Pension Deficits: An Unnecessary Evil

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Abstract

Many companies believe that

- *Underfunding pension plans is an inexpensive way to borrow from employees; and*
- *Mismatching equity investments against bond-like pension promises creates shareholder value.*

On the contrary, financial economics calls for fully funding and immunizing accrued pensions.

For nonguaranteed pensions, inadequate funding magnifies employees' exposure to their employers' financial health, exposure that they cannot diversify. Fully securing the pensions eliminates this inefficiency in employee compensation.

Governmental guarantees eliminate the employees' pension risk but may invite weak sponsors to extract subsidies from strong ones through underfunding. A statutory requirement of full funding and immunization eliminates these subsidies.

Introduction[1]

Falling equity markets and interest rates have devastated pension plans worldwide during the past several years. The Standard & Poor's 500 companies enjoyed a collective pension surplus of $252 billion in 1999. Even after the 2003 market rally, they face a deficit of $179 billion in 2003 (Bianco 2003). These events have spotlighted 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."

"Full Funding", with initial capital letters, here signifies a funding condition that eliminates dependence on the creditworthiness of the pension sponsor. With Full Funding, an immunizing bond portfolio secures all benefits to

[1] This article draws substantially on the thinking of Sharpe (1976), Black (1980), and Tepper (1981).

which employees would be entitled upon service termination. The sponsor commits not to undermine the security by changes in investment or funding policy, by plan amendments that are not immediately funded, or by plan mergers or spin-offs.

The discussion of pension funding begins in the absence of governmental guarantees, because most countries lack guarantees and because this approach yields insights that are useful in evaluating guarantee programs. Without governmental guarantees and without Full Funding, pension security depends on the continued solvency of plan sponsors. This exposure to their employers' fortunes, on top of the basic exposure that their employment creates, gives the employees large, company-specific risk that they cannot diversify.

Eliminating pension risk by Full Funding is more valuable to employees than it is costly to their companies. Companies can recoup the cost of the risk elimination by offsetting the added pension value against salaries. Full Funding, therefore, benefits all stakeholders in the pension system – sponsors, participants, and the public. In a pension system without guarantees or statutory funding requirements, transparency should lead to voluntary Full Funding.

The guarantees provided by the Pension Benefit Guaranty Corporation (PBGC) reverse the incentives for Full Funding. This reversal can produce widespread underfunding and uncontrolled subsidization of weak sponsors by strong ones. To avoid these subsidies, the guarantee system must either impose rigorous funding standards or combine risk-based premiums and intrusive regulation of corporate solvency. True risk-based premiums, however, are impractical, and the insurance program can function properly only with a statutory requirement of Full Funding.

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

We begin in a preregulatory environment – no taxes, regulation, or governmental guarantee of pension promises. These factors will appear in the course of the discussion.

A Simple Pension Promise

Suppose that an employee's compensation for a year includes both 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.

First suppose that this nontransferable bond is fully collateralized by a portfolio of matching risk-free bonds. Then 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's a danger that the company might default. Then the employee would discount 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 the employee, the risk of his employer's bond is very different from that of other companies' bonds. It adds to the large employer-specific risk that he already

[2] This article assumes full vesting throughout. Nonvested benefits – a small percentage of the liability for most plans – raise several issues beyond the scope of the discussion. Also, the article considers only the hedgeable, bond-like accrued pensions, not the economically uncertain projected pensions. Projected pensions are not a true corporate liability (Bader 2003b).

bears through his employment, risk that he cannot diversify or hedge in any practical way.[3]

In selling its own risky bond to its own employee, the company would be selling to an unwilling buyer. Unlike the investors who determine market prices, the employee cannot diversify the company-specific risk to which he is already overexposed, so he would not pay the full market price. Nor would it be rational for him to give up enough salary to cover the full market value of the risky pension.

Companies may still wish to provide pension plans despite this inefficiency. Plans may help to 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 valuations 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 improvement by securing pension promises through Full Funding. We have seen that any employer-specific risk in a pension fund makes the pensions inefficient, because their cost to the employer is greater than their value to employees. Full Funding eliminates the risk, which 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 in order to "refinance" its inefficient "debt" to the employees. The company is better off borrowing from investors who can diversify than from employees who can't.

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.

[3] Although a short position in the company's debt offers a theoretical (and very approximate) hedge for the pension promise, this strategy would be costly or impossible for rank and file employees and would be frowned on or forbidden for management-level employees.

