Ageing-driven pension reforms

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Two worldwide trends: are they connected?

- Population ageing
- (Types of) Pension reform
- Are the two connected?
  - Can pension reform be explained from ageing of the population?

Structure of presentation

- Population ageing
- Pension reform
- A 2-period OLG model
  - Applied to PAYG pensions
  - Applied to funded pensions

Population ageing

- Bron: CBS

Pension reform

Finance / Plan feature	Unfunded (paygo)	Funded	
DB	[1] Payg DB (PDB)	[2] Funded DB (FDB)	
DC	[3] Notional DC (NDC)	[4] Individual DC (IDC)	[5] Collective DC (CDC)

= Parametric reform

= Plan reset

A 2-period OLG model

- Assume the population consists of two generations:
  - One is old
  - The other is young
- Absent a pension scheme,
  - the young consume their wage income
  - the old consume their income from private saving
- Assume two risk factors:
  - The rate of return on saving
  - Life expectancy

A 2-period OLG model

- Define social welfare as a function of consumption by the young and consumption by the old
- Generation size affects the social welfare function:
  - The bigger a generation, the larger its weight in the social welfare function
- The pension scheme organizes transfers from the young to the old
  - They allow for higher consumption by the old
  - They reduce consumption by the young
- The pension scheme chooses the transfer function such that it maximizes social welfare

PAYG pensions

- Pension income of the old consists of two components:
  - The gross return on their private saving
  - Income provided through the PAYG scheme
- Both components loose value upon an unexpected increase in life expectancy
- The transfer function distributes part ϕ of the income loss as regards the PAYG scheme to the young generation
  - $\phi = 0$: the old generation bears the full burden of the life expectancy shock
  - $\phi = 1$: the life expectancy shock is completely shifted to the young generation
  - $0 < \phi < 1$: the young and old generation share the burden of the life expectancy shock

Results

- In case of a zero or small correlation between the shock in the return on saving and the longevity shock, the optimal ϕ is strictly between zero and one
  - Both the old and the young generation absorb part of the shock
- The optimal ϕ relates to the wage rate (+), the replacement rate (-) and the weight given to the old in the social welfare function (+)
- The optimal ϕ relates negatively to $E(\mu)$, the expected old-age dependency ratio

Results

- Empirical evidence indicates that the correlation between the return on saving and longevity may be zero or negative
- Negative correlation between the two shocks increases optimal risk sharing
- Negative correlation does not affect the reduction in ϕ upon an increase in $E(\mu)$ in relative terms

Funded pensions

- Transfer function distributes a part ϕ of a shock to the young generation
  - $\phi = 0$: the old generation bears the full burden of the shock
  - $\phi = 1$: the shock is completely shifted to the young generation
  - $0 < \phi < 1$: the young and old generation share the burden of the shock
- Unlike the PAYG case, the shock can be in the rate of return on saving or in life expectancy

Results

- The optimal ϕ is strictly between zero and one
  - Both the old and the young generation absorb part of the shock
- The optimal ϕ relates to the wage rate (+), the replacement rate (-) and the weight given to the old in the social welfare function (+)
- The optimal ϕ relates negatively to $E(\mu)$, the expected old-age dependency ratio
- Unlike the case of PAYG pensions, the degree of correlation between the shock in the rate of return on savings and in life expectancy does not play a role

Take home message

- Across the world, pensions are being reformed, reducing intergenerational risk sharing between the young and the old
- This can be seen as a welfare-best response to population ageing
- Our result is general and should apply both when governments are left-wing or when they are right-wing
- This may help to explain the universality of the connection between pension reform and population ageing