

Political Intergenerational Risk Sharing

by

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Motivation

- Intergenerational risk sharing is from particular interest
 - In times of financial troubles pension schemes guarantee stable old age consumption
 - Aging of population decreases returns from pension schemes
 - Pension schemes become a political instrument to attract voters



Innovation

- D'Amato and Galasso abstract from distorting effects of pension schemes, e.g. crowding out effect on the stock of capital
- They compare a pension scheme under a benevolent government with the pension scheme of an politician who seeks office
- They examine the effect of an aging population on the design of the pension scheme



Basic Model

Environment

- Two period OLG model with a constant population growth rate n
- Every period two generations are alive: old and young
- Young agents are endowed with one unit of labor which they supply inelastically to receive a wage w , which is deterministic and assumed to be 1
- Agents save their entire endowment for old age consumption using a risky asset
- The return of the risky asset is stochastic with $E[R_t]=R$, $\text{Var}[R_t]=\sigma^2$, $E[R_t R_{t+1}]=R^2$ and $R>1+n$



Basic Model

Ex-ante Pareto Efficient Risk Sharing

- Agents have quadratic preferences

$$U(c_{t+1}) = -\frac{1}{2} E_t (c_{t+1} - \gamma)^2$$

- The budget constraint of an individual at time t is given by

$$c_{t+1} = R_{t+1} (1 - \alpha) + (1 + n)\alpha$$

- Maximizing utility subject to the budget constraint gives

$$\alpha = \frac{\sigma^2 + (R - (1 + n))(R - \gamma)}{\sigma^2 + (R - (1 + n))^2}$$

- For a sufficient large degree of risk aversion the young choose some intergenerational risk sharing, i.e. $\alpha > 0$
- Under risk sharing expected consumption is lower than without however so is the variance



Model – Benevolent Government

Optimization Problem of the Government

- There is no commitment hence government can modify policy if it is optimal to do so

- Maximization problem is

$$V(\omega_t) = \max_{\{T_t\}} \{U(\omega_t, T_t) + \delta(1+n)E_t V(\omega_{t+1})\}$$

subject to

$$c_{t+1} = R_{t+1}(1 - T_t) + (1+n)T_t$$

with $\omega_t = R_t(1 - T_{t-1})$ the net private wealth of the elderly at time t

- FOC gives a trade off between the marginal utility of the young and the marginal utility of the old

$$(\omega_t + (1+n)T(\omega_t) - \gamma) = \delta E_t (\omega_{t+1} + (1+n)T(\omega_{t+1}) - \gamma) R_{t+1}$$



Model – Benevolent Government

Optimal Transfer Policy

- D'Amatio and Galasso guess a linear time consistent policy of the form $T(\omega_t)=A+B\omega_t$ and verify that it solves the FOC

- The solution is given by

$$T^G(\omega_t) = \frac{\delta[S - R\gamma] + (\gamma - (1+n))}{\delta[S - R(1+n)]} - \frac{1}{\delta S} \omega_t$$

with $S=R^2+\sigma^2$ and δ the planner's discount factor

- If the government sufficiently cares about the young it will implement a pension scheme such that
 - Elderly are provided with a constant share (first term)
 - The constant share is reduced by a proportion, depending on the state of the world (second term)



Model – Office-seeking Politicians

Political System

- Election takes place every period after the realization of the stochastic return on the assets of the current old
- Two politicians compete in a majoritarian voting model
- Each candidate determines her political platform by choosing a transfer T which maximizes her probability of winning
- An agent's voting decision depends on the policy of the politician and a political ideology of the individual
- Elderly only care about current transfers whereas the preferences of the young also depends on expected future policy
- In this environment politicians face the same optimization problem and choose the same transfers



Model – Office-seeking Politicians

Maximization Problem of the Politicians

- Maximizing the probability of winning the election is equal to maximize

$$W_t = \phi_o U(c_t) + (1+n)\phi_y E_t U(c_{t+1})$$

where ϕ_o and ϕ_y representing the density of an uniform ideology distribution function of the old and young respectively

- The current choice of the politicians affects future politicians and future intergenerational risk sharing
- The optimization problem of the policy maker at time t is then

$$\max_{\{-\omega \leq T(\omega) \leq 1\}} U(c_t) + (1+n)\phi_y E_t U(c_{t+1})$$

where ϕ_o is normalized to 1, $\omega_t = R_t(1 - T_{t-1})$ the net private wealth of the elderly at time t and $T_t = T(\omega_t)$ the Markov strategy



Model – Office-seeking Politicians

Solution to the Maximization Problem

- Assuming a quadratic utility function as before the FOC is

$$(\omega_t + (1+n)T^P(\omega_t) - \gamma) = \phi(1 + (1+n)T')E_t(\omega_{t+1} + (1+n)T^P(\omega_{t+1}) - \gamma)R_{t+1}$$

$$\text{with } T' = \frac{\partial T^P(\omega_{t+1})}{\partial \omega_{t+1}}$$

- D'Amato and Galasso show that a linear Markov perfect policy function $T^P(\omega_t) = \theta + T' \omega_t$ exists which takes the form

$$\theta = \frac{2(\gamma - (1+n)) - \phi(\mathcal{R} - S)(1 + \sqrt{1 - (4(1+n)/\phi S)})}{\phi[S - R(1+n)](1 + \sqrt{1 - (4(1+n)/\phi S)})}$$

$$T' = -\frac{1}{2(1+n)}(1 - \sqrt{1 - (4(1+n)/\phi S)})$$

- Compared to the social planner's solution an office seeking politician also cares about the voting power of the young



Politics vs. Social Planner

Comparing the Outcomes

- Politicians provide a larger fixed amount compared to the social optimum and a lower reduction associated to the state of nature
- Political intergenerational risk sharing is too generous and too persistent
- Current politician anticipated that future politicians will compensate the current young in their old age for their current contributions
- Comparing FOCs the policy of the benevolent government and politicians coincide only if

$$\phi = \delta \left[1 - \frac{1+n}{\delta S} \right]^{-1}$$

which implies a unusual high voting power for the young



Politics vs. Social Planner

Effect of an Aging Population – The Benevolent Government

- Two opposite effects:
 - Increase in the relative importance of risk sharing
 - Increase in the costs to maintain intergenerational risk sharing
- For a benevolent government the first effect dominates and leads to higher transfers since

$$\frac{\partial T^G(\omega_t)}{\partial n} = -\frac{(\delta R - 1)(R\gamma - S)}{\delta[S - R(1 + n)]^2} < 0$$



Politics vs. Social Planner

Effect of an aging Population – An Office Seeking Politician

- D'Amato and Galasso show that when $T^P(\omega) > T^G(\omega)$ the fixed component decreases with a shrinking population
- The degree of adjustment to a wealth shock always increases with a fall in the population
- Aging reduces transfers to the elderly proposed by an office seeking politician
- Aging increases the costs of large current transfers in terms of tomorrow's adjustments. Future politicians will become less keen to accommodate the previous policies



Conclusion

- Politician concerned with elections might tend to support too generous and persistent social security systems
- They anticipate that future politicians compensate the current young in their old age
- Surprisingly an aging population has a tilting effect on transfers chosen by politicians
- This is due to the reason that aging reduces the room for strategic behavior