After extensive litigation, a U.S. Court of Appeals recently upheld a settlement providing a share of about one-sixth of the total overfunding to the plan's participants.[6]

The law is largely silent as to the ownership of the pension overfunding. A strict interpretation would ascribe such funds to the sponsoring firm. The intent of the law may be different, however, as suggested by the A&P court rulings. This point is discussed later in more detail.

The growing value of pension overfunding

For most firms, the value of their net equity in pension plans has been growing at a substantial pace over the last few years. The proportion of overfunded large corporate plans went from an already significant 50 percent in 1980 to 67 percent in 1982. Moreover, among overfunded plans, the average level of overfunding almost doubled from $54.0 million in 1980 to $105.3 million in 1982.[7]

At the same time, the problems of underfunding—so pervasive in the 1970s—have been dwindling in magnitude. Only 20 percent of large corporate plans had some unfunded vested liabilities in 1982, as compared with 38 percent in 1980. The proportion of firms with unfunded vested liabilities in excess of 30 percent of net worth—and, thus, with liabilities covered by the PBGC—remained stable at about 2 percent.

The recent funding success of corporate pension plans is largely attributable to developments in the financial markets—most importantly, the stock market climb and the course of interest rates. Somewhat ironically, the recession, through its depressing effects on employment and wages, contributed as well. The following have been the most important factors.

Stock market climb

Pension funds hold, on average, 60 percent of their assets in equities. Hence, they benefitted from the boom in stock prices that began in 1982. From August of 1982 to October of 1983, for example, the S&P 500 index rose by 69 percent. (It should be noted that some of these gains—though certainly not most—have been reversed so far in 1984.)

[6]The United States Court of Appeals for the Third Circuit (in Philadelphia) decided on December 29, 1983 to uphold an earlier settlement which allocated $50 million of the A&P plan's overfunding to its participants. See Walsh v. The Great Atlantic and Pacific Tea Company, Inc., 726 F.2d 956 (1983).

[7]Johnson & Higgins, *op. cit.*

In addition, dividend rates have been at historically high levels since 1978. Dividends, which accrue without taxes to pension funds, must be taken into consideration when determining the total return to holding equities. During the recent rise in stock prices, it is clear that the appreciation did not occur at the expense of dividend distributions.

High interest rates

Increases in interest rates tend to depress the value of pension assets. On the other hand, they tend to reduce the present value of pension liabilities to an even greater extent. Therefore, the degree to which a pension plan is overfunded typically increases with interest rates. Although this principle does not necessarily apply to every pension plan, it does seem to hold in the majority of cases.

To obtain a more precise formulation of the conditions required for this to hold, define:

R = funding ratio of a pension plan
= pension fund/accrued liability, and
R_D = duration of accrued liability/
duration of pension fund.[8]

We observe that:

- R increases with the interest rate whenever R_D is greater than 1 (that is, whenever the duration of the accrued liability exceeds that of the fund); and that

- The absolute dollar amount of overfunding (the pension fund minus the accrued liability) increases with the interest rate whenever R_D is greater than R.

Estimates based on data for 1980 and 1982 indicate that the duration ratio R_D is approximately 1.4 for the typical private pension plan. Since private pension funds are relatively homogeneous in terms of asset composition, this figure is probably fairly stable across

[8]The duration of a stream of payments is defined as the weighted average of the time remaining to each payment, with each weight equal to the present value of the corresponding payment. The usefulness of the concept of duration stems from the fact that—up to a proportionality factor—it represents the percentage reduction in the present value of a stream that is associated with an increase in the interest rate. If i is the interest rate, P is the present value of a stream and D its duration, then

$$D = -(1+i)\frac{d\log P}{di}.$$

In a continuous time model, the $(1+i)$ factor drops out. For more details, the reader may consult: Richard W. McEnally, "Duration as a Practical Tool for Bond Management", Journal of Portfolio Management (Summer 1977) or G.O. Bierway, George G. Kaufman and Alden Toevs, "Duration: Its Development and Use in Bond Portfolio Management", Financial Analysts Journal (July-August 1983).

Table 2

Distribution of Funding Ratios* of Large Corporate Pension Plans, 1980 and 1982

Funding ratio	Percent of plans† 1980	Percent of total accrued liabilities‡ 1980	1982
At least:			
1.0.....	41.6	43	52
1.4.....	9.3	11	29
1.5.....	6.4	7	25
2.0.....	1.0	0§	8

*The funding ratio is here defined as the market value of the pension fund divided by its accrued liability (See text)

†Calculated from survey data in Laurence J. Kotlikoff and Daniel E. Smith, *Pensions in the American Economy*, Chicago: NBER (1983). Sample consists of approximately one half of the Fortune 1000 industrial companies.

