Asset and Liability Composition in Participating Life Insurance: The Impact on Shortfall Risk and Shareholder Value

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Abstract
Management decisions regarding the asset and liability composition can have a substantial impact on a life insurer’s risk situation and also on the fair risk-adjusted compensation for the company’s shareholders. Decisions can relate to various aspects, including a dynamic adjustment of the portion invested in high-risk assets, the portfolio composition on the liability side as well as the type of surplus appropriation scheme, which at the same time influences the extent of the guarantees. The aim of this paper is to analyze the impact of such management decisions on the company’s shortfall risk and shareholder value in the sense of a fair risk charge. This analysis is also intended to offer insight regarding a fair risk-adjusted position of different stakeholders, which is particularly relevant to regulatory authorities.

A special feature in life insurance contracts in many European countries and particularly in Germany are the legally enforced participation mechanisms through which policyholders participate in the company’s surplus. But not only the absolute amount of surplus distributed to the policyholders has an effect on shortfall risk and shareholder value, but also the concrete way of how distributed surplus
is credited to the policyholders considerably influences the value of the surplus participation part of the contracts and the risk profile of the insurance company. Another important control variable besides the surplus appropriation scheme and the surplus distribution rate is the mixture of the product portfolio, e.g. the percentage of annuities and life insurance contracts an insurance company sells, as well as the riskiness of the insurer’s investment portfolio.

In this paper, we analyze the impact of management decisions regarding the asset side, the product portfolio composition and the surplus appropriation schemes on the risk exposure of a life insurance company selling annuities and endowment insurance contracts. We thereby ensure a fair situation for the shareholders by calibrating the dividend rate using risk-neutral valuation. On the asset side, management can set up a rule that modifies the riskiness of the investment, i.e. funds are dynamically shifted from stocks to bonds to reduce volatility and vice versa using a constant proportion portfolio insurance (CPPI) based investment strategy. In turn, this asset feedback mechanism can have an impact on the overall amount of generated surplus and thus also on the policyholders’ surplus participation. Thus, management decisions regarding the asset side will simultaneously influence the value of the liabilities, which may imply complex interactions.

Our findings show that the management’s decisions have a considerable impact on a life insurer’s risk exposure and the company’s shareholder value. While the effectiveness of the different management rules varies in regard to shortfall risk, in general, prudent management’s discretion can decrease an insurer’s risk substantially. At the same time, the company’s shareholder value can be increased by target-oriented management actions. Thus, management behavior should be accounted for when evaluating an insurer’s risk situation and when determining a fair risk-adjusted compensation for shareholders.

References

