Inter-generational conflict and the declining labor share

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Since World War II

1. Appearance of the **baby-boomers' cohort** in many OECD countries

2. **Declining labor income share** since the entry of the boomers on the labor market
   - Biased technical change, institutions, globalization ?

How does age structure affect the income allocation between capital and labor in high-income countries ?

Why would this matter ?

$\Rightarrow$ Aging population in many OECD countries

$<$ Old-age dependency ratio figure $>$

What do we know ?

- Population aging affects the labor share **through capital accumulation**
  - **Schmidt and Vosen (2013)**

- **Biased technical change** is the long-run response of firms to thwart **workers empowerment**
  - **Caballero and Hammour (1998)**; Blanchard (1997); Bentolila and Saint-Paul (2003); Acemoglu (2002); Karabarbounis and Neiman (2014)

- **Inter-generational conflict** over the public budget allocation
  - **Gonzalez-Eiras and Niepelt (2012)**; Lancia and Prarolo (2012); Busemeyer et al. (2009); Sørensen (2013); Jäger and Schmidt (2016)

What I do ?

1. OLG model focusing on two elements:
   - **Direct cohort effect**: factor accumulation
   - **Indirect policy mechanism**: age-structure determines labor market institutions

2. **Calibration** to analyze the co-movement between labor share and age-structure
   - France and the United-States

3. **Quantify** the role of population growth and survival rate

Outline

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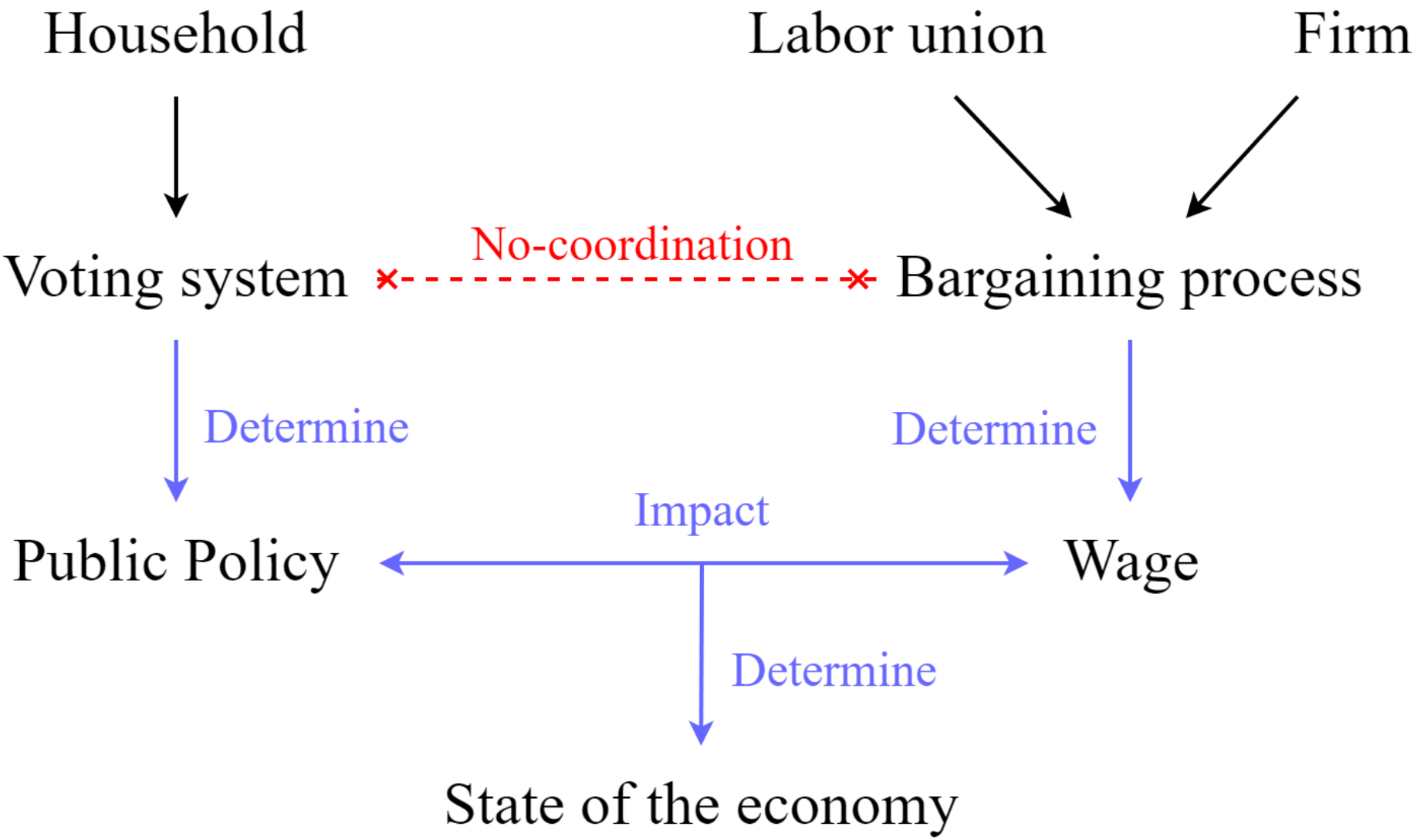
Overlapping generations model

