

*Fast Facts*

A Tale of Two Pension Plans: Measuring Pension Plan Risk from an Economic Capital Perspective

SUMMARY

This paper is part of a multi-phase study of population aging and its impact on pension plans. The paper provides an in-depth risk analysis of two pension plans.

One plan is a representative U.K. plan using publicly available information from a large U.K. defined benefit (DB) plan. The other is a stylized U.S. plan with the same membership profile but modified to reflect a typical U.S. DB plan. The authors' risk measure estimates economic capital requirements using a Solvency II framework. See a few of the findings in the Highlights and view papers from other phases here:

- ❖ [*Use of Overlapping Generations Model in Modeling Demographic Change Introduction to the Literature Review*](#)
- ❖ [*Use of Overlapping Generations Model in Modeling Demographic Change – Summary of the Literature Review*](#)
- ❖ [*The OLG Model Environment*](#)
- ❖ [*Population Structure and Asset Values*](#)
- ❖ [*Literature Review on Demographics and Asset Returns and Model Specifications Related to Housing Prices*](#)

HIGHLIGHTS

Some key results:

- As a percentage of starting assets, the U.S. stylized plan is more volatile than the U.K. plan.
- The reduction in economic capital requirement of a larger allocation to long bonds is greater in the U.S. stylized plan than in the U.K. plan.
- The effect on economic capital for either plan is much larger for changes in asset allocation than for changes to plan contributions.

Some key implications:

- The large range of potential outcomes in a typical DB pension plan can result in significant variation in plan contributions. To some extent, the range of outcomes can be narrowed by appropriate selection of asset allocation and plan provisions.
- This report shows the full distribution of results. In discussions with plan sponsors, pension practitioners can use this to assist sponsors in understanding the full range of uncertainty they are assuming in the financing of their DB plans.
- An economic capital framework provides pension regulators with another tool to consider exposure to benefits guarantees. It also provides them with some guidance in circumstances where it is appropriate to expect plan sponsors to hold some degree of margin for adverse deviation within their pension funds.

LINK TO FULL REPORT

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<https://www.soa.org/globalassets/assets/files/resources/research-report/2019/pension-plan-risk.pdf>

METHODOLOGY

- Focus: The authors describe the methods used to update the economic capital analysis of the U.K. plan and apply the analysis to a stylized U.S. plan. See detailed discussion in Section 5, on page 16.
- Approach: Given the long-term nature of pension plan risks, the authors propose using a runoff approach, so the time horizon of their analysis is set until the time when the last of the current plan members dies. The authors include various notations and formulas.
- Definition: The authors define risk measure in terms of economic capital, noting that this is “designed to be consistent with our previous work on solvency capital calculations for many different financial services firms and conglomerates,” Due to the long-term nature of pension plans’ benefit obligations, it is important to use the entire runoff period as the time horizon, they add.

REPORT SPECS

- Published: November 2019
- Pages: 66
- Access: Downloadable pdf
- Author(s): Douglas Andrews, Stephen Bonnar, Lori J. Curtis, Jaideep S. Oberoi, Aniketh Pittea and Pradip Tapadar
- Contents: Executive summary introduction; literature review, data; assumptions; methodology; results for the U.K. plan; results for the stylized U.S. plan; conclusion and future work; bibliography; appendices A, B and C; backgrounders on the four main research bodies; more than 25 tables; more than 50 charts; and numerous equations.



YOU MIGHT ALSO LIKE

The Other Longevity Risk: Impact of Population Aging on Pension Plan Finances in Canada

<https://globalriskinstitute.org/download/the-other-longevity-risk-impact-of-population-aging-on-pension-plan-finances-in-canada/>

Trends in Canadian Mortality by Pension Level: Evidence from the CPP and QPP

<https://www.soa.org/globalassets/assets/files/resources/research-report/2019/longevity-morbidity.pdf>

Low Rates are Here to Stay

<https://www.soa.org/globalassets/assets/library/newsletters/risks-and-rewards/2020/february/rr-2020-iss-02-20-faivre.pdf>



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