UNDER EMBARGO UNTIL 00:01 MONDAY 26 NOVEMBER 2007

LATEST RESEARCH REVEALS MEN COULD LIVE UP TO 12 YEARS LONGER BY 2050 THAN CURRENTLY PREDICTED

Pension fund deficit could be as much as £160,368* per person

A new model for forecasting mortality rates has revealed that British men could live 12 years longer than currently predicted and this, according to experts from Cass Business School, would leave the government and pension funds having to pay out as much as £160,368 per person between them.

The new model, formulated by Professor David Blake from Cass Business School with fellow academics Professor Andrew Cairns (Heriot-Watt University) and Professor Kevin Dowd (Nottingham University Business School), is based on an analysis of mortality data for 65 year old males and indicates that people are living longer and that longevity is increasing far more rapidly than previously predicted. According to the Cairns-Blake-Dowd model, males reaching 65 in 2050 would on average live for another 26 years, six years more than currently predicted (on the basis of Office for National Statistics data), with (to 90% statistical confidence) an upper bound of likely life expectancy of 32 years, twelve years more than now.

Professor David Blake, Director of the Pensions Institute at Cass Business School commented: "We know that people are living for longer but this model demonstrates that longevity is accelerating far beyond what is currently predicted and that there is considerable uncertainty surrounding future life expectancy. This will present a huge challenge for long term health care providers and intensifies the problems faced by both government and the UK pensions industry. Providers need to urgently update the projection models they use before the pensions deficits reach catastrophic proportions."

The Cairns-Blake-Dowd (CBD) model has so far only been applied to male mortality data from England and Wales but will be extended to consider female data. The model

has already been taken up widely by actuaries in Germany and is currently being investigated by the UK's Continuous Mortality Investigation Bureau.

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* This figure is based on the Department for Work and Pensions 2005/2006 figures for a single male pensioner receiving an average of £257 pension per week (state and personal pension income). This is then multiplied by 52 to generate an annual pension income of £13,364, and then multiplied by 12 to represent the difference between current longevity estimates and those of the CBD model for 2050.

Research methodology

The CBD model builds on the observation that the probability of dying in a given year increases with age. Specifically, we find that, to a first approximation, the log odds of dying in a given year is linearly increasing in age. (The log odds of dying at age 65 is defined as the logarithm of the ratio of the probability of dying at age 65 to the probability of surviving to age 66.) The CBD model also builds on the observation that mortality rates have been falling over time, but these falls have not been smooth from one year to the next (in other words, there has been some randomness in the change in mortality rates).

The CBD model is a two-factor model which means that the way mortality rates change over time depends on two stochastic (or time-varying) factors. The first factor is common for all ages: it leads to the same reduction over time in mortality rates at different ages. The second factor is age-specific and results in different improvements over time in mortality rates at different ages. This second factor is important because it allows for the fact that mortality rates have been improving more rapidly at lower ages than at higher ages. The factors are stochastic rather than deterministic in recognition of the fact that mortality rates do not change over time in a smooth way, but change randomly over time in a way that is partly predictable, but partly unpredictable. It is the unpredictable nature of mortality rate changes over time that leads to what is called longevity risk. The stochastic factors need to be quantified or estimated and we use mortality data on English & Welsh males over the last 20 years to do this.

Having estimated the model, we can then make projections of future mortality (and hence life expectancy), as well as estimates of the volatility surrounding those projections. In the above example, the most likely estimate of life expectancy of 65 year old males in 2050 is 26 years, but due to longevity risk, it could be anywhere between 21 and 32 years (with 90% statistical confidence). We use what we call a longevity fan chart to both quantify and illustrate longevity risk.

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