29th Colloquium on Pensions and Retirement Research

1-2 DECEMBER 2021 | online

FINANCING RETIREMENT IN THE 2020s AND BEYOND

ARC CENTRE OF EXCELLENCE IN POPULATION AGEING RESEARCH

UNSW SYDNEY

School of Risk & Actuarial
Business School

cepar.edu.au/colloquium-2021
Jointly hosted by the ARC Centre of Excellence in Population Ageing Research (CEPAR) and the UNSW School of Risk & Actuarial Studie202

ABOUT CEPAR

The ARC Centre of Excellence in Population Ageing Research (CEPAR) is a unique collaboration between academia, government and industry, committed to delivering solutions to one of the major economic and social challenges of the 21st century.

'Population ageing is an issue of paramount importance to all; this is truly the ageing century. The research we undertake has the potential to transform Australia's future. It supports a vision of Australia where economic growth is robust, the mature labour market is buoyant, health and social services are effectively and sustainably delivered, cognitive ageing is slowed as a result of meaningful work and social participation, outcomes for women in the workplace and in retirement are improved, and individuals are effectively guided in decision making and financial risk management.'

Scientia Professor John Piggott AO, CEPAR Centre Director

THE ONLY RESEARCH CENTRE OF ITS KIND

CEPAR's strength lies in its integrated approach. Its high level expertise draws from Actuarial Studies, Demography, Economics, Epidemiology, Psychology and Sociology.

Based at the University of New South Wales Sydney, the Centre has nodes at The Australian National University, Curtin University, The University of Melbourne, and the University of Sydney and partnerships with government, industry and international organisations.

Funded primarily by an initial seven-year grant from the Australian Research Council, with generous support from the collaborating universities and partner organisations, the Centre was established in March 2011 to undertake high impact independent multidisciplinary research and build research capacity in the field of population ageing.

Disclaimer
All details in this program handbook are correct at the time of publication.
If unavoidable changes are required, we apologise for any inconvenience.

Enquiries cepar@unsw.edu.au | cepar.edu.au

WELCOME FROM THE COLLOQUIUM CO-CHAIRS AND COMMITTEE

Dear colleagues,

The Annual Colloquium on Pensions and Retirement Research is a unique annual event, bringing together academia, government and industry to discuss the latest research on pensions, superannuation and retirement. It is co-hosted by CEPAR and the UNSW School of Risk & Actuarial Studies.

The theme of the 29th Colloquium on Pensions and Retirement Research is **'Financing Retirement in the 2020s and Beyond'**.

This year the Colloquium will be held online on 1 December and 2 December, 2021.

The Colloquium will also host a special online session on 3 December, sponsored by the International Pension Research Association (IPRA).

We hope you will enjoy this year's Colloquium.

Kind regards,

Colloquium Co-Chairs

Professor Hazel Bateman, CEPAR Deputy Director, School of Risk & Actuarial Studies, UNSW Sydney
Scientia Professor John Piggott AO, CEPAR Director, School of Economics, UNSW Sydney

COLLOQUIUM COMMITTEE

Professor Hazel Bateman, CEPAR Deputy Director, UNSW Sydney
David Bell, CEPAR Associate Investigator, The Conexus Institute
Inka Eberhardt, CEPAR Research Fellow, UNSW Sydney
Dr Katja Hanewald, CEPAR Associate Investigator, UNSW Sydney
Dr George Kudrna, CEPAR Senior Research Fellow, UNSW Sydney
Scientia Professor John Piggott AO, CEPAR Director, UNSW Sydney
For media or event enquiries please contact Silke Weiss (she/her)

PROGRAM & WEBSITE

The electronic program is available via any web/mobile browser:

https://cepar.edu.au/colloquium-2021

MEDIA

Media representatives may attend sessions.

PROGRAM SCHEDULES at-a-glance

View the online program of the Colloquium on 'Financing Retirement in the 2020s and Beyond', held online on 1-2 December 2021: https://cepar.edu.au/colloquium-2021

View the online program for the IPRA special online session on 'The Global Experience: Financing Retirement in the 2020s and Beyond', held online on 3 December 2021: https://cepar.edu.au/ipra-session-2021

PROGRAM SCHEDULE at-a-glance:

Time (AEDT time zone)	Day 1 Program Schedule: 1 December 2021, online	Online venue
9.00am-9.05am	*Welcome and Opening Remarks*	*Main Room*
9.05am-10.35am	Session 1: Plenary Session	Main Room
10.35am-10.50am	*Break*	
10.50am-12.30pm	Sessions 2A, 2B, 2C: Concurrent Paper Sessions	Break-out Rooms
12.30pm-1.30pm	*Break*	
1.30pm-2.00pm	Session 3: Retirement Sandbox	Main Room
2.00pm-3.15pm	Sessions 4A, 4B: Concurrent Paper Sessions	Break-out Rooms
3.15pm-3.30pm	*Break*	
3.30pm-5.10pm	Sessions 5A, 5B, 5C: Concurrent Paper Sessions	Break-out Rooms
5.10pm	*Closing Remarks*	*Break-out Rooms*

Time (AEDT time zone)	Day 2 Program Schedule: 2 December 2021, online	Online venue
9.00-9.05am	*Opening Remarks*	*Main Room*
9.05am-10.45am	Sessions 6A, 6B, 6C: Concurrent Paper Sessions	Break-out Rooms
10.45am-11.00am	*Break*	
11.00am-12.30pm	Session 7: Policy/Industry Panel Session	Main Room
12.30pm-1.15pm	*Break*	
1.15pm-2.55pm	Sessions 8A, 8B: Concurrent Paper Sessions	Break-out Rooms
2.55pm-3.10pm	*Break*	
3.10pm-4.25pm	Session 9: Plenary Session	Main Room
4.25pm-4.30pm	Announcement of the Best PhD Paper Presentation Award	Main Room
4.30pm	*Closing Remarks*	*Main Room*

PROGRAM			
Day 1: Wednesday 1st December (AEDT) *(please note: the times shown are Australian Eastern Daylight TIme (AEDT) - please convert the program timing according to your personal time zone)*			
Time (AEDT Time zone)	**Session details**	**Presenter**	**Online venue**
9.00-9.05am	**Welcome and opening remarks** Hazel Bateman, CEPAR Deputy Director, Professor, School of Risk & Actuarial Studies, UNSW Sydney John Piggott, CEPAR Director, Scientia Professor of Economics, UNSW Sydney		**Main Room**
9.05am-10.35am	**Session 1: Plenary Aged Care Financing** Chair - Marc J de Cure (Adjunct Professor, CEPAR, UNSW Business School)		**Main Room**
9.05-9.30am	A Preference for Quality: Australian General Public's Willingness to Pay for Home and Residential Care	Julie Ratcliffe (Flinders University)	
9.30-9.55am	Long-Term Financing Options for Aged Care in Australia: Lessons from the Royal Commission	David Cullen (National Disability Insurance Scheme) and Bridget Browne (Australian National University, EY)	
9.55am-10.20am	On Sustainable Aged Care Financing in Australia	Michael Sherris (CEPAR, School of Risk & Actuarial Studies, UNSW Sydney)	
10.20am-10.35am	General Discussion		
10.35am-10.50am	*Break*		

10.50am-12.30pm	**Concurrent Session 2: Contributed papers**		**Break-out rooms:**
	Aged Care Financing Chair – Katja Hanewald (Risk & Actuarial Studies and CEPAR, UNSW Sydney)	**Session 2A**	**Room 2A**
10.50am-11.15am	Understanding the Determining Factors of Aged Care Accommodation Payment Choices	Yuanyuan Gu (Macquarie University Centre for the Health Economy)	**Room 2A**
11.15am-11.40am	Assessing Sustainable Aged Care Financing in Australia	Ellora Shirodkar (Risk & Actuarial Studies, UNSW)	**Room 2A**
11.40am-12.05pm	Sustainable Financing of Aged Care Capital Expenditure: Stakeholder Perspectives	Megan Gu (IHPA, Macquarie University Centre for the Health Economy)	**Room 2A**
12.05pm-12.30pm	The Role of Financial Literacy When Paying for Aged Care	Henry Cutler (Macquarie University Centre for the Health Economy)	**Room 2A**
	Impact of COVID-19 and more Chair – George Kudrna (CEPAR, UNSW Sydney)	**Session 2B**	**Room 2B**
10.50am-11.15am	Effects and Impacts of Allowing Early Pension Access: The Chilean Experience	Félix Villatoro (Universidad Adolfo Ibañez, Chile) [8.50pm Chile, 30 November CLST]	**Room 2B**
11.15am-11.40am	A Market-Linked Annuity	Melanie Dunn and Aaron Minney (Challenger)	**Room 2B**
11.40am-12.05pm	Allowing Early Access to Retirement Savings: Lessons from Australia	Nathan Wang-Ly (Psychology, UNSW)	**Room 2B**
12.05pm-12.30pm	Changes in Investment Switching Behaviour Due to Covid-19 Amongst Superannuation Fund Members	William Lim (ANU)	**Room 2B**

	Superannuation I Chair – David Bell (The Conexus Institute, CEPAR)	**Session 2C**	**Room 2C**
10.50am-11.15am	The Pursuit of Tax Aware Investment Management (Taim) to Maxmise Member Outcomes	Thulaisi Sivapalan (University of Technology, Sydney)	**Room 2C**
11.15am-11.40am	A Pathway Forward for Super Funds and Investment Managers Under the Your Future, Your Super Performance Test	David Bell (The Conexus Institute)	**Room 2C**
11.40am-12.05pm	Overcoming Supply-Side Resistance to Lifetime Annuities	Anthony Asher (Risk & Actuarial Studies, UNSW)	**Room 2C**
12.05pm-12.30pm	Optimising the Structure of the Superannuation System	Richard Dunn (Deloitte)	**Room 2C**
12.30pm-1.30pm	**Lunch Break (AEDT)**		
1.30pm-2.00pm	**Session 3: Retirement Sandbox** Chair – Hazel Bateman (Risk & Actuarial Studies and CEPAR, UNSW Sydney)		**Main Room**
	Retirement Sandbox: Engaging Young Minds to Provide New Solutions to Old Problems	Kevin Liu (Risk & Actuarial Studies UNSW, Aware Super, The Conexus Institute)	

2.00pm-3.15pm	**Concurrent Session 4: Contributed papers**		**Break-out rooms:**
	Pensions, Labour Supply and Household Decisions Chair – Akshay Shanker (University of Sydney Business School, CEPAR)	**Session 4A**	**Room 4A**
2.00pm-2.25pm	Responses to Increases in the Superannuation Preservation Age	Roger Wilkins (University of Melbourne)	**Room 4A**
2.25pm-2.50pm	Trends in the Labour Supply of Older Men and the Role of Social Security	Zhixiu Yu (University of Minnesota) [9.25pm Minnesota, 30 November CST]	**Room 4A**
2.50pm-3.15pm	On the Limits of Fiscal Financing in Australia	Nabeeh Zakariyya (ANU)	**Room 4A**
	The Retirement Standard and New Retirement Products Chair – David Bell (The Conexus Institute, CEPAR)	**Session 4B**	**Room 4B**
2.00pm-2.25pm	Nearly 20 Years of the ASFA Retirement Standard – Why it Remains Realistic and Relevant	Ross Clare (ASFA)	**Room 4B**
2.25pm-2.50pm	An Update on the QSuper Lifetime Pension	Kathryn Spragg (QSuper)	**Room 4B**
2.50pm-3.15pm	Innovation in Retirement Investing	Paddy McCrudden and Brett Cairns (Magellan Financial Group)	**Room 4B**
3.15pm-3.30pm	**Break**		

3.30pm-5.10pm	**Concurrent Session 5: Contributed papers**		**Break-out rooms:**
	Health and Longevity Chair – Len Patrick Garces (CEPAR, UNSW Sydney)	**Session 5A**	**Room 5A**
3.30pm-3.55pm	Inequities in the Golden Years: Increasing Returns to Wealth in Healthy and Work-Free Life	Tyler Welch (University of Wisconsin-Madison) [10.30pm Minnesota, 30 November CST)	**Room 5A**
3.55pm-4.20pm	Mortality Heterogeneity and Clustering Using Joint Body Mass Index and Self–Reported Health Trajectories	Michelle Vhudzijena (CEPAR, Risk & Actuarial Studies, UNSW)	**Room 5A**
4.20pm-4.45pm	Mortality Sharing in a Multi-State Model of Functional Disability and Health Status	Doreen Kabuche (CEPAR, Risk & Actuarial Studies, UNSW)	**Room 5A**
	Financial Decisions Chair – Cheng Wan (Risk & Actuarial Studies and CEPAR, UNSW Sydney)	**Session 5B**	**Room 5B**
3.30pm-3.55pm	Time-Varying Risk Aversion and Investment Switching: Evidence from an Australian Superannuation Fund	Kiarna Rosandic (University of Sydney)	**Room 5B**
3.55pm-4.20pm	Debt Illusion, Broker Usage, and Mortgages	Junhao Liu (University of Sydney)	**Room 5B**
4.20pm-4.45pm	Saving Less and Taking Risks: Including the Age Pension in Retirement Saving and Investment Decisions	Thomas Hendry (Griffith University)	**Room 5B**
4.45pm-5.10pm	Understanding Member' Behavioural Responses to Market Volatility	Inka Eberhardt (CEPAR, UNSW) and Shang Wu (Aware Super) [6.45am Copenhagen, 1 December CET]	**Room 5B**

	Superannuation II Chair – Akshay Shanker (University of Sydney Business School, CEPAR)	**Session 5C**	**Room 5C**
3.30pm-3.55pm	Investigating the Relationship Between Personal Rates of Return Within MySuper and the Account Characteristics that Influence These	Mark Bastiaans (University of South Australia)	**Room 5C**
3.55pm-4.20pm	What Makes 'Superbad'? Exploring the Influence of Different Groups in Superannuation Policy Recommendations	Erin Ma (Queensland University of Technology)	**Room 5C**
4.20pm-4.45pm	Why Time-In-The-Market no Longer Works	John Livanas (State Super)	**Room 5C**
5.10pm	**Closing remarks for Day 1**	Session chairs	Break-out Rooms

Day 2: Thursday 2nd December (AEDT) *(please note: the times shown are Australian Eastern Daylight TIme (AEDT) - please convert the program timing according to your personal time zone)*			
Time (AEDT Time zone)	**Session details**	**Presenter**	**Online venue**
9.00-9.05am	**Opening remarks**	Hazel Bateman (CEPAR, UNSW Sydney)	Main Room
9.05am-10.45am	**Concurrent Session 6: Contributed papers**		**Break-out rooms:**
	Pensions and Long-term Care in Asia Chair – Philip O'Keefe (Ageing Asia Research Hub and CEPAR, UNSW Sydney)	**Session 6A**	**Room 6A**
9.05am-9.30am	Gender Effect in Long-term Care: Evidence from China	Yuanyuan Deng (CEPAR, UNSW) [2.05pm California, 1 December PST]	**Room 6A**
9.30am-9.55am	The Demand for Longevity, Health, and Long-term Care Insurance in the Wake of the COVID-19 Pandemic	Cheng Wan (CEPAR, UNSW)	**Room 6A**
9.55am-10.20am	Fertility, Human Capital and Intergenerational Transfers in Developing Countries	Trang Le (CEPAR, School of Economics, UNSW)	**Room 6A**
10.20am-10.45am	The Spousal Labor Supply Response to a Universal Social Pension in Thailand	Yang Huang (The World Bank)	**Room 6A**

	Home Equity Release Chair – Katja Hanewald (Risk & Actuarial Studies and CEPAR, UNSW Sydney)	**Session 6B**	**Room 6B**
9.05am-9.30am	Delivering Wealth to an Ageing Population: Australia's Three Pillar Approach	Josh Funder (Household Capital)	**Room 6B**
9.30am-9.55am	Evaluating the Australian Government's Pension Loans Scheme	Katie Sun (CEPAR, Risk & Actuarial Studies, UNSW)	**Room 6B**
9.55am-10.20am	Retirement, Housing Mobility, Downsizing and Neighbourhood Quality - A Causal Investigation	Ha Nguyen (Telethon Kids Institute and University of Western Australia)	**Room 6B**
10.20am-10.45am	How do Seniors Conceptualise the Utility Functions of Home and Mental Accounts Attached to Home Equity? - A Pilot Study	Aviel Leong (RMIT)	**Room 6B**
	Annuities Chair – Len Patrick Garces (CEPAR, UNSW Sydney)	**Session 6C**	**Room 6C**
9.05am-9.30am	Gender Price Discrimination in the Annuity Market: Evidence from Chile	Piera Bello (University of Bergamo and ZEW) [11.05pm Bergamo, 1 December CET]	**Room 6C**
9.30am-9.55am	Spousal Death and Survivor's Financial Response	Onur Eryilmaz (ETH Zurich) [11.30pm Zurich, 1 December CET]	**Room 6C**
9.55am-10.20am	Innovative Designing and Pricing of a Hybrid Variable Annuity and Long-Term Care Insurance Product	Yawei Wang (Risk & Actuarial Studies, UNSW)	**Room 6C**
10.20am-10.45am	Voluntary Versus Mandatory Public Annuity Plans: A Common Framework to Understand their Pros and Cons	Qilin Zhang (The University of Hong Kong) [7.20am Hong Kong, 2 December HKT	**Room 6C**
10.45am-11.00am	**Break**		

11.00am-12.30pm	**Session 7: Policy/Industry Panel: The Retirement Income Covenant** Chair - John Piggott (CEPAR Director, UNSW Sydney) *Panellists:* • Jordan George (Retirement, Advice and Investments Division, Australian Treasury) • Suzanne Smith (Executive Director – Superannuation, APRA) • Robbie Campo (Group Executive – Brand, Engagement, Advocacy and Product, Cbus) • Jeremy Cooper (Chairman, Retirement Income, Challenger Ltd)		**Main Room**
12.30pm-1.15pm	**Lunch Break (AEDT)**		
1.15pm-2.55pm	**Concurrent Session 8: Contributed papers**		**Break-out rooms:**
	Retirement Outcomes Chair – Hazel Bateman (Risk & Actuarial Studies and CEPAR, UNSW Sydney)	**Session 8A**	**Room 8A**
1.15pm-1.40pm	Ensuring all Retirees find a Suitable Retirement Solution	David Bell (The Conexus Institute) and Geoff Warren (ANU)	**Room 8A**
1.40pm-2.05pm	A Retirement Choice Support Model	Pamela Hanrahan (Management & Governance, UNSW)	**Room 8A**
2.05pm-2.30pm	Principles and Rules for Translating Retirement Objectives into Strategies	Geoff Warren (ANU)	**Room 8A**
2.30pm-2.55pm	Realistic Spending Levels and Savings Targets for Retirement	Matthias Oldham (Super Consumers Australia)	**Room 8A**

	Pensions and Climate Change Chair – George Kudrna (CEPAR, UNSW Sydney)	**Session 8B**	**Room 8B**
1.15pm-1.40pm	It's Good for the Planet and it's Good for your Portfolio: Encouraging Millennial Participation in 401(k) Plans Through Lowering Barriers to ESG Investing	Rachel Mann (University of Pennsylvania) [Philadelphia 9.15pm, 1 December EST]	**Room 8B**
1.40pm-2.05pm	Modern Challenges to the Prudence Expected of Pension Fund Trustees	Scott Donald (UNSW Law and Justice)	**Room 8B**
2.05pm-2.30pm	Company-level GHG Emissions and an Institutional Investor's Active Ownership: Sorting the Wheat from the Chaff	Robert Annabel (CEPAR, Risk & Actuarial Studies, UNSW)	**Room 8B**
2.55pm-3.10pm	**Break**		
3.10 pm-4.25pm	**Session 9: The Macroeconomic Environment for Superannuation and Pensions** Chair – Hazel Bateman (Risk & Actuarial Studies and CEPAR, UNSW Sydney)		**Main Room**
3.10pm-3.35pm	Estimating the Lifetime Fiscal Impact of Permanent Migration	Peter Varela (The Treasury)	
3.35pm-4.00pm	Wealth Transfers and Inequality in Australia	Rebecca Chin and Catherine de Fontenay (The Productivity Commission)	
4.00pm-4.25pm	The Economy-wide Effects of Mandatory Superannuation and its Tax Concessions	George Kudrna (CEPAR, UNSW)	
4.25pm	**Announcement of the Best PhD Paper Presentation Award by Head Judge Dr George Kudrna**	**George Kudrna (CEPAR, UNSW)**	**Main Room**
4.30pm	**Closing remarks**	**Hazel Bateman (CEPAR, UNSW Sydney)**	**Main Room**

IPRA Special Online Session Program *(subject to minor change)*

Please note: The program times shown are Australian Eastern Daylight Time (AEDT) - please convert the program timing according to your personal time zone.