‡Estimated from survey data in Johnson & Higgins, "Funding Costs and Liabilities of Large Corporate Pension Plans", New York (1981 and 1983). Sample includes most firms from Fortune's 500 industrials (77 percent in 1980, 80 percent in 1982). Plans are weighted by their accrued liabilities, and the funding ratio is assumed to be normally distributed.

§Less than 0.5 percent.

plans.[9] Thus, while it is almost certain that an increase in interest rates would raise the funding ratio R, the absolute level of overfunding may rise or fall, depending on whether or not a plan is less than 40 percent overfunded. Using actual pension plan data, Table 2 illustrates that most pension funds, in fact, have funding ratios of less than 1.4.

Interest rates have been persistently high since 1978. Although they are currently below their 1980-81 record levels, they remain significantly higher than at comparable points in previous cycles. Thus, with the exception of plans with very high funding ratios, interest rates have been important contributors to the recent overfunding of plans.

Decelerating wage bill

High levels of unemployment during the last recession have dampened the extent of coverage under private pension plans. In general, when employment and employee-hours grow less rapidly, the pension obligations of corporations are correspondingly constrained. In addition, pension participants who quit or are permanently laid off stand to lose benefits that have been accrued but are still unvested.

Slowdowns in wage increases also serve to contain the growth of pension liabilities. Many pension plans, especially those of salaried employees, have benefit formulas which depend on wages. In such cases, accrued liabilities have grown less rapidly as a response to decelerating or decreasing wage levels.

Valuation of termination liabilities

Since corporate pension overfunding may revert to the firm only after a plan is terminated, the liabilities involved must be calculated under the assumption of termination. As compared with the liabilities of a continuing plan, those at termination have tended to be lower in the last few years. There are two principal reasons for this.

The first is that current wages, rather than a projection of expected future wages, are used in calculating pension liabilities upon termination. Since many pension benefit formulas depend on final wages, which in almost all cases would truly be expected to rise over time, the use of current wages has an obvious depressing effect on the termination value of the accrued liability.

The second reason is that the interest rates used by actuaries to valuate the liabilities of continuing plans are typically lower than the rate required by the PBGC for plan termination valuations. In general, actuaries prefer to use conservatively low interest rate assumptions, since that tends to overstate the required level of the fund and promotes greater plan solvency.

Should the firm terminate an overfunded plan?

If corporate behavior with respect to pension overfunding is to be understood, two basic facts must be explained. First, large reversions have occurred much more frequently in the last two years than in the previous eight years since the passage of ERISA. Second, only a small fraction of the potential overfunding has thus far been tapped.[10]

The analysis of these facts is made clearer if we begin by considering a situation in which certain simplifying assumptions are imposed. Specifically, suppose that:

[9]The duration of the accrued liability was estimated using an actuarial rule of thumb derived in Howard E. Winklevoss, "Pension Mathematics", (Irwin, 1977). The duration of the pension fund was based on pension fund asset proportions from the *Flow of Funds* data of the Federal Reserve Board and on typical durations for each type of asset.

[10]The firm may alternatively take advantage of overfunding by reducing the level of its pension contributions. This would be comparable to recouping the excess funding through an amortization schedule. Under this alternative, however, the immediate gain is not nearly as large; and uncertainty about the future makes the total payoff more risky.

- The age distribution of the employee population is fixed over time;
- the plan's benefit formula does not change;
- the rate of interest and the price level are constant over time;[11] and
- the returns to the fund fluctuate randomly (but symmetrically) about the interest rate.[12]

One implication of these assumptions is that the accrued liability is constant over time. In addition, benefit payments and regular pension contributions remain unchanged through time.[13]

Consider first the net value of the pension fund, that is, the fund less the accrued liability. If the firm were fully liable for plan underfunding, this difference would represent its net equity in the plan, as illustrated in Chart 2(a). In that case, and under the stated assumptions, a firm that is not averse to reasonable financial risks would be indifferent as to whether to terminate or continue an overfunded plan. The intuition is as follows:

If the future returns to the fund turn out to be better than expected, the firm benefits fully from the gains. If, on the other hand, the returns are worse than expected, the firm bears the full risk. Since these two types of situations are equally likely by assumption, the firm is indifferent between acquiring the present level of overfunding and accepting a future level which is expected to be the same.

