Living to 100 and Beyond
Session 2: Impact of Aging Populations – Part 1

Remarks of Discussant: J. Bruce MacDonald, FSA, FCIA, MAAA

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2a. The Effects of Advanced Age Mortality Improvements on the Valuation of Variable Annuities with Guaranteed Benefits,
By Lijia Guo, PhD, ASA, Actuarial Program Director, Assistant Professor, Department of Statistics, University of Central Florida, Orlando, Florida

This is an important paper, but of limited interest. It is a valuable tool for measuring the effects of improved mortality on a type of investment contract with certain guarantees, which obviously become more expensive as mortality rates drop. It is of great interest to those working at determining costs of such contracts, but most of us here, including me, do not work in this field. I do not claim any expertise in this area, and I shall leave the main discussion of this paper to those with knowledge in the subject. Again my congratulations to Professor Guo for a good paper.

2b. The Impact of the Equity Risk Premium and Population Aging on the Canadian Retirement Savings System,
By Doug Andrews, MBA, FSA, FCIA, MAAA, CFA, Vice President, Aon Consulting Inc., Toronto, Ontario, Canada

This is a paper that is squarely in my field of competence.

I should begin by pointing out that Doug has not made any comments about the Old-Age Security Act (OAS) or the Guaranteed Income Supplement (GIS), which are important sources of retirement income for low-income Canadians. Doug has omitted these for the good reason that they operate on a pay-as-you-go basis and are not funded; as a result a drop in the equity risk premium will not impact them.

I am not sure that everyone agrees that the equity risk premium will be lower in the future than many expect, but it is a risk worth examining. I agree with Doug's conclusion that even with a drop in this premium, coupled with lower mortality rates, both the Canada Pension Plan (CPP) and Quebec Pension Plan (QPP) with have acceptable costs. While it seems intuitive that the OAS and GIS costs will also be acceptable, as they are hit with only one of the two increases that affect the CPP/QPP, it would be a good idea for someone to actually measure the effect.

The effect on defined-benefit occupational pension plans will obviously vary from plan to plan and will depend upon both their funded status and the financial strength of their sponsor. Certainly their cost will increase, and as a result they will require either increased contributions from one or both of the employer and members, or a reduction in benefits, such as an increase in the retirement age, or a combination of these.

Defined-contribution plans will simply produce lower pensions than expected and may require an increase in the normal retirement age, unless contributions are increased in the near future.

The effect upon Registered Retirement Savings Plans (RRSPs) will be substantial, as Doug points out. These will produce lower pensions at the expected retirement age. This may result in a need to increase the retirement age (and so work longer) or may have a lower income during retirement than expected. It is also a possibility, because of the laws governing RRSPs, that a higher income may be elected than is actuarially sound, and then the funds may run out while the recipient is still living, leaving the last few years of life to be lived in poverty. This part of the paper should be a warning to Canadians that their RRSPs may not do as good a job as they expect.

It should also be a warning to those countries that have a social security system that in part or in whole operates on a defined-contribution basis, and to Americans, who are considering individual accounts as a replacement of part of their Social Security system. This is a potential risk of individual accounts that should be studied carefully.

I enjoyed this paper very much.

2c. Mortality Improvement Cohorts and the Effect on the Annuities Market
By Krzysztof Ostaszewski, PhD, FSA, MAAA, CFA, Actuarial Program Director and Professor, Department of Mathematics,
And Richard MacMinn, PhD, Professor and Edmonson-Miller Chair in Insurance and Financial Services,
And Ranee Thiagarajah, PhD, ASA, MAAA, Associate Professor, Department of Mathematics
All of Illinois State University, Normal, Illinois

I found this a fascinating paper. The authors have identified certain years in which the rate of mortality improvement is better than in the year before or the year after. They have not identified the reason for this, and this is not a criticism of their paper as they set out determine whether such a phenomenon existed, but not to determine why. That is left to other researchers and will probably require experts in history, and probably medical historians.

It is most interesting that the cohorts vary from country to country and are not the same in each. That would seem to rule out astrological reasons, if this is not an

oxymoron. It would also seem to rule out astronomical reasons, such as sunspot activity or bursts of gamma rays from outer space. Causes that could be investigated are localized epidemics, sociological changes that occurred in one country but not another, wars that affected a limited geographical region, abundant harvests in some countries, etc. I can think of many possibilities, but most of them could be classified as "sociological."

This cohort effect should not have much effect on social security systems that operate largely on a defined-benefit basis, as the increased costs of some cohorts will be offset by the decreased costs of others. For social security systems that operate in large part on an individual account basis, the factors for converting the account balances into pensions would apparently have to vary even more by year of birth, whether the pension is paid from the state fund, or whether the funds in the account are used to buy an annuity from an insurance company.

The sellers of annuities, usually insurance companies, will have to take this cohort effect into account in setting their rates.

The paper opens up a whole new field of research.