Time (AEDT)	3 December 2021	
10.00pm - 10.05pm	**Welcome Remarks** John Piggott AO (Director, ARC Centre of Excellence in Population Ageing Research (CEPAR), Scientia Professor of Economics, UNSW Sydney)	
10.05pm-11.20pm	IPRA Special Online Session 1	Session chair: Pablo Antolin (OECD)
10.05pm – 10.30pm	Investigating the Introduction of a Fintech Advancement Designed to Reduce Limited Attention Regarding Inactive Saving Accounts - Data, Survey, and Field Experiment	Maya Haran Rosen (Hebrew University of Jerusalem)
10.30pm – 10.55pm	Understanding the Old Age Financial Stress and Retirement Planning of Workers in the MSME Sector in India	Amlan Ghosh (National Institute of Technology Durgapur, India)
10.55pm – 11.20pm	A Sustainable, Variable Lifetime Retirement Income Solution for the Chilean Pension System	Olga Fuentes (Pension Regulator of Chile)
11.20pm-11.30pm	*Break*	
11.30pm-12.45pm	IPRA Special Online Session 2	Bas Werker (Netspar)

11.30pm – 11.55pm	Gender Gap in Pension Savings: Evidence from Peru's Individual Capitalization System	Javier Olivera (Luxembourg Institute of Socio-Economic Research (LISER), and Pontificia Universidad Catolica del Peru (PUCP))
11.55pm – 12.20am	Set it and Forget it? Financing Retirement in the Age of Defaults	Anita Mukherjee (University of Wisconsin-Madison) *(tbc)*
12.20am – 12.45am	Using a Lifecycle Model to Design Target Date Funds	Brett P Hammond (Capital Group)
12.45am	Closing Remarks	Hazel Bateman (IPRA President, CEPAR Deputy Director, UNSW Sydney Professor)

ABSTRACTS AND SPEAKER BIOS

SESSION 1 – PLENARY

A Preference for Quality: Australian General Public's Willingness to Pay for Home and Residential Aged Care

Julie Ratcliffe[1]

[1]Health and Social Care Economics Group, Caring Futures Institute, Flinders University

Abstract: In Australia and many other countries internationally, aged care services are provided to older people in their own homes or residential care facilities. The majority of these services are funded by the federal government using taxpayer contributions from the general public. However, the monetary value Australians place on aged care services, and the factors that predict this value, have not been examined. We, therefore, sought to determine the general public's willingness to pay (WTP) for aged care services and examine which factors influence this WTP. A cross-sectional contingent valuation survey was administered to a nationally representative cohort of 10,285 Australians between September and October 2020 from the general population aged 18 years and over. Respondents were asked to indicate their WTP values for satisfactory and high-quality aged care services to be provided in the future. A two-part regression model was used to explain what factors explained variation in WTP. In total, 80% (61%) of respondents were willing to pay to access satisfactory (high) quality home care (counterpart figures for residential care were 64% (45%)). On average, respondents were willing to pay between $126 and $158 ($145 and $237) per week to receive satisfactory-quality (high-quality) home care and between $333 and $520 ($308 and $680) per week for satisfactory-quality (high-quality) residential care. Respondents were willing to pay an additional $120 per week on average to access high-quality aged care. Higher WTP values were generally associated with being younger, male, recent experience with aged care through a close family member accessing aged care and ability to pay. These results suggest general public support for payment of individual cocontributions to access aged care services in the future.

Julie Ratcliffe is Matthew Flinders Fellow and Professor of Health Economics in the College of Nursing and Health Sciences. She is the Health and Social Care Economics Theme Lead for the newly established Caring Futures Institute, Flinders University and also holds Honorary Professorial positions in the Institute of Health and Wellbeing at the University of Glasgow and the School of Health and Related Research at the University of Sheffield. Previously Professor Ratcliffe has held academic positions in the Health Economics Research Unit at Brunel University, the School of Health and Related Research at the University of Sheffield and most recently in the Institute for Choice, University of South Australia. During the course of her career, Professor Ratcliffe has published over 200 papers in peer reviewed journals and she has been a chief investigator on over 50 multi-disciplinary research grants including grants awarded by the NHMRC and ARC in Australia and the MRC and ESRC in the UK. Her research interests include the measurement and valuation of health and quality of life outcomes, patient and consumer preferences and the economic evaluation of interventions across health and social care sectors.

Long Term Financing Options for Aged Care in Australia: Lessons from the Royal Commission

PAGONE, Tony[1]; CULLEN, David[2]; BROWNE, Bridget[3]

[1] Chair, Royal Commission into Aged Care Quality and Safety

[2] Chief Economist, National Disability Insurance Scheme and Senior Advisor, Royal Commission into Aged Care Quality and Safety

[3] Partner, EY Australia and Advisor, Royal Commission into Aged Care Quality and Safety

Abstract: For many decades, aged care in Australia has been financed by a mix of public funding, sourced through the general taxation system and private contributions in the forms of means tested fees and co-payment for certain services. In the final report of the Royal Commission into Aged Care Quality and Safety, the Chair of the Commission argued that the current ties between the public financing of aged care and the annual budget cycle have led to many of the ills identified in the Commission as the fiscal priorities of the day have been allowed to take precedence over the delivery of quality care.

Dr David Cullen is currently the Chief Economist of the National Disability Insurance Scheme (NDIS). David was the first person to be appointed Chief Economist of the NDIS. Prior to that he was also the first person to be appointed Chief Economist of the Australian Department of Health. He was a Senior Advisor to the Royal Commission on Aged Care Quality and Safety. David is a Fellow of the Royal Society for Public Health and is Honorary Professor of Health Economics and Aged Care Policy at the National Centre for Social and Economic Modelling at the University of Canberra. David is internationally recognised as one of Australia's leading health economists, with a special interest in the economics of social services and the regulation of social service markets. He was President of the OECD's Expert Group on the Economics of Prevention in 2014 and 2015 and represented Australia at the OECD's 2017 Global Forum on Competition. He has led several major reviews of major Australian Government programs in aged care, disability services and health. In 2015, he was commissioned to provide advice to the Australian Health Ministers' Advisory Committee on improving productivity and efficiency in the Australian health care system, including through payment system reform.

Bridget Browne, BEc, FIAA, FIA, CERA, GAICD is a Partner at EY and Senior Lecturer at ANU providing actuarial consulting advice to the government sector in health and human services and risk quantification. Bridget has over 30 years' experience and is a Certified Enterprise Risk Actuary and a Fellow of both the Institute of Actuaries of Australia and the Institute and Faculty of Actuaries, UK. She has a wealth of experience in financial services having practised in the life insurance and reinsurance sectors in Australia internationally. Bridget has lectured in actuarial studies and risk management at the Australian National University (ANU), with a research focus on aged care, mortality, longevity and securitisation of these risks. Bridget has been a member of the Centre for Excellence in Population Ageing Research and is a Graduate of the Australian Institute of Company Directors. In addition to supporting the Department of Health to model and analyse future demand for and supply of services for aged care needs in the Australian population, she recently had the privilege of working with the Royal Commission into Quality and Safety in Aged Care, specifically exploring and modelling options for future financing.

On Sustainable Aged Care Financing in Australia

SHERRIS, Michael[1]

[1]ARC Centre of Excellence in Population Ageing Research (CEPAR), School of Risk and Actuarial Studies, UNSW Business School, UNSW Sydney

Abstract: The Final Report of the Royal Commission into Aged Care Quality and Safety (2021) highlighted the challenges in developing a sustainable financing system for Aged Care in Australia. The Report recommended additional funding both in the short term and longer term, to provide an adequate level of aged care quality for older Australians including exploring an actuarially based contributory social insurance scheme for aged care. Sustainable financing of aged care requires a balance between government tax-based financing, individual contributions during working life through an aged care levy, co-payments for aged care costs for those receiving aged care and means testing for these co-payments. There should be a role for private market insurance and financing to supplement government financed aged care support.

Michael Sherris is a CEPAR Chief Investigator, Director of Industry Engagement, and a part-time Professor of Actuarial Studies in the UNSW Business School. His research sits at the intersection of actuarial science and financial economics and has attracted a number of international and Australian best paper awards. He has published in leading international risk and actuarial studies journals, including Journal of Risk and Insurance, Insurance: Mathematics and Economics, Scandinavian Actuarial Journal, ASTIN Bulletin, Journal of Economic Dynamics and Control, North American Actuarial Journal and Geneva Papers on Risk and Insurance. He is on the editorial board of the Annals of Actuarial Science and is a co-editor of the North American Actuarial Journal. Prior to becoming an academic he worked in the banking and finance industry. He has been an active member of the Australian actuarial profession having served on the Council of the Institute of Actuaries of Australia. He was President (2008-2009) of the Asia Pacific Risk and Insurance Association and a Board and Executive Member of the Enterprise Risk Management Institute International. He was Chair of the AFIR-ERM Section of the International Actuarial Association until 2019. He was named Australian Actuary of the Year 2007 in recognition of his contributions to actuarial research and education both internationally and within Australia.

SESSION 2A: AGED CARE FINANCING

Understanding the Determining Factors of Aged Care Accommodation Payment Choices

GU, Yuanyuan[1], CUTLER, Henry[1], AGHDAEE, Mona[1], BILGRAMI, Anam[1], YONG, Jongsay[2], GU, Megan[1,3]
[1] Macquarie University Centre for the Health Economy
[2] Melbourne Institute of Applied Economic and Social Research
[3] Independent Hospital Pricing Authority

Funding: This research was partially funded by the Commonwealth Department of Health. The views expressed in this report are wholly those of the authors.

Abstract: Due to population ageing and increased chronic disease prevalence, demand for long term care (LTC) services has been rising in many developed countries. Sustainable LTC financing is required to ensure the delivery of appropriate care that meets the preferences of aged care residents and their families. In many countries LTC providers rely on government contributions to fund capital expenditure. Providers in the US, the UK and Canada mostly rely on debt and equity sourced from financial markets. Australia has a unique financing approach to LTC capital expenditure. Aged care residents can choose to pay a lump sum to providers, known as a refundable accommodation deposit (RAD), with the accommodation payment returned to the resident or estate on leaving care. Alternatively, residents can pay for their accommodation using a daily accommodation payment (DAP) that acts like a rent, or by choosing to pay any combination of RAD and DAP.

Deciding on an accommodation payment type is a complex financial decision. Selling the family home and paying a RAD reduces investment exposure to residential property. Paying a DAP and keeping the family home maintains an investment in residential property, with the income earned from renting that property potentially used to pay for residential care accommodation. Given a resident can pay for accommodation using any combination of RAD or DAP, there will be an optimum combination for a consumer based on their specific financial situation, expected length of stay, level of risk adversity, and views on future asset performance.

Consumer accommodation payment choice ultimately determines the trends in RADs. In recent years, individual preferences have shifted towards DAP as a payment choice. Providers are now concerned that their total RAD balances may decline, thereby significantly increase their liquidity risk, as banks are reluctant to lend to providers to cover a large RAD shortfall on a permanent basis.

To understand why there is such a trend of shifting from RADs to DAPs and to assess if consumers make optimal decisions, a good understanding of what factors drive consumer accommodation payment choices is needed. However, only a few studies researched the topic.

A survey of persons aged 60 years and over, informal carers, and aged care recipients undertaken by KPMG in August 2018 identified several factors that impact the accommodation payment decision. This included the level of the maximum permissible interest rate (MPIR), expected length of stay, personal financial circumstances, whether the consumer is part of a couple, and the time it takes to sell the family home (Aged Care Financing Authority, 2018).

Aged Care Financing Authority (ACFA) has also reported feedback from providers on factors that may impact consumer choice. It suggested a reduction in housing prices and a reluctance for consumers to sell their home in a declining market may reduce the likelihood that consumers to choose a RAD. ACFA also suggested a shift to DAPs may be due to greater consumer awareness of their accommodation payment choices. ACFA noted that the impact of the MPIR on choice depends on investment rates faced by consumers. If the return is greater than the MPIR, the consumer is better off financially investing the lump sum and paying a DAP (Aged Care Financing Authority, 2020).

Our study contributes to the literature via a systematic examination of a large number of predictors of consumer accommodation payment choice. We do so by utilising the linkage between large administrative datasets and novel econometric modelling strategies.

Dr Yuanyuan Gu is a Senior Research Fellow at the Macquarie University Centre for the Health Economy (MUCHE). Dr Gu has established an excellent track record, having published in top health economics journals such as *Journal of Health Economics*, *Health Economics*, and *Social Science and Medicine*. His research is in the broad area of health economics, economics of ageing, choice modelling and econometrics, focusing on preferences, choice, behaviour and performance in the health care system. He has undertaken several pioneering projects related to Australian aged care sector, including the examination of residential aged care financing and financial literacy's role in aged care home payment decision. He has been a Chief Investigator on over $8 million in external funding including an MRFF grant and a Marie Skłodowska-Curie Individual Fellowship. He is an editorial board member of *PharmacoEconomics* and *Journal of Hospital Management and Health Policy.*

Assessing Sustainable Aged Care Financing in Australia

SHIRODKAR, Ellora[1]; SHERRIS, Michael[1]; ZIVEYI, Jonathan[1]; SHEN, Yang[1]

[1]School of Risk and Actuarial Studies, UNSW Sydney; ARC Centre of Excellence in Population Ageing Research (CEPAR)

Abstract: The recent Royal Commission into Aged Care Quality and Safety found that "the current state of Australia's aged care system is a predictable outcome of measures to limit expenditure and ignore the actual cost of delivering aged care" (Commonwealth of Australia, 2021). The ageing population will cause significant financing sustainability issues in the next 20 years, on top of the budget crisis from COVID-19. This thesis, for the first time, determines the cost of aged care from a demand perspective. By applying previous actuarial literature in disability transition models, we are able to project the population within different core activity limitations. The quantification of aged care costs under different sensitivity assumptions guides policymakers and academia on the risks the aged care financing system will face. If supply constraints were removed, the current financing system would not be sustainable, and the cycle of sub-standard care would continue.

This thesis provides evidence that an aged care levy, a recommendation from Commissioner Pagone which was not accepted (Department of Health, 2021), alleviates the burden on government expenditure and should be investigated as a viable financing option for Australia. Co-contributions, currently applied through means-tested arrangements, are necessary for a sustainable financing system and mitigate inter generational equity concerns on younger generations. If future supply of aged care is to be uncapped, private financing mechanisms, for example, private long-term care insurance, annuities, and reverse mortgages, are an avenue of funding that will ensure public aged care costs, as a percentage of GDP, do not exceed their projected value.

The interaction of mortality and disability improvements create the greatest changes in future aged care costs. Whether Australia falls into a 'dynamic equilibrium' or a 'compression of morbidity' is an important concern for policymakers, and future research is needed in analysing disability experience for older Australians. If Australia's aged care system is to "provide a system of care based on a universal right to high quality, safe and timely support and care" (Commonwealth of Australia, 2021), the current financing system needs to be reformed as it will not be sustainable.

Ellora Shirodkar is currently pursuing a Bachelor of Actuarial Studies (Honours) at UNSW having recently graduated from a Bachelor of Actuarial Studies/Bachelor of Economics dual degree. Her research interests lie within population ageing, focused on financing future aged care costs. Her honours thesis, "Assessing sustainable aged care financing in Australia" combines previous Actuarial literature in disability modelling and recent findings from the Royal Commission into Aged Care Quality and Safety to provide an actuarial perspective on future aged care costs and risks. In addition to her study, she is also a Casual Academic Senior Tutor for the School of Economics and has been involved in course development and innovative assessments.

Sustainable Financing of Aged Care Capital Expenditure: Stakeholder Perspectives

GU, Megan[1]; CUTLER, Henry[1]; AGHDAEE, Mona[1]; GU, Yuanyuan[1]

[1]IHPA, Macquarie University Centre for the Health Economy

Abstract: Residential aged care providers must attract a significant and continuous stream of equity and debt, build new facilities, and refurbish old facilities to meet consumer demand and provide quality care. Refundable accommodation deposits (RADs) play a crucial role in the capital funding of these facilities. This study examines the advantages and risks associated with RADs based on stakeholder views. We explored how government policy could mitigate risks associated with a significant reduction in RADs resulting from shifting consumer preference toward Daily Accommodation Payments (DAPs).

We used a qualitative approach to understand the perspectives of aged care sector stakeholders including providers, bankers, valuers, and peak groups. We conducted focus group discussions with 23 providers and interviewed 14 key stakeholders, asking about the use of RADs, the impact of a fall in RADs and alternatives in capital financing. We conducted thematic analysis to code transcripts and identify key themes.

