

Pension Deficits: An Unnecessary Evil

Lawrence N. Bader

Falling equity markets and interest rates have devastated pension plans worldwide during the past several years. The S&P 500 Index companies enjoyed a collective pension surplus of \$250 billion in 1999. Even after the 2003 market rally, they face a deficit of \$168 billion in 2003 (Bianco, Deng, and Suri 2004). These circumstances spotlight the weakness of current funding and investment practices for corporate defined-benefit pension plans. This article presents a case for securing all accrued benefits through *full funding*.¹

“Full funding” is commonly understood to mean that assets are sufficient to cover liabilities measured at an arbitrary discount rate, with no consideration of how the assets are invested. Here, I use “full funding” to signify a much stronger funding condition, one in which an immunizing bond portfolio secures all benefits to which employees would be entitled upon service termination. The combination of sufficient assets and an immunization strategy eliminates dependence on the creditworthiness of the pension sponsor. Furthermore, the sponsor commits not to undermine that security by changes in investment or funding policy, by plan amendments that are not immediately funded, or by plan mergers or spin-offs.

I discuss pension funding initially in the absence of governmental guarantees because most countries lack guarantees and because this approach yields insights that are useful in evaluating guarantee programs.

Preregulatory Environment

The setting for this discussion is a transparent financial system in which plan sponsors, investors, creditors, and employees fully understand the value and risk of pension plans. In this transparent system,

- capital providers understand that a dollar owed to a pensioner and a dollar owed to a creditor have the same (tax-adjusted) effects on corporate value and

- employees understand the risks of both underfunding and asset/liability mismatches. They correctly value their pensions and are able to make rational trade-offs between pensions and salary.

These assumptions are heroic. But we cannot base an optimal pension system on the behavior of stakeholders who view pension plans only through a veil of ignorance.

The simple preregulatory environment has no taxes, no regulation, and no governmental guarantee of pension promises. Later in the discussion, I introduce these factors.

A Simple Pension Promise. Suppose an employee’s compensation for a year includes a salary and a promise of a \$20,000 lump sum payable in 25 years. The lump sum is vested and payable whether or not the employee is alive at the due date.² This pension promise is economically equivalent to the employer’s issuing its own nontransferable bond to the employee as part of his pay package.

Suppose this nontransferable bond is fully collateralized by a portfolio of matching risk-free bonds. In this case, the employer’s bond itself is risk free and would be valued at riskless rates by the market and the employee. But suppose the collateral is too small or too risky and there is a danger that the company might default. In this case, the employee discounts the bond for its default risk.

Nondiversifiable Risk. If the plan sponsor issued such a bond publicly, investors would treat it like any other similarly risky bond in their diversified portfolios. But for employees, the risk of the employer’s bond is different from that of other companies’ bonds. The employer bond adds to the large employer-specific risk that the employees already bear through their employment, and the employees cannot diversify or hedge this risk in any practical manner.³

If a company were to sell its own risky bonds to its own employees, therefore, the company would be selling to unwilling buyers. Unlike the investors who determine market prices, employees cannot diversify the company-specific risk to which they are already overexposed, so they would not pay the full market price. Nor would it be rational for them to give up enough salary to cover the full market value of the risky pension.

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A company might still, despite this inefficiency, wish to provide pension plans. Such plans might help manage retirement patterns and assure retirees a decent standard of living. Also, society encourages pension plans through tax subsidies, which can close the gap between company cost and employee valuation of their pensions. But can companies improve the value of pensions to employees without commensurate cost?

Full Funding of Accrued Benefits. Companies can accomplish such an improvement by securing pension promises through full funding. As noted, any employer-specific risk in a pension fund makes the pension inefficient because its cost to the employer is greater than its value to employees. Full funding eliminates the risk that can arise from pension assets that are either too small or too risky.

If the risk is from pension assets that are too small, the company should borrow in the capital markets from willing lenders to “refinance” its inefficient “debt” to its employees. The company is better off borrowing from investors who can diversify than from employees who cannot.

If the risk arises from aggressive investing, the company can shift to an immunizing bond portfolio. Exchanging one class of marketable assets for another creates no first-order change in shareholder value, but the company gains by raising the value that employees attach to their pensions and, therefore, the salary that they will sacrifice for those pensions.

Tax Arbitrage. Companies can also gain from full funding by saving taxes for their shareholders. Like a number of other countries, the United States taxes bonds at a higher rate than equities and gives favorable tax treatment to pension funding. Under these conditions, Black (1980) and Tepper (1981) showed that it is tax efficient to fully fund pension plans, invest the pension fund in bonds, and shift equity risk to the shareholders’ own portfolios or elsewhere in the company.

