

20190814 Retirement

Xinwei Dong

August 2019

1 Introduction

1.1 Background

- The world's population is living longer but retiring earlier.
- Adults in many (developed) countries are now spending between a third to a half of their adult lives in retirement.

1.2 Motivation

- Study on retirement helps predict **poverty and poor health** in old age.
- When to retire is an important **labor supply decision**.
- Employer policy regarding older worker pay and productivity can be seen as a **labor demand decision**.
- Early retirement trends threaten the financial stability of national pay-as-you-go **social security systems**.

2 Understanding retirement


2.1 Concept

- the act of accepting a pension or social security benefits
- voluntary or forced job-leaving
- reductions in hours of work and/or pay
- job change
- complete labor force withdrawal

Retirement may be a "state of mind" rather than an objectively defined labor force concept.

2.2 Retiree well-being

Poverty at old age:

- Lifecycle saving model with uncertainty: rational far-sighted economic men and women consume less than their income when young, saving to cover their retirement needs.
 - Making bad bets about such things as their likely future mortality? \Rightarrow Men tend to be overoptimistic (oversave); women tend to underestimate their chances of living to age 75 (undersave).
-  – Well-informed economically rational people simply cannot buy "fair" annuity products in the insurance market? \Rightarrow Reasonably priced annuity products exist.
- Adequacy of retirement saving: the government-set poverty line; income-to-needs ratio.
- Who are poor: non-married; poor health; poor labor market history./

3 Modeling retirement

Important review: Lazear(1986)

3.1 Older workers' retirement decisions

1. The Gustman-Steinmeier model

- Choosing $C(t)$ (consumption) and $L(t)$ (leisure) at time t to maximize lifetime utility.
- Feature: allow retirement to occur gradually via the transition from full to part-time work.



2. The Stock-Wise model

- At any given age, based on information available at that age, an employee compares the expected present value of retiring immediately with the value of retiring at each future age.
- At t , compare $\max_r \{G_t(r)E_t V_t(r) - E_t V_t(t)\}$ with 0. Postpone retirement until age r if the maximum value > 0 .

3. A stochastic dynamic programming model

- At year t , the individual has two choices: retire now and derive utility from future retirement benefits, or work for the year and derive utility from income while working during the year and retaining the option to choose again next year.
- Recursive representation:

$$W_t = \max(W_{1t} + \epsilon_{1t}, W_{2t} + \epsilon_{2t})$$

$$\text{Work now: } W_{1t} = U_w(Y_t) + \beta \pi(t+1|t) E_t W_{t+1}$$

$$\text{Retire now: } W_{2t} = \sum_{\tau=t}^T \beta^{\tau-t} \pi(\tau|t) U_R[B_{\tau|t}]$$



- Solved by backward recursion.
4. Berkovec and Stern (1991)
 - Allow three states: full-time work, part-time work, and retirement.
 - Retirement is not an absorbing state.
 - Allow uncertainty w.r.t. future wages.
 5. Rust and Phelan (1997)
 - Joint retirement/consumption decision making.
 - Allows for individual subjective uncertainty w.r.t. future mortality, health status and expenditures, marital status, employment, and income.

3.2 The demand for older workers



Not simple " $w = MP$ " in the spot labor market: many employees are covered by longterm contracts, where productivity and pay profiles may and do deviate from each other at any given time. With **long contract**: compensation over the work life = expected present value terms to expected marginal product over the work life.

- Reduced benefits will be paid to those who change jobs, or leave prior to the company's retirement age.
- Pay towards the end of the work life is likely to exceed the worker's productivity. Then the employer will have an incentive to recontract with older workers when the longterm arrangement nears its end. (?)
- To insure the worker's career compensation would not come to exceed his career value to the firm:
 - mandatory retirement
 - recontract with older workers by lowering pay at older ages (Japan)
 - benefit pension plan rules in such a way that workers lose money by deferring retirement past a certain date, or financial packages offered to workers as retirement inducements

Employers structure their longterm contracts so as to share the additional risk and potential return.

3.3 Other influences on retirement

3.3.1 Health and disability problems


- On the budget constraint
 - Illness → less productive in SR, more absenteeism in MR → less likely to invest in longterm skill in LR. 
 - Alter the value of people's time: change one's  time horizon; in US those in poor health are generally most needful of continuing to work to preserve health care benefits.
- On preferences

- Change people’s perception of the utility of work versus leisure. (Related issue: other family members’ labor supply and caregiving decisions are likely to be endogenous to the older worker.)
- Influence the decision-making process directly.
- Future challenges
 - to test the effect of both chronic and acute health problems on retirement
 - to examine how workers respond by choosing different treatment paths
 - to examine how health and work evolve **simultaneously** through the latter part of the work life

3.3.2 Institutional rigidities

Mandatory retirement, pensions, hours constraints; Workplace rigidities, work environments (future question).

3.3.3 Sociological or behavioral influences

- Decision-making in a family context.
- Adding multiple states to dynamic model. $((A,B): 2 \times 2)$ 

3.3.4 Other issues

Employer-side models of demand for older workers have lagged behind.

How to model:

- uncertainty in the firm
- a continuous transition to retirement
- individual perceptions and self-selection
- in the family context


4 Empirical lessons

4.1 Retirement, pensions and social security benefits

4.1.1 Labor supply effects

- Social security rule modifications/pensions on retirement: little effects.
- (Unanticipated) early retirement windows on retirement: powerful effect.
- Social security system/law change on retirement: large effects.

4.1.2 Labor demand

Difficult to estimate labor demand models: lack of company-level data; whether older workers actually represent different quality employees than do younger workers; sample selection. 

- Older female employees are substitutes with mature men(?), but older male employees are complementary workers with young men.
- Earnings profiles do not fall as workers age. Inverted U-shape is attributed to the fact that people move into part-time, bridge jobs with lower wages at older ages. → suggests longterm contract model (with some additional facts).

4.2 Retirement and other economic variables

4.2.1 Health and disability

- Poor health encouraged early retirement. But indicators of poor health were correlated with early retirement (self-reported).
- Most early retirees are better off and less likely to be in poor health.
- Interaction between health and other factors:
 - health insurance: estimated effect far from being pinned down
 - the nature of the job: people in physically demanding jobs retired earlier
 - employer attitudes towards older workers and their willingness to adjust to workers' health problems: people return to work more quickly after a temporarily disabling health problem when their employer encourages return-to-work by making workplace accommodations
 - the worker's family status: women workers retired later when their husband was ill

4.2.2 Institutional rigidities

- endogeneity of pension plan design decisions
- mandatory retirement and age discrimination are expected to increase older workers' employment rates

4.2.3 Family considerations

- relationship between caregiving and employment: positive for young and middle aged women, but opposite for individuals near retirement age.

4.3 Expectations and uncertainty

Econometrician does not know when the individual makes the decision to retire; workers cannot perfectly forecast future economic conditions; many people do not fully understand the inputs into the retirement decision.