The consensus is that RADs encourage and facilitate capital investment in aged care facilities. They also allow banks to offer cheaper interest rates and greater amount of commercial debt to a larger range of providers. However, providers have no control over residents' accommodation payment choices, making their financial position exposed to shifting consumer preferences for RADs. They also create a more volatile capital structure, and any sustained outflow would reduce liquidity for providers.

Australian Government should intervene if there was a reduction in RAD balances which significantly impact on consumers' access to quality residential aged care. Possible direct interventions targeting providers include more capital grants, guaranteeing commercial debt by banks, establishing a government loan facility as recommended by the Aged Care Royal Commission. Indirect interventions include attracting more real estate investment trusts or commercial debt into the sector, although this would necessitate a substantial increase in provider returns.

Megan Gu is a Technical Manager, Analytics at the Independent Hospital Pricing Authority (IHPA), joining in October 2021. She is also an Honorary Research Fellow at Macquarie University Centre for the Health Economy (MUCHE), where she worked from 2019 to 2021. Megan has experience in applied economic research in healthcare and aged care, with particular focus on working with longitudinal linkage datasets, conducting surveys, and using qualitative methodologies. She previously worked as a Research Fellow at the ARC Centre of Excellence in Population Ageing Research (UNSW) investigating the formation of subjective survival expectations. She is also a former Post-doctoral Fellow at the Centre for Health Economics Research and Evaluation (UTS) (jointly with Capital Markets Cooperative Research Centre), working with an industry partner on research topics including hospital choice and hospital charges. She also served as Public Officer of the Australian Health Economics Society from 2020 to 2021. Megan holds a PhD in Economics from the University of New South Wales and a Bachelor of Economics (Honours) from the University of Sydney.

The Role of Financial Literacy When Paying for Aged Care

CUTLER, Henry[1]; BILGRAMI, Anam[1]; GU, Megan[1]; GU, Yuanyuan[1]; AGHDAEE, Mona[1]

[1]Macquarie University Centre for the Health Economy

Abstract: Deciding how to pay for accommodation when entering residential aged care in Australia is complex. It can impact the residents' income and wealth, along with their bequest value. Many older Australians and their informal carers lack financial literacy, which increases the likelihood of making suboptimal accommodation payment decisions. This may be exacerbated by cognitive decline. Our study examines how the financial literacy of informal carers impacts accommodation payment decisions made by Australians when entering residential aged care. It draws on an Australia wide survey to measure financial literacy among informal carers who helped residents make their accommodation payment decision. We used a set of regressions to estimate the relationship between the respondent characteristics and financial literacy, financial literacy and financial adviser use, and financial literacy and accommodation payment decision confidence, complexity, and stress. We found less than half of respondents were financially literate. Many exhibited underconfidence in their financial literacy, while others were overconfident. Both may lead to sub-optimal accommodation payment decisions. We found aged care providers had a greater impact on using a financial adviser than financial literacy, suggesting a principal-agent relationship exists. Our results suggest higher financial literacy may reduce some decision complexity but its relationship with decision confidence was weak and its relationship with decision stress was not significant. These relationships were moderated by the perceived time available to decide on an accommodation payment. Increasing financial literacy is unlikely to significantly help people make a better accommodation payment decision. Increasing access to financial advice may reduce the likelihood of making sub-optimal decisions, but limited trust and anxiety with using a financial adviser means there is no guarantee that people would use this service. Making the accommodation payment choice simpler may increase welfare by reducing the potential to make a suboptimal accommodation payment decision and reducing decision stress.

Professor Henry Cutler is the inaugural Director of Macquarie University's Centre for the Health Economy, a health economics research team with 15 professional health economists and six PhD students. His career is focused on enhancing health and aged care policy decisions to improve social welfare. He has led or significantly contributed to over 140 health economic research projects funded by Australian and state governments, multinational health care organisations, large not-for-profit organisations and competitive academic grants. Professor Cutler currently sits on the National Mental Health Commission's National Workplace Initiative Evaluation Group. He was an expert witness for the Royal Commission into Aged Care Quality and Safety, and sat on the economic research committee for the Royal Commission into Victoria's mental health system. Prior to MUCHE, Professor Cutler built and led the health economics team at KPMG for nearly four years, and built and led the Sydney Health Economics and Social Policy team at Access Economic for four years. He worked as a senior economic consultant the Centre for International Economics for five years, undertaking microeconomic evaluation of agriculture, international trade and investment, utility regulation and natural resources. He also spent eight years in the debt, equity and derivative markets, both in Australia and the UK.

SESSION 2B: THE IMPACT OF COVID-19 AND MORE

Effects and Impacts of Allowing Early Pension Access: The Chilean Experience

FUENTES, Olga; MITCHELL, Olivia S.; VILLATORO, Félix[1]

[1]Universidad Adolfo Ibáñez Business School

Note: Work in progress, please do not cite.

Abstract: The goal of our paper is to describe and evaluate early pension withdrawals in Chile, 2020-2021, during the COVID-19 pandemic. Similar early access has been permitted in several other countries (e.g., Peru, Australia, US, others) but relatively little is known about the results.

Chile has a three-pillar pension system. The largest component of this system is a mandatory funded defined contribution (DC) scheme, launched in 1981. Under this scheme, formal sector workers contribute 10% of their taxable income into an individual account, which is entrusted to a Pension Fund Manager (Administradoras de Fondos de Pensión – AFPs). These are for-profit and single-purpose private firms, in charge of collecting contributions, keeping records of individual accounts, investing funds, and paying some benefits, such as disability and old-age pensions. By June 2020, assets under management were above US $200 billion, representing 82% of GDP. There is also a solidarity pillar provided by the government, aimed at providing non-contributory pensions for qualifying individuals. The main criteria for eligibility are the amount of self-financed pension, age, years of residency in the country, and belonging to the poorest 60% of individuals. Finally, there is a voluntary savings pillar aimed at increasing self-financed pension; this pillar can include state-matched incentives and tax subsidies for members.

The COVID-19 pandemic had a considerable impact on the Chilean economy. According to reports from the National Statistics Bureau (Instituto Nacional de Estadísticas - INE), unemployment peaked at 13.1% in July 2020. While this figure has fallen to around 10% recently, it remains higher than its pre-COVID levels (7%). Moreover, reported job losses have been higher for women. Overall, the economic impact has been especially hard on women and low- and middle-income households. Amidst these developments, there have been several governmental efforts to support households. These include: cash transfers, job retention schemes, increased unemployment insurance (UI) benefits, along with less requirements to receive UI benefits. According to IMF (2021), the resources devoted to these measures have equaled 14.1% of GDP, while the average for emerging countries is 4.4% of GDP.

Despite this stimulus, pressure grew to allow Chilean pension participants to gain early access to their traditionally illiquid pension funds. With practically unanimous support from legislators, withdrawal was made on a voluntary basis, up to one year after its approval. Moreover, access was unconditional, without requirements or restrictions. For the first two rounds, only active affiliates and pensioners were allowed to tap their savings, while annuitants were also included in the 3rd withdrawal. The second withdrawal was the only one that required individuals to pay income tax if their monthly earnings exceeded US $2,100.

As we will show in our analysis, most members of the system have decided to withdraw their funds. Our work tries to identify the main motivations behind these individuals' decisions.

Félix Villatoro, Ph.D., is an Assistant Professor at Universidad Adolfo Ibáñez Business School, Chile. He is also a research fellow at the Network for Studies on Pensions, Aging and Retirement (NETSPAR). Before joining UAI, he was an economist at the Chilean Banking Supervisor and a senior economist at the Chilean Pension Supervisor. Félix's research focuses on pension systems, including savings and investment decisions made by both individuals and fund managers. His work has been published in the Journal of Banking and Finance, the Pacific-Basin Finance Journal and the Journal of Pension Economics and Finance. As a consultant, Félix has studied the sustainability of pension reserve funds and collaborated in proposing draft regulation to allow Chilean pension funds' investment in alternative assets.

A Market-Linked Annuity

DUNN, Melanie[1]; MINNEY, Aaron[1]

[1]Challenger

Abstract: Australia's Innovative Superannuation Income Stream legislation opened the door for the development of new products to assist retirees maximise their income from super in retirement.

One of the concerns with a traditional lifetime annuity is that the guaranteed income can only be delivered with underlying fixed interest investments. The cost to guarantee returns from 'growth' assets such as shares can be prohibitive. A potential alternative is to access growth markets, but without a fixed guarantee on the income level. An alternative proposed by Dunsford[1] is to create an annuity on investment units and provide income by selling units. However, this is not necessarily easy to administer. This paper discusses an alternative approach, called a market-linked annuity, that grows income in line with an underlying market index (or combination of indices). In addition to explaining the mechanics of such a product, we demonstrate that it is equivalent to providing an annuity invested in the 'growth' assets.

[1] Dunsford, G. (2014, April). Investment Linked Lifetime Annuity. Actuary Australia https://www.actuaries.asn.au/Library/Events/SAF/2014/InvestmentLinkedLifetimeAnnuity.pdf

Melanie Dunn, FIAA, CERA, SSA, is a Fellow of the Institute of Actuaries of Australia specialising in global retirement income systems, and is passionate about the development of retirement solutions and tools to assist in providing retirees with financial security. With nearly 15 years' experience in the sector, she has extensive knowledge and experience with superannuation, SMSFs, and Australia's retirement system. As Senior Manager, Retirement Solutions at Challenger she manages retirement models that allow for decision making in light of uncertainty and risk, assisting with product and solution research and design, and the development of tools for institutions, financial advisers and retirees. Melanie is a member of the Actuaries Institute Retirement Income Working Group and Wealth Management Sub-Committee.

Aaron Minney, CFA, is the Head of Retirement Income Research for Challenger. In this role, he is responsible for the development and dissemination of research on investment and portfolio construction strategies to deliver an appropriate income stream to retirees. Aaron has 26 years' experience as an investment strategist and researcher, across a wide range of asset classes. In his previous roles Aaron has been responsible for the evaluation and strategic development of investment capability; portfolio management, asset allocation strategy; and an economic analysis across his career. Aaron is an Honorary Fellow at the Macquarie Applied Finance Centre where he is an adjunct lecturer in Advanced Investment Management. He has a collaborative participant in an ARC-linkage grant by CSIRO and Monash university into the drawdown of savings in retirement. He was previously a member of the advisory committee to first after-tax return performance index for the Australian equity market.

Allowing Early Access to Retirement Savings: Lessons from Australia

WANG-LY, Nathan[1]; NEWELL, Ben[1]

[1]School of Psychology, UNSW Sydney

Abstract: In response to the COVID-19 pandemic, many governments around the world introduced policies aiming to provide citizens with financial relief through early access to their retirement savings. In Australia, the Early Release of Super (ERS) scheme allowed eligible citizens to withdraw up to AUD 20,000 in funds between April and December 2020. Using data provided by a large Australian bank, we examine the characteristics of the individuals who withdrew, how they used the withdrawn funds, and what impact this had on their financial wellbeing. We find that, for the most part, the scheme achieved its intended goal; it was accessed by individuals in poorer financial circumstances and helped them to pay down high-interest debts and avoid arrears. However, our results also suggest that some individuals may

have used their withdrawn funds on discretionary purchases, contrary to the scheme's intended purpose. Based on our findings, we consider the implications for governments looking to implement similar policies in the future, as well as the opportunities to support individuals who have already withdrawn from their retirement savings.

Nathan Wang-Ly is a PhD candidate at the School of Psychology, UNSW Sydney. His research interest lies in household financial decision-making - particularly how individuals make these decisions when faced with uncertainty. Alongside his PhD, Nathan is part of the Behavioural Economics team at the Commonwealth Bank of Australia. His work involves a combination of research and applied projects that aim to improve the financial wellbeing of the bank's customers and Australians more broadly.

Changes in Investment Switching Behaviour Due to Covid-19 Amongst Superannuation Fund Members

BUTT, Adam[1]; KHEMKA, Gaurav[1]; LIM, William[1]; WARREN, Geoff[1]; WU, Shang[2]

[1]Australian National University

[2]Aware Super

Abstract: The COVID-19 induced market crash in March 2020 saw a significant increase in members making an investment switch decision within their superannuation balance. This research is undertaken by researchers from ANU and Aware Super which is a large Australian superannuation fund to better understand how members made those investment switch decisions during the March 2020 market crash.

Using data from Aware Super, we are studying the characteristics of members who make an investment switch in their superannuation fund balance. In addition to identifying drivers of propensity to switch, we also analyse how this varies with market conditions by comparing the characteristics of members who are ‘switchers’ prior, duing and after the COVID crash periods. This work builds on some preliminary research presented at last year’s Colloquium.

William Lim is an Associate Lecturer and a PhD candidate at Actuarial Studies at the Research School of Finance, Actuarial Studies and Statistics, Australian National University (ANU). William’s research interest includes Superannuation and Retirement Income, Computational Economics, and Long-term Care Insurance. William completed his Bachelor of Actuarial Studies (Hons) at ANU in 2014, with a research paper on calculating mortality and morbidity rates for the elderly. In 2017, he started a PhD program with research aims at personal retirement planning.

SESSION 2C: SUPERANNUATION I

The Pursuit of Tax Aware Investment Management (Taim) to Maxmise Member Outcomes

SIVAPALAN, Thulaisi[1]; LANIS, Roman[1]; WELLS, Peter[1]; GOVENDIR, Brett[1]

[1]University of Technology, Sydney

Abstract: This study evaluates the incidence of taxation of industry superannuation funds in their pursuit of maximising after tax returns to members in the context of fund efficiency. The Cooper Review and Productivity Commission Review highlight the need for efficiency, specifically to eliminate excessive costs (Cooper et al., 2010). Accordingly, this paper evaluates the largest explicit cost to the fund– tax as highlighted by the Cooper Review and Productivity Commission, who both raise concerns about the management of taxes within the superannuation system. Interestingly, analysis of tax has not yet been rigorously pursued (Cooper et al., 2010; Productivity Commission, 2016–2018). This study aims to build upon Mackenzie and McKerchar (2014) and develop a framework of Tax Aware Investment Management (TAIM) activities employed by superannuation funds to manage tax effectively, which will enable more focused research into the tax aware investment strategies of superannuation funds. This study employs multivariate analysis on a sample of 60 fund-year observations over the period 2014 to 2016, to understand whether industry superannuation funds are effectively managing taxation for the benefit of members. The expected findings from this study should provide empirical evidence that suggest that funds that employ Tax Aware Investment Management (TAIM) a better able to manage tax effectively.

Dr Thulaisi Sivapalan, (PhD) (CA) is part of the exciting next generation of pension/superannuation thought leaders who aim to shape the transition of the Australian Superannuation industry for future generations. Thulaisi's PhD empirically evaluates the tax implications of the compulsory superannuation system for the first time in its 30-year history. To accomplish this task, he became a member of 30 superannuation funds to gain access to unabridged audited financial statements. During this quest, he shone light on the lack of transparency in the superannuation system and championed the dissemination of financial documentation and reports. He is currently seeking opportunities to implement the insights gained from conducting a deep dive on Australia's retirement income system. In addition, Thulaisi facilitates postgraduate and undergraduate accounting and business analytics seminars. He has been recognised as one of the Top 20 Postgraduate Teaching Staff across the UTS Business School. His approach aims to empower students with the skills and knowledge to succeed both academically and professionally. To achieve this, he draws upon his extensive corporate experience as a Chartered Accountant, working in the recovery, turnaround and business advisory industry during the global financial crisis (GFC). This gave him the opportunity to engage with diverse clientele in retail, hospitality, finance, health and real estate industries during a period of strong economic headwinds and uncertainty.

A Pathway Forward for Super Funds and Investment Managers Under the Your Future, Your Super Performance Test

BELL, David[1]

[1]The Conexus Institute; CEPAR

Abstract: One of the most controversial elements of the Government's significant Your Future, Your Super (YFYS) reform package was the introduction of a performance test. The performance test is 'bright lines' in nature and is applied retrospectively to all super funds.

The performance test, designed to protect consumers by identifying funds which don't meet a baseline standard of performance, has generated concerns relating to its design and accuracy. There have been claims of 'rough justice' from some parts of industry due to the way some investments and portfolios strategies are assessed.

The performance test and the objective of managing in member best interests are not perfectly aligned. The test focuses on implementation performance, a measure of performance relative to a fund-tailored benchmark of 16 market indices. Member best interests considers total investment outcomes and is risk cognisant.

As super funds integrate the YFYS performance test into their investment governance framework and practices, the trade-offs will become more apparent.

This paper considers the pathway forward for super funds. How do they maximise member outcomes in the presence of the performance test? To address this we explore the alignment between managing portfolios to pass the performance test and maximise member outcomes. We detail how various asset categories experience differential assessment.

This leads us to provide a roadmap to assist super funds determine their investment strategy. It considers the alignment issues, techniques for managing risk, implementation, and regulatory reporting. It accounts for contemporary practices such as the total portfolio approach.

Our conclusion is that performance test risk is likely to be effectively managed to the point that it becomes a non-issue for sophisticated funds in the future. Loss of portfolio flexibility will depend on the aggressiveness of the reporting approach adopted by funds. This has flow-on effects to the broader investment management community.

David Bell is the executive director of The Conexus Institute, an independent research institute focused on improving Australia's retirement system. David is an active researcher in the areas of retirement, superannuation, investment management, and governance. David strives to link industry, academia and policy. David's industry career experiences include working at Mine Super (as CIO), St Davids Rd Advisory (consulting and governance), and CFS GAM (now First Sentier, primarily fund-of-hedge funds). Academically David completed his PhD at UNSW and taught for 12 years at Macquarie University.

Overcoming Supply-Side Resistance to Lifetime Annuities

ASHER, Anthony[1]

[1]UNSW Sydney

Abstract: The Annuity Puzzle is that lifetime annuities are not utilized in retirement as often as might be expected. The literature invariably provides demand side explanations: bequest motives, liquidity preferences, crowding out by social security and family insurance, unattractive investment returns, poor money's worth particularly for those with lower life expectancies and solvency concerns. On closer examination, none of these are found to adequately explain the puzzle, so the accepted view has come to be that a considerable proportion is due to behavioural biases and misunderstandings.

Overcoming behavioural biases and misunderstandings is likely to require a significant advances in the provision of financial advice. The tension between ensuring that advice is both appropriate and affordable is widely recognised, with the current focus in Australia being on simplification and financial technology.

On the other hand, supply side limitations to alternative products have barely been explored; particularly the possibility that it too is due to behavioural biases and misunderstandings. There is evidence of general resistance to change that could be explained by the interests of trustees and advisors to increase the size of their funds under management, and fees. The paper concludes by identifying challenges to trustees, advisors, regulators and academics.

