Nan Zhu   PhD, FSA, CERA

Curriculum Vitae (May 2018)

Contact Information

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Pennsylvania State University, University Park, PA, 16802

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Academic Positions

Assistant Professor of Risk Management
Department of Risk Management, Smeal College of Business, Pennsylvania State University
08/2016 - present

Assistant Professor of Actuarial Science
Department of Mathematics, College of Arts and Sciences, Illinois State University
08/2012 - 08/2016

Education

Department of Risk Management and Insurance, J. Mack Robinson College of Business, Georgia State University

- Ph.D., Risk Management and Insurance — 2012

School of Mathematical Sciences, Peking University, Beijing, China

- M.S., Financial Mathematics — 2007
- B.S., Financial Mathematics — 2005

China Center for Economic Research, Peking University, Beijing, China

- B.A., Economics — 2005

Research

Publications

8. MacMinn, R.D., **N. Zhu** (2018+). Hedging Longevity Risk: Does the Structure of the Financial Instrument Matter? Accepted by *The North American Actuarial Journal*.
7. Bauer, D., M.V. Fasano, J. Russ, **N. Zhu** (2018+). Evaluating Life Expectancy Evaluations. Forthcoming at *The North American Actuarial Journal*.
6. Moenig, T., **N. Zhu** (2018+). Lapse-and-Reentry in Variable Annuities. Forthcoming at *The Journal of Risk and Insurance*.
   ◇ Winner of the 2017 Redington Prize by the Society of Actuaries for the best paper in investment.
5. Bauer, D., J. Gao, T. Moenig, E.R. Ulm, **N. Zhu** (2017). Policyholder Exercise Behavior in Life Insurance: The State of Affairs. *The North American Actuarial Journal*, 21: 485-501.
4. MacMinn, R.D., **N. Zhu** (2017). Hedging Longevity Risk in Life Settlements Using Biomedical Research-Backed Obligations. *The Journal of Risk and Insurance*, 84: 439-458.
3. **Zhu, N.**, D. Bauer (2014). A Cautionary Note on Natural Hedging of Longevity Risk. (Formerly circulated as "A Natural Examination of the Natural Hedging Approach.") *The North American Actuarial Journal*, 18: 104-115.
   ◇ Top three most downloaded articles in *The North American Actuarial Journal* in 2014.
2. **Zhu, N.**, D. Bauer (2013). Coherent Pricing of Life Settlements Under Asymmetric Information. *The Journal of Risk and Insurance*, 80: 827-851.
   ◇ Semifinalist for 2012 FMA Annual Meeting Best Paper Award in Investments.
1. **Zhu, N.**, D. Bauer (2011). Applications of Forward Mortality Factor Models in Life Insurance Practice. *The Geneva Papers on Risk and Insurance - Issues and Practice*, 36: 567-594.
   ◇ Finalist for the 2011 Lloyd's Science of Risk Prize in Insurance operations and markets.

Submitted Papers

2. Jung, H., Z. Liu, **N. Zhu** (2017). Product market competition and corporate demand for insurance.

1. Bauer, D., J. Russ, **N. Zhu** (2017). Asymmetric Information in Secondary Insurance Markets: Evidence from the Life Settlement Market. (Formerly circulated as "Adverse Selection in Secondary Insurance Markets: Evidence from the Life Settlement Market.")

Working Papers

3. Crocker, K.J., **N. Zhu** (2018). The Efficiency of Voluntary Risk Classification in Insurance Markets.
2. **Zhu, N.**, D. Bauer (2013). Modeling and Forecasting Mortality Projections. (Formerly circulated as "Coherent Modeling of the Risk in Mortality Projections: A Semi-Parametric Approach.")
1. **Zhu, N.**, D. Bauer (2010). On the Economics of Life Settlements.

Research in Progress

2. Moenig, T., **N. Zhu** (2018). The Economics of the Secondary Market for Variable Annuities.
1. **Zhu, N.**, D. Bauer (2016). The Economic Value of Life Expectancy Providers in the Secondary Life Market.

