

# Optimizing the Equity-Bond Annuity Portfolio in Retirement : The Impact of Uncertain Health Expenses

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## Abstract

This paper derives optimal optimal equity-bond–annuity asset portfolios for households in the retirement phase who, with or without a bequest motive, face stochastic capital market returns, have differential exposures to mortality risk and uncertain uninsured health expenses, and have differential Social Security and defined benefit pension coverage. The numerical results show that the presence of health spending risk drives households to shift their portfolios from risky equities to safer assets and works to enhance the demand for annuities due to their increasing-with-age superiority over bonds as a hedge against life-contingent health spending as well as longevity risks. The safe and higher return annuities in turn provide a greater leverage for equity investment in the remaining asset portfolios. This health-spending-uncertainty-enhanced optimal annuitization result is compatible with the broader theory about liquidity constraints and precautionary savings.