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*Constrained portfolio optimization in variable annuities*

We discuss a portfolio management problem in which a rational policyholder of a variable annuity (VA) with minimum accumulation guarantee wants to maximize the utility of her terminal wealth. We assume that the investment mix in the VA account can be modified throughout the contract, subject to a fair pricing constraint. This problem is formulated in terms of constrained optimal stochastic control which requires the maximization of a non-concave utility function, and is solved using a martingale approach. Numerical examples are used to analyze the interplay between the VA fee structure and optimal investment strategies. In particular, we show that there exist different ways to set the VA guarantee fee, and that lower fees can lead to a higher expected utility without increasing the VA provider's liability.