The arguments about employee risk and tax arbitrage do not demean equity investment. They merely redirect the equity investment away from pension plans so that it will not subject shareholders to unnecessary taxes and employees to nondiversifiable dependence on their employers’ creditworthiness.

A Note on Immunization. The argument so far is that eliminating market risk is more valuable to employees than costly to sponsors. This argument weakens, however, for the final increment of risk reduction—that is, replacing the highest-quality corporate bond portfolio with U.S. Treasuries. In this

replacement, sponsors pay for the state income tax exemptions and high liquidity of Treasuries. These qualities are unimportant to pension funds and may make reducing pension risk to “absolute zero” overly expensive.

Unfortunately, no riskless securities exist that do not have these costly—but in this context, useless—properties. Therefore, this potential final improvement in pension security may not justify the cost of squeezing out the last bit of default risk.

The shortcomings of Treasury immunization do not, however, make corporate bonds the correct measurement standard. Only government bonds offer a risk-free, objective, and hedgeable standard.⁴ But in practical situations, an imperfect immunization—one that relies on bonds that are very high quality but not riskless—may offer the optimal balance of cost and security. The sponsor of an imperfectly immunized plan should maintain sufficient assets to meet a Treasury-based standard at all times by slight overfunding in anticipation of possible losses.

Funding under a Guarantee System

Now consider how Pension Benefit Guaranty Corporation guarantees change the desirability of funding.⁵ The PBGC is financed by premiums paid by plan sponsors to insure each other’s pension plans. Thus, we may refer to the PBGC as the “OPSGC”—the “other plan sponsors’ (OPS) guaranty corporation”—to remind us that the cost of one sponsor’s pension plan failure is borne by other plan sponsors, not by some outside party. The law provides no taxpayer money, so economically, the other plan sponsors are the guarantors and the PBGC is only an administrator and collection agency.

The PBGC guarantees most, although not all, corporate defined-benefit pensions. These guarantees undercut the major advantage of funding in the unregulated system described previously. A PBGC-guaranteed pension is secure with or without company funding, and employees with such guaranteed pensions have no company-specific risk to worry about.

By fully funding a pension on which it might have defaulted and forced the PBGC to pay, the company transfers value to the PBGC without benefit to its own employees. In the absence of legal funding requirements, each sponsor’s narrow interest is thus to fund as little as possible. At the same time, each sponsor wants all other plans to be well funded so that it will not have to pay for their failures. In game theory terms, this situation is a “prisoner’s dilemma.”

As the guarantee system shifts risk from employees to the OPS, legislation becomes necessary to prevent each sponsor's pursuit of self-interest from producing the worst result for all sponsors. A compulsory guarantee system, if combined with permissive funding and investment standards, can enable weak companies to drag down and prey upon strong ones. So, beneath the veneer of an insurance operation, the PBGC serves primarily to extract capital from successful companies to pay the obligations of unsuccessful ones.

For example, suppose a failing company cannot pay competitive salaries. It may be able to solve that problem by promising outsized pensions and funding them inadequately. The guarantees give the full value of the pensions to the employees, and the company gets to use in its business the money that should go toward employee compensation. In this sense, the OPS involuntarily provides a loan guarantee to the failing company and the company gets full value for its pension promise from its employees, value that it could not get from its employees or from the capital markets for a similar promise without the guarantee.

Two broad legislative solutions are available:

1. The government can require full funding, thereby preventing plan sponsors from taking risks that are borne by others.
2. The government can charge each plan sponsor a premium that accurately reflects the risks that the sponsor imposes on the system.⁶

The second solution is appealing because of the freedom it gives sponsors to manage their plans. But charging true risk-based premiums would put the PBGC in a uniquely difficult position among the government regulators of financial intermediaries. Think how closely we regulate banks, insurance companies, and brokerage firms. These financial intermediaries must have assets that cover their liabilities and maintain a reasonable match in risks between assets and liabilities. If similar standards were applied to pension plans, the PBGC could limit its regulatory focus to the plans themselves. But suppose pension plans were not held to the standards governing other financial intermediaries, so they remained dependent on their sponsors' financial health. Then, the PBGC would have to extend its regulatory reach to evaluating and monitoring the operations of every sponsor of an underfunded plan. This role would be daunting for a government agency whose mission is simply to insure pensions.

A final and critical problem with permissive funding and investment rules is that the risks borne by the PBGC are not diversified. The vast majority of sponsors are taking the same risk—betting on

equities instead of hedging their pension liabilities with bonds. A severe and prolonged decline in stock prices can thus trigger an assessment spiral among plan sponsors and, eventually, a taxpayer bailout of the PBGC.