- **Standard 2-period OLG model** with logarithmic utility function and CES production function
  - Closed economy and capital fully depreciates between two periods
  - Perfect annuities market

- Each cohort: continuum of homogeneous agents
  - Young households: supply labor inelastically, earn income, pay taxes, consume and save for retirement
  - Old households: consume the return on their savings, pay taxes and derive utility from government health spending

Diagram of the model



Public policy preferences

- **Age-related conflict** in the public policy:
  - Young households desire more unemployment benefit (b)
  - Old households desire more health spending (h)
  - Both desire less taxes (τ)

- Solved with **probabilistic voting**: public policy depends on...
  1. Macroeconomic variables (*wage rate, unemployment rate, etc.*)
  2. Preference for government health spending
  3. Weight of the young generation within the social welfare function (η_t)

$$\eta_t = \frac{n_t}{p_t} \frac{1 + \alpha p_{t+1}}{\omega}$$

n population growth
p survival rate
α discount rate
ω relative per-capita influence of old households

- Maximization program characterizing equilibrium policy choices in period t :

$$\max_{\{\tau_t, b_t, h_t\} \geq 0} \ln(1-\tau_t) + \beta \ln h_t + \eta_t \ln\left[(1-u_t)(1-\tau_t)w_t + u_t b_t\right] + \ldots$$

$$\text{s.t.} \quad \tau_t Y_t = b_t u_t N_t^y + h_t N_t^o$$

η_t the weight of the young generation within the social welfare function :

$$\eta_t = \frac{n_t}{p_t} \frac{1+\alpha p_{t+1}}{\omega}$$

- Focusing on the interior solution, first order conditions give :

$$\frac{b_t}{(1-\tau_t)w_t} = \frac{1-u_t}{u_t}\left(\eta_t \frac{1-\theta_t}{\theta_t} - 1\right)$$

$$\tau_t = 1 - \left[(1-\theta_t)(1+\beta+\eta_t)\right]^{-1}$$

$$h_t = \left(\tau_t \frac{Y_t}{N_t^y} - b_t u_t\right)\frac{n_t}{p_t}$$

Wage bargaining

- Right-to-manage model *à la* Nickell & Andrews (1983) :
  - Single union that represents workers and bargains only over wages
  - Employer retains the prerogative to hire and fire

- Maximization program characterizing equilibrium wage bargaining :

$$\max_{w_t>0} \quad \{(L_t[U_t^{y,e} - U_t^{y,u}])^{\gamma} (Y_t - w_t L_t)^{1-\gamma}\}, \quad \gamma \in (0,1)$$

$$\text{s.t.} \quad U_t^{y,e} - U_t^{y,u} = (1 + \alpha p_{t+1}) \ln \left[\frac{(1-\tau_t)w_t}{b_t}\right]$$

- From the first-order condition :

$$k_t(X_t) = \left[\frac{1-\phi}{\phi} \frac{1-\gamma(1-\sigma)}{\gamma} \frac{X_t}{1-\sigma X_t} \right]^{\frac{\sigma}{\sigma-1}}$$

where $X_t = \ln \left[\frac{(1-\tau_t) w_t}{b_t} \right]$ is the value-added to be employed in utility terms.

Equilibrium

- Using first order conditions from the voting and wage bargaining, the **capital-to-labor ratio** (k) **at the equilibrium** solves :

$$X_t = \ln\left(\frac{\frac{N_t^y}{K_t}k_t - 1}{\frac{\phi}{1-\phi}k_t^{\frac{\sigma-1}{\sigma}}\eta_t - 1}\right) \tag{1}$$

$$X_t = \left(\sigma + \frac{1-\phi}{\phi}\frac{1-\gamma(1-\sigma)}{\gamma}k_t^{\frac{1-\sigma}{\sigma}}\right)^{-1} \tag{2}$$

- Uniqueness of the equilibrium : ▸ Details

Comparative statics : public policy and households

- The longer you expect to live, the more you save : $\frac{\partial S_t}{\partial p_{t+1}} > 0$
- Young households desire...
  - more redistribution : $\frac{\partial \tau_t}{\partial \eta_t} > 0$
  - a higher unemployment replacement rate : $\frac{\partial \frac{b_t}{(1-\tau_t)w_t}}{\partial \eta_t} > 0$
- Unemployment benefits increases the labor income share : $\frac{\partial \theta_t}{\partial b_t} > 0$

Comparative statics : labor share

- Labor share : $\theta_t = \frac{w_t L_t}{Y_t} = \left(1 + \frac{\phi}{1-\phi} k_t^{\frac{\sigma-1}{\sigma}}\right)^{-1}$
- Comparative statics :

$$\left\{ \frac{\partial w_t}{\partial k_t} > 0, \quad \frac{\partial (Y_t/L_t)}{\partial k_t} > 0, \quad \frac{\partial \theta_t}{\partial k_t} \lessgtr 0 \right\}, \quad \sigma \gtrless 1$$

- It implies that :

$$\left\{ \frac{\partial w_t}{\partial k_t} \lessgtr \frac{\partial (Y_t/L_t)}{\partial k_t} \right\}, \quad \sigma \gtrless 1$$

- Finally,

$$\frac{\partial \theta_t}{\partial X_t} < 0, \quad \forall \sigma \in \mathbb{R}_+^\star \setminus \{1\}$$

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Conclusion