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TECHNICAL REPORT

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A Special Report II: LDI: An Enterprise-Wide Risk Management approach

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LDI: An Enterprise-Wide Risk Management approach

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Undoubtedly, the pension systems are in a crisis. Corporations, governments and regulators need to adopt new approaches before individuals are left alone with their pension and healthcare planning. An increasing dependency ratio (ratio of pensioners versus workers) has forced governments to decrease their retirement benefits; while at the same time corporate pension schemes have disappointed with their low returns (not to speak about their deficits) due to their current financial planning. The perceived view of experts is that regulators and pension fund trustees need to identify the pension schemes funding difficulties and take corrective actions quickly. From an asset management side the investment strategy needs to protect a plan's surplus in downward market conditions.

Mulvey et al. propose an integrated pension trust and corporate planning system; enterprise-wide risk management, which is a generalisation of the LDI/ALM framework. The pension plan can be closely linked to the economic path of the sponsoring company as well as the sponsoring company can be closely linked with the overall economy. Market conditions will affect the sponsoring company's contribution policy. The mathematical model Mulvey et al. propose is a multi-objective multiperiod stochastic programming model which is more suitable for long-term investors than a static model such as a fixed mix approach. At each time period and possible future outcome (scenario) the value of the pension trust as well as its sponsoring company is calculated. The models objectives are: a) maximise shareholder value for the company, b) minimise the present value of contribution for the pension plan and c) provide an adequate level of safety for the pension plan. The model outcomes contain a) investment guidelines and policies, b) sponsor's contribution policy and c) corporate borrowing policies. The results from the study suggest the following: a) underfunded plans should invest more heavily in equities, b) plans close to full funding should follow a more traditional strategy and c) overfunded plans should invest more conservatively to protect their surplus. Furthermore, alternative investment strategies can improve the pension funds performance, such as leveraging and structured products aiming to improve the pension plan's goals.

In the current economic climate model based decision making is increasingly important for pension funds. The advantage is that they take into account complex real world constraints (such as tax and funding regulations). Further they allow the use of long term scenarios which are consistent for the assets as well as liabilities. Models which support optimum risk decisions give the flexibility for many decision variables and objectives which allow for the consideration of both the sponsoring company and the pension scheme beneficiaries interests.

References:

- (1) Cambridge Systems Associates, *iALM*, 2008
- (2) Mulvey, John M., Simsek, Koray D., Zhang, Zhuojuan, Fabozzi, Frank J. and Bill Pauling (2007), *Assisting Defined-Benefit Pension Plans*, Princeton University Report, Department of OR and Financial Engineering