So, mandatory full funding, not risk-based premiums, is the only practical prevention for the diseases that can afflict a guarantee system.⁷ A workable, equitable, and financially sound guarantee system would have the following characteristics:

- The guarantee agency would function mainly as a monitor and enforcer rather than as a claims-paying insurer.
- The failures that it covered would be rare misfortunes rather than inevitable outcomes of widespread risky practices.
- Pension plans would be fully funded with respect to the benefits that would be due upon plan termination.
- Plans would remain fully funded at all times, without the need for extended periods or full market cycles to correct deficiencies.
- Plans would not take on new liabilities without sufficient assets to cover them.

Questions and Objections

I have argued here that nonguaranteed pensions should be voluntarily fully funded in a transparent but unregulated pension system and that a sound government guarantee system must mandate full funding. In this section, I consider some questions and objections concerning full funding.

1. *I suggested that companies with underfunded plans should borrow money to fund their deficits. But companies may object that debt is a limited resource. Alternative uses for borrowed funds must compete with each other, and companies should have far better uses for debt than buying bonds for their pension funds.*

Borrowing to fund a pension deficit does not use scarce capital; it simply refinances or restructures liabilities. Pension deficits affect corporate value in the same way that debt does. By borrowing and funding, the company replaces inefficient and expensive pension debt with conventional debt. The restructuring leaves its net liabilities unchanged and its borrowing capacity undiminished.

A company eager to borrow for an attractive capital investment would gain, not lose, by first refinancing inefficient or expensive debt. The debt may be an old loan that can be replaced at a lower interest rate, or it may be a pension deficit—which is highly inefficient, not only because of the employee or PBGC risk, but also because the company is deferring the tax deduction available for

paying off the pension debt and forgoing the use of the pension tax shelter on the earnings of that payoff.

Either type of refinancing reduces the company's after-tax debt cost and *strengthens* its financial position. So, these types of borrowing do not compete with borrowing to fund capital investment.

The downside of borrowing to fund a pension deficit is that it increases the likelihood that the pension will be paid and raises the liability value—effects that are similar to those from voluntarily collateralizing a risky debenture. If the pensions are not guaranteed, the employees are bearing the risk and the cost of eliminating the risk has to be recovered from the employees through salary concessions (or from tax savings). If the pensions are guaranteed by the PBGC—that is, other plan sponsors—the cost of that risk should properly be borne by the company, either by full funding (preferably) or through full risk-based premiums.

2. *Doesn't funding pension plans harm the economy by depriving plan sponsors of capital they could use in their businesses?*

Companies would, of course, like to divert to other business uses the portion of their compensation costs that should go into their pension plans. Troubled plan sponsors are especially fond of this argument, which would save them the bother of competing for capital in the public markets. But of course, money contributed to a pension fund does not go down a rat hole; pension fund investments recirculate it into the capital markets to efficient users of capital.

ERISA's intent is to limit plan sponsors' ability to use their pension funds in their businesses. Permissive funding standards, however, create a massive loophole. ERISA generally restricts defined-benefit plans to investing no more than 10 percent of the plan assets in the sponsor's securities. But that restriction applies only to the assets actually invested; it ignores the implicit employer bond that covers the shortfall of those assets relative to full funding. By ignoring this employer bond, ERISA enables sponsors to turn hundreds of billions of dollars of pension capital to their own uses.

3. *If full funding is so attractive, why doesn't everybody do it voluntarily?*

Part of the answer to this question lies in the guarantees provided by the PBGC, which largely eliminate the employee pension risk that provides the main incentive for full funding. The broader reason that we do not see full funding, however, is that pension finance is not currently transparent.

Even for nonguaranteed pensions, employees seem to be generally unaware of their pension risk. Not only employees but capital providers also com-

monly fail to understand pension finance. When pension funds invest in equities, current accounting rules permit the sponsors to anticipate the risk premiums in their reported earnings and to conceal the risk by smoothing out the effect of market fluctuations. Financial economists commonly assume that investors look through the reported earnings to the underlying economic reality. Companies, however, do not appear to share that assumption about investor sophistication, and recent empirical research supports the company view with regard to pension accounting (Coronado and Sharpe 2003). Thus, companies have been able to deal with pension risk through sponsor-friendly accounting rules rather than genuine asset/liability management.