The actual situation is more favorable to the firm. Recall from the analysis of Chart 1 that the firm's liability is limited in the case of underfunding. Hence, in actuality, the downside risk for a firm with an overfunded plan is smaller than in the case just described. This limited risk feature tilts the balance in favor of plan continuation, as that alternative represents, in effect, a favorable bet for the sponsoring firm. The true value of the overfunding hence exceeds the strict difference between the fund and the accrued liability.

An extreme example of limited downside risk is presented in Chart 2(b). Here, the firm is fully protected against asset market fluctuations that would make the plan underfunded. This case is interesting for two reasons. First, it corresponds to the situation prior to ERISA, when there were neither guaranteed benefits nor a PBGC. The risks of underfunding were borne by plan participants.

Second, the value of the overfunding under this type of full protection represents an upper bound on the actual value to the firm of the excess pension funds. The arrangement is formally equivalent to a call option, and is briefly analyzed as such in the box.

To summarize, under the basic assumptions, it is financially preferable for a firm with an overfunded plan to provide for its continuation. Moreover, the returns to qualified pension funds accumulate without taxes, providing a further incentive to continue "investing in the plan." These conclusions are consistent with the fact that most firms with overfunded plans have not opted for termination. To account for the recent surge in terminations, new elements must be brought into the picture.

Possible reasons for the surge in reversions

The relatively small but significant number of recent terminations may be explainable by firms' perceptions of departures from the above conditions. Any firm with a substantially overfunded plan, but which expects a long-term decline in the level of overfunding, may be tempted to realize the gains through plan termination.

Several factors may lead to reductions in overfunding.

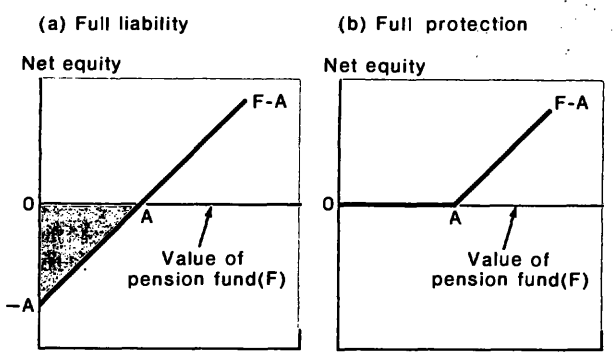
[11]The more general assumption that prices grow at a steady rate (that is, that the rate of inflation is constant) does not alter the general character of the results. The case of a constant price level is used in the discussion for the sake of convenience.

[12]More precisely, the fund's instantaneous returns could be assumed to follow a Brownian motion process. This is the standard assumption in option pricing theory.

[13]These regular contributions are called "normal costs" in the actuarial literature. See, for example, Trowbridge and Farr, *op. cit.*

Chart 2

Firm's Net Equity in Plan Under Alternative Arrangements



F=value of pension fund.
A=accrued liability.
The shaded area represents a net liability for the firm.

The stock market, for example, could turn around and eliminate some or all of the previous gains. Alternatively, for a highly overfunded plan (more than 40 percent), interest rates could rise. For a less overfunded plan (less than 40 percent), interest rates could decline.

If any of these events were expected to occur and persist into the future, some firms might be inclined to terminate their plans. Expectations of rising interest rates, for example, may have been at least partly responsible for some recent terminations. As shown in Table 1, plans that were recently terminated with valuable reversions to firms had a weighted average funding ratio of 1.71. (The simple average is 2.46.) Moreover, only one of the top twelve reversions involved a plan that was less than 40 percent overfunded. Given these high funding levels, firms may have been concerned about the adverse effects of increasing interest rates on the levels of overfunding.

One other important factor that must be considered is the firm's attitude toward risk. Ordinarily, economic theory treats firms as neutral or indifferent to risk. A sufficiently risk averse firm, however, might not fully appreciate the protection against economic losses provided by ERISA. It might instead go for the bird in hand, and terminate the plan immediately.

The firm's choice regarding termination is also influenced by the funding level of the plan. The table in the box illustrates that the relative attractiveness of continuing with a plan diminishes as the funding ratio becomes larger. Thus, at high levels of funding, it takes a smaller change in expectations about future economic and financial conditions to reverse the decision not to terminate. A look at Table 1 confirms that most of the recent reversions involve plans with high funding ratios.

Apart from these technical reasons, other factors have been suggested as contributing to the recent surge in terminations of overfunded plans. One of these is the rise in merger and acquisition activity. A corporate takeover affords the possibility of capturing an overfunded plan with other firm assets. Although this is most probably not a dominant consideration, a valuable overfunded plan may "sweeten the pot" when a corporate acquisition is being considered.