CONFERENCE PRESENTATIONS († INDICATES PRESENTATION BY COAUTHOR)

Risk Theory Society, Annual Meeting, Atlanta, GA 04/2018
"The Efficiency of Voluntary Risk Classification in Insurance Markets"

Society of Actuaries, Redington Prize-Winning Paper Webcast, University Park, PA 02/2018
" Lapse-and-Reentry in Variable Annuities"

Thirteenth International Longevity Risk and Capital Markets Solutions Conference, Taipei, Taiwan 09/2017
"Hedging Longevity Risk: Does the Structure of the Financial Instrument Matter?"

Actuarial Research Conference, Atlanta, GA 07/2017
"Evaluating Life Expectancy Evaluations"

The 20th Insurance: Mathematics and Economics Meeting, Atlanta, GA 07/2016
"The Economic Value of Life Expectancy Providers in the Secondary Life Market"

Third World Risk and Insurance Economics Congress, Munich, Germany 08/2015
"Hedging Longevity Risk in Life Settlements Using Biomedical Research-Backed Obligations"

Society of Actuaries Longevity Seminar (invited), Chicago, IL 02/2015
"A Cautionary Note on Natural Hedging of Longevity Risk"

American Economic Association Annual Meeting, Boston, MA† 01/2015
"Adverse Selection in Secondary Insurance Markets: Evidence from the Life Settlement Market"

Tenth International Longevity Risk and Capital Markets Solutions Conference, Santiago, Chile 09/2014
"Hedging Longevity Risk in Life Settlements Using Biomedical Research-Backed Obligations"
"The Economic Value of Life Expectancy Providers in the Secondary Life Market"

Econometric Society European Meeting, Toulouse, France† 08/2014
"Adverse Selection in Secondary Insurance Markets: Evidence from the Life Settlement Market"

American Risk and Insurance Association, Annual Meeting, Seattle, WA 08/2014
"Adverse Selection in Secondary Insurance Markets: Evidence from the Life Settlement Market"

International Congress of Actuaries, Washington D.C. 04/2014
"A Cautionary Note on Natural Hedging of Longevity Risk"

NBER Insurance Workshop, Boston, MA† 03/2014
"Adverse Selection in Secondary Insurance Markets: Evidence from the Life Settlement Market"

Financial Management Association Annual Meeting, Chicago, IL 10/2013
"A Cautionary Note on Natural Hedging of Longevity Risk"

American Risk and Insurance Association, Annual Meeting, Washington, DC 08/2013
"A Cautionary Note on Natural Hedging of Longevity Risk"

Asia-Pacific Risk and Insurance Association Annual Conference, New York, New York 07/2013
"Optimal risk capital under the consideration of systemic risk"

The 17th Insurance: Mathematics and Economics Meeting, Copenhagen, Denmark 07/2013
"A Cautionary Note on Natural Hedging of Longevity Risk"

Financial Management Association Annual Meeting, Atlanta, GA 10/2012
"Coherent Pricing of Life Settlements Under Asymmetric Information"

"Coherent Modeling of the Risk in Mortality Projections: A Semi-Parametric Approach"†

Eighth International Longevity Risk and Capital Markets Solutions Conference, Waterloo, Ontario, Canada 09/2012
"A Natural Examination of the Natural Hedging Approach"

Econometric Society European Meeting, Malaga, Spain† 08/2012
"Coherent Modeling of the Risk in Mortality Projections: A Semi-Parametric Approach"

Canadian Institute of Actuaries Annual Meeting (invited), Toronto, Canada 06/2012
"Applications of Forward Mortality Factor Models in Life Insurance Practice"

Lloyd's Science of Risk Prize Award Conference, London, U.K. 11/2011
"Applications of Forward Mortality Factor Models in Life Insurance Practice"

Seventh International Longevity Risk and Capital Markets Solutions Conference, Frankfurt, Germany 09/2011
"Coherent Pricing of Life Settlements Under Asymmetric Information"