4. *Why not fund pension liabilities with equities or other risky assets that have higher expected returns than bonds?*

By funding with risky assets (risky beyond the modest level suggested in the section "A Note on Immunization"), a company fails to eliminate the plan's dependence on the company's credit. That company-specific risk is inefficiently borne either by employees (for nonguaranteed pensions) or by the PBGC.

Furthermore, investing the pension fund in risky assets leaves the plan leveraged rather than defeased. In the transparent financial world toward which we are moving, pension risk would raise the company's cost of capital. By absorbing some of the company's risk-taking capacity, pension fund equity risk would come at the expense of other risks that the company could take without introducing inefficiencies into employee compensation and tax management.

Corporate investing in marketed equities delivers no value to shareholders: The shareholders can make those investments for themselves. But those pension fund equity investments may crowd out the investments in the core business that can uniquely deliver value to shareholders.

In addition, funding with equities gives up the tax gain available with bonds (Tepper).

5. *Isn't funding with immunizing bonds more expensive than funding with equity investment?*

Yes, under the standard actuarial or accounting model. No, in terms of shareholder value. Although the expected contributions over the life of immunized plans are higher, there is a compensatory drop in the company's risk, so shareholder value is unaffected. The only "loss" to the company comes from the transfer of value to employees or the PBGC by better collateralization of the pensions (see the answer to Question 1), and the company can recover any value transferred to employees through salary concessions that recognize the

greater pension value. Overall, shareholders gain from substituting bonds for stock in the pension plan because of tax efficiencies and other second-order effects (Bader 2003a).

6. *Full funding would generate considerable demand for high-quality, long-duration bonds. This demand would disrupt the U.S. capital markets and cause the interest rates on such bonds to drop to levels that pension sponsors would find unattractive. In most countries, the inadequate supply of such bonds would make large-scale immunization impossible.*

Since 1980, the sleep of pension plan sponsors has been untroubled by the Tepper–Black critique of their errors. To worry that sponsors will all awaken one morning in a headlong rush to implement the Tepper–Black advice seems rather alarmist.

In free markets, new demand for long-duration bonds should, over time, call forth an adequate supply. As companies immunize their long-duration pension liabilities, they will acquire capacity to issue long-term debt without net damage to their balance sheets. (They will simply be substituting one long-term liability for another.) And if long-term market debt carries low interest rates, companies will choose to issue such debt in preference to using other capital sources, such as private credit, short-term debt, or equity financing.

7. *Even granting that secure pensions serve the company's or the PBGC's interests, why fund beyond the amount needed to purchase annuities?*

The actual purchase of an annuity contract would provide adequate security. But simply funding to a level that is believed to be adequate for an annuity purchase would not.

The private annuity market for pension plan terminations is small, and its pricing is opaque. Pension plans cannot hedge their funding levels on an annuity purchase basis, so they cannot assure that adequacy today means adequacy tomorrow. Also, insurance companies combine their gross interest rate with conservative demographic assumptions and loadings for profit and expenses. Therefore, annuity purchase rates are unlikely to be significantly (if at all) below liabilities that combine Treasury rates with the demographic assumptions used for funding the plans.

8. *Why would companies establish defined-benefit plans with such funding strictures? Defined-contribution plans can give employees similar benefits (through investment in a Treasury portfolio) and other options they might prefer (such as equity investments).*

In the United States, this is a trillion-dollar question, to which the answer is not at all clear: Can the virtues of defined-benefit plans outweigh the clar-

ity, relative administrative simplicity, and employee choice offered by defined-contribution plans?

A defined-benefit plan cannot provide the same benefits as a defined-contribution plan more cheaply if the risks to the shareholders are correctly reflected. But neither is it a more expensive vehicle. It is simply a different vehicle—one in which the company may provide value to the employee by absorbing certain demographic risks.⁸ It is also a more efficient human resource tool. Unlike defined-contribution plans, defined-benefit plans can provide guaranteed income amounts targeted to achieve various human resource objectives, such as encouraging early, normal, or late retirement. The target levels can be met through good times and bad, so human resource planners need not worry that a market plunge will discourage retirements just when the company most desires voluntary departures. Defined-benefit plans also lend themselves more readily than defined-contribution plans to “window programs” that might be needed to cope with temporary conditions.

Employees who want equity exposure can obtain it with assets other than their pensions. (Companies might assist with supplemental defined-contribution plans.) For employees who have no other financial assets, it may be just as well that their savings take the form of fixed and secure pensions.

