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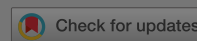Volume 18, 2014 - Issue 1: Longevity Risk and Capital Markets

Feature Articles

Downside Risk Management of a Defined Benefit Plan Considering Longevity Basis Risk

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Abstract

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Notes

Normal contribution or service cost, C, is the cost of additional benefits earned by employees for their service each year, which depends on salary levels, employee turnover and mortality. However, the ultimate cost is usually uncertain. To measure this cost, in practice, pension firms often first estimate their future pension obligations using actuarial assumptions and then attribute these obligations to service years to derive an annual service cost (Competition Commission 2007). In our example, we calculate future pension obligations based on the retirement benefit B and then determine the optimal annual normal contribution C with our proposed model.

Available at http://www.mortality.org or http://www.humanmortality.de (data downloaded on November 22, 2011).

Withdrawals from DB pension plans are often not permitted, or if permitted are subject to excise taxes. As a robustness check, we resolve our optimization problems with and without hedging at a higher withdrawal penalty factor of $\psi_2=0.5$ that equals the prevailing excise tax rate in the United States. Overall, the results confirm the findings based on the withdrawal penalty factor of $\psi_2=0.2$ shown in this article. To conserve space, we do not report the results. The results are available upon request.

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