What's Wrong with ASOP 27?

Bad Measures, Bad Decisions

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1 Introduction

Todisco (2004) discusses the shortcomings of ASOP 27 as a standard of practice and disclosure. In this paper, we address its shortcomings as a statement of actuarial and economic science.

ASOP 27 guides actuaries in selecting economic assumptions for valuing pension plans (excluding assumptions prescribed by regulation)[1]. Its guidance, however, fails to apply the lessons of economics – most egregiously in (3.6)[2], which directs us to use expected returns on risky assets to discount benefit cash flows.

The lens of ASOP 27 distorts everything it measures. It prescribes discount rates that systematically undervalue pension liabilities. The projection of future salaries overstates costs for young employees and understates costs for the old. These actuarial distortions lead to bad decisions about investment, plan design, compensation and financing. These same mismeasures have led FASB and GASB to flawed standards for financial reporting and federal and state legislators to weak funding rules.

In the sections that follow, we highlight key portions of ASOP 27, trace the roots of existing practice, and show how ASOP 27 prescribes mismeasurement. We look at the influence that traditional pension actuarial discounting has had on financial reporting rules and funding statutes. We conclude by recommending changes that would rescue ASOP 27 from its own history and the defined benefit world from its distorting lens.

2 What ASOP 27 Says

ASOP 27 provides guidance on the selection of economic assumptions for measuring defined benefit pension plan obligations including discount rates, compensation scales and investment returns (1.1). The standard incorporates various precepts:

- Selection of rates expected to prevail over the (long) term of the liabilities (3.3b)
- Consistency among assumptions (e.g., common role of inflation) (3.10)
- Reliance on actuarial judgment (3.1)
- Reasonable range estimation (3.1)
- Consideration of the purpose for the valuation (e.g., ongoing vs. termination) (3.3a)
- Recognition of prescriptions imposed on the process (e.g., FAS 87, ERISA) (1.2, 3.11)
- Discount rates and investment returns are synonymous (3.6)
- Inclusion of expected risk premiums (3.62)

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1 As, for example, by FAS 87 and by IRC Section 412(l).

2 We show ASOP 27 section numbers in parentheses without further identification.

3 The Roots of ASOP 27

Actuarial cost methods (also known as funding methods) were developed to solve the employer's "budgeting problem" (Trowbridge and Farr, Chapter 1), i.e. how much (and when) to contribute in order to achieve and maintain actuarial balance – to wit, funded assets and future contributions plus earnings thereon are expected to meet all benefits earned or to be earned by the current plan members.

With this goal in mind, and without competing objectives such as statutory solvency or financial reporting, best estimates of future rates of return and future pay increases are necessary inputs to an actuarial model. Reflecting these needs, ASOP 27 prescribes a best-estimate range as "the narrowest range within which … results … are more likely than not to fall." (2.1) This is a median concept. For symmetric distributions, the median matches the mean and thus we can say that the central best estimate is the expected investment return and the expected annual salary increase.

Budgeting methods anticipate deviations from the expectation that are unbiased in the sense that year-to-year gains and losses are equally likely and of equal expected magnitude. Such gains and losses are amortized over forward periods in a symmetric and presumably unbiased fashion with the result that, on average, the budget meets the goal.

Once we understand that the goal is to make future values match – on average – we can see that the use of expected asset returns to discount contribution and benefit flows is merely a device to state the future balance in present value terms, i.e., "discounted" liabilities less "discounted" contributions equal plan assets. Unlike discounted values used by investors, these discounted values have no economic meaning. They give us no useful information about how the plan affects the earnings or the value of the sponsor and tell us little about whether the plan will be able to pay the promised benefits.

4 Measuring the Economic Value of Future Cash Flows

The anticipation of risky investment returns mismeasures the economic value of future cash flows. We refer the reader to Bader (2001), Bader-Gold (2003), Day (2004) and Gold (2002).

4.1 Swaps and futures show that the market value of the equity risk premium is zero

Total return swap contracts allow two investors to exchange the total return on one asset (e.g., a zero-coupon bond) for the total return on another (e.g., the S&P 500 Index). Periodically throughout the life of the contract, one party (whom we will call the "long" position) receives the total return on the S&P and pays the "short" party the total return on the bond. Because of arbitrage considerations, the price for such a swap (involving marketed instruments) must be zero.

If we define the payment interval to be the entire length of the swap (shorter periods are used to reduce counterparty default risk, which we ignore), we find the following relationships:

$$V(S_0) = V(E_0 - B_0) = 0$$

$$EV(S_1) = EV(E_1 - B_1) = ERP$$

$$EV(S_t) = EV(E_t - B_t) = ERP_t$$

where $V()$ and $EV()$ represent market value and expected market value, S, E and B represent the swap, the equity index and the bond, ERP is the equity risk premium and subscripts denote time.