Transition

Transition from the current permissiveness to a full funding standard even over an extended time would be painful to some major businesses and their employees. An important first step, however, would be to stop the bleeding—by preventing plan sponsors from taking on new unfunded liabilities. Specifically, a plan should be permitted to accrue additional benefits, by plan amendment or by continuing accrual of credits under existing provisions, only if

- the sponsor fully funds those new accruals or
- existing plan assets are sufficient to maintain full funding.⁹

How can such a draconian provision be justified? If a company cannot afford currently to pay its employees' salaries, other companies are not required to chip in. The same standard should apply to a company that provides part of its employees' pay in the form of pensions. If the company cannot afford to pay for those pensions currently, it should not be able to impose on other companies the cost of guaranteeing those pensions. Although dumping pension liabilities on the PBGC is fast becoming a major corporate pastime, encouraging the weak to prey on the strong is neither a fair nor an efficient way to run an economy.

Conclusion

The idea that underfunding pension plans is a way for companies to borrow inexpensively from their employees is a myth. It may be true for companies with weak credit, but only if someone else—someone other than the company—is bearing the pension risk without full compensation. For non-guaranteed pensions, the someone else must be employees who do not recognize the risk they are bearing. For guaranteed pensions, the someone else must be a guarantor who does not charge enough for the risk.

Without a guarantee, informed employees would deeply discount an underfunded pension promise from a weak company. They would discount it, first, for the normal default risk and, second, for the employer-specific nature of that risk. So, they would charge for the borrowing by requiring much larger salaries than if the pension were fully funded. Thus, the employees' inability to diversify firm-specific risk makes them a poor financing source for their employers.

If the pensions are guaranteed, the cost of the pension fund "borrowing" depends on the premiums charged by the guarantee agency. If the premiums are accurately risk based, they effectively impose a market interest rate on the borrower.

In this article, we began with considering an economy without governmental guarantees for pension funding. We found that transparency should lead to voluntary full funding. Otherwise, employers and employees would have inefficient compensation contracts that exposed employees to risk that they could not diversify. We then introduced a guarantee program and found that it reversed the main incentive for full funding. We noted that insufficient funding, however, enables weak or irresponsible plan sponsors to dip into the pockets of other sponsors—and perhaps of taxpayers. So, the government that includes a guarantee program must require plan sponsors to fund their plans; that is, it must compel behavior that would occur naturally in an unregulated, transparent pension system.

In short, pension risk is inefficiently borne by employees or governmental guarantors. Full funding eliminates the pension risk. With or without guarantees, full funding is the optimal condition for all stakeholders in the pension system.

I thank Bruce Cadenhead, Jeremy Gold, Tom Lowman, Wendy McFee, Bob North, and Peggy Warner for their comments and suggestions.

Notes

1. This article draws substantially on the thinking of Sharpe (1976), Black (1980), and Tepper (1981).
2. I assume full vesting throughout this article. Unvested benefits—a small percentage of the liability of most plans—raise several issues beyond the scope of the discussion. Also, the article considers only hedgeable, bondlike accrued pensions, not economically uncertain projected pensions. Projected pensions are not a true corporate liability (Bader 2003b).
3. Although a short position in the company's debt offers a theoretical (and very approximate) hedge for the pension promise, such a strategy would be costly or impossible for rank-and-file employees and would be frowned on or forbidden for management-level employees.
4. I have argued elsewhere (Bader 2003b) that the valuation of corporate plan sponsors' pension obligations, like the valuation of their debt, should reflect credit risk (after factoring in the security provided by any pension assets). The current article, however, addresses optimal funding policy, which should aspire to eliminate, rather than reflect, risk.
5. Although I refer to the PBGC specifically, this analysis also applies to other governmental guarantee systems, such as those in Ontario (Canada), Germany, and the proposed U.K. Pension Protection Fund.
6. See Bodie and Merton (1992). Currently, PBGC premiums are modestly risk related; they include a charge of 0.9 percent of the unfunded liability. The premiums are not *equitably* risk based because they do not reflect the investment policy or strength of the sponsor.
7. Bodie (1996) discussed this problem in similar terms, but he suggested another possible solution: replacing the PBGC with private-sector guarantees that rely on the risk management products developed since the PBGC was founded.
8. Defined-benefit plans have the apparent advantage of paying lifetime pensions, which free employees from the danger of outliving their retirement plans. This advantage is diluted, however, because these plans also commonly offer lump-sum options, which are heavily used. Also, defined contributions can, and often do, offer annuity purchase options.
9. This condition would often make the introduction of plan amendments (or new plans) that provide significant "past service benefits" impractical. Although intended as an incentive for employees to render future service, these benefits are credited to employees immediately, creating substantial current liabilities. Gold (2003) suggested an alternative plan design that would credit the benefit increases only over employees' future service, which would improve both the incentive effects and the economics.

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