Anthony Asher is an actuary and Adjunct Associate Professor at the UNSW Business School - ie now retired from paid work. His working life has been divided between university teaching and a variety of professional roles including Chief Actuary of a life insurer, consultant actuary to a range of companies and governments, and with APRA. He is currently a member of the Council of the Actuaries Institute and the

Retirement Strategy Group, and Convenor of the Retirement Incomes Working Group, which is working on the design of post retirement products and advice. He is well known in the profession for his interest in ethics in professional life, particularly the social impact of actuarial work.

Optimising the Structure of the Superannuation System

DUNN, Richard[1]; RICE, Michael[1]; STEVENS, Alun[1]

[1]Deloitte

Abstract: Australia's superannuation system is still developing. Since the introduction of mandatory superannuation in 1992, Australians have typically retired with stronger financial outcomes than those who have preceded them. Despite these strong and improving outcomes, domestic commentary on the sector is often negative and focuses on the ways the system needs change to avoid failing consumers.

In response, this paper analyses current system dynamics to establish whether structural change in the system would deliver improved member outcomes. This is achieved through considering the extent to which the current 'privatised-free market' model for the system empowers superannuation funds to provide a balance of strong quantitative and qualitative member outcomes. Extension of this framework to the range of alternative models that have been put forward by industry commentators provides a fact base to help establish whether the current model is a bad egg or an undervalued golden goose.

Richard Dunn joined Deloitte in May of 2021 following the acquisition of the Rice Warner consulting business where he had worked since 2015. Richard applies his experience to the wealth management sector to:

- Review and provide guidance on the behaviour of investment strategies and investment governance, including several material bodies of work on the design of appropriate member-centric strategies in the superannuation sector.
- Provide strategic advice to superannuation funds and wealth management firms regarding their market position, member-centric product design and mergers and acquisitions.
- Produce a range of Public Policy submissions, particularly regarding the development of retirement products and assessing the long-term sustainability of the superannuation sector.

In addition to a combined Bachelor of Commerce and Bachelor of Science (Adv. Math) degree from the University of New South Wales Richard has qualified for fellowship of the Institute of Actuaries Australia (FIAA). During this study Richard specialised in Investment Management and Finance and was subsequently awarded two Andrew Prescott Prizes for the highest performance in each examined course.

Michael Rice specialises in providing strategic advice to the superannuation industry. At Rice Warner, Michael contributed to public policy work, which included submissions to government inquiries and research. He has undertaken pioneering research into Age Pension dependency and trends. He has a keen interest in the integration of social security and superannuation, as well as measuring the adequacy of retirement incomes. Michael has had several industry roles over the years, including being:

- A former Councillor of the Actuaries Institute and an active volunteer. He is a former member of its Public Policy Council Committee from 2014-2019 and was awarded Actuary of the Year for 2017.
- A member of the Advisory Board of the ANU College of Business and Economics (2014 to present).
- A Trustee director of StatePlus from October 2016 to June 2019.
- Chair of QSuper's Investment Committee from January 2009 to June 2013, remaining as an independent investment expert on the Committee until March 2016.

- In 2020, Michael was awarded an Officer of the Order of Australia, “for distinguished service to business and economics, particularly to the actuarial profession, and through advisory roles”.

Alun Stevens has over 30 years’ experience in financial services in Australia and overseas, both in senior management roles and as a consultant. Alun has extensive experience in wholesale and retail markets and has managed and provided advice on product design and pricing, related systems development, marketing, advertising and distribution (both direct and via advisors). He has also had significant involvement in developing and implementing corporate strategy including restructurings, mergers and acquisitions. This includes personal experience of mergers as a director of his own company (which he acquired via an MBO and ultimately listed via a merger) and as a director of NM Health (HBA and Mutual Community) which explored a number of mergers with not-for-profit health funds. His wealth management experience includes life insurance, health insurance, superannuation, funds management, master funds, lending and distribution. He also has experience of the equity and derivatives markets as a broker. Alun’s recent focus has been on specialist benefit design and strategic advice for funds.

SESSION 3: RETIREMENT SANDBOX

Retirement Sandbox: Engaging Young Minds to Provide New Solutions to Old Problems

LIU, Kevin[1,2]; Industry Partner Representatives (Aware Super, The Conexus Institute); Student Representatives[1,2]

[1]School of Risk & Actuarial Studies, UNSW Business School

[2]Aware Super; The Conexus Institute

Abstract: How to increase superannuation engagement amongst young members? How to design a better approach to provide retirement saving and investment information to help super fund members make better decisions? What are the material environmental, social and governance risks and opportunities an long-term asset owner, like superannuation funds, should be considering when making investment decisions? Though academics, policymakers and industry have mounted massive effort to address these ongoing issues, young people, as key stakeholders, are typically not engaged in developing solutions to these most pressing challenges in their tomorrows. Can we inspire young people to be part of this process, to own the problems, and to unleash their creativity and innovation to come up with actionable ideas?

UNSW Business School's Sandbox Education Program is created as a platform to connect the industry, academics, and students, empowering them to co-create solutions to real-life problems. It introduces students to industry projects as part of their coursework. Industry partners develop project tasks that reflect contemporary challenges and then engage with student project teams through the term. Collaborating with leading industry partners, Aware Super, The Conexus Institute and Super Consumers Australia, we have incorporated Sandbox industry projects in the '*Retirement Saving and Spending over the Lifecycle*' course at the UNSW Business School. This provides our students with unique opportunities to learn, engage with industry, and contribute to the solutions to real-world retirement challenges. Our students have impressed us with a range of exciting and innovative solutions, which provides industry partners with fresh perspectives and creative ideas. Our Sandbox collaboration experience shows that we can inspire talented young minds to play an important role in co-creating solutions to the pressing retirement challenges through partnering with industry.

Dr. Kevin Liu is the Undergraduate Program Coordinator of the School of Risk and Actuarial Studies, UNSW Business School. Kevin is a multi-award-winning educator who is committed to empowering students by developing inspirational learning experiences through the integration of a career-focused educational approach and innovative educational technologies. Kevin co-directs the Sandbox Education Program. He pioneered the StoryWall Formative Assessment Model, which has been adopted in over 25 courses at UNSW Business School to engages students as partners in co-creating authentic learning experiences and active online learning communities. Kevin's primary area of expertise is superannuation and retirement income policy. Kevin is also a regular contributor to superannuation policy discussions, and his research is cited by major public reviews and inquiries.

SESSION 4A: PENSIONS, LABOUR SUPPLY AND HOUSEHOLD DECISIONS

Responses to Increases in the Superannuation Preservation Age

CHAN, Marc[1]; POLIDANO, Cain[1]; TONG, Lan[2]; VU, Ha[2]; WILKINS, Roger[1]; HOLLAND, Justin[3]; NGUYEN, Son[3]

[1]University of Melbourne

[2]Deakin University

[3]Australian Tax Office

Abstract: Private pensions are characterized by: (1) illiquidity, whereby individuals cannot access the funds until reaching a withdrawal/access age; and (2) preferential tax treatment of contributions and accrued earnings aimed at boosting retirement savings. The literature to date has primarily paid attention on preferential tax treatment and very little work has been done to understand the impact of illiquidity and how it influences individual decisions in contributions, draw-downs and employment. Understanding these implications is very important for the debate of whether the access age should increase against a backdrop of increases in life expectancy, as has been the case with public pensions (OECD 2017). We aim to address this gap in the literature by studying increases of the Australian superannuation preservation age from 55 to 60 through stepwise increases that were announced in 1997 and began in July 2015. We begin with a lifecycle model that highlights the trade-off between saving for retirement through pension contributions and more liquid forms of savings, and the constraints that forced savings have on consumption and asset allocation. Our initial analysis suggest that the effects of superannuation preservation (access) age increases have a small negative impact on superannuation contributions and little impact on employment, and such as the changes have a positive impact on balance accumulation as intended by the policy makers. Further analysis will tease out the extent to which the changes differ across sub-groups of population and link with the testable theoretical predictions.

Professor Roger Wilkins is the Deputy Director of the Melbourne Institute of Applied Economic & Social Research at the University of Melbourne. He is also the Deputy Director (Research) of the HILDA Survey, Australia's nationally representative longitudinal household study. His research interests include the nature, causes and consequences of labour market outcomes; the distribution and dynamics of individuals' economic wellbeing; and the incidence and determinants of poverty, social exclusion and welfare dependence. As part of his work on the HILDA Survey, Roger produces the annual HILDA Survey Statistical Report, which each year analyses the latest release of the HILDA data. He has also produced the Australian income component of the World Inequality Database since 2014. Roger is a member of the ABS Labour Statistics Advisory Group, and the Australian Housing and Urban Research Institute (AHURI) Research Panel, and is a Policy Adviser for the Australian Council of Social Service. He is also a Research Fellow at the IZA Institute of Labor Economics and a Fellow of the World Inequality Database.

Trends in the Labour Supply of Older Men and the Role of Social Security

YU, Zhixiu[1]

[1]University of Minnesota, Department of Economics

Abstract: The labor supply of older men increased from the 1930s to the 1950s cohort. I estimate a structural model that fits the participation and hours worked by the 1930s cohort well. The observed policy changes in normal retirement age, the earnings test, and delayed retirement credits explain 73.4% and 88.7% of the observed rises in labor force participation and hours worked by the 1950s cohort. Additional policy experiments suggest that postponing retire- ment age have little effect on older workers, while eliminating the earnings test and reducing retirement benefits would further increase older age participation by 3.37 and 5.10 percent, respectively.

Zhixiu Yu is a Ph.D. candidate in Economics at the University of Minnesota. Her research focuses on labor, health, gender, and public economics. She is particularly interested in how the public insurance programs interact with the labor supply, savings, human capital formation, and welfare of their intended beneficiaries throughout the lifecycle. Her research combines rigorous macro models, rich microdata, and large-scale simulations to explore important problems at the interaction of public policy and individual behaviors in the United States. She will be on the job market during the 2021-2022 academic year.

On the Limits of Fiscal Financing in Australia

TRAN, Chung[1]; ZAKARIYYA, Nabeeh[1]

[1]The Australian National University

Abstract: The fiscal challenges owing to the pandemic, natural disasters, low population growth and an ageing population means that Australia faces decades of debt and deificit. Given this context, we examine the extent to which the Australian government could finance its pension and other expenditures, and its debt through changes to the tax system. Using a dynamic general equilibrium overlapping generations model with skill heterogeneity and uninsurable labor productivity risk, we simulate various changes to the tax system to estimate Laffer curves of tax revenue against tax rates and other tax parameters. Our focus is on the peak of the Laffer curves beyond which further changes lead to declining revenues (fiscal limit); and the maximum potential revenue at the peak compared to the status quo (fiscal space). Specifically, we analyse changes to the progressivity and scale of the income tax system, consumption tax rates and company income tax rates. Of these taxes, a flat income tax system has the potential to raise the most revenue. Depending on the degree of openness of the economy, the fiscal limit of Australia's income tax system is a flat tax rate between 60% under closed economy assumptions and 95% under perfect capital mobility. This represents a fiscal space between 116% - 126% of current tax revenue levels.

Nabeeh Zakariyya is a post-doctoral research fellow in the Research School of Economics at the Australian National University. His research focusses on fiscal policy and how it affects economic efficiency, social welfare, and inequality over the life cycle. He is currently working on the ARC Project "Lifetime Approach to Measuring Inequality in Living Standards in Australia" with Associate Professor Chung Tran. His other research projects explore trends in progressivity and redistributive effect of Australia's income tax system, and the dynamic general equilibrium effects of income tax reforms.

SESSION 4B: THE RETIREMENT STANDARD AND NEW RETIREMENT PRODUCTS

Nearly 20 Years of the ASFA Retirement Standard – Why it Remains Realistic and Relevant

CLARE, Ross[1]

[1]Association of Superannuation Funds of Australia (ASFA)

Abstract: Since 2004 The ASFA Retirement Standard has served as reference point for individuals in retirement or planning for retirement. It also is widely used by financial planners, funds and government agencies. It reflects evolving community expectations and spending habits needed to maintain health, vitality, and connection in retirement. Versions of the Retirement Standard have been adopted in the United Kingdom, Hong Kong and New Zealand.

The ASFA Retirement Standard benchmarks the minimum annual cost of a comfortable or modest standard of living in retirement for singles and couples aged around 67, is reviewed regularly and updated quarterly in line with inflation. There also are revisions every five years or so in order to reflect changing living standards and consumption patterns in the Australian community.

ASFA also creates annual retirement budgets for Australians aged around 85. These have less expenditure on leisure activities and transport and more on health care related items.

A few commentators, who can be loosely described as being anti retirement income, have been critical of the ASFA Retirement Standard budgets. However, the thrust of arguments used by such commentators typically are misconceived and/or inconsistent with the needs and aspirations of the great bulk of Australians.

Errors and misinterpretations by such commentators include:

- Assertions that the comfortable budgets only are applicable to the top 20 per cent of the income distribution.
- Paternalistic assessments of what people need rather than having regard to survey and other evidence on what people want.
- That retirees should not share in increases in community living standards over time (despite the Age Pension being indexed to wages and not just CPI increases).
- Misrepresentations of what are in the budgets, including frequency of travel and overseas.
- An inability to distinguish between normative and positive analysis, as in being willing to accept continuance of past failures in retirement income adequacy rather than setting realistic goals for the future.

Ross Clare is Director of Research, Association of Superannuation Funds of Australia (ASFA). Ross Clare joined ASFA in 1996 and has been Director of Research since 2006. In this role he has been responsible for preparation of research papers across a range of superannuation and retirement income issues, including adequacy of retirement income and the structure of the Australian retirement income system. He was responsible, amongst other things, for the development of the ASFA Retirement Standard, which is now very commonly used. He has contributed papers at nearly all of the Colloquiums of Superannuation Researchers that have been held, including the last 25 or so in a row, which must be a record for the Colloquium. Prior to joining the staff of ASFA he held senior positions with the Australian Treasury and an Australian Government research agency, the Economic Planning Advisory Commission. Ross has degrees in Economics and Law from the Australian National University.

An Update on the QSuper Lifetime Pension

SPRAGG, Kathryn[1]

[1]QSuper

Abstract: In response to the Financial System Inquiry, the Government defined that the objective of the superannuation system was to provide income in retirement to substitute or supplement the Age Pension. At this time retirement product options available to members were unfortunately limited. Legislation has since evolved to allow for a new retirement product category called Innovative Retirement Income Streams which is effectively a cross between an Annuity and an Account Based Pension. On 1 March 2021, QSuper launched an Innovative Retirement Income Stream, Lifetime Pension. While it is acknowledged that it is a new product and experience is still evolving, there are some key insights that have been observed since inception.

Kathryn Spragg is a Fellow of the Institute of Actuaries of Australia and a Chartered Enterprise Risk Actuary who specialised in Global Retirement Income Systems. Other relevant qualifications include a Bachelor of Commerce (Finance)/Bachelor of Science (Applied Mathematics) and a Graduate Diploma in Applied Finance and Investment. Kathryn has been part of the Asset Liability Management team within the Investments division at QSuper for eight years. In this team her high level responsibilities have involved the development and setting of strategies for QSuper's accumulation and retirement products. This involves the application of asset and liability management techniques as it applies to QSuper's pension obligations as well as to individual QSuper members. The demographics and transactional behaviours of members and relevant information from the industry (e.g. Australian Life Tables, ASFA Retirement Standards, Age Pension etc.) as used as key inputs for the development of these strategies. Commencing this year, Kathryn became responsible for monitoring and maintaining the solvency of QSuper latest retirement product offering, Lifetime Pension. Kathryn's experience also includes ten years in financial planning developing superannuation/retirement and investment strategy advice, as well as the pricing of various insurance products.

Innovation in Retirement Investing

MCCRUDDEN, Paddy[1]; CAIRNS, Brett[1]

[1]Magellan Financial Group

Abstract: The Australian superannuation system is one of the largest and most sophisticated in the world. But despite the maturity and scale of the system, development of solutions in the retirement phase of superannuation in the last two decades has been lacking. More recently, the commercial opportunity combined with guidance on future obligations of trustees of super funds has led to the development of several retirement income products in the Australian market.

In this paper we outline the thinking behind one of the recently launch retirement products, Magellan FuturePay. The product seeks to balance the competing goals of a regular, predictable income; capital growth to ensure investors' money lasts; and some flexible access to savings during retirement. It utilises several new, and not so new investment technologies – pooling; mutualisation of risk; risk management through reserving; active exchange trade funds; and the ability to trade the same asset on- and off-exchange. We describe how these technologies come together in a single product, and how they can work together to improve outcomes in retirement.

Paddy McCrudden joined Magellan in 2017 as the Head of Retirement Solutions and Data Science. Before that, Paddy worked for 16 years at BlackRock. From 2015 to 2017, Paddy was based in New York where he led a team building quantitative models for global equities and worked as a lead strategist for active equities. Between 2010 and 2015, Paddy was the head of portfolio management for Australian equities based in Sydney, overseeing index, active and long-short funds. Between 2001 and 2010, Paddy was a portfolio manager and trader in a team responsible for multi-asset portfolios. Prior to the finance industry, Paddy worked as a lecturer in pure mathematics at McGill University in Québec and Macquarie

University in Sydney. Paddy earned a CFA in 2005 and holds a Bachelor of Science (hons) from Sydney University and a Ph.D. in pure mathematics from Macquarie University.

Brett Cairns became Chief Executive Officer of Magellan Financial Group in 2018. From 2015 to 2018, Brett was Executive Chairman of Magellan, having been Non-Executive Chairman of Magellan Financial Group since 2013 and having served on the boards of Magellan Financial Group and Magellan Asset Management since 2007. Brett was formerly co-head of the Capital Markets Group within Structured Finance at Babcock & Brown, which he joined in 2002. Brett was a former Managing Director and Head of Debt Capital Markets for Merrill Lynch in Australia where he worked from 1994 to 2002. Prior to joining Merrill Lynch, Brett spent 3 years with Credit Suisse Financial Products, the then derivatives bank of the Credit Suisse group. Brett has a Bachelor of Engineering (First Class Honours), Master of Business Administration and a Doctorate of Philosophy from the University of Sydney.

SESSION 5A: HEALTH AND LONGEVITY

Inequities in the Golden Years: Increasing Returns to Wealth in Healthy and Work-Free Life

BAVAFA, Hessam[1]; MUKHERJEE, Anita[1]; WELCH, Tyler Q.[1]

[1]Wisconsin School of Business, University of Wisconsin-Madison

Note: Preliminary, please do not cite.

Abstract: Recent work has established that the gradient of life expectancy with respect to wealth is large and widening (Chetty et al., 2016). We make three contributions to build on that result. First, the additional years are in healthy, disability-free years, indicating substantial utility gains for the wealthy. Second, the return to wealth in achieving these healthy years is increasing over two recent decades for all but the poorest quartile. Third, the additional years lived by the wealthy result in more years of work (and the most work-free years), exacerbating wealth inequality. The subjective expectations of individuals appear misaligned with the empirical findings, with the least wealthy reporting excessive optimism about life expectancy gains.

