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Academics launch new blueprint for building mortality models

'General procedure' could transform the way mortality rates are forecast

A pioneering new blueprint for constructing mortality models has been developed by academics at the Pensions Institute at Cass Business School, part of City University London.

The blueprint could transform the way pensions and annuity providers and governments forecast mortality rates.

Called the 'general procedure', the blueprint can be applied to any dataset to build a mortality model that fits all ages across the population.

In recent years, there has been an explosion in the number of new mortality models being developed. These models often involve ad hoc extensions to existing models that have questionable demographic significance. They also have difficulties in providing realistic forecasts of specific mortality rates.

"Rather than propose yet another new mortality model, we outline and implement a general procedure for building a mortality model from scratch," said co-author of the research, and Director of the Pensions Institute, Professor David Blake.

"The general procedure is a way of constructing mortality models which are tailored to specific datasets. This means it is able to identify the idiosyncratic features of different populations which conventional "off-the-peg" models are unable to do."

When tested on UK data, the general procedure comfortably outperformed simpler models such as the Lee-Carter model. It produced more parsimonious models than those generated using a mechanical algorithm, such as principal component analysis. It also gave well specified cohort effects which are essential for reliable forecasting of mortality rates.

Existing mortality models cannot ensure that cohort effects – effects that influence the mortality experience of a specific birth cohort – are well specified as the age effects in these models are either set in advance without justification from the data, or are generated mechanically and so lack biological and demographic plausibility.

This will then cause problems when the model is used to project mortality rates into the future. The general procedure has been developed to address this issue and produce well specified mortality models.

"The procedure works by sequentially extending a simple mortality model – first with freely varying age effects which take whatever shape fits the data best and then replacing these with a simpler, parametric age function which does the same job. It uses a combination of expert judgement and a toolkit of functional forms," said Andrew Hunt, another co-author of the study.

“This then achieves a good fit to the data with a relatively parsimonious model whose age effects can then be interpreted in light of the underlying socio-economic and demographic drivers of changing mortality rates.”

A General Procedure for Constructing Mortality Models, by Andrew Hunt FIA and Professor David Blake, Pensions Institute, Cass Business School, is available at:

<http://pensions-institute.org/workingpapers/wp1301.pdf>

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ABOUT THE PENSIONS INSTITUTE

The Pensions Institute (PI) conducts research and provides expert advice on all aspects of pensions. Established in 1996, PI was the first academic research centre in Europe to focus exclusively on pensions.

The Pensions Institute is unique in bringing together internationally renowned experts from across many different disciplines - including economics, finance, insurance, actuarial science, accounting, corporate governance, law and regulation. This interdisciplinary approach enhances strategic thinking towards the development of new solutions to the complex pensions challenges facing states, corporate and individuals, and fosters research and knowledge sharing.

ABOUT CASS BUSINESS SCHOOL

Cass Business School, which is part of City University London, delivers innovative, relevant and forward-looking education, training, consultancy and research. Located in the heart of one of the world's leading financial centres, Cass is the business school for the City of London.

Our MBA, specialist Masters and undergraduate degrees have a global reputation for excellence, and the School supports nearly 100 PhD students.

Cass offers the widest portfolio of specialist Masters programmes in Europe. It also has the largest faculties of Finance and Actuarial Science and Insurance in the region. It is ranked in the top 10 UK business schools for business, management and finance research and 90% of the research output is internationally significant.

Cass is a place where students, academics, industry experts, business leaders and policy makers can enrich each other's thinking. For further information visit: www.cass.city.ac.uk.

A DECADE AS CASS BUSINESS SCHOOL

2012 marks 10 years since City University Business School became Cass Business School - new premises, name, and brand - the business school for the City of London.

This followed a generous donation from the Sir John Cass's Foundation. Founded in 1748 by philanthropist Sir John Cass, the Foundation is one of London's oldest and largest education charities. Sir John Cass was born in the City of London in 1661 served as Alderman, Sheriff and MP for the City, receiving a knighthood in 1712.

Cass is marking this anniversary with a year of activities and events. The celebration will start in September 2012, which marks 10 years since Cass's contemporary premises on Bunhill Row opened for business.

For more information see <http://www.cass.city.ac.uk/10th-anniversary>