

# Pintao Lyu

Department of Econometrics and Operations Research  
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## EDUCATION

- Ph.D.      Econometrics and Operations Research, Tilburg University, 2017-2020 (expected)  
             Visiting scholar at The University of Melbourne (Host: Prof. Johnny Siu-Hang Li)
- M.Phil.    Economics *with distinction*, Tilburg University, 2015-2017  
             Key courses: The economics and finance of the pension (9.5/10.0), Life cycle investment and pension systems (9.0/10.0), Asset liability management (8.5/10.0), Valuation and risk management (8.5/10.0)
- B.Sc.      Economics *with honor*, Central University of Finance and Economics, 2011-2015

## RESEARCH AREAS

Household finance, Risk management, Actuarial science

## TEACHING EXPERIENCE

### Tilburg University

Econometrics (B.Sc. Econometrics and Operations Research), 2018  
Evaluations: 4.42/5.00 (peer average: 4.00/5.00)

## PAPERS

### Job market paper

2019-      Lyu, P., "Heterogeneous survival expectations and wealth inequality"

#### *Abstract:*

Using new survey evidence in Heimer et al. (2019, Journal of Finance), I show how subjective life expectancy leads to wealth inequality. Agents with higher educational attainment switch from underestimating to overestimating survival earlier in life, which results in higher saving motives when young and slower asset drawdown when old. Educational attainment positively correlates with living conditions, causing various degrees of agents' overreaction to salient risks in the vicinity. I characterize a standard stochastic life cycle model to these subjective mortality beliefs and demonstrate that heterogeneous survival expectations contribute to retirement wealth inequality.

#### *Key skills:*

Used Stata to process survey and estimate reduced-form econometrics models. Used MATLAB and Fortran to simulate the life cycle model and match the model outputs to the data moments. Used the parallel computing environment in the Lisa Cluster to streamline the simulations.

### Articles in Peer-Reviewed Journals

- 2020      Lyu, P., De Waegenare, A., & Melenberg, B. (2020) “A multi-population approach to forecasting all-cause mortality using cause-of-death mortality data.” *North American Actuarial Journal*, 1-36.

#### *Key skills:*

Used SQL to process a large-scale WHO database. Used R to visualize the data. Used MATLAB to construct statistical tests and forecast time series.

### Working papers

- 2018-      Lyu, P., De Waegenare, A., & Melenberg, B. “A quantitative comparison of simulation strategies for longevity risk management.”

#### *Key skills:*

Assessed the asymptotic validity of various bootstrap schemes using a simulation study in MATLAB.

- 2019-      Lyu, P., Zhou, K. Q., & Li, J. S. H. “Incorporating the association between socioeconomic status and mortality into index-based longevity hedges.”

#### *Key skills:*

Evaluated the hedge effectiveness of the newly proposed index-based hedges in Python.

## PROFESSIONAL EXPERIENCE

- 2016–      Nationale-Nederlanden Life, Quantitative Researcher, 2 days a week

#### *Involved projects:*

Longevity Redesign: wrote a technical model document of an internal model for approx. €2 bn longevity trend risk and implemented it in R jointly with Anastasios Bardoutsos, supervised by Wilbert Ouburg.

Mortality Differentiation: extended a mortality model to price pension contracts differently for various salary thresholds in MATLAB jointly with Ahmad Salahnejhad, supervised by David Schrager.

## CONFERENCE AND SEMINARS

- 2019      Fifteenth International Longevity Risk and Capital Markets Solutions Conference (Longevity 15).

- 2018 22nd International Congress on Insurance: Mathematics and Economics, Fourteenth International Longevity Risk and Capital Markets Solutions Conference, European Actuarial Journal Conference 2018, Netspar International Pension Workshop '18, The Asia-Pacific Risk and Insurance Association Conference 2018, Invited seminar at The University of Melbourne.
- 2017 Thirteenth International Longevity Risk and Capital Markets Solutions Conference (Longevity 13).

## GRANTS AND AWARDS

### Awards and Honors

- 2018 Kyobo Life Travel Scholarship

### Grants

- 2019 Longer life, longer in good health, working longer? Implications of educational differences for the pension system, Netspar Thema grant. Project member.
- 2018 Modeling and forecasting Chinese population dynamics in a multi-population context (\$10,000). Society of Actuaries China research grant. Co-PI with Hong Li and Yang Lu.
- 2017 An investigation into Differentiated longevity trends within the Dutch population. Netspar Ph.D. grant with Nationale-Nederlanden Life and Tilburg University. Supervisor: Bertrand Melenberg and David Schrager.

## PROGRAMMING SKILLS

MATLAB, R, Stata, SQL, Python

## TEACHING REFERENCE

Dr. Pavel Cizek  
Tilburg University  
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## RESEARCH REFERENCE

Prof. Bertrand Melenberg  
Tilburg University  
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Prof. Anja De Waegenare  
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Updated May 2020