# Managing Capital Market and Longevity Risks in a Defined Benefit Pension Plan

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This paper proposes a model for a defined benefit pension plan to optimize the mean-variance tradeoff of its funding status while controlling expected total pension cost and managing longevity risk. With this setup, we first investigate the plan's optimal contribution and asset allocation strategies, given the projection of stochastic asset returns and random mortality evolutions. We then show the sensitivity of the plan's funding status to mortality improvement. To manage longevity risk, the plan can use either the ground-up hedging strategy or the excess-risk hedging strategy. Our numerical examples demonstrate that the plan transfers more longevity risk with the excess-risk strategy due to its lower total hedging cost.