Terminating a plan, then, becomes one part of an overall defensive strategy for preventing a takeover. There is evidence that in more than one instance, terminations which involved substantial reversions were connected to leveraged buyouts designed by management to prevent takeovers. If a takeover does go through, the new management—with no close ties to the acquired firm's employees—may be less reluctant to terminate a plan.

Another reason for the recent terminations may be the experience that corporate management has gained over time with the provisions of ERISA. The complications involved in understanding and interpreting the Act may for some time have prevented firms from taking full advantage of the options permitted under law. With a better grasp of both substance and regulatory experience, corporate executives may be reaching farther.

The effects of termination on plan participants

So far we have concentrated on the financial aspects of the termination decision from the firm's point of view. Even though the firm is the primary decision maker, it is essential to consider how plan participants are affected by the termination of an overfunded plan. Are they being treated fairly? The answer may depend on the particular relationship of the employee to the plan.

Even when a plan is overfunded, employees with vested benefits may suffer intangible losses in the event of termination. Though all accrued benefits are generally provided for, a degree of certainty about future benefits is lost with the plan. Under some defined benefit plans, for example, the employee accrues a given percent of final salary with each year of service. If the individual were forced to save for retirement exclusively through other directly held financial instruments, or through a defined contribution plan, the future value of the employee's savings would be, in a sense, less predictable.[14]

When the benefit formula depends upon the employee's final salary, as in the above example, it also makes a difference whether one applies the formula to a future salary (as under plan continuation) or to the current salary (as under termination). Thus, even though a vested employee receives his full share from the plan, he may come up short as far as future expected benefits are concerned.

A special case of a fully vested employee is the current retiree. In this case, termination has very little significance, save for plans which provide *ad hoc* cost-of-living increases in pension benefits. These would presumably be discontinued after the plan ceases to exist, making the participant worse off.

Employees with some unvested benefits share the foregoing difficulties; but, when the plan is overfunded, all their benefits become, in effect, vested upon termination. The net result of termination is thus ambiguous for them, and it is difficult in general to say which of the two factors predominates.

On the whole, it seems that participants tend to be net losers when a plan is terminated. The exact extent of the losses, however, is hard to ascertain.

The PBGC's finances also may be adversely affected

[14]Plans terminated with reversions are frequently replaced with defined contribution plans.

by plan terminations. PBGC premiums are determined solely on the basis of the number of participants. Thus, when an overfunded plan is terminated, the pool of contributions is curtailed, but only a "good risk" is eliminated. Terminations of underfunded plans may induce actual payouts for the PBGC, and if these ever exceed the agency's reserves, the Federal Government may find itself under pressure to cover the shortfall.

Is the government committed to the establishment and continuation of pension plans? Even though the emphasis in ERISA and in later policy statements is on the financial soundness of existing plans,[15] the establishment of tax advantages and of the PBGC seem to point to a desire to promote the growth of private pension plans. If this is the case, it is important to determine whether the increased frequency of terminations with reversions is being driven by elements within the current pension law.

Whether or not the employees must share in the proceeds from a reversion, it is clear that firms have a legal right to terminate an overfunded plan and that, in practice, they end up with most if not all of the excess funds. One proposal under current debate would give the plan participants a greater share (say, half) of the overfunding in case of termination.[16] Once the decision to terminate has been made, this arrangement may have some desirable redistributive properties. All other things equal, however, it may tend to increase the firm's incentive to terminate an overfunded plan.

The reason for this is that the net equity of the firm in the plan, as presented in Chart 1, would be reshaped in a way that could make termination more desirable. Under the present law, the firm benefits fully from unexpected gains, but is partially protected against unexpected losses. A proposal to curb the firm's upside potential from plan continuation, leaving the downside risk intact, would seem to make the case for continuation weaker.

Another alternative for reform would involve giving the firms the right to withdraw the excess funds from a plan without the need to terminate it. This would seem to solve the present problem, but in the longer run, it could jeopardize the solvency of plans. If firms were to avail themselves of every opportunity of getting at the excess funds, all plans would end up underfunded.

Nevertheless, a limit could be set on the firm's proceeds from a reversion that does not involve plan termination. Firms might be allowed, for example, to withdraw funds in excess of a certain degree of overfunding,

[15]See, for example, "Coming of Age: Toward a National Retirement Income Policy", President's Commission on Pension Policy (February 1981).

[16]See, for instance, the editorial "Terminated Funds: A Fair Solution", *Pensions and Investment Age* (June 27, 1983).

