Contents

General Notes:

Lecture 1: Measuring Aging

Defining ageing.

- Demographic Process
- Change in health
- Change in productivity

Life Tables

EXAM QUESTION EVERY YEAR: What is the difference between period and cohort life tables

Observed data vs fictitious cohort

- Period life table can be observed at each period, but does not reflect mortality experience of a real cohort
- Cohort life table can be observed once every individual of a cohort has died.

Old Age Dependency Ratios

$$\frac{Number\ of\ People\ Older\ than\ 65}{Number\ of\ People\ between\ 15-65}$$

$$\frac{D_{65+}}{N_{15-64}}$$

Ageing by the Top

From the bottom

Ageing driven by fertility decrease : reductions in number of youths or prime aged individuals

- Historically decline in infant mortality led to increase in the share of the 60+

From the Top

More recent realisation that recent ageing process is essentially ageing by the top

- Recent gains in life expectancy come from gains at older ages
- Variety of experience at international level

Institutional design of Pensions

History Of Retirement

Family Support

Charity and Assistant

Occupational Pensions

Individual Savings

Birth of the Welfare State: Bismark

Work Related Accident Assurance

Healthcare Insurance

Employers contributed one-third, the workers two-third

"Sickness funds"", managed by workers' representatives

Old-age and disability insurance (1889)

Participation was mandatory (except for civil servants,covered by previous scheme)

All workers concerned (not only industry workers)

Contributory system funded by employee, employers and the State

Pension age was set at 70.

This was not about enjoying life after a career of hard work. This was strictly pragmatic. What do you expect from the Germans?

The UK and the Beverage Report

Unlike Bismark, the objective of the Beverage report was to lift all British out of poverty, but not to provide high replacement rates.

It was a comprehensive report that factored in all parts of living standards from cradle to grave. (Health system, Education, Housing, etc.)

An attack on the 5 evils:

Want, Disease, Ignorance, Squalor, and Idleness.

Rationale for Public Intervention

Market Failures

Capital Markets

Large volatility in capital market returns
Inflation could wipe out the value of someone's holdings very quickly in rare events.

Governments began to create index-linked bonds in an attempt to attenuate the effects of those events.

Myopia

People are often short sighted, and so they under-save for retirement

Samaritan's dilemma

If there is expectation that there will be assistance to the elderly poor (i.e., elderly cannot be left dying) Then some will under-save for retirement, expecting receiving welfare when poor

Governments will the intervene to attenuate the motivation to game the system.

Redistribution

Both within and between cohorts. (Some cohorts experience different shocks, large systems help smooth the effects of these)
General objective to prevent poverty, especially of elderly individuals.

Efficiency and Administrative Costs

One of the benefits of compulsion is that no money is spent on selling insurance products by the state. But this harms competition and a uniform scheme might not accommodate heterogeneity in preferences (if too big).

- **Bismarckian system**

  - Contributory benefit
  - Funded by Social Security contributions
  - Covering only workers and their family
  - Managed by employee and employers' unions

- **Beveridgian system**

  - Flat-rate benefits
  - Universal coverage
  - Funded by general taxation
  - Managed by the State

Pension Design around the World

Bismark vs Beveridge

Historically more complex

Beveridge plan was in the form of a social insurance

- Funded by National insurance contributions (NICs)
- Contributory benefits proportional to years of contribution

Big difference : benefits expressed as absolute amount (not as share of earnings). Evolution lead to marked difference with earnings-related schemes

Types of Pensions

Public vs mandatory private vs voluntary private

- Mandatory systems can be public or private
- Mandate can be found with scheme monopoly or competition
- Public schemes can be run by the State or Social security administrations

Funded vs unfunded vs mixed funding

Think of funding more as a spectrum with complete funding and unfunded being corner solutions.

- Funded : contributions invested in capital markets
- Unfunded or PAYGO : contributions directly used to finance current pensions
- Mixed funding : PAYGO with some reserves

Pensions and Capital Markets

Funded vs Unfunded

Chocolate Economy - Paul A. Samuelson

Imagine an economy with no durable goods, just goods like chocolate which you cannot store. There are two periods:

1. You work
2. You retire

Now lets introduce an unfunded pension scheme, where workers give a fraction of their income to the retirees.

Samuelson claims in his model that Unfunded pension system offers implicit rate of returns equal to the growth of the tax base, approximately $n + g$.

However, this is contingent on the consistent growth of the population.

He states you can get the same result with **fiat money.** This suggests that the ownership of durable capital is what defines a Funded system.

NB. EXAM QUESTION

Understand that investing in treasury bonds is feature of an unfunded system.
Funded systems require on the ***investment and ownership of capital which will produce returns***

Peter Diamond - National Debt in Neoclassical Growth Model

Now lets acknowledge the existence of capital. Despite, three decade in which the rate of return for capital is lower than the growth of the economy, unfunded systems are not pareto-efficient.

Loss/gain from unfunded pension is $(r - \gamma)\tau w_t L_t$. We can see that if $r < \gamma$ then you see a loss yet for most of recent history r.

Labour Supply Response

Adequacy of Savings

Are people aware of how much money they should save or be saving?

