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Reply to discussion of
"Efficient Gain and Loss Amortization and Optimal Funding in Pension Plans"

M.I. Owadally and S. Haberman
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The contributors to the discussion of our paper have outlined a so-called "business-centric" approach to defined-benefit pension funding. They claim that there is a fundamental division between this and the "plan-centric" approach. The truth about this division is more pedestrian. The plan-centric approach is embedded in the current regulatory and statutory reality of pension funding. Our paper confines itself to this reality. On the other hand, the contributors have recently rediscovered the "extended balance sheet" argument (which integrates the balance sheet of the pension plan into that of the sponsor) and would like to overhaul current pension legislation, regulation and standards of practice. Their arguments ignore funding requirements, employee contributions, trust law, and discretionary benefits. We welcome the reiteration of these ideas, which are neither new nor original.

We address, in this paper, a purely practical issue concerning funding methods and amortization mechanisms and we suggest that spreading is better than amortization. The point of the paper is not to examine the purpose of pension funding and the overall suitability of actuarial funding methods. Nor are we promoting one asset allocation strategy over another. We are pointing out that, under the usual (and rather limited) objectives of actuarial funding methods which are to minimize the volatility of contribution rates and funding levels around a normal cost and actuarial liability respectively, a contrarian investment strategy follows (which is expected), together with an optimal funding strategy involving spreading (which is new).

The discussion misrepresents a number of points. We emphasize that the first moment of the unfunded liability is zero, which enables us to look at volatility through the second moment. (We point out in the paper that the quadratic criterion is simplistic.) The funding valuation basis does not have to take advance credit for the risk premium in risky assets. It is quite possible to value liabilities at a suitable discount rate while calculating contributions and making funding decisions based on a higher expected rate of return on plan assets (Owadally, 2003). Finally, our use of the term "efficient" does not mean that we simplify pension funding into a one-period portfolio selection problem.

The discussants assume that the pension plan is not a financial entity which is distinct from the corporation. This view turns accrued benefits into bonds and plan members into bondholders. It is difficult to see what level of funding is optimal under this scenario. Disregarding statutory funding requirements, an unfunded book-reserve system may even be optimal for the firm.

Several of the discussants refer to the "irrelevancy proposition" of Modigliani and Miller (1958). Under this theorem, the purchase or sale of financial assets by a company makes no difference to the shareholders of the company. This theorem is derived and hence applies under a series of strict conditions:

(i) all shareholders can buy or sell financial assets on the same terms as the company;

(ii) all shareholders have optimised their private portfolios.

Condition (ii) requires that all the shareholders have efficient portfolios in the Markowitz sense. In order to apply the theorem to the financial strategy of a defined benefit pension plan sponsored by the company, we must add the following 2 further conditions:

(iii) the assets of the pension fund belong to the company;

(iv) the benefits provided by the pension plan are marketable financial assets.

There are serious difficulties when we attempt to apply the Modigliani-Miller theorem to the financial strategy of the company pension plan. Is a company really in a similar financial position if it invests its pension fund entirely in bonds while simultaneously issuing a matching quantity of its own bonds, as the discussants appear to believe? If the assets of the pension fund did belong to the company, one could argue that the net gearing of the company would be unchanged. Pension fund assets, however, cannot be used to redeem the company's loan stock if it gets into financial difficulties, so that condition (iii) does not hold. It follows that a financial strategy for the pension plan that results in higher gearing for the company would reduce the security of the retirement benefits.

Thus, a defined benefit pension plan is not in reality simply an extension to the balance sheet of the sponsor. It is by design independent, involving an independent fund, managed independently in the best interests of the plan members and, as such, the plan forms part of the remuneration package of the members. The investment of the funds is the responsibility in the UK of trustees who are required to invest on behalf of the members and beneficiaries as a prudent person would do.

Turning to the members of the pension plan, it is clear that the Modigliani-Miller conditions are not satisfied. These individuals have large amounts of their wealth tied up in defined-benefit pension assets that cannot be traded, so that they cannot change their private portfolios in ways that could nullify changes to their pension benefits – thus, assumption (iv) does not hold. We argue that the financial strategy adopted by the pension plan affects the balance between the security of the termination benefit and the security of the retirement benefit. There are no market transactions which members can perform that would alter the balance between these risks. Consequently, changes to the financial strategy of the pension plan will have real "first-order" consequences for the diversification of risk within each member's private portfolio.

Our view is that the assumption of independence between the sponsor and the plan is crucial and the erosion of this assumption is partly the cause of the decline in defined-benefit pension provision. It must be recognized that defined-benefit pension risk is not borne by stockholders alone but is also borne by plan beneficiaries because of uncertain discretionary benefit enhancement and job mobility. In our view, a "consumer-centric" approach must be restored, whereby the defined-benefit promise is simplified and made explicit so that both employees and stockholders can cost it under standardized valuation models and identify the risks that they take. This should then inform the valuation of company stock by investors and of employment contracts by employees. This may involve the introduction of novel designs for defined benefit pension plans, such as variable benefit accrual rates (Khorasanee and Ng, 2000).

Khorasanee, M.Z. and Ng, H.K. (2000). A retirement plan based on fixed accumulation and variable accrual. *North American Actuarial Journal*, 4(1), 63–79.

Owadally, M.I. (2003). Pension funding and the actuarial assumption concerning investment returns. *ASTIN Bulletin*, To appear.