Tax Arbitrage

Companies can also gain from Full Funding by saving taxes for their shareholders. Like a number of other countries, the U.S. taxes bonds more highly 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, to invest the pension fund in bonds, and to shift equity risk to the shareholders' own portfolios or elsewhere in the company.

Like the employee risk argument, the tax argument does not demean equity investment. It merely redirects the equity investment elsewhere, where it does 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, though, for the final increment of risk reduction achieved by replacing the highest quality corporate portfolio with 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 it overly expensive to reduce pension risk to "absolute zero."

Unfortunately, there are no riskless securities without these costly, but in this context useless, properties. Because of the bond markets' incompleteness, the potential 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 make corporate bonds a correct measurement standard. Only government bonds offer a risk-free, objective, and hedgeable standard.[4] In practical situations, though, an imperfect immunization, relying on bonds that are very high-quality but not riskless, may offer the optimal balance of cost and security. The sponsor of

[4] I have argued elsewhere (Bader 2003b) that the valuation of corporate plan sponsors' pension obligations, like 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.

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.

Part II. Funding Under a Guarantee System

Now we consider how the PBGC guarantees change the desirability of funding.[5]

The PBGC is financed by premiums paid by plan sponsors to insure each other's pension plans. Because of this, we may refer to the PBGC as the OPSGC – the Other Plan Sponsors Guaranty Corporation, to remind ourselves 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: economically, the OPS are the guarantors, and the PBGC is only an administrator and collection agency.

The PBGC guarantees most, though not all, corporate defined benefit pensions. These guarantees undercut the major advantage of funding described above. 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 would transfer value to the PBGC, without benefit to its own employees. Absent legal funding requirements, each sponsor's narrow interest is to fund as little as possible. At the same time, each sponsor wants all other plans well funded, so that it does not pay for their failures. In game theory terms, this 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. A compulsory guarantee system, if combined with permissive funding and investment standards, can enable weak companies to drag down and prey upon strong ones. Beneath the veneer of an insurance operation, the PBGC would serve primarily to extract

[5] Though referring to the PBGC, this analysis also applies to other governmental guarantee systems, such as those in Germany, Ontario, and the proposed UK Pension Protection Fund.

capital from successful companies to pay the obligations of unsuccessful ones.

For example, suppose that a failing company cannot pay competitive salaries. It may be able to solve that little problem by promising outsized pensions and funding them inadequately. The guarantees give the pensions full value 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 provide a loan guarantee to our failing company – 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.

There are two broad legislative solutions:
1. The government can require Full Funding, preventing plan sponsors from taking risks that are borne by others; or
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 in the freedom it gives sponsors to manage their plans. But assessing true risk-based premiums would put the PBGC in a uniquely difficult position among 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, with a reasonable match in risks between assets and liabilities. If similar standards apply to pension plans, the PBGC can limit its regulatory focus to the plans themselves. But suppose pension plans are not held to the standards governing other financial intermediaries, but remain dependent on their sponsors' financial health. Then the PBGC must extend its regulatory reach to evaluate and monitor the operations of every sponsor of an underfunded plan. This is a daunting role 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

[6] See Bodie and Merton 1992. Currently, PBGC premiums are modestly risk-related, including a charge of 0.9% of the unfunded liability. The premiums are not *equitably* risk-based, because they do not reflect the investment policy or the strength of the sponsor.

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 could 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. In a workable, equitable, and financially sound guarantee system:

- The guarantee agency functions mainly as a monitor and enforcer, rather than as a claims-paying insurer.
- The failures that it covers are rare misfortunes rather than inevitable outcomes of widespread risky practices.
- Pension plans are Fully Funded to the extent of close-out benefits.
- They remain Fully Funded at all times, without needing extended periods or full market cycles to correct deficiencies.
- They do not take on new liabilities without sufficient assets to cover them.

Questions and Objections

Part I above argues that nonguaranteed pensions should be voluntarily Fully Funded in a transparent pension system, and Part II contends that a sound government guarantee system must mandate Full Funding. This section considers some questions and objections concerning Full Funding.