Drop in consumption at retirement

Reasons for expecting lower consumption needs

- change in housing size or location
- with children gone, lower expenses
- substitution of market expenditures to home production

Reasons for expecting higher consumption needs

- enjoying leisurely activities
- out-of pocket health care costs
- long-term care at older ages

Empirically however we see that consumption usually drops upon retirement.
Evidence also shows that this is negatively correlated with wealth (with consumption of wealthier dropping less than the poorer)

Solving the Puzzle

While it is true that ***expenditure*** drops in retirement (due to reduced work related expenditure and an increase in non-market home production like cooking) ***consumption*** (such as caloric intake) remains very similar! This is an important shift in understanding.

Impact of Pensions on Savings

Do pensions crowd out other investments?

If so the impact of an unfunded pension system would be hugely detrimental!

REVIEW SLIDES FOR LITERATURE.

Retirement Saving Policies

Tax Incentives

There exists tax favoured savings accounts (IRA in US, PERP in France)

Or a defined contribution account (401K)

- No tax on contribution
- Interest is accumulated tax free
- Taxes are paid on withdrawal

(Roth IRAs work a little bit differently)

Keep in mind that Tax Incentives have both substitution effect (which suggests you will substitute consumption for saving) and ***income effects*** (which suggest that saving the save amount has made you richer and so you might choose to save a little less)

Pensions and Labour Markets

What is retirement?

In economics retirements is viewed as withdrawing from the labour force. The claiming of a pension is not necessarily involved, as there is no reason why both have to happen simultaneously (even though they tend to).

Yet retirement is ambiguous. Are people retired or unemployed? People may be retired and then choose to re-enter the workforce. People also may not completely withdraw from the labour force, but partially retire by reducing their hours.

Labour force participation for those 65 and over has dropped significantly in 100 years.

Modelling Retirement

A Simple Retirement Model

Income effects

Long-term trend in decreasing retirement age, might be explained by income effects. Being richer, we consume more leisure

Limits

Value of market time independent of age. Value of leisure independent of age. No reason for bunching of leisure at the end of life.

Option Value Model

Dynamic Programming Models

Impact of Pensions on Incentives

Retirement Spikes

Pension Incentives

NB ALWAYS A QUESTION ABOUT THE EARNINGS TEST

Following these kinds of studies most countries have removed the earnings test.

Changes in Retirement age (Bozio did his PhD on this)

Use of Diff-in-Diff when exact date of birth not known.

Ideally RDD designs are used.

Redistribution and Well-Being

The objective of a pension system is by definition to redistribute wealth from those who die early to those who die late. They act as an insurance against the risk of living a long time. It would be an insurance if mortality was completely random.

Redistribution

Poverty & Differential Life-Expectancy:

Unemployed people are significantly more likely to die at a given age than those who are in employment.

Life expectancy also increases as income increases. Furthermore, at the poorest end where you live has an impact.

Deaths from cardiovascular disease contributed most to the gap in life expectancy between income quartiles, with cancer (lung especially) being second.

Elderly Poverty

Measured in absolute terms in the US and in relative terms in the EU. Can also use living situations as poverty can lead to multi-generational cohabitation.

The causal impact of social security benefits is tough to establish.

Redistribution Across Cohorts

Redistribution Within Cohorts

Annual vs Lifetime

- Annual: workers to elderly
- Lifetime: largely an empirical question

Leibman, 2022: US

Germany

Health & Well-Being

Impact of Health on Retirement

Does health status affect recession decisions ?

Impact of Retirement on Health

Does retirement affect your health/mortality?

- Meta-analysis has shown that there is no or very little impact of retirement age on mortality.
- Retirement leads to better self-reported health.
- Retirement leads to a decrease of cognitive functions.

Work Quality

There is a link between the quality of ones job and their health in retirement.

Longterm Care for the Elderly

We use surveys to measure people's abilitiy to look after them selves (APL and iADL).

Insuring against long-term care risk

There is a large and uncertain risk suggests great value to insurance. 35%-50% of 65 year-old will use nursing home (in the U.S.) among which 10-20% more than 5 years.

Why so little private insurance?

U.S. 14% of 60+ had a long-term care insurance policy. Typical policy only covers 2/3 of long-term care cost, with a premium of $4,500 per year.

- **Supply side market failures**
  - asymmetric information (adverse selection and moral hazard)
  - imperfect competition
  - transaction costs
- **Limited Demand**
  - Imperfect but cheaper substitutes (Medicaid in the US, Informal Care, money from kids)
  - Limited Rationality

title

Pension Reforms

Motivated by significant demographic changes (baby boomers retiring, increased life expectancy, lower birthrate), countries are having to reform their pension schemes. These reforms will have significant impacts on their public finances.

Policy Options

1. Higher level of funding
   - Higher public funding
   - Higher savings rates
2. Radical reform (privatisation)
   - Switch from unfunded to funded
3. Parametric reform
   - Increase contributions
   - Reduce benefits
   - Increase retirement age

Increased Funding

Benefits of funded systems

- Higher return on funded systems
- Lower costs of running pension
- Higher savings and higher investments $\rightarrow$ Higher economic growth

Demographic changes also impact funded systems (higher life expectancy $\rightarrow$ lower annuity). This is particularly problematic for countries with a declining population.

Transition from unfunded to funded

- Cut current pension benefits (pisses off retirees)
- Ask cohort to pay twice (pisses off workers)
- Issue debt to pay for it (pisses off those who cant vote yet)

Unfunded systems have an implicit debt, and so to transition governments would have to pay that debt. **The implicit debt of Pensions is often multiples of GDP in size.** Pensions account for a large percentage of annual government spending. To do that each year and secure it, you would need a large loan.

Privatisation

Only Chile has managed to do it.

Reforming PAYGO