Thus the long position represents ownership of the total ERP for the life of the contract and its value today is zero. Similar contracts, e.g., S&P 500 Index Futures, trade every day at this same zero price.

Why should the future ERP be worth zero today? Think about someone who owns the $100 zero-coupon bond and, preferring an equity return, takes the long swap position. She will now receive the total return on $100 of the S&P Index. The swap cannot be priced above zero because the potential long would then forgo

the swap and simply sell the $100 bond and buy $100 of the S&P. Symmetry shows that the swap could no more be priced below zero than above zero.

4.2 How anticipating risky returns overvalues the equity risk premium making $100 in stocks worth more than $100 in bonds.

Suppose the length of time and the interest rate applicable to the zero-coupon bond are such that the bond will be worth exactly $200 when it matures and the swap is settled. It is clear that the present value of this future $200 is $100.

Consider the present value of the same $200 future payment (a pension benefit cash flow) when a party obligated to meet it (a defined benefit pension plan) invests in the S&P 500. According to ASOP 27, we discount the future $200 using the expected rate of return on the S&P. We estimate the annual ERP and add it to the bond rate of return and find that the calculated present value is $50.

From this we conclude that $50 worth of stock is equal in ASOP 27 value to $100 in bonds or, equivalently, that $100 worth of stock is twice as valuable as $100 worth of bonds. Of course, actuaries who anticipate risk premiums in pension valuations do not literally value a $100 equity portfolio more highly than a $100 bond portfolio. They achieve the same result indirectly, however, when they value liabilities financed by equity more cheaply than the same liabilities financed by bonds.

5 Financial Reporting

The objective of financial accounting is to report value-relevant information to interested parties – information about assets and liabilities, and changes therein, that would alter the price that a buyer would be willing to pay, or a seller to accept, for a share of the firm.

Transparency, a high priority for modern accounting, describes an ideal condition in which all interested parties have costless access to the best information. Rational agents operating in a transparent environment make efficient decisions. Lack of transparency is costly.

In recent years, financial standards setters have moved their central paradigm from historic cost and internal consistency towards transparency and economic value relevance. With these new priorities, the weaknesses of FAS 87 have become evident. Several of these weaknesses may be traced to the traditional actuarial model and to the support that it receives from ASOP 4, ASOP 27 and the proposed ASOP in re: asset valuation methods:

- Anticipation of the ERP – although FAS 87 does not use the expected return on assets to discount liabilities (and thus the ABO is a value-relevant liability), the expected return on assets goes directly into the P&L statement with no adjustment for risk. This overstates earnings –and encourages unnecessary investment risk taking (Gold 2000b, Coronado and Sharpe 2003).
- The market value of plan assets is relevant. The actuarial asset value is a distortion that reduces transparency and relevance.
- The inclusion of a salary scale in the projected benefit obligation and in the service cost overstates liabilities and misstates income. In the common case where there is no commitment to grant total compensation increases in excess of those necessitated by competitive forces, there can be no recognizable liability based on estimated future increases. The inclusion of a salary scale overstates the benefit costs for young employees (and employers with young workforces) and understates the cost for older employees (and their employers).
- The amortization of gains, losses, benefit improvement costs and the value of assumption changes defies transparency and value relevance. During 2001 and 2002 as the financial position of virtually every U.S. DB plan deteriorated sharply, the sponsors continued to report pension "income."

Neither pension actuaries nor financial standards setters stand behind FAS 87 today. Robert Herz, the Chairman of the FASB, has said FAS 87 is *"one of the prime examples of bad accounting."* (Burkholder 2003). Although we might be able to blame FASB for adopting our budgeting model, a fair review of the history of FAS 87 shows that actuaries and plan sponsors vociferously resisted efforts of the Board to make FAS 87 more transparent and value relevant.

6 ERISA Funding

ERISA was enacted in order to correct numerous perceived defects in the U.S. private pension system in the preceding two decades. A primary concern was the failure of plans that terminated with assets that were insufficient to cover benefits that had been promised. Despite what amounted to a solvency concern that should have pointed to the relationship of plan assets and liabilities (the plan's balance sheet), the minimum funding rules were built on the actuarial budgeting model, focusing on the stream of contributions from the sponsor to the plan.

6.1 Why is it public policy that pension plans be well-funded?

Society has concluded that promises made by employers to their employees be kept. Bader (2004) shows that requiring full funding of accrued benefits at all times is economically efficient. The societal motivation for adequate funding is more likely to derive from our collective sense of fairness, the damage done by plan failures, and the recognition that employers and non-represented employees do not bring equal strength and knowledge to the contracting process. To mitigate this damage, ERISA also established the PBGC. Unless full funding is a concomitant requirement, however, the PBGC is merely the conduit whereby weak firms with poorly funded plans take advantage of strong sponsors of well-funded plans. A side effect of such game playing is that DB plans become less attractive to strong sponsors.