Actuarial Research Conference, Storrs, CT 08/2011
"Applications of Forward Mortality Factor Models in Life Insurance Practice"

American Risk and Insurance Association, Annual Meeting, San Diego, CA 08/2011
"Applications of Forward Mortality Factor Models in Life Insurance Practice"

Risk Theory Society, Annual Meeting, Little Rock, AR 04/2011
"On the Economics of Life Settlements"

Second World Risk and Insurance Economics Congress, Singapore 07/2010
"On the Economics of Life Settlements"

Invited Seminar Presentations

2018 Georgia State University (RMI)

2017 Temple University (RIHM); University of Wisconsin-Madison (RI)

2016 Pennsylvania State University (RM)

2015 University of Iowa (Finance); University of Cincinnati (Finance); University of Illinois at Urbana-Champaign (Math); University of Georgia (ILSRE); University of Nebraska - Lincoln (Finance)

2014 Georgia State University (RMI)

2012 University of Manitoba (ActSci); Illinois State University (Math); University of Wisconsin-Madison (RI); EMLYON Business School (Finance); University College Dublin (Math)

Grants & Prizes

CKER Individual Grant (18,000 USD). Co-Principal investigator (with T. Moenig)
Society of Actuaries, USA 2018

Redington Best Paper Prize (10,000 USD). Paper coauthored with T. Moenig
Society of Actuaries, USA 2017

Educational Institution Grant (7,500 USD). Principal investigator
Society of Actuaries, USA 2014

Summer Research Grant (16,000 USD). Co-Principal investigator (with D. Bauer)
Katie School of Insurance & Financial Services, Illinois State University 2014

Pre-Tenure Faculty Initiative Grant (3,000 USD). Principal investigator
College of Arts and Sciences, Illinois State University 2014

New Faculty Initiative Grant (3,000 USD). Principal investigator
College of Arts and Sciences, Illinois State University 2013

Dissertation Research Grant (10,000 CHF). Principal investigator
The Geneva Association, Switzerland 2011

Centers for Actuarial Excellence Research Grant. Affiliated researcher (with D. Bauer, J. Gao, T. Moenig, and E. Ulm)
Society of Actuaries, USA 2011

Professional Experience

Research Assistant 05/2005 – 06/2006
China Insurance Regulatory Commission, Beijing, China

Professional Affiliations & Services

Fellow of the Society of Actuaries (FSA), Chartered Enterprise Risk Analyst (CERA)

Journal Referee (in alphabetical order): the *Annals of Actuarial Science*, *Asia-Pacific Journal of Risk and Insurance*, *ASTIN Bulletin – The Journal of the International Actuarial Association*, *Geneva Papers on Risk and Insurance – Issues and Practice*, *Geneva Risk and Insurance Review*, *Insurance: Mathematics and Economics*, *Journal of Insurance Issues*, *Journal of Risk and Insurance*, *Journal of Risk Finance*, and *North American Actuarial Journal*

Member of the American Academy of Actuaries, American Economic Association, American Risk and Insurance Association, Risk Theory Society

Program reviewer committee member, American Risk and Insurance Association Annual Conference (2015; 2018)

Committee member, Brockett-Shapiro Actuarial Journal Award, American Risk and Insurance Association (2018)

Program reviewer, Second International Congress on Actuarial Science and Quantitative Finance (2016)

Teaching

Risk Management Department, Pennsylvania State University

RM 415 – Modeling for Actuarial Science (Derivative Markets)
Fall 2016, 2017

RM 411 – Actuarial Mathematics I (Life Contingencies)
Spring 2017, 2018

Department of Mathematics, Illinois State University

MAT 383 – Actuarial Models III (Derivative Markets)
Spring 2013-2016, Fall 2014, 2015

MAT 280 – Financial Mathematics (Theory of Interest)
Fall 2012-2015, Spring 2013-2016

Department of Risk Management and Insurance, Georgia State University

RMI 3500 – Introduction to Risk Management and Insurance
Fall 2009, Spring 2012