



**Actuarial
Research Centre**

Institute and Faculty
of Actuaries

The Actuarial Research Centre (ARC)

Recent developments from its commissioned research programmes

Martin White

Member of IFoA's Research and thought leadership board



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Outline

- Introducing the Actuarial Research Centre (ARC)
- Current research programmes
- Engaging with the ARC – how you can get involved

Introducing the Actuarial Research Centre (ARC)

- The IFoA typically has around 100 research activities at any one time:
 - Volunteer working parties
 - Commissioned research projects through the **Actuarial Research Centre (ARC)**
- **Vision for the ARC:** A global network of researchers addressing industry relevant issues in actuarial science
- Research programmes **bridge academic rigour with practitioner needs**
- Working collaboratively with academics, other actuarial bodies and the end user community (industry, policymakers and others)
- Overseen by the IFoA's Research and Thought Leadership Board (RTLb), with a panel of ARC Directors



ARC Directors

Panel of senior actuarial researchers, who provide academic leadership:

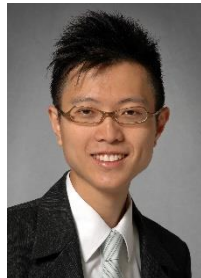
- Oversee progress and delivery of the ARC's research programmes
- Provide quality assurance of research
- Ambassadors of ARC
- Develop a wider actuarial network by attracting the best actuarial consortia



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Current Research Programmes in the ARC

Minimising Longevity and Investment Risk while Optimising Future Pension Plans (1)

Co sponsored with Royal London (UK Life Office)

- Led by Heriot-Watt University (UK) and Cass Business School (UK), in collaboration with Danica Pension (Denmark)
- Aims:
 - Development of future pension products that produce a real income in retirement while minimising the cost to the customer
 - Identify blend of risk-sharing between customers, with excess risk transferred to an insurer
 - Quantifying trade-off between the performance and stability of pension income
 - Consideration of investment market timing into the investment strategies



Minimising Longevity and Investment Risk while Optimising Future Pension Plans (2)

Recent developments

- A view of modern tontines and how they could be applied to also include a bequest
- Forecasting benchmarks of long term stock returns via machine learning

What's next?

- Comparing different accumulation (pre-retirement) investment strategies
- Scientific paper: Incorporating market timing in pension design
- Sharing investment risk and return within the age-heterogeneous group
- Maintaining the investment risk profile when there is investment risk sharing

Find out more and view free webinars: bit.ly/arc2142



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Use of Big Health and Actuarial Data for understanding Longevity and Morbidity (1)

- Led by University of East Anglia (UK), with assistance from technical experts at Aviva (UK)
- Aims:
 - Identify and quantify key factors affecting mortality (lifestyle, medical, interventions)
 - Modelling temporal changes in factors affecting morbidity and mortality
 - Future scenarios in mortality trends arising from medical advancements, lifestyle changes
 - Tools to forecast longevity risk arising from these scenarios



Use of Big Health and Actuarial Data for understanding Longevity and Morbidity (2)

Recent developments

- Review of impact of diabetes and hormone replacement therapy (HRT)
- Study on blood pressure control and survival

What's next?

- Analysis of Statins data and impact on longevity
- Models on stroke and transient ischemic attack (TIA)

Find out more and view free webinars: bit.ly/arc2173



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Modelling, Measurement and Management of Longevity and Morbidity Risk (1)

Co sponsored with the Society of Actuaries and the Canadian Institute of Actuaries

- Led by Heriot-Watt University (UK), with Cass Business School (UK), University of Southampton (UK), Aarhus University (Denmark), University of California Santa Barbara (USA), Longevitas Ltd. (UK)
- Aims:
 - Developing next generation of mortality models
 - Modelling drivers of mortality
 - Better understanding of options to manage longevity risk
 - New methods for pricing and reserving for Critical Illness Insurance



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Modelling, Measurement and Management of Longevity and Morbidity Risk (2)

Recent developments

- Cutting-edge longevity research: focuses on risk and transfer solutions
- Application to the large public pension plans in Canada: Canadian Pension Plan (CPP); Quebec Pension Plan (QPP)
- Analysis of mortality and deprivation in England

What's next?