6.2 What is wrong with the budgeting model and ASOP 27 for statutory funding?

The basic ERISA budgeting model is satisfied when the future contribution stream plus existing assets plus expected investment returns thereon are sufficient to meet all promises to current members, provided that the contribution schedule has been maintained to date (non-negative credit balance).

Companies that sponsor defined benefit plans do go bankrupt and are more likely to do so during periods of economic weakness. During these same periods, pension plans invested in equities are likely to be poorly funded and there is a substantial correlation between bankruptcy and poor funding. Companies approaching insolvency often fund at or below minimum statutory levels.

The inadequacy of the budgeting model, particularly in tough economic environments, prompted the introduction of IRC Section 412(l). This section directly attacks the problem of asset adequacy, focusing on accrued benefits discounted at bond or annuity rates. This concept which (from the perspective of ASOP 27) is fully prescribed, ignores the budget model and substitutes a "collateral" model. The budget model requires a lower asset value when assets are risky, but a sound collateral model would require greater assets when assets and liabilities are mismatched (Bodie, Merton, 1992). Although Section 412(l) does not take mismatch into account, the PBGC has recently pointed out the need for new legislation to strengthen funding levels and to take account of mismatches in the computation of its variable premiums.

6.3 What modern actuarial science should tell the world about funding

A critical element in any plan to strengthen funding levels must be the discount rate used to value the accrued benefits. If, when the sponsor goes bankrupt, the assets are not sufficient to acquire a riskless portfolio of matching bonds, some party other than the promise-maker must bear the risk or make up the deficiency. Therefore the public policy that minimizes the gaming possibilities by weak employers must eventually incorporate the use of the riskless yield curve into the determination of liabilities and required assets. In light of the weak state of present plan funding and the persistence of mismatching, we will need a substantial transition period.

Actuarial science, informed by the teachings of modern economics, points to the logic of the collateral model and for rigorous measures of plan solvency in the public policy arena. To the extent that our practice standards should reflect our best science (Bader et al, 2004), ASOP 27 must support a collateral-based funding method with riskless discount rates.

7 Public Plan Funding

Public plans (covering governmental employees) might seem to be the place where all we are interested in is a budget that balances assets, contributions, investment returns and benefits over "the long term." As long as the long-term budget can be maintained, we might argue that solvency and financial reporting are relatively unimportant. With PAYGO as a possibility, one might ask, why should a governmental plan fund at all? Peskin (1999) answers that intergenerational equity (fairness among taxpayers over time) is the primary reason that public plans are funded. Each taxpayer generation should pay its fair share of multigenerational plan costs.

Gold (2002) looks at the intergenerational effect of using expected returns to discount benefit flows. When the plan invests in risky assets, actuarial methods can lead to equal expected costs across generations or to equal risk-adjusted costs, but not both. Anticipating equity premiums, which equates expected costs across generations, lowers the risk-adjusted costs for current taxpayers, plan participants and politicians at the expense of future taxpayers.

Following ASOP 27, which overly discounts benefits earned today, leads to bad decision making:

- Today's elected "management" offers too much in future benefits in exchange for too little in current wage concessions.
- Although taxpayers are ultimately responsible for all the benefits promised, workers often argue that they are entitled to extra benefits when risky assets do well for a while. Elected officials find these demands easier to meet than wage requests and are likely to provide ad hoc increases or more formal "reward sharing" schemes known as "skim funds."
- Because ASOP 27 credits equity returns without charging for equity risk, public pension plans credit returns in excess of the borrowing rate for most governments. This encourages the issuance of Pension Obligation Bonds which may be sold as "an arbitrage" or "an actuarial arbitrage" when in fact they usually represent an expensive way to borrow in order to invest in equities. (Gold 2000a).

8 Conclusion

ASOP 27 reflects the budgeting history of actuarial methods and assumptions. As such it presumes that the expected return on assets is the singularly proper way to discount liabilities – regardless of the purpose of the valuation. The "liabilities" developed by expected-return discounting represent no economic value and are useless for any purpose other than budgeting. For ongoing valuations of pay-related plans, ASOP 27 presents an equally flat-footed prescription: always include an actuarial estimate for future pay increases. ASOP 27 devotes much of its text to telling us how to build expected returns and expected future salaries.

Employer budgeting is an all-but-forgotten piece of pension actuarial science. Our science needs to have answers to two much more important questions today: what amount of assets should be required as a matter of public policy, and what measures of funding and expense should appear in financial reports to investors?

ASOP 27 must be amended to recognize that:

- Anticipation of the ERP is not appropriate for liability discounting (except as a calculation convenience in the budgeting process) nor for financial reporting, nor for statutory funding.
- Inclusion of a salary scale is not appropriate in measuring liabilities for financial reporting and solvency purposes.

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