1. Part I suggests 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 than buying bonds for their pension funds.

Borrowing to fund a pension deficit does not use scarce capital, but simply refinances or restructures liabilities. Pension deficits affect corporate value in the same way as debt. 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 – highly inefficient, not only because of the employee or PBGC risk, but 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 – similar to voluntarily collateralizing a risky debenture. If the pensions are not guaranteed, the employees were bearing the risk, and the cost of eliminating the risk would have to be recovered from the employees through salary concessions (or from tax savings). If the pensions are guaranteed by the PBGC – that is, the OPS – 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 that 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 trouble of competing for capital in the public markets. But of course money contributed to a pension fund does not go down a rat hole; the 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. But permissive funding standards create a massive loophole. ERISA generally restricts defined benefit plans to investing no more than 10% of the plan assets in the sponsor's securities. That restriction, though, applies only to the assets actually invested and 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 that attractive, why doesn't everybody do it voluntarily?

Part of the answer is the guarantees provided by the PBGC, which largely eliminate the employees' pension risk that provides the main incentive for Full Funding. But the broader reason that we don't see Full Funding is that pension finance is not currently transparent.

Even for nonguaranteed pensions, employees seem generally unaware of their pension risk. Not only employees but also capital providers commonly fail in their understanding of 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. Managements, though, do not appear to share that assumption about investor sophistication, and recent empirical research backs them up with regard to pension accounting (Coronado 2003). Companies have therefore been able to deal with pension risk through sponsor-friendly accounting rules, rather than genuine asset/liability management.

4. Why not fund with equities or other risky assets that have higher expected returns?

By funding with risky assets (risky beyond the very modest level suggested above in 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 uninsured pensions) or by the PBGC.

Further, 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.

Also, funding with equities gives up the tax gain available with bonds (Tepper 1981).

5. Isn't funding with immunizing bonds very expensive, compared with equity investment?

Yes, under the standard actuarial or accounting model, but not 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 answer to Question 1 above – 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 the 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 very unattractive. In most other countries, the inadequate supply of such bonds would make large-scale immunization impossible.

For the past quarter-century, the sleep of pension plan sponsors has been untroubled by the Tepper-Black critique of their errors. It seems rather alarmist to worry that sponsors will all awaken one morning in a headlong rush to implement the Tepper-Black advice.

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 acquire capacity to issue long-term debt without net damage to their balance sheet. (They would simply be substituting one long-term liability for another.) And if long-term market debt carries low interest rates, companies would choose to issue such debt in preference to other capital sources, such as private credit, short-term debt, or equity financing.

7. Even granting that secure pensions serve the company's or PBGC's interest, 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 opaque. Pension plans cannot hedge their funding level 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), as well as other options they might prefer, such as equity investments.

In the U.S., this is a trillion-dollar question, to which the answer is not at all clear: Can the virtues of defined benefit plans outweigh the clarity, 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 design, in which the company may provide value to the employees by absorbing certain demographic risks.[7] 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 are met through good times and bad; human resource planners need not worry that a market plunge will discourage retirements

[7] Defined benefit plans have the apparent advantage of paying lifetime pensions, which free employees from the danger of outliving their retirement plans. But this advantage dwindles because these plans also commonly offer lump sum options, which are heavily used. Meanwhile, defined contributions can, and often do, offer annuity purchase options.

just when the company most desires voluntary departures. Defined benefit plans also lend themselves more readily to window programs needed to cope with temporary conditions.

Employees who want equity exposure can obtain it with their other assets. (Companies may 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

Even an extended transition from the current permissiveness to a Full Funding standard would be painful to some major businesses and their employees. An important first step 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.[8]

How can we justify such a draconian provision? If a company cannot currently afford to pay its employees' salaries or make contributions to a defined contribution plan, we do not require other companies 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 efficient way to run an economy.

Conclusion

[8] This condition would often make it impractical to introduce plan amendments (or new plans) that provide significant "past service benefits". Although intended as an incentive for employees to render future service, these benefits are credited to employees immediately, creating substantial current liabilities. Gold (2003) suggests an alternative plan design, which credits the benefit increases only over employees' future service, improving both the incentive effects and the economics.

We can summarize by addressing the myth that underfunding pension plans is a way for companies to borrow inexpensively from their employees. This can 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 nonguaranteed pensions, the someone else must be employees who don't recognize the risk they are bearing. For guaranteed pensions, the someone else must be a guarantor who doesn't 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 were the pension were fully funded. 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 borrowing.

Let's sum up the argument. We began without governmental guarantees. We found that transparency should lead to voluntary Full Funding. Otherwise employers and employees have inefficient compensation contracts that expose employees to risk that they cannot diversify.

We then introduced a guarantee program and found that it reversed the main incentive for Full Funding. But insufficient funding enables weak or irresponsible plan sponsors to dip into the pockets of other sponsors and perhaps of taxpayers. So the government must require plan sponsors to fund – 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.

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