

# Actuarial and Financial Valuations of Guaranteed Annuity Options

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Guaranteed Annuity Options (GAOs) are options available to holders of certain pension policies. Under these contracts, policyholders contribute premiums into a fund managed by the insurer. At retirement, the policyholders buy life annuities at a guaranteed rate provided by the original insurer, or annuitize with another insurer. If the guaranteed annuity rates are better than the prevailing rates in the market, the insurer has to make up the difference. GAOs can be viewed as interest rate options, since retiring policyholders can choose to use the higher of the guaranteed annuity rate and the prevailing market rate. In this paper, GAOs are studied using two models for the interest rate; the Vasicek and the Cox-Ingersoll-Ross models. An actuarial approach is used to value the GAOs and compared with the value of a replicating portfolio.