Have Life Insurers Done Right in The Process of Dynamic Optimized ALM? The Participating Life Policy Case

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Abstract:

Nowadays most Chinese insurance companies follow a liability-driven asset management pattern. Under this pattern the product development department of insurance companies would pay most attention to the premium scale increment and the investment department constructs the portfolio to maximize the rate of return under certain constrains separately. However, currently on account of the new regulation policy, stronger competitions from other financial investment vehicles and much more uncertainty of the capital markets, the importance of an appropriate asset and liability management (ALM) models has been much more valued by life insurers. Most of the market entities have the concern whether they have done the right thing now for the ALM process.

Intuitively, global optimum is to be considered obviously more appropriate and efficient. As to ALM, under the current practice, the product development department and the investment department have their own different objective functions, probably they are both different from the company's. So the company would doubt whether it could be better, compared with the current sequential separate optimization, to do the optimization including the product development and the investment sides simultaneously.

In this paper we study the problem of asset and liability management of participating life insurance policies for the case of Chinese life insurers. Firstly, we attempt to construct a two-period simplified ALM model according to the different ALM patterns mentioned above, and we considered discrete situation with two kind of assets and a typical participating life policy. Under this model, the policy is adjustable every period so its sale would be dynamic and influenced by the characters of the policy, such as bonus declaration. We solve the model and compare insurers' decisions under the two patterns. Secondly, we try to simulate this model for efficient long periods.

In the sequential separate optimization, the product development department make the decisions on the main parameters of policies, such as the scheduled interest rate, participating rate, etc. to maximize the premium income scale. Then the investment department construct the asset portfolio under the mean-variance framework to maximize the portfolio rate of return. At the end of second period we calculate the equity owner's total return.

In the simultaneous global optimization, the two departments are controlled by a supervisor, for example the company level executive. So there is only one optimization every period where the liability parameters (the characters of policy) and the asset parameters (the percentage of different assets) are decided simultaneously to maximize the return to the owner's equity directly.

After solving the two-period optimization, we find that there are significant differences on bonus declaration and investment decision. The simultaneous global optimization performs better to maximize the insurers' equity. And the insurer under global optimization tends to declare less bonus comparing to the one of separate optimization. For the simulation we want to see how the variables we concern vary through the process and compare the difference between the paths of two models. We expect to compare the outcomes under the two optimizations in multiple dimensions to find model implications for insures.

Keywords: Asset-Liability Management   Liability-Driven Asset Management   Optimization

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