Inter-generational conflict and the declining labor share
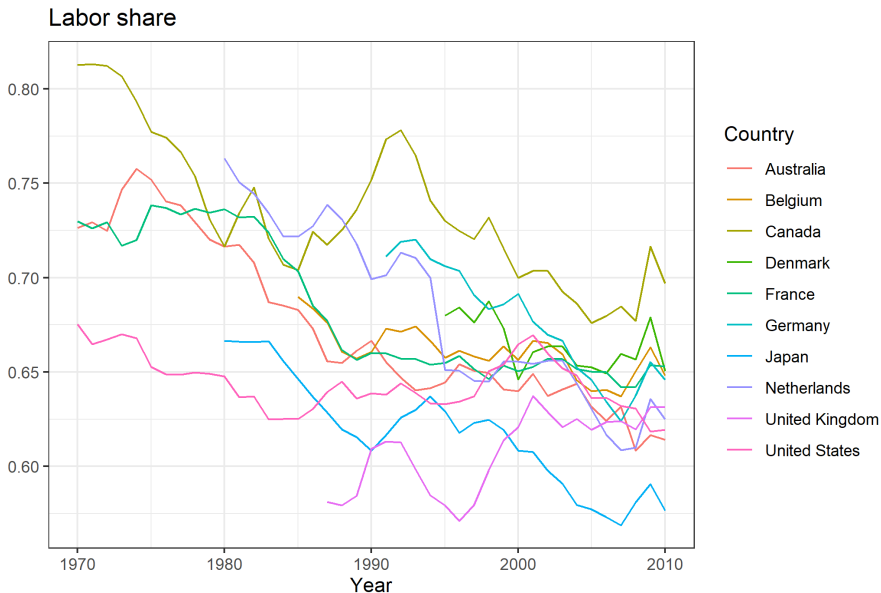
Fabien Petit[1]

[1]Aix-Marseille Univ., CNRS, EHESS, Centrale Marseille, AMSE

October 21, 2020

Declining labor share in high-income countries

Labor share

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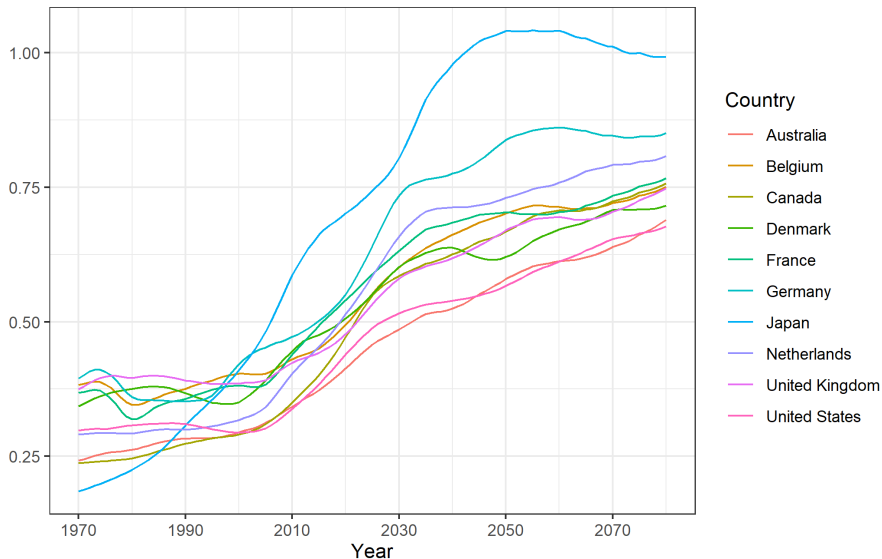
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