Tyler Welch is a second-year PhD Student in the Actuarial Science, Risk Management, and Insurance program at the University of Wisconsin-Madison's Wisconsin School of Business. Tyler aims to focus his research on social insurance, behavioral insurance, longevity risk management, health insurance, and the economics of retirement. Prior to beginning the doctoral program, Tyler earned the Certified Employee Benefit Specialist (CEBS) designation through the International Foundation of Employee Benefit Plans and the Wharton School at the University of Pennsylvania. In 2020, Tyler graduated summa cum laude from Temple University's Fox School of Business with a BBA in Risk Management and Insurance, including focuses on economics and employee benefits. Furthermore, as the 2019 Merton C. Bernstein Intern on Social Insurance with the National Academy of Social Insurance in Washington, D.C., Tyler authored a report with the Congressional Research Service on the Social Security Retirement Earnings Test.

Mortality Heterogeneity and Clustering Using Joint Body Mass Index and Self–Reported Health Trajectories

VHUDZIJENA, Michelle[1,2]; SHERRIS, Michael[1,2]; VILLEGAS,Andrés[1,2] ; ZIVEYI,Jonathan[1,2]

[1]ARC Centre of Excellence in Population Ageing Research

[2]School of Risk and Actuarial Studies, UNSW Business School, UNSW Sydney

Abstract: Mortality models that capture heterogeneity are becoming increasingly important in pricing actuarial products. This is pertinent given the vast amounts of individual level data that provide additional information on health status, socio-economic circumstances and financial wellbeing over time. There is not much work in the actuarial literature on the objective determination of mortality risk profiles using individual level data. This work leverages clustering techniques developed in machine learning to develop homogeneous groups for older adults in the US Health and Retirement Study (N=9, 815) where the data are segmented into distinct mortality risk profiles. We apply an unsupervised k-means 3D algorithm to jointly cluster body mass index (BMI) and self-reported health trajectories. We identify three clusters: normal, stable BMI and declining very good health (A); normal, stable BMI and declining fair (B); high, increasing BMI and declining good health (C). One–Way Anova tests show that the clusters are unique across different socio–economic characteristics and pairwise tests show that the differences between clusters are statistically significant ($p < 0.0001$) even after adjusting for multiple testing. We find very strong evidence ($p < 0.0001$) of an association between mortality and cluster allocation. Pairwise, we have very strong evidence of differences in mortality amongst clusters ($p < 0.0001$). The mortality odds are 0.303(0.274, 0.334) times lower in Cluster A than in Cluster B. They are 0.461(0.412, 0.516) times lower in Cluster A than in Cluster C, and 1.525(1.391, 1.671) times higher in Cluster B than Cluster C. As such, the

estimated predicted probabilities of death are consistently highest in the normal, stable BMI and declining fair health cluster at different ages for both males and females. Consequently, the different annuity prices for the clusters demonstrate that accounting for heterogeneity can lead to fairer pricing and potentially greater demand for annuity products.

Michelle Vhudzijena is a PhD student in the School of Risk and Actuarial Studies at the University of New South Wales. She graduated from Harvard University in 2012 with a Bachelors in Biomedical Engineering. Before her doctoral studies, she worked as an actuarial consultant and biomedical engineering researcher. Her research interests include mortality modelling using multiple health and socio-economic risk factors, cause of death mortality modelling, long term care, predictive models and survival analysis. Most of her work involves unsupervised learning and individual level longitudinal data.

Mortality Sharing in a Multi-State Model of Functional Disability and Health Status

KABUCHE, Doreen[1,2]; SHERRIS, Michael[1,2]; VILLEGAS, Andres M.[1,2]; ZIVEYI, Jonathan[1,2]

[1]ARC Centre of Excellence in Population Ageing Research

[2]School of Risk and Actuarial Studies, UNSW Business School, University of New South Wales

Abstract: We design a pooled health care annuity product that allows sharing mortality risk according to individuals functional disability and health statuses in the presence of systematic trends and uncertainties. In particular, we apply the model proposed in Sherris and Wei (2021), which considers both functional disability and health status to estimate the transition rates. We illustrate the importance of pooling mortality risk on heterogeneous individuals by quantifying the annuity payments for each state and as individuals move to different states. Our results suggest that pooling enhance the annuity payments for those in worse conditions such as disability and chronic illness due to mortality and morbidity credits. Individuals moving into the dependent state have a higher death probability than people staying in the healthy state; hence mortality credits in a pooled health care fund account increase, and the payments in dependency and chronic illness naturally increase. Finally, we incorporate equity into our pooled health care annuity product and compare the benefits with a standard life care annuity. Compared to the standard products, a pooled health care annuity product with equity significantly reduces charges, leaves the risks to the pool members while providing enhanced benefits.

Doreen Kabuche is a PhD candidate at University of New South Wales (UNSW) in Sydney, Australia and a Research Scholar at the Australian Research Council (ARC) Centre of Excellence in Population Ageing Research (CEPAR). She researches on retirement income (pension) products designing, longevity risk and risk management strategies. Her research interest covers a wide range of topics, including population ageing, mortality modelling, pension products, health insurance markets, computational finance, petroleum and energy economics. She holds a Masters in Petroleum, Energy Economics and Finance from the University of Aberdeen, UK and a Bachelor degree in Actuarial Sciences from the University of Dar es Salaam, Tanzania. Prior to her doctoral studies, Doreen was a research fellow at the United Nations Economic Commission for Africa (ECA). She is also an assistant lecturer in the Department of Mathematics at the University of Dar es Salaam, Tanzania.

SESSION 5B: FINANCIAL DECISIONS

Time-Varying Risk Aversion and Investment Switching: Evidence from an Australian Superannuation Fund

ROSANDIC, Kiarna[1]; LIU, Junhao[1]; THORP, Susan[1]; WU, Shang[2]

[1]The University of Sydney

[2]Aware Super

Abstract: Understanding member risk preferences is vital in the design of superannuation investment options. Yet the Australian Government's *Your Super Your Future* reforms and the 2020 Retirement Income Review findings highlight the limited understanding superannuation funds have of member decision-making. The current industry use of simple risk tolerance questionnaires makes it difficult to measure member risk preferences accurately. This research is undertaken collaboratively by researchers from the University of Sydney and Aware Super (a large superannuation fund) to elicit, measure and anlayse risk preferences of superannuation fund members.

Using administrative data and two waves of an internal survey of around 3,300 members from Aware Super, we analyse different survey methods to elicit members' risk preferences and the impact of COVID-19 on their preferences. Our contributions to the literature are two-fold: first, to our knowledge, this is the first paper that compares three common methods to measure risk attitudes: hypothetical income questions, a simulator task and self-reported risk attitude. We compare and contrast the three measures in the context of financial asset allocation in superannuation. Second, we provide empirical evidence of the impact of COVID-19 on risk attitudes. Our preliminary findings show that, despite significant market volatility during COVID-19, the average member risk aversion decreased. We investigate several possible theoretical and behavioural reasons for this change in risk aversion and examine the power of the risk measures to predict member investment selection and switching decisions during COVID-19.

Kiarna Rosandic is a Finance Honours student at the University of Sydney. Her research, undertaken collaboratively by researchers from the University of Sydney and Aware Super, focuses on the power of risk aversion measures to predict superannuation investment selection and switching decisions during COVID-19.

Debt Illusion, Broker Usage, and Mortgages

AGNEW, Julie[1], BATEMAN, Hazel[2], ECKERT, Christine[3], ISKHAKOV, Fedor[4], LIU Junhao[5], THORP, Susan[5]

[1]College of Willam and Mary

[2]UNSW Sydney and CEPAR

[3]University of Technology Sydney

[4]Australian National University

[5]University of Sydney

Abstract: Recent research shows that the presentation format of wealth – as a lump sum or an equivalent income stream - changes consumer satisfaction and related financial behaviour (Goldstein, Hershfield, and Benartzi 2016). We examine a similar presentation effect for debt rather than wealth, specifically, consumer satisfaction with home-loan choices. We test whether and to what extent perception's of lump-sum mortgage debt and equivalent repayment streams are format-dependent. With randomised control experiments, we investigate the effect of lump sum framing on the psychological comfort level and perceived repayment burden of participants. We also explore the impact of using mortgage brokers,

participant financial literacy, risk tolerance and patience on comfort level using OLS and instrumental variables. In addition, we investigate the characteristics of participants who have, or intend to, use mortgage brokers. Our preliminary results show that, given a mortgage debt size, lump sum framing significantly reduces participant comfort with the loan but does not alter their willingness to change the debt size. All else equal, the use of brokers is associated with a higher comfort level with mortgage debt.

Junhao Liu is a postdoctoral research associate at the University of Sydney Business School, and a CEPAR associate investigator. He conducts empirical research on personal finance and financial regulation using a wide range of data sets such as experimental data and statutory filings. Junhao's current projects include studies of the decision making regarding the COVID-19 early access of superannuation and mortgage choices. His other research studies the regulation of insurance contract language and prices. His work has been published in the Journal of Risk and Insurance and the Journal of Consumer Affairs. Before moving to Sydney, Junhao received a Ph.D. in Risk and Insurance at the University of Wisconsin–Madison. Prior to that, he studied mathematics and statistics at the University of Hong Kong and the University of Cambridge and worked in actuarial consulting in Shanghai, China.

Saving Less and Taking Risks: Including the Age Pension in Retirement Saving and Investment Decisions

HENDRY, Thomas[1]; DE ZWAAN, Laura[1]; MACDONALD, Kirsten[1]

[1]Griffith Business School, Griffith University

Abstract: The life-cycle hypothesis and modern portfolio theory are often used as normative mathematical frameworks to optimise household saving behaviour and asset-allocation decisions related to retirement saving. Although the Age Pension is not strictly an 'asset', including future eligible Age Pension payments in the retirement portfolio highlights significant differences in optimal savings and asset-allocations for the rational Australian household. Specifically, many households should adopt riskier portfolios, which are effectively hedged against future Age Pension payments, while consuming more income during working years and saving less than the existing superannuation guarantee. This research is particularly relevant to retirement policymakers as it sheds light on household-level disincentives to save for retirement or take on conservative investments. This research is also relevant to financial advisers, who might recommend certain clients save less and take more risk as a rational utility-maximising strategy.

Thomas Hendry is a PhD candidate at Griffith University. His thesis focuses on the financial wellbeing of young adult households across four areas. Thomas's research interests are personal finance and financial planning, financial technology, and intergenerational equity.

Understanding Members' Behavioural Responses to Market Volatility

BATEMAN, Hazel[1]; EBERHARDT ,Inka[1]; ELLIS, Jacki[2]; WU, Shang[2]

[1]ARC Centre of Excellence in Population Ageing Research, UNSW Sydney

[2]Aware Super

Abstract: The sharp market fall in March 2020 at the start of the COVID-19 pandemic saw many superannuation members switch their investment options, reduce their voluntary contributions and/or withdraw from their super account under the early release scheme. While some of these changes are well-thought-through decisions, many others are likely to lead to worse member outcomes in the long term. This research uses a large-scale survey to study how superannuation fund members respond to market volatility by adjusting their investment options and voluntary contributions. The research further investigates how different types of member communications, such as sending members a reassuring letter or providing retirement benefit projections, could influence the members' decisions. The research findings provide insights into the key drivers behind members' decisions in periods of unusual market volatility,

and evidence of the effectiveness of alternative communication strategies to facilitate better member outcomes. The results will also inform crisis response policies.

Inka Eberhardt is a CEPAR Research Fellow, located in the UNSW Business School. She joined the Centre in October 2018. Inka is interested in the interface between individual behaviour and pension systems. For her dissertation, Inka worked together with the “Bedrijfstakpensioenfonds Detailhandel”, the pension fund of the Dutch retail sector. She uses field experiments and online surveys to research the effectiveness of pension communication on savings and investment behavior. The aim of her research is to improve communication and to enable consumers to make better choices.

Shang Wu is an Associate Portfolio Manager in the Investment Strategy team at Aware Super. Shang joined Aware Super in August 2017 and in this time has focused on retirement strategy research including the development of retirement solution for the fund. He is also responsible for member outcomes modelling and research collaboration between the fund and academia. Shang has over 9 years of experience in retirement income research. Prior to joining Aware Super, Shang was a Senior Research Associate at the University of New South Wales where he obtained his PhD in Actuarial Studies. His academic research focuses on financial decision making in retirement. He has published several papers in leading international economic journals. Shang is also a qualified actuary and a member of the Retirement Income Working Group of the Actuaries Institute.

SESSION 5C: SUPERANNUATION II

Investigating the Relationship Between Personal Rates of Return Within MySuper and the Account Characteristics that Influence These

BASTIAANS, Mark [1]

[1]University of South Australia

Abstract: The MySuper Dashboard ‘representative member’ investment return is intended to inform MySuper superannuation members about their fund’s performance and, by inference, the returns received on their superannuation investment. However, this brings forward the question: Who exactly is the ‘representative member’? This study argues that a reliance on the MySuper Dashboard ‘representative member’ return leads to a lack of transparency on investment outcomes experienced by its members. To show this, Excel’s XIRR formula is used to derive individual MySuper member money-weighted personal rates of return, making explicit the dispersion of personal rates of return relative to the superannuation fund’s ‘representative member’. Additionally, the study utilises a multiple regression framework to identify cohort account characteristics and specific transactions (cash-flows) that impact on investment returns achieved. The study finds use of a single figure for communicating a MySuper fund’s investment return is inaccurate, as evidenced by 84.2 per cent of members in the study received a personal rate of return below that of the MySuper Dashboard ‘representative member’. Higher opening account balances, not paying insurance premiums, and more frequent contributions, have a positive effect on personal rates of return. Being female, paying insurance premiums, having a higher salary, receiving less frequent SGC, and Hardship payments, have a negative effect on personal rates of return. Transparency and member best interest reporting support the inclusion of the individual member money-weighted personal rate of return in member statements and fund communications (by cohort).

Mark Bastiaans is a Masters by Research student and casual lecturer in Personal Finance and Insurance at UniSA Business. His research investigated the personal rate of investment returns achieved by individual superannuation fund members invested in a default ‘MySuper’ product. Mark is a Certified Financial Planner (CFP®) with over 20 years’ experience in providing personal financial advice in a range of business environments, including family practice, retail banking, corporate and employer superannuation schemes. His qualifications include a Bachelor of Business (Banking & Finance) from UniSA, and an Advanced Diploma in Financial Services (Financial Planning) from Kaplan Professional. Mark is a member of the Financial Planning Association (FPA) and is a registered Tax (Financial) Adviser with the Tax Practitioners Board.

What Makes 'Superbad'? Exploring the Influence of Different Groups in Superannuation Policy Recommendations

MA, Kexin (Erin)[1]; DE ZWAAN, Laura[2]

[1]School of Accountancy, Queensland University of Technology

[2] Department of Accounting, Finance and Economics, Griffith University

Abstract: Superannuation is of growing importance to the future economic stability of Australia. Totalling $3.1 trillion at the end of the March 2021 quarter, superannuation is now around 175% of GDP and contributes significantly to Australia being the fifth largest funds management market in the world (Tang, 2020). Given the importance of superannuation to national savings and the retirement income of the population, understanding the different groups involved and how their interests are represented is of upmost importance. Drawing on lobbying participation and influence research, this paper explores the 2017 Parliamentary inquiry into superannuation guarantee non-compliance using interpretive content analysis. We examine the 65 submissions to the inquiry and the subsequent recommendations that were

made in the 'Superbad - Wage theft and non-compliance of Superannuation Guarantee' (2017) report. We identify most submissions are used to lobby the committee to take actions that serve their self-interests of the submitter. Overall, we identify the final recommendations serve the public interest; however the process has the potential to be influenced by superannuation funds.

Erin Ma is a PhD candidate in the School of Accountancy at Queensland University of Technology (QUT). Her current research is motivated by the 2017–2019 Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry, which revealed a fees scandal where superannuation funds were making profits while disregarding the interests of members. Her research examines superannuation fees and costs disclosure from a member's perspective, member engagement with disclosures, and the efficiency of superannuation funds. Prior to commencing her PhD, Erin completed her Diploma of Business, Bachelor of Business, and Bachelor of Business (Honours) at QUT.

Why Time-In-The-Market no Longer Works

LIVANAS, John[1], WU Charles[1], CHAN Allan[1], HUANG, Andrew[1]

[1]State Super

Abstract: The contemporary wisdom amongst financial investment strategists, is that timing the market creates significant risks, and that maintaining a strategic investment strategy over multiple market periods, is the preferred option. The proof is provided in terms of average investment returns over differing time periods. However, as Superannuation Funds move to outlows, is this thinking still appropriate.

We start off by noting that investor cashflows affect the dollar outcomes under different scenarios, even with precisely the same percentage investment return sequence. We then demonstrate that a lower volatility investment strategy can provide better dollar outcomes in a negative cashflow fund, even with the same (or lower) percentage investment return). Lastly we note that outdlows are time sensitive, and downside protection, whether passive, or in investment strategy tilts, is a necessary tool to maximise investor outcomes. In order to support such investment strategy tilts, we propose a machine learning system within a governance structure, and demonstrate its development and successes to date.

John Livanas is the CEO of the A$42bn fund State Super, one of the oldest funds in Australia and one of the top 100 funds in the world. He is also on the Board of the Australian Council of Superannuation Investors (ACSI), and is a member of the University of Sydney, Investment Committee.Prior to joining State Super, John was CEO for the A$3.0bn AMIST Super Fund. His financial services career has spanned over 25 years and has included being General Manager of the A$20bn FuturePlus Fund and was the inaugural CIO of SEBO, the precursor to the US$168bn sovereign fund of South Africa. He has also held senior executive roles in consulting and industry at organisations including Deloitte, Kimberly Clark, McCann Erickson (Europe), Rothmans (Australia), eCom Global and Denel.He holds an MBA and a BSc (Elect. Eng.) from the University of the Witwatersrand, Johannesburg, and has undertaken postgraduate work with UNSW and University of Wollongong.

DAY 2: THURSDAY, 2 DECEMBER 2021

SESSION 6A: PENSIONS AND LONG-TERM CARE IN ASIA

Gender Effect in Long-term Care: Evidence from China

DENG, Yuanyuan[1]; HANEWALD, Katja[1]; SI, Yafei[1] ; WANG, Melantha[2]

[1]UNSW Sydney, ARC Centre of Excellence in Population Ageing Research (CEPAR)

[2]UNSW Sydney

Abstract: Population aging causes growing needs for long-term care, especially for older women. At the same time, most informal caregivers are female. Given the observed benefits of gender matches in health care and education settings, this paper investigates the impact of the gender match effect on health and long-term care outcomes at older ages. Using data from the 2018 wave of the Chinese Longitudinal Healthy Longevity Survey, we find that disabled older adults who receive informal care from caregivers of the same gender are more likely to receive adequate long-term care and enjoy better self-reported health compared to those who receive informal care from caregivers of the opposite gender. Our results suggest that the health of older male Chinese could be improved if they received more informal care from male caregivers. Long-term care policies should encourage sons to care for fathers and provide advice and support for male caregivers.

