عنوان مقاله:

Market-Consistent Actuarial Valuations with Applications to EIOPA Risk-margin and Time-consistent Pricing

محل انتشار:

بیست و سومین همایش ملی و نهمین همایش بین المللی بیمه و توسعه (سال: 1395)

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خلاصه مقاله:

Most life insurance and pension contracts are very long-dated liabilities that are not traded in the market. The supervisor requirement for a Market-Consistent valuation emphasizes the importance of pricing and risk management for such liabilities. To obtain amarket-consistent price, we combine hedgeable financial risk with an (partially) unhedgeable actuarial risk and price the hybrid payoff using a two-step market evaluation. In a general setting, the valuation process comprises the no-arbitrage price of pure financial risk, the value of partially hedged actuarial risk attributable to its correlation with financial risk (if available), and finally the value of pure actuarial risk through well-known actuarial premium principles. We implement a two-step valuation using a backward iteration method and obtain a timeconsistent market-consistent (TCMC) price during the valuation period. We also provide a continuous-time limit of the TCMC price for the Variance and Standard-Deviation actuarial prices. We also provide a market-consistent version of alternative pricing methods: the Best-Estimate pricing method typically used for pension liabilities and the EIOPA's Risk- Margin method used under Solvency II to value life insurance liabilities. By comparing these prices with the TCMC price for a unit-linked contract, we show that the EIOPA Risk-Margin method acts in the correct direction to reflect part of the uncertainty attributable to the future dynamics of non-hedgeable risks, whereas Best-Estimate pricing completely ignores that uncertainty. Because the Risk-Margin method still ignores certain uncertainties, it is not fully time consistent and its gap with TCMC should not be ignored for long-dated contracts. We also numerically show that the two-step actuarial valuation captures partial (or perfect) hedging because all three prices converge to one adjusted Best-Estimate price when the correlation between financial and actuarial risks increases.

کلمات کلیدی:

market-consistent, time-consistent, actuarial valuation, EIOPA, risk-margin, bestestimate

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