Feedback Mechanisms and Surplus Appropriation Schemes in Participating Life Insurance

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Abstract

Feedback mechanisms controlling a life insurance company's the asset base can have a substantial impact on its risk situation. At the same time, it also affects the fair risk-adjusted compensation offered to the company's equityholders for providing capital and guarantees that support the life insurers' various types of guarantees and surplus participation schemes. Such management strategies include numerous control variables that come along with complex interaction effects. The aim of this paper is to analyze the impact of an active management of assets in life insurance including decisions regarding the product portfolio composition and a detailed modeling of surplus appropriation schemes 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 abso-

lute 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 path dependent management rules in depth by considering a life insurance company selling immediate annuities and endowment insurance contracts with different surplus appropriation schemes on the company's shortfall risk and fair risk-adjusted shareholder value. On the asset side, management can modify the riskiness of the investment, i.e. funds can be shifted from stocks to bonds to reduce volatility and vice versa for a riskier investment strategy. These asset feedback mechanisms in turn have an impact on the overall amount of generated surplus and thus also on the policyholders' surplus. Consequently, management decisions regarding the asset side will simultaneously influence the value of the liabilities, which implies 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.

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