Yuanyuan Deng is a CEPAR Senior Research Associate. She is an applied microeconomist with broad empirical interests focusing on Health Economics, Public Economics, and Labor Economics. Her research has been supported by the Michigan Retirement and Disability Research Center (MRDRC) and the Center for Retirement Research (CRR) at Boston College. Yuanyuan is current working on issues related to the same-gender effect on long-term care in China, the first-interview effect related to the recovery from mobility limitations among older Americans, and the intergenerational effect of depression on children's life outcomes. She is also working on projects investigating the relationship between measures of labor supply flexibility and portfolio-choice decisions. Yuanyuan received her Ph.D. in Economics from the State University of New York-Stony Brook in 2016. Before joining CEPAR, she held positions at Singapore Management University.

The Demand for Longevity, Health, and Long-term Care Insurance in the Wake of the COVID-19 Pandemic

WAN, Cheng[1]; BATEMAN, Hazel[1]; FANG, Hanming[2]; HANEWALD, Katja[1]

[1]School of Risk & Actuarial Studies, UNSW Sydney, and CEPAR

[2]Department of Economics, University of Pennsylvania; School of Entrepreneurship and Management, ShanghaiTech University; and CEPAR

Abstract: We conduct an online survey to a sample of 1,000 urban Chinese of retirement age to elicit and analyse preferences for retirement insurance products including longevity, health and long-term care insurance products in the wake of the COVID-19 outbreak. We designed a sequence of choice tasks to elicit the preferred allocation of retirement financial assets across a savings account, a life annuity, critical illness insurance and long-term care insurance and the extent to which access to retirement insurance products would lead people to release precautionary savings for longevity insurance. Our survey also collected comprehensive data on personal preferences, financial competence, demographics and socioeconomic indicators as well as variables measuring the effects of COVID-19 on personal finance, mental stress, and risk-taking behaviours. On average, the most preferred retirement portfolio comprised health-contingent insurance that covers 50% of the expected out-of-pocket (OOP) costs for critical illness

and long-term care, a monthly annuity of ca. 19.6% of the average disposable income in urban China, with the remaining retirement wealth placed in a savings account. However, we find considerable variation in portfolio composition by personal characteristics. The portfolio that covers 50% of the OOP costs for long-term care is most effective to release precautionary savings to increase annuitisation. Findings inform the development of retirement products in China and other developing economies facing population ageing and incomplete insurance markets.

Cheng Wan is a Research Associate in CEPAR's UNSW Business School node. He has recently submitted his PhD thesis on retirement insurance in China at the UNSW School of Risk & Actuarial Studies. Cheng has a Master of Science in Statistics from Katholieke Universiteit Leuven and a Bachelor of Science in Computational Mathematics from Wuhan University. Before pursuing the PhD, Cheng was a Research Manager in Willis Towers Watson Research and Innovation Centre (Wuhan Office). Cheng's research interests focus on pensions economics and finance, individual retirement financial planning, health risks of environmental factors, and longevity risk management. He has shared his research in many conferences and workshops, including the International congress on Insurance: Mathematics and Economics, American Risk and Insurance Association Annual Meeting, Colloquiums from International Actuarial Association, Longevity, Netspar International Pension Workshop, International Health Economics Association World Congress, and past colloquiums on Pensions and Retirement Research. Part of his research at Willis Towers Watson has been published in Insurance: Mathematics and Economics.

Fertility, Human Capital and Intergenerational Transfers in Developing Countries

LE, Trang[1]

[1]CEPAR, UNSW Sydney

Abstract: How does low fertility associate with lower income? This paper seeks an answer for this seeming extraordinariness in the effects of potential market failures on fertility and education. Relying on the assumption that parents and children are linked through two-sided altruism, I present a simple life-cycle model of endogenous fertility, education investment, and intergenerational transfer. Two specific market frictions are taken into consideration, including (i) the borrowing constraint, which is simplified to the no-loan situation; and (ii) the property rights constraint, the limited right of parents to claim over kids' resources. Utilizing the model, I show that while sufficiently high-income families are not affected by the constraints, lower-income families are more likely to face either restriction, which significantly dampens both fertility and education to inefficiently low levels. The property rights constraint tends to exert a dominant impact but does not always obscure the borrowing constraint. The results provide an insightful policy implication for developing countries where pension plan and credit access are absent.

Trang Le is a Ph.D. candidate at the School of Economics, University of New South Wales and is also affiliated with the ARC Centre of Excellence in Population Ageing Research (CEPAR). Before joining UNSW, she worked as a research associate at Asian Development Bank Institute (ADBI) in Japan and a lecturer at Banking Academy in Vietnam. Trang Le's current work focuses on the aging population issue in emerging countries, especially fertility, education investment, and long-term care, to produce insightful implications for public policy decisions. Her expertise includes modeling and estimating the model with a large dataset from Indonesia and Vietnam.

The Spousal Labor Supply Response to a Universal Social Pension in Thailand

GILES, John[1]; HUANG, Yang[2]

[1]The World Bank and Institute for Labor (IZA)

[2]The World Bank

Abstract: This paper investigates the causal impact of the universal social pension (Old-Age Allowance, OAA) introduced in Thailand in 2009 on the consumption and the labor supply responses of recipients and their spouses. The empirical results obtained by Difference-in-Difference and Fuzzy Regression Discontinuity Design show that OAA does not generate significant impacts on household poverty status or expenditures but receiving OAA has a significant negative impact on beneficiaries' own labor supply decision. When a spouse receives a pension, both men and women are more likely to stop working and become inactive. Pension receipt by a wife has a larger impact on the employment of a husband relative to the impact on employment induced by a husband's receipt of a pension. While single women are less likely to perform household chores if they receive a pension, married women are more likely to report "household chores" as their primary job if their husband receives a pension. Taken together, the findings suggest that a full understanding of the labor supply responses to pension income should be conducted at the household or family level.

Yang Huang is Economist with the Social Protection & Jobs Global Practice (East Asia and Pacific Unit) of the World Bank. He is an applied labor economist by training and has led or worked on several World Bank lending operations and analytical work in both East Asia and Africa. His research interests include migration and the left-behinds, aging and elderly care. Yang received his Ph.D. in Economics in 2017 from the Paris School of Economics and École des Hautes Études en Sciences Sociales, Paris. His Ph.D. dissertation is about the "left-behinds" in rural areas of emerging countries. Prior to joining the Social Protection & Jobs Global Practice, he worked with the Human Development and Public Services Team of the Bank's Development Research Group (DEC) for five years.

SESSION 6B: HOME EQUITY RELEASE

Delivering Wealth to an Ageing Population: Australia's Three Pillar Approach

FUNDER, Josh[1]

[1]Household Capital

Abstract: Australian retirees have the highest median wealth in the world and yet our current retirement funding system does not deliver adequate access to wealth to meet the longevity needs of an aging population. Drawing on the work of the Australian Retirement Income Review and the Retirement Income Covenant, a newly developed Three Pillar approach to retirement funding promises to deliver greater access to wealth and improved retirement funding and housing outcomes.

Pillar 1: Government Funded Pension (means tested, sustainably funded)

Pillar 2: Universal, compulsory superannuation savings (immature for baby boomers)

Pillar 3: Private Savings including Home Equity (currently 3-4 times superannuation savings)

To deliver widespread access to wealth, new forms of guidance, defaults and products will be required - full financial advice will not meet mass market needs. In this session, a new default product guidance is proposed to deliver Three Pillar retirement funding in Australia.

Dr Josh Funder is CEO and Managing Director of Household Capital, an innovative Australian home equity retirement funding provider which has raised over $25m in equity and $300m in wholesale debt. Household Capital's mission is to help retired Australians Live Well At Home, drawing on over $1trillion in home equity already saved by retirees to improve retirement outcomes and meet the challenges of an aging population. Household Capital founded and hosts the Three PIllars Forum, an annual meeting of experts from the pension, superannuation and home equity sectors. Prior to founding the company in 2016, he was a director of Celladon Inc (NASDAQ: CLDN) and spent over a decade as a partner at GBS, Australia's largest venture funds management firm. He previously worked at Infinity Inc (NASDAQ: INFI) in Boston, and at the Boston Consulting Group in San Francisco. Working with the Clinton Foundation HIV/AIDS Initiative, Josh helped successfully negotiate reduced prices for anti-retrovirals and initiate pharmaceutical supplies across eastern and southern Africa. Josh is a co-founder, director and former chairman of Per Capita, whose research on longevity and positive ageing formed part of the inspiration for Household Capital. He is also the author of the novel, Watson's Pier (MUP 2015). Joshua earned B.Sc. and LL.B. degrees at Melbourne University, an LL.M. degree at the London School of Economics and a D.Phil in intellectual property for biotechnology from Oxford University, where he studied as a Rhodes Scholar

Evaluating the Australian Government's Pension Loans Scheme

SUN, Katie[1]; BATEMAN, Hazel[1]; HANEWALD, Katja[1]

[1]University of New South Wales, ARC Centre of Excellence in Population Ageing Research (CEPAR)

Abstract: We evaluate the Pension Loans Scheme (PLS), an Australian government-offered reverse mortgage designed to help supplement retirement income. The PLS allows older homeowners to continue to age in place while receiving loans with their home equity as security. The PLS remains understudied in academic research, despite policy interest (including proposed changes to the PLS in the most recent Federal Budget) and its uniqueness as a government-offered reverse mortgage in which loan payments are linked to the level of Age Pensions.

To study the PLS, we develop a new stochastic model to reflect the circumstances of typical Australian retiree households facing financial uncertainty and longevity and health risks. We use our model to consider welfare gains from PLS use across various household structures and wealth levels. We run

scenario analyses that consider different methods of utilising the current PLS, and assess the introduction of lump-sum advances in the future PLS (effective from 1 July 2022, as proposed in the 2021-22 Federal Budget). We also perform policy experiments that aim to increase welfare gains by considering further changes to the PLS design.
We show that a government-offered reverse mortgage scheme, in which loan payments are linked to public pensions, is a welfare-enhancing method of supplementing retirement incomes. We find that choosing to receive the maximum payment is the most welfare-enhancing method of utilising both the current and future PLS for most households. In particular, conclusions we draw from our modelling of the current PLS are found to be broadly consistent with insights from analysis of PLS loan and participant data. We also show in policy experiments that increasing the maximum permissible payment from the PLS does not benefit most households, but reductions in the interest rate do.

Katie Sun has a Bachelor of Actuarial Studies (Co-op), and is currently completing an Honours year in Actuarial Studies at UNSW. She is supervised by Professor Hazel Bateman and Dr. Katja Hanewald.

Retirement, Housing Mobility, Downsizing and Neighbourhood Quality - A Causal Investigation

NGUYEN, Ha[1,2]; MITROU, Francis[1,2]; ZUBRICK, Stephen[1,2]

[1]Telthon Kids Institute

[2]The University of Western Australia

Abstract: This paper provides the first causal evidence on the impact of retirement on housing choices. Our empirical strategy exploits the discontinuity in the eligibility ages for state pension as an instrument for the endogenous retirement decision and controls for time-invariant individual characteristics. The results show that retirement leads to a statistically significant and sizable increase in the probability of making a residential move or the likelihood of becoming outright homeowners. We also find that individuals downsize both physically and financially and tend to move to better neighbourhoods or closer to the coast upon retirement. We additionally discover that some housing adjustments take place up to 6 years before retirement. Moreover, our results reveal significant heterogeneity in the retirement impact by gender, marital status, education, housing tenue, income and wealth. Within couple households, housing mobility choices are primarily influenced by the wife's retirement while housing downsizing decisions are only affected by the husband's retirement. The results suggest that failing to address the endogeneity of retirement often under-states the retirement impact on such housing arrangements.

Ha Nguyen is a Senior Research Fellow at the Telethon Kids Institute. He also holds an adjunct Senior Research Fellow position at the Centre for Child Health Research, the University of Western Australia. He received his PhD in economics from the Australian National University. His general research interests have focused on applied econometrics, particularly in the fields of health economics and labour economics. He has published widely in both academic and policy outlets, with articles appearing in high-ranking economics journals, including Journal of International Economics, Health Economics, American Journal of Health Economics, Journal of Population Economics, Social Science & Medicine, Labour Economics, IZA Journal of Labor Economics, International Migration Review, Journal of Development Studies and Economic Record. He has collaborated on a number of research projects funded through grants awarded by the Australian Research Council and the Australian Housing and Urban Research Institute.

How do Seniors Conceptualise the Utility Functions of Home and Mental Accounts Attached to Home Equity? - A Pilot Study

LEONG, Aviel[1]

[1]RMIT, School of Economics, Finance and Marketing

Abstract: Releasing home equity has been promoted as an important tool for people facing shortfalls in their retirement savings. Often seniors will make decisions about downsizing or accessing financial products like reverse mortgages or home reversion schemes only when under duress, like when a health crisis occurs, or a partner needs to go into care. Seniors tend not to use their home equity even when living in sub-par conditions such as inadequate heating or leaky roofs, (Widdowfield & Wilkinson 2002; You & Kim 2019). This is despite its potential to relieve financial stress and improve quality of life by facilitating "in-place" independence. Low use of home equity also runs contrary to lifecycle theory's prediction, which posits that individuals will consume accumulated wealth in life's late years. Although studies have been conducted to explain the limited use of home equity, few have explored the actual decision making process employed by seniors. Previous findings suggest that retirees associate home equity with three utilities, a) housing utility, b) insurance utility (as "precautionary savings") and c) investment utility (includes bequest motives). However, to date the literature lacks analysis of all three utilities together. These associated trends appear to satisfy the "mental accounts" concept introduced by Richard Thaler (Seiler, Seiler & Lane 2012; Thaler 1990). Drawing on the lifecycle theory and mental accounting concepts, this research uses qualitative interviews to explore how seniors are making decisions relating to home equity access, and investigates the utility functions. Perspectives will be gleaned from home owners and from financial advisers. Insights into seniors' home equity decision making framework will also aid in exploring the trade-offs between retaining 100% of home equity while realising ageing in place and the expectations of a given quality of life in the later years.

Aviel Leong is currently a PhD researcher with RMIT researching the topic of Using Home Equity to Aid Ageing in Place. Her current areas of research include financial well-being in retirement and cryptocurrencies. Prior to entering academia, Aviel worked as the Vice President of Equities in Merrill Lynch, and as an investment analyst for various asset management houses as well as government bodies such as Ministry Of Finance (Singapore) in valuing investment portfolios and projects. She had also participated in market and policies' research for Singapore's reverse mortgage industry. Her work across different sectors has taken her to work in China, Singapore, Hong Kong, Australia, and the US. During her time as a RMIT researcher, she has also co-authored a paper on reverse mortgages.

SESSION 6C: ANNUITIES

Gender Price Discrimination in the Annuity Market: Evidence from Chile

BELLO, Piera[1,2]

[1]University of Zurich

[2]ZEW

Abstract: This paper provides the first evidence for discriminatory behaviour against female consumers in the annuity market. It focuses on Chile, where an electronic bidding system allows retirees to receive offers, simultaneously, from several firms in the market for the same standardised annuity product. By exploiting within-individual variation in initial offers across firms, the analysis shows that firms with market power offer more unfairly priced annuities to women than to men. The result is driven by highly rated firms. Gender differences in risk-aversion can explain why firms find it profitable to offer higher prices to women.

Piera Bello is an assistant professor of economics at the University of Bergamo. She is also a ZEW research associate and research fellow at NETSPAR and BAFFI-CAREFIN centre (Bocconi University). Her research has focused on household finance and retirement and has been published e.g. in the Journal of Public Economics, Journal of Economic Geography, Economic Inquiry, International Tax and Public Finance, and Population Studies. Her recent work examines the functioning of annuity markets.
Piera Bello received her PhD from the Università della Svizzera italiana (USI) in 2016. Prior to joining the University of Bergamo, she worked as a postdoctoral fellow at University College London and at the University of Zurich.

Spousal Death and Survivor's Financial Response

DAMINATO, Claudio[1]; ERYILMAZ, Onur[1]; GEMMO, Irina[2]

[1]Center of Economic Research at ETH Zurich, Switzerland

[2]University of St. Gallen, Switzerland

Abstract: Spousal death represents one of the most severe financial shocks that an individual may face during their life-cycle. Understanding to what extent individuals are insured against financial risks accompanying the death of their spouse is a key question in the design of old-age support policies. In this paper, we examine implications of a spousal mortality shock on survivors' consumption in the U.S. Combining data from the Health and Retirement Study with data from the Consumption and Activities Mail Survey, and exploiting an event-study research design, we find evidence that, while both non-durable consumption and durable spending decrease sharply following the spousal death shock, consumption per adult equivalent is on average unaffected. We interpret this result as evidence of complete consumption insurance against spousal death shocks. However, we find large consumption response heterogeneity between widows and widowers, and provide suggestive evidence that wealth effects play a major role in explaining this finding. Further, our results support the notion that wealthier households use their financial wealth to insure their consumption against mortality shocks.

Onur Eryilmaz is a second year PhD student at the Center of Economic Research at ETH Zurich, supervised by Antoine Bommier. His research interests lie in the areas of household finance, microeconometrics, and the economics of climate change. Onur is currently focusing on the role of collective models in understanding household portfolio choices and retirement decisions. He obtained a master's degree in Economics at the University of Mannheim, where he wrote his master's thesis on the impact of large-scale natural disasters on individual risk preferences and subsequent financial decisions.

Before joining ETH Zurich, Onur worked as a pre-doctoral researcher at the Goethe University Frankfurt and as a junior research manager at the Center for Evaluation and Development in Mannheim (C4ED).