- Mortality of Danish males using a new affluence index
- Mortality in the US by education level

Find out more and view free webinars: bit.ly/arc2165



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Behavioural Finance (1)

- Led by City, University of London (UK), Ipsos (UK), Leeds University Business School (UK), University of East London (UK) and Reverence Limited (UK)
- Aims:
 - Explore decision-making of institutional investors, in particular insurers and pension schemes
 - Explore biases that may affect investment decisions
 - Establish if there is evidence for behavioural factors causing deviation from optimal behaviour
 - Develop practical conclusions for actuaries working in investment and related areas



Behavioural Finance (2)

Recent developments

- Review of behavioural biases in pension fund trustees' decision making

What's next?

- The influence of advice on pension trustee decision-making
- Surrogate decision making with pension trustees
- Institutional investors chase performance in mutual fund decisions
- Policy implications of the research

Find out more and view free webinar: bit.ly/arc2976



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Evolution and Application of Economic Thinking (1)

- Initial survey by Leeds University Business School
- Aims:
 - Understanding current practice and application of economic thinking in the actuarial community
 - Review what existing literature and recent past experience tells us
 - Consider the application of evolving thinking from economists



Evolution and Application of Economic Thinking (2)

Recent developments

- Publication of review of existing practice amongst some actuaries (published 24 June 2019)

What's next?

- Literature Review on 'Economics and Actuaries'
- Thought leadership campaign on this issue

Find out more at bit.ly/arc2568



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Equity Release Mortgages (ERM) (1)

Co sponsored with the Association of British Insurers (ABI)

- Delivered by a team at the University of Kent (UK)
- Aims:
 - Consider how the No Negative Equity Guarantee feature of ERMs should be modelled
 - Consider how ERM cashflows more generally should be modelled
 - Inform practice and regulation



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Equity Release Mortgages (ERM) (2)

Recent developments

- Research published
- Underlying assumptions open to debate: main output has been the development of a framework
- Balance of current practice (easy model to apply, less theoretically robust) v more theoretically robust model but harder to apply
- ARC research recognised by UK financial regulator

What's next?

- IFoA ERM working party to consider next steps with research
- Possible application in other markets? E.g. Hong Kong

Find out more at bit.ly/arc2188



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Coming soon....

Periodical Payment Orders (PPOs)

- PPOs: regular amount of money paid by an insurer to an injured life in the event of a personal injury claim
- Imposed by the courts of law in place of a lump sum settlement
- AKA “structured settlements” in other markets
- ARC research to look at feasibility of development appropriate mortality tables for these injured lives
- Call for Research expected to be published in coming weeks

Find out more at www.actuaries.org.uk/arc



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Engaging with the ARC

Ensuring a global research agenda

Developing an internationally relevant programme of research through:

1. **Subject matter**: identifying the relevant gaps in research and asking questions that reflect the needs of the global actuarial community
2. **Research partnerships**: supporting research teams from around the world and collaborating with industry partners who define the problems



Your opportunity to shape the ARC's research agenda for the IFoA

Questions for you:

- What do you think are the main areas of research that IFoA should seek to address through the ARC over the next:
 - a) Year?
 - b) 1-3 years?
 - c) Beyond 3 years?



Get involved in the ARC

- **Partner on research**

- Does your organisation have actuarial problems that could be addressed through the ARC?
- Would your own organisation be interested specifying the ARC research and becoming a sponsor?

- **Be part of a research team**

- Are you part of a university department or research-led organisation?
- ARC research opportunities are open to applications from around the world: bit.ly/ifoacalls

- **Help to scope and oversee research programmes**

- Opportunities are advertised on IFoA's volunteer vacancies: bit.ly/ifoavolunteer
- Feedback always welcome – arc@actuaries.org.uk

- **Knowledge exchange**

- View the ARC webinars: bit.ly/arcwebinars2018
- Research outputs offer CPD opportunities
- Content for conferences and events



Useful links and resources

- Actuarial Research Centre: www.actuaries.org.uk/arc
- More detail on the ARC programmes? Contact: arc@actuaries.org.uk
- IFoA research programme, including the ARC: www.actuaries.org.uk/research
- Sign up to the IFoA's research newsletter: research@actuaries.org.uk
- For more information about collaborating in the ARC, contact:



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Thank you

Questions

Comments

The views expressed in this presentation are those of the presenter.



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