The Pension Call Option

A *call option* gives its bearer the discretionary right to buy a given asset on or before a specified time in the future at a preset price. When a firm has full protection against the liabilities of an underfunded pension plan (as discussed in the text) its right to any pension overfunding may be construed as a call option.* The firm may at any time buy the pension fund at a price equal to the accrued liability of the plan. By presenting an estimate of the true worth of such an option, this box illustrates how the value of the overfunding may exceed its actual level (called the *intrinsic value* of an option) whenever there is some protection against downside risk.

As in the text, we assume the constancy of the major economic variables involved. Under those conditions, the table presents the ratio of the intrinsic value to the option value for various levels of the funding ratio of the plan (the ratio of the value of the fund to the accrued liability). In pension fund terminology, this ratio represents the actual level of overfunding (its value to the firm if the plan is terminated immediately) as a proportion of its value assuming the continuation of the plan.

At low funding levels, the protection afforded by the option makes its value substantially larger than the strict overfunding amount. As the funding level increases, however, the two values become much closer, and the financial incentive for plan continuation becomes relatively less powerful.

Ratio of Intrinsic Value to Option Value for the Pension Call Option

Funding ratio	Intrinsic/Option value In percent
1.1	24.7
1.2	41.5
1.3	53.4
1.4	62.1
1.5	68.7
1.6	73.7
1.7	77.7
1.8	80.8
1.9	83.4
2.0	85.4
2.5	91.8
3.0	94.8

*The intuition behind the results of the box is given in the text. For a largely nontechnical discussion of options in general see Laurie S. Goodman, "New Options Markets", this *Quarterly Review* (Autumn 1983).

which could be stated as a percent of the accrued liability. Thus, suppose this rule were to apply with a minimum overfunding level of, say, 25 percent. A firm sponsoring a plan with an accrued liability of $10 million and a fund valued at $18 million could obtain a reversion of $5.5 million (that is, $8 million in overfunding minus 25 percent of the accrued liability, or $2.5 million). In this way, the firm would obtain a short-term gain, but the plan would still be continued with a buffer against unanticipated financial adversities.

Such an arrangement might be construed as a tax-sheltered form of investment for the corporation. As such, it would seem to be a departure from the basic purpose of pension legislation—the enhancement of the retirement income of workers. Nevertheless, U.S. pension legislation has traditionally relied on financial incentives to firms as a means of promoting its basic goals.

It should be clear that any solution to the problem would involve some sort of trade-off. It has been argued, in fact, that reversions are not a problem, especially if plan participants are otherwise compensated for any losses incurred. In attempting to find a solution, care should be taken not to provide other incentives for undesired behavior on the part of those involved.

Conclusion

The recent flurry of terminations of overfunded plans is probably not over. Strong gains in the stock market have been followed by increased uncertainty, and interest rates are again rising. Thus, firms that find themselves with heavily overfunded plans could be tempted to cash in their gains in anticipation of adverse market movements. The numbers in Table 2 indicate a large potential for this.

For the firms that have taken this opportunity so far, the main incentive seems to have been provided by the fact that the funds were there—somewhat unexpectedly and in large amounts. That much is common to all the firms. Each individual case, of course, was precipitated by its own particular set of circumstances. A careful study of these seems potentially fruitful, but lies beyond the scope of this article.

Even though some firms have obtained very profitable reversions, relatively few have availed themselves of this opportunity so far. There seem to be two possible explanations for the apparently unexploited opportunities: the lure of further gains and the indirect costs of plan terminations. If costs—such as alternative compensation for workers—are the main concern, the number of terminations would be expected to remain at a modest level in the future. If, on the other hand, firms are waiting for the appropriate moment to realize the maximum possible gains, the looming of a large drop in the stock market, or in interest rates, could set off another stream of terminations.

There is also an important issue of equity involved. For many plan participants, their pension is the principal source of saving for retirement, apart from Social Security. The continuation of the plan could be of great importance for them. Even when a new defined contribution plan is established, as is sometimes the case, the nature of employee benefit expectations can be significantly altered.

The situation is not clear-cut, however. The reversion of a plan's overfunding to the firm improves its financial position in a way that could lead to increases in productivity, or even prevent its demise. In those cases, the employees also stand to gain from a termination, especially if a substitute pension plan is introduced.

The legal and ethical issues revolve around the question of who ultimately owns the pension fund. The law is ambiguous on this matter and provides little direct guidance. Pension obligations, for example, vary depending on whether or not the plan is terminated. Moreover, while an existing plan is closely regulated, there is no legal requirement for a firm to either start or to maintain one. Thus, while the claims of the various parties involved depend upon the circumstances, it is the firm that, at present, holds essentially all the options.

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