Innovative Designing and Pricing of a Hybrid Variable Annuity and Long-Term Care Insurance Product

SHERRIS, Michael[1]; SHEN, Yang[1]; WANG, Yawei[1]; ZHU, Dan[2]; ZIVEYI, Jonathan[1]

[1]School of Risk and Actuarial Studies, ARC Centre of Excellence in Population Ageing Research (CEPAR), UNSW Sydney

[2]Monash University

Abstract: This paper presents a novel pricing framework for a combo product consisting of a variable annuity (VA) contract embedded with guaranteed minimum accumulation benefits (GMAB) rider and long-term care (LTC) insurance using the Fourier Cosine series expansion (COS) method when the underlying fund evolves according to the geometric Brownian motion (GBM). A 5-state Markov chain disability transition model is developed in modelling disability transitions for the entire Australian male and female population. The weighted least squares method is applied to calibrate the parameters of the transition intensity matrix of the multiple disability state Markov chain model. When we examine the future life expectancy, we observe females are more exposed to the longevity risk and disability risk than males. Numerical comparisons for the combo product with Monte Carlo simulation show that the COS method is computational efficient and accurate. Cost efficiency analyses relative to standalone LTC and VA with GMAB riders reveal that the combo product is attractive from both the policyholders' and policy providers' perspective. When we examine the price sensitivity of the combo product with respect to time to maturity, we observe a concave shape curve which is typically seen when plotting a European call option price against various time to maturities. The price is an increasing function of the guaranteed variable annuity benefit and the health contingent payment, a policy with longer maturity is the more price sensitive to the guaranteed death benefits, a policy with shorter maturity is the more price sensitive to the guaranteed survival benefits, and the price increases with the increasing volatility and decreases with the increasing interest rate. The results provide a comprehensive analysis of pricing the VA embedded with GMAB and LTC riders.

Yawei Wang is currently taking Master of Pre-Doctoral Business Studies at UNSW. He is also a research assistant at the ARC Centre of Excellence in Population Ageing Research (CEPAR). His current research interest is retirement income products innovation.

Voluntary Versus Mandatory Public Annuity Plans: A Common Framework to Understand their Pros and Cons

LAU, Sau-Him P.[1]; ZHANG, Qilin[1]

[1]Faculty of Business and Economics, The University of Hong Kong

Abstract: Many countries have recently adopted the fully-funded retirement financing system, but one disadvantage of this system is that retirees have to bear longevity risk. In this context, several economies have also introduced the public annuity plans. Using a simple model with asymmetric information on survival probability and different degrees of choice restriction, we provide a unified framework to understand the pros and cons of voluntary public annuity with ceiling (VPAc) plan versus mandatory public annuity with flexibility (MPAf) plan that are empirically observed. Introducing either plan reduces the severity of adverse selection in the public annuity market, but further distorts the private annuity market. These two plans have systematically different effects on retirees' utility levels: the healthy (or wealthy) group loses but the intermediate group benefits. The poor health (or low income) group benefits

from the VPAc plan but loses under the MPAf plan. These results provide guidance regarding which public annuity plan the government chooses.

Qilin Zhang is a postdoc fellow in the Faculty of Business and Economics at the University of Hong Kong. He received Ph.D. from the University of Hong Kong in 2020. Before that, he received B.A. and M.A. from Harbin Institute of Technology in 2009 and 2011, respectively. Qilin has a general interest in the economic issues related to population aging. Motivated by recent practices in Singapore and Hong Kong, he is currently studying pubic annuity plans to deal with longevity risk.

SESSION 7 - POLICY/INDUSTRY PANEL: THE RETIREMENT INCOME COVENANT

Chair - John Piggott (CEPAR Director, UNSW Sydney)

Panellists:

- Jordan George (Retirement, Advice and Investments Division, Australian Treasury)
- Suzanne Smith (Executive Director – Superannuation, APRA)
- Robbie Campo (Group Executive – Brand, Engagement, Advocacy and Product, Cbus)
- Jeremy Cooper (Chairman, Retirement Income, Challenger Ltd)

Jordan George is a Director in Treasury's Retirement, Advice and Investment Division. His team is responsible for the policy settings of the Superannuation Guarantee, the retirement phase of superannuation, and how superannuation works alongside other retirement income system elements such as the Age Pension and housing. Prior to joining Treasury in 2019, Jordan worked in the superannuation industry as the Head of Policy of the SMSF Association.

Suzanne Smith is the Executive Director for the Superannuation Division of APRA. The Superannuation Division is responsible for the prudential supervision of superannuation funds licensed under the Superannuation Industry (Superannuation) Act 1993. Since joining APRA in March 2019 Ms Smith has served as the Executive General Manager for the Specialised Institutions Division and as the General Manager for Superannuation. Prior to joining APRA, Ms Smith's career included senior roles across the superannuation and financial services industry in areas including life insurance, funds management, asset servicing, alternative investments and property.

Robbie Campo is the Group Executive – Brand, Engagement, Advocacy and Product at Cbus. She has worked as an executive for over two decades in the superannuation industry. Robbie has extensive experience in executive leadership within superannuation and pension funds with expertise in strategy, communications, CX, member engagement and enablement, product, brand & marketing, public policy & advocacy, risk management and financial advice. She is also experienced as a non-executive director in financial services, investment, public sector and not for profit sectors. Robbie is currently a Director and Audit and Risk Committee member at Victoria Legal Aid. She is also a Director of Women in Super and the Chair of their Policy Committee. She was previously on the Board and Audit and Risk Committee of Industry Fund Services.

Jeremy Cooper is Chairman, Retirement Income at Challenger, a full-time executive role focusing on research, public policy issues and thought leadership. Prior to joining Challenger, Jeremy chaired the 'Cooper Review' into the superannuation system, the recommendations of which have been substantially adopted. Before his review role, Jeremy was Deputy Chairman of the Australian Securities and Investments Commission (ASIC) for five years from mid-2004.

SESSION 8A: RETIREMENT OUTCOMES

Ensuring all Retirees Find a Suitable Retirement Solution

WARREN, Geoff[1]; BELL, David[2]

[1]Australian National University

[2]The Conexus Institute; CEPAR

Abstract: The Government is currently drafting the Retirement Income Covenant (RIC), which is expected to come into operation on 1 July 2022. The RIC will "codify the requirements and obligations of superannuation trustees to improve the retirement outcomes for individuals". This paper outlines what is needed to establish a retirement framework that ensures super funds assist all retiring members to find their way to retirement solutions that are not only suitable for their needs, but also accord with how they want to engage with the process.

Our central theme is the need to cater for substantial differences in the willingness and capacity to make financial decisions, and to seek financial advice. We argue that reliance should not be placed entirely on retirees to actively choose a retirement solution for themselves. The ability for retirees to request that their super fund either recommend or select an option on their behalf should be accommodated, which we call 'fund-guided choice'. A mechanism is also needed to address fund members who do not choose at all, which might entail a 'safety net' provision whereby trustees can assign retirees to an option under certain conditions.

Our focus is the delivery mechanisms for suitable retirement solutions by APRA-regulated funds. We do not let the existing legal and regulatory environment nor policy guidance constrain our considerations, although do attempt to identify where our recommended mechanisms sit outside existing and indicative constraints. We also offer suggestions on how the RIC might be framed to accommodate differences across member types in their preferred mode of engagement.

Dr Geoff Warren is an Associate Professor at the Australian National University, where he is Fund Convenor of the ANU Student Managed Fund. He is a member of various investment and research advisory boards, including for Atlas Infrastructure, ASIC Consultative Panel, Brandes Institute, Conexus Institute, FMAA, Salvation Army and Super Consumers Australia. Geoff is an active researcher who focuses on investment-related areas with an applied emphasis, including: superannuation, retirement, fund management, portfolio construction, long-term investing, and evaluation and taxation of investments. Prior to pursuing an academic career, he spent over 20 years in investment markets, including as the Director of Capital Markets Research at Russell Investments; as an analyst, Chief Strategist and Head of Research with investment bank Ord Minnett / JP Morgan Australia; and as an equity portfolio manager at AMP Capital. Geoff has a PhD from the AGSM, and a BComm (Hons) with the University Medal from UNSW.

David Bell is the executive director of The Conexus Institute, an independent research institute focused on improving Australia's retirement system. David is an active researcher in the areas of retirement, superannuation, investment management, and governance. David strives to link industry, academia and policy. David's industry career experiences include working at Mine Super (as CIO), St Davids Rd Advisory (consulting and governance), and CFS GAM (now First Sentier, primarily fund-of-hedge funds). Academically David completed his PhD at UNSW and taught for 12 years at Macquarie University.

A Retirement Choice Support Model

HANRAHAN, Pamela[1]; BELL, David[2]

[1]UNSW Sydney

[2]The Conexus Institute; CEPAR

Abstract: We outline the concept of a choice support model for retirees. Our initial position is that the legal and regulatory framework for financial advice, starting with Chapter 7 of the Corporations Act, is broken. Under the current rules, the provision of advice and guidance services by many super funds will largely depend on the legal risk appetite of trustees.

A retirement plan is important, yet complex to devise. Complexity comes from the functional difficulty of the challenge: making retirement savings last over a long and unknown timeframe during which investment returns are uncertain is a well-known problem which receives significant research attention. Financial plans need to be determined for individuals with unique characteristics and preferences, while incorporating a range of products. Australia's means-tested Age Pension exacerbates the challenge.

While most consumers would benefit from financial advice, there are cost and supply constraints. We propose a government-provided solution, which sits outside existing laws and regulations. Choice support is not intended to be as exhaustive as comprehensive financial advice. The intention is to provide a quality retirement recommendation comprising a blend of retirement products and a drawdown plan to accompany the account-based pension. Our design intention is that this will be suitable for 90% of the population.

Presently the benefits of ongoing retirement income policy development may not be fully realised due to the incapacity of funds to provide appropriate advice and guidance to their members. In this context, a retirement choice support model has the potential to uplift retirement outcomes for a significant portion of the population.

Dr Pamela Hanrahan is a lawyer, legal academic and author who specialises in corporate law, corporate governance, financial services regulation, data governance and business ethics. She is Professor of Commercial Law and Regulation at the University of New South Wales (UNSW) Business School, a Senior Fellow of the Melbourne Law School, a member of the Centre for Law Markets and Regulation at UNSW, an associate of the Centre for Corporate Law at the University of Melbourne, and founding director of the Cybersecurity and Data Governance Research Network at UNSW Sydney. She is also a founding member of the Society of Investment Law (USA), a Fellow of FINSIA, and a solicitor member of the Law Society of New South Wales. Pamela is a member of the Executive Board of the Business Law Section of the Law Council of Australia, a member of the National Corporate Governance Committee of the Australian Institute of Company Directors, a member of the Conexus Institute Advisory Board and a non-executive director of Landcom. In 2010-11 she was the Queensland Regional Commissioner of the Australian Securities and Investments Commission (ASIC) and in 2013-15 served as the Registrar of Community Housing for New South Wales. In 2016-17 Pamela was an appointed member of the ASIC Enforcement Review Taskforce and in 2018 she was an adviser to the Hayne Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry.

Principles and Rules for Translating Retirement Objectives into Strategies

BUTT, Adam[1]; KHEMKA, Gaurav[1]; WARREN, Geoff[1]

[1]Australian National University

Abstract: This presentation outlines principles and decision rules for determining appropriate drawdown and investment strategies during retirement, depending on an individual's objectives and preferences. Also discussed are the member attributes that matter for identifying a suitable strategy. The presentation and related working paper draw on what academic research reveals about the manner in which optimal retirement strategies relate to differing objectives and preferences. An example will demonstrate how applying the principles and rules may result in contrasting strategies. Key takeaways include the existence of two main types of income objectives (target; maximise), the potential role of a minimum acceptable income, and the importance of member heterogeneity.

Dr Geoff Warren is an Associate Professor at the Australian National University, where he is Fund Convenor of the ANU Student Managed Fund. He is a member of various investment and research advisory boards, including for Atlas Infrastructure, ASIC Consultative Panel, Brandes Institute, Conexus Institute, FMAA, Salvation Army and Super Consumers Australia. Geoff is an active researcher who focuses on investment-related areas with an applied emphasis, including: superannuation, retirement, fund management, portfolio construction, long-term investing, and evaluation and taxation of investments. Prior to pursuing an academic career, he spent over 20 years in investment markets, including as the Director of Capital Markets Research at Russell Investments; as an analyst, Chief Strategist and Head of Research with investment bank Ord Minnett / JP Morgan Australia; and as an equity portfolio manager at AMP Capital. Geoff has a PhD from the AGSM, and a BComm (Hons) with the University Medal from UNSW.

Realistic Spending Levels and Savings Targets for Retirement

OLDHAM, Matthias[1]

[1]Super Consumers Australia

Abstract: One of the key observations of the recently completed Retirement Income Review was that complexity, misconceptions and low financial literacy have resulted in people not adequately planning for their retirement or making the most of their assets when in retirement. Our research sought to better understand how consumers go about planning for retirement and the difficulties they face. Finally, it attempts to displace one of these barriers by producing spending levels and an associated reliable savings target which consumers can use in planning to align their pre and post retirement standard of living.

We derive spending levels of low, medium and high spending recent retirees and pre-retirees from ABS Household expenditure survey data. We derive spending levels for home owning retirees who may be single or in a couple. We produce associated spending targets required to sustain spending levels from age 65 until age 90, using a stochastic model to simulate investment returns during retirement. This allows us to produce saving targets that provide the user with a particular degree of confidence that their spending will be sustained through retirement. We assume spending increases with CPI during retirement, aligned with evidence about retiree spending patterns detailed in the retirement income review. We incorporate eligibility for the age pension and assets outside of super.

We package up these spending levels and associated targets into a consumer facing guide that explains the assumptions that underpin them and their value for consumers. We test our guide with a sample of pre-retiree and retired interviewees and incorporate the insights into the final guide.

Matthias Oldham is a data analyst and researcher at Super Consumers Australia, the people's advocate for superannuation consumers. His work combines data and research to produce insights that help the organisation evaluate key industry issues and make the case for positive change that benefits consumers. He is passionate about evidence based policy making. His background is in economics; he holds a Master of Economics from UNSW and a Master of Research (Economics) from Macquarie University. He has a particular interest in behavioural economics and applying the insights of the discipline to consumer issues in the superannuation space.

SESSION 8B: PENSIONS AND CLIMATE CHANGE

It's Good for the Planet and it's Good for your Portfolio: Encouraging Millennial Participation in 401(k) Plans Through Lowering Barriers to ESG Investing

MANN, Rachel[1]

[1]J.D. 2021, University of Pennsylvania Law School; B.A. University of Pennsylvania

Note: All views presented in this paper are my own, and do not represent legal advice or the opinions of Morgan, Lewis & Bockius.

Abstract: Investors are demanding greener and cleaner investment options. These values-based investors are increasingly pursuing a strategy known as ESG, where a company's environmental, social, and governance decisions are included in the overall investment process. This strategy is especially popular among millennials, who are particularly concerned about climate change and other social justice issues. In a recent survey, 90% of millennials stated they would be interested in an ESG option in their 401(k)-retirement plan lineup. Yet only 3% of employers offer one. Employers' reticence to offer an ESG option is understandable in light of historical Department of Labor regulations that suggest doing so might violate the strict fiduciary requirements under the federal law regulating employee benefit plans (known as ERISA.) The Department of Labor ("DOL") under the Trump Administration characterized ESG investing as a suspect strategy that values a positive impact on the planet over maximizing financial returns. But long-term research into ESG investing shows this concern is unwarranted—ESG investments perform as well, and sometimes better than, non-ESG investments, which makes sense when you understand the ESG strategy to be simply another layer of investment analysis and risk management.

The Biden Administration's DOL has proposed new regulations relating to ESG investing. These proposed regulations frame ESG as a win-win, better both for long-term investment returns and for Planet Earth. If the regulations are adopted as proposed, they would likely spur employers to offer ESG options in their 401(k) lineups in response to employee demand. This change could encourage more employees, particularly millennials, to participate in the plan, thus saving more for retirement while providing a market incentive for companies to get greener. The proposed ESG regulations are good law and good policy and should be adopted as-is into law. Not only do they align with decades of ERISA case law's understanding of retirement plan fiduciaries' duties, but they may also lead to increased retirement security and a more sustainable future.

Rachel Mann is a lawyer at a large international law firm in the employee benefits practice group. She advises employee benefit plan sponsors and administrators on a range of matters related to employee benefits. She graduated magna cum laude from the University of Pennsylvania Carey School of Law, where she served as a Senior Editor on the University of Pennsylvania Law Review, a contributing author to the Regulatory Review, and the co-chair of Penn Law for Philly. She has published multiple articles on issues relating to ESG regulation and healthcare reform, and was the recipient of the M.H Goldstein Award for the best paper in the field of labor law and the Sidney N. Perlstadt Memorial Award from the American College of Employee Benefits Counsel. She published the article she will be presenting at this conference, It's Good for The Planet and It's Good for Your Portfolio, during her final year of law school.

Modern Challenges to the Prudence Expected of Pension Fund Trustees

SCOTT, Donald[1]

[1]Centre for Law, Markets and Regulation, UNSW Sydney

Abstract: The trustees of pension funds in the United Kingdom and Australia are responsible for administering the retirement savings of millions of individuals. This paper examines those legal responsibilities specifically in the light of three contemporary challenges: the existential threats of climate

change and viral pandemic, and the development of cryptocurrencies. It identifies that that the nature of the risk in each case is different, and that consequently what the law expects of pension fund trustees in relation to each is also different. It further identifies that prudent administration of a fund in the face of these distinctive uncertainties requires attention not only to the investment strategy of the fund, but to the governance structure and processes of the trustee itself.

Associate Professor Scott Donald PhD CFA is Director of the Centre for Law, Markets and Regulation, UNSW Law, UNSW Sydney. Scott joined the Faculty of Law and Justice in 2010 after a successful career in the funds management industry advising governments, superannuation funds, insurance companies and fund managers on investment strategy, governance and regulation. Scott teaches corporations, trusts and superannuation law at both undergraduate and post-graduate level. He regularly presents at academic, professional and industry conferences in Australia and overseas and publishes in both the academic and professional press on research related to financial services regulation, governance and superannuation policy.

Company-level GHG Emissions and an Institutional Investor's Active Ownership: Sorting the Wheat from the Chaff

ANNABEL, Robert[1]; ASHER, Anthony[2]; GHOSH, Arghya[3]

[1]School of Risk and Actuarial Studies, UNSW Business School; CEPAR; Centre for Law, Markets and Regulation, UNSW Sydney

[2]School of Risk and Actuarial Studies, UNSW Business School; Centre for Law, Markets and Regulation, UNSW Sydney

[3]School of Economics, UNSW Business School

Abstract: Academics and regulators have given significant attention to the impact of institutional investors. Some are concerned that the institutional investors are common owners. But in their active ownership policies institutional investors often say they are long-term shareholders, socially responsible investors and/or stakeholder oriented. The evidence from the respective academic literatures seems to support both those concerned about common ownership and the institutional investors' claims. Putting aside empirical methodological considerations and foul play, how can this be? We suggest this problem could be arising because the natural experiments in the respective literatures do not analyse situations or outcomes that differentiate the various active ownership objectives listed above. We demonstrate one example of this by examining the nascent literature on the association between firm-level GHG emissions and institutional investor influence. Subject to assumptions about the significance of the damage from climate change, we find that the negative association between GHG emissions and institutional ownership that is generally found in this literature is consistent with many active ownership objectives, except the short-term profit maximiser. We then extend our models to allow firms to mitigate and adapt to the damage from GHG emissions, and discuss two early papers with results on institutional investor influence and firm-level investments in mitigation. In our model we find that the short-term common owner can be differentiated from other active ownership types by no increase in investments in mitigation or adaptation. We then consider two special cases that allow the long-term profit maximiser and long-term common owner to be differentiated from the rest. To differentiate the long-term profit maximiser, we suggest the sample only consider firms that have no exposure to damage from climate change. In this case, the long-term profit maximiser will not reduce emissions or increase investments in mitigation. To differentiate the long-term common owner, we suggest a sample of firms from industries in which demand is highly inelastic, there are low marginal costs, and common ownership is high, and that the dependent variables be revenue and investments in mitigation divided by revenue. Our study, however, should be seen as limited as we have not confirmed the robustness of our results in reasonable alternative models.

Robert Annabel is a first year PhD candidate in the UNSW School of Risk and Actuarial Studies. His thesis focuses on identifying the active ownership type of an institutional investor based on the institutional investor's effect on their investee companies, with potential applications to decision-making by and monitoring of institutional investors' active ownership decisions and effects. He also has 3 years industry experience working for various actuarial consulting firms over 3 years as a graduate consultant and UNSW Co-Op intern.

SESSION 9: THE MACROECONOMIC ENVIRONMENT FOR SUPERANNUATION AND PENSIONS

Estimating the Lifetime Fiscal Impact of Permanent Migration

VARELA, Peter[1]; HUSEK, Nick[1]; WILLIAMS, Thom[1]; MAHER, Richard[1]; KENNEDY, Darren[1]

[1]Commonwealth Treasury

Abstract: The Fiscal Impact of New Australians model (FIONA) has been developed by The Treasury to estimate the fiscal impact of permanent migrants over their remaining lifetimes in Australia. This estimate captures tax revenues and government expenses incurred by Commonwealth, State and Territory Governments that are directly attributable to migrants.

FIONA adopts a lifetime perspective because migration typically results in a period of net fiscal benefit (while migrants are of working age) followed by a period of net fiscal cost (after migrants retire). Therefore, a lifetime perspective is required to fairly reflect the overall fiscal impact of permanent migrants. The model also estimates the lifetime value of taxes paid and the costs of services received by the general Australian population to enable comparison to the permanent migrant cohort.

FIONA builds upon previous Australian research, including by the Productivity Commission and Deloitte Access Economics. While following a similar conceptual framework to these studies, FIONA incorporates a variety of additional datasets that were not available when these earlier works were produced. In particular, FIONA incorporates information from the Multi–Agency Data Integration Project (MADIP) that links visa application data with a variety of administrative datasets.

FIONA is based on a demographic projection of the 2018–19 permanent migration cohort which includes mortality, emigration away from Australia and net interstate migration. The model then uses a variety of approaches to identify taxes individuals pay, and the cost of services that they use. Where possible, administrative data is used that directly links the tax or government service to particular migrants. In other cases, FIONA models the fiscal impact of migrants using tax rates and expenses observed in survey data. The additional infrastructure costs incurred as the population increases are also included in FIONA results, which is an extension from previous estimates of lifetime fiscal impact.

Dr Peter Varela works at the Commonwealth Treasury, where he uses administrative tax data to understand the impact of migration on the Australian economy. Prior to joining Treasury, Peter worked as a Research Fellow at the Tax and Transfer Policy Institute at the ANU.

Wealth Transfers and Inequality in Australia

Rebecca Chin[1]; Catherine de Fontenay[1]

[1]The Productivity Commission

Abstract: The past twenty years have seen a significant increase in wealth accumulated by older Australians. The trend is driven by rising asset prices and by increased longevity, which raises the risk of running out of assets prematurely. A corollary of this is that older Australians also bequeath more to their descendants. Using simulations calibrated to micro-level data on income, wealth, savings and wealth transfers , the Productivity Commission addresses the following questions: Over the next thirty years, how will the wealth of older Australians evolve? Is the trend of increasing bequests likely to continue? Will increasing bequests lead to a large increase in wealth inequality, as has been suggested by Thomas Piketty and others? If so, there is likely to be more impetus for policy change. Surprisingly, the Commission finds that while wealth transfers, bequests in particular, will likely continue to increase in size in line with wealth, they are unlikely to exert much influence on relative wealth inequality, even after thirty years. Indeed, the projections show that bequests – consistent with the recent past, according to our analysis of historical data – will impose a slight moderating influence on relative wealth inequality under a range of (but not all) plausible scenarios.

Rebecca Chin is a Senior Research Economist at the Productivity Commission. She has worked on research and modelling across a range of projects and inquiries including on transport regulation, education, and regional adaptive capacity. She holds a Master's Degree in Economics from the University of Melbourne.

Catherine de Fontenay is a Commissioner at the Productivity Commission. Catherine has taught at UNSW, Melbourne University, and the Stern School of Business at NYU. At the Commission, Catherine has been involved in research on Bequests, on Small Business Access to Finance, on Productivity in Services, on Vulnerabilities in Australia's Supply Chains, on Labour Market Outcomes for Young People, and on Expenditure on Services for Children and Families in the Northern Territory.

The Economy-wide Effects of Mandatory Superannuation and its Tax Concessions

KUDRNA, George[1]

[1]CEPAR, UNSW Business School

Funding: Financial support by the Australian Research Council through its grant to the ARC Centre of Excellence in Population Ageing Research (CEPAR) is gratefully acknowledged.

Abstract: This paper investigates the economy-wide effects of mandatory superannuation and its concessional tax treatment, quantifying the implications for household economic decisions over the life cycle, their welfare, and macroeconomic implications. We develop a stochastic, overlapping generations (OLG) model with labour choice and endogenous retirement that distinguishes between ordinary private (liquid) assets and superannuation (illiquid) assets. The benchmark model is calibrated to the Australian economy (pre-COVID-19), fitted with Australian demographic, household survey and macroeconomic data. The model accounts for a detailed representation of Australia's government policy, including its progressive income taxation, means-tested age pension and mandatory superannuation policy. We then apply the model to simulate changes to (i) mandatory Superannuation Guarantee (SG) rate and (ii) superannuation tax concessions.

In terms of (i), the main focus is on the "legislated" 12% SG rate (increased from the benchmark 7% SG rate). We show that in the long run, this policy leads to increased total household wealth (by 12.65%), output or real GDP (by 6.21%) and welfare across the entire income/skill distribution (and that is despite of a lower wage rate). In terms of (ii), we focus on the "hypothetical" removal of all superannuation tax concessions (i.e., policy with no concessional taxes on contributions and fund earnings, but with an extended progressive income tax base), to calculate their budgetary cost. We find that this tax expenditure amounts to 2.5% of GDP (assuming the benchmark SG rate). The simulation findings for this hypothetical policy change also show increased household wealth and average welfare, but the policy reduces output and welfare of high-skill households.

George Kudrna is a Senior Research Fellow at CEPAR, UNSW Business School. He completed his undergraduate studies in economics and insurance management in the Czech Republic, and received a PhD in Economics from the University of Sydney in 2009. His research encompasses the areas of public economics, macroeconomics, population ageing and computational economics. He develops and applies rigorous macroeconomic models to investigate the economic impacts of demographic change and retirement income and tax policy reforms. His research has been published in both national and international economics journals, with recent publications in the *European Economic Review, Macroeconomic Dynamics* and *Economic Record*. He has also co-authored several government reports on pension and tax related issues, including commissioned reports for the Australian Treasury, for the Michigan Retirement Research Center (MRRC) and U.S. Social Security Administration, and for the Norwegian Fafo Research Foundation and Frisch Centre. George currently leads an ARC linkage grant "Policy modelling for ageing in emerging economies: Indonesia and beyond", with the World Bank and Indonesian Ministry of National Development Planning (Bappenas) as partner organisations. He is also affiliated with the Global Labour Organization (GLO), the Centre for Applied Macroeconomic Analysis (CAMA) at ANU and UNSW Ageing Asia Research Hub.

IPRA SPECIAL ONLINE SESSION: ABSTRACTS AND SPEAKER BIOS

Investigating the Introduction of a Fintech Advancement Designed to Reduce Limited Attention Regarding Inactive Saving Accounts - Data, Survey, and Field Experiment

Maya Haran Rosen (Hebrew University of Jerusalem)

Abstract: Lost and forgotten retirement savings accounts are increasingly becoming a problem. This paper uses proprietary data, survey data, and a field experiment to study the effect of two campaigns to raise awareness and direct attention to this issue among account holders. The first campaign is based on a fintech innovation – a centralized database, accessible via a website, created by the Israeli financial regulator to help individuals find and manage inactive retirement savings accounts. The website substantially lowered observation and information search costs for finding inactive accounts and was widely publicized. The second campaign utilized the information from the website to encourage individuals (via a tax exemption and an awareness campaign) to close small inactive accounts and avoid new minimum management fees that would gradually exhaust the savings over time. We show evidence that after the campaigns, inactive retirement accounts still only received limited attention. This is more pronounced for individuals with low socioeconomic status and low financial literacy. The results of a controlled field experiment indicate that interventions that provide similar information using a more personal interaction (face-to-face or video) can increase attention.

Maya Haran Rosen is an Economist at the Finance Division in the Bank of Israel, Research Department, and is finishing her PhD at the Hebrew University of Jerusalem Finance Department. Her PhD dissertation explores households' attention to financial regulation which is based on fintech advancements. Her research at the Bank of Israel focuses on household finance, financial institutions, and Hi-tech finance. In addition, she participated in writing official reports on the Israeli financial system. These reports include subjects such as long-term care insurance, insurance funds stability, pensions actuary deficits, and the level of private debt in Israel.

Understanding the Old Age Financial Stress and Retirement Planning of Workers in the MSME Sector in India

Amlan Ghosh (National Institute of Technology Durgapur, India)

Abstract: Unorganised sector workers constitute a major part of the employed population who are without any cover of social security in India. India estimated to have a total workforce of 450 million; out of this, 93 per cent of people working in the unorganised sector. We conduct a survey on Micro-Small and Medium Enteprises (MSME) workers in India during 2019- 2020 and finds that the workers are facing a financial stress due to low level of income and job security but there exists a positive relationship between financial literacy and willingness to save for retirement benefits among the unorganised sector workers in India. This research on the unorganised sector workers also brings out other critical socio-economic factors that positively correlate with old-age financial planning in India.

Amlan Ghosh, PhD in Finance and working as an Associate Professor at the Department of Management Studies, National Institute of Technology Durgapur, India and have more than 16 years of teaching experience. Before NIT Durgapur, he was at IBS Hyderabad, Hyderabad and Sikkim Central University, Sikkim.

His research interest is in the area of Financial Public Policy mainly in the areas of pension sector, insurance, banking, financial development, financial inclusion and Post offices. He has published papers in reputed journals such as The Geneva Papers on Risk and Insurance - Issues and Practice, Journal of Asia

Business Studies, Journal of Financial Economic Policy, International Journal of Social Economics, International Journal of Economics and Financial Issues etc. Apart from that he has authored a book on insurance namely, "Life Insurance in India: Reforms and Impacts". He is also a reviewer of different international/national journals such as Journal of Institutional Economics, IIMB Management Review, Asia Pacific Journal of Risk and Insurance (APJRI), Journal of Financial Economic Policy, International Journal of Productivity and Performance Management etc.

He has presented his research papers in different conferences such as World Finance Conference, World Finance & Banking Symposium, International Conference on Public Policy and Management, Asia Pacific Risk and Insurance Association (APRIA) annual conference etc.

He has conducted many FDPs and MDPs at NIT Durgapur and organisations, such as at Reserve Bank of India (RBI), Mumbai. He has conducted a Global Initiative of Academic Network (GIAN) course on "Analysing Public Policy Issues in India" in collaboration with Prof. Mukul Asher, National University of Singapore (NUS) at NIT Durgapur, sponsored by MHRD, Govt. of India in 2019.

A Sustainable, Variable Lifetime Retirement Income Solution for the Chilean Pension System

Olga Fuentes (Pension Regulator of Chile)

Abstract: There is a need in pension systems to significantly improve the level and stability of pension payments as pensioners age. The solution to address increased longevity and longevity risk should be not limited to increasing the take-up rate of annuities – explicit guarantees are costly in a low-interest rate environment, and lock-in of savings may not be in line with members' preferences. Our proposal is to develop a Sustainable, Variable Lifetime Retirement Income Solution in a more flexible and cost-efficient way. Recent developments favoring flexible products that are more suited to satisfy the needs and preferences of members are key for improving the pay-out phase. In this respect, we believe our tontine design proposal is a superior alternative compared to the ones already existing in the Chilean Pension System. Tontine-like arrangements offer a unique value proposition to address the global retirement challenge. Our retirement income proposal provides clear transparency and investment flexibility with higher expected income streams. It does not involve higher costs since there are no explicit guarantees and provides a means to offer longevity insurance even if insurers are unwilling to supply it. Several proposals are analyzed, including deferred pension arrangements and tontine-like solutions combined with existing pay-out products. Our proposal does not distort the annuity market; on the contrary, it complements it, and it is in line with the transition of many countries to include tontine-like longevity-risk sharing and collective elements in their defined-contribution designs.

Olga Fuentes is a pension and labor expert with extensive experience in the global research, regulation and supervision of pension and unemployment insurance systems. She is currently Head of Strategic Research and International Affairs at the Chilean Pension Regulator and was previously Deputy Chair of Regulation and Head of the Research Division. She is Vice-President of the International Organization of Pension Supervisors (IOPS) and the delegate of the Chilean government to the OECD Working Party of Private Pensions. She has collaborated with OECD and IOPS on many research papers. Dr. Fuentes is the Pension Regulator representative in the Chilean Green Finance Working Group, responsible for advancing in the incorporation of climate change into the investment risk management of institutional investors. She is member of the Global Advisory Board at PinBox Solutions for financial inclusion. Previously, she was Senior Advisor to the Minister of Finance between 2007 and 2009 following work as an Economist at the Central Bank of Chile in the area of International Finance and as a Research Analyst at a major Chilean Stock Broker. She has been a consultant for the IADB, speaker in international conferences, lecturer in economics and finance in Chile and the United States, and author of papers and articles in the areas of pensions including on investment, risk, financial education, experimental evaluations, unemployment insurance, labor, applied micro-econometrics and applied macroeconomics.

She has a first degree in Economics and a Master's degree in Finance from the University of Chile. She holds a PhD. in Economics at Boston University.

Gender Gap in Pension Savings: Evidence from Peru's Individual Capitalization System

Javier Olivera (Luxembourg Institute of Socio-Economic Research (LISER), and Pontificia Universidad Catolica del Peru (PUCP))

Abstract: We seek to contribute to the literature on gender pension gap by studying the case of Peru, a country where the main compulsory pension system is of an IRA type (the Private Pension System, SPP). Although there is an alternative public pension system (SNP) most of the new workers enrol into the SPP. We use representative samples of the non-retired population affiliated in the SPP, randomly selected from administrative registers in 2005, 2006, 2011, 2012, 2013, 2015, 2016, and 2019. The size of each year-sample is about 2% of the total number of affiliates in the corresponding year. The samples are random and stratified. We restrict the year-samples to individuals aged between 21 and 64, implying that we observe individuals born between 1946 and 1998. After pooling together all the year-samples, we obtain a total sample of 725,868 observations. Our data allows us to analyse gender gaps in pension balances along birth year cohorts and across the years of our period of analysis. According to preliminary results, on the one hand, we observe a decreasing gender gap among younger cohorts, which is in line with other findings in the labour market, but on the other hand, the length of time participating in the pension system increases the gap though the capitalization process.

Javier Olivera is a research scientist at the Luxembourg Institute of Socio-Economic Research (LISER) and full professor of economics at Pontificia Universidad Catolica del Peru (PUCP). He holds a PhD in economics from KU Leuven. Previously, he was a research fellow at the Institute for Socio-Economic Research at the University of Luxembourg and the Geary Institute at the University College Dublin (UCD) and worked for the Superintendent of Banking, Insurance Companies, and Pension Funds and the Ministry of Economy of Peru. His research interests include public economics, inequality, pensions, intergenerational transfers, ageing, and redistributive preferences. He has published several academic articles in journals such as Science, JEBO, Socio-Economic Review, Journal of Social Policy, and Journal of International Money & Finance; and in prestigious collective volumes such as the Handbook of Income Distribution (Elsevier) and National Wealth: What is missing, why it matters (Oxford UP).

Set it and Forget it? Financing Retirement in the Age of Defaults

Anita Mukherjee (University of Wisconsin-Madison)

Abstract: Retirement savings abandonment is a rising concern connected to defined contribution systems and default enrollment. We use tax data on Individual Retirement Accounts (IRAs) to establish that in 2017, 2.7% of 72.5 year-old account-holders in total abandoned $790 million; the median abandoned account held $5,400. Nearly all of these funds remain with plans and are not sent to state unclaimed property. Regression discontinuity estimates show that abandonment is 10 times higher in automatic rollover IRAs, a type of default account. We nest our findings in a model of retirement savings featuring forgetting to derive implications for passive and active savers.

Anita Mukherjee, PhD, is an Assistant Professor of Risk and Insurance at UW-Madison's Wisconsin School of Business. Her research focuses on the impact of insurance, financial literacy, and legal policies on vulnerable populations, especially related to aging and health. She is a fellow of the TIAA Institute. She is also actively engaged with a number of social science units on campus, and is an affiliate of the Center for Financial Security, the Institute for Research on Poverty, the Center for Demography and Ecology, the Center for Demography of Health and Aging, and the University of Wisconsin Law School. She recently co-edited a special issue on Financing Longevity for *The Journal of the Economics of Ageing*.

Using a Lifecycle Model to Design Target Date Funds

Brett P Hammond (Capital Group)

Abstract: The literature on lifecycle model design, optimization and hypothetical solutions is impressive, but for the obvious application—target date funds—few practitioners seem to use lifecycle models for actual design and management and we have no extant analysis of how to do so. This paper evaluates a real-world use case by examining development of a new lifecycle model to serve an existing set of target date funds. A key finding is that lifecycle model development can and should be informed by questions and challenges arising from target date fund design and management. Questions include: how are outcomes affected by degrees of flexibility in the asset mix? How, if at all, should target date fund vintages be designed to account for labor income interruptions, unplanned lump sum withdrawals and other investor behavior? It turns out that solving for the lifecycle model challenges and for target date fund design involves a feedback loop: solutions and progress for one lead to progress for the other and vice versa. We illustrate how this process produced concrete glide path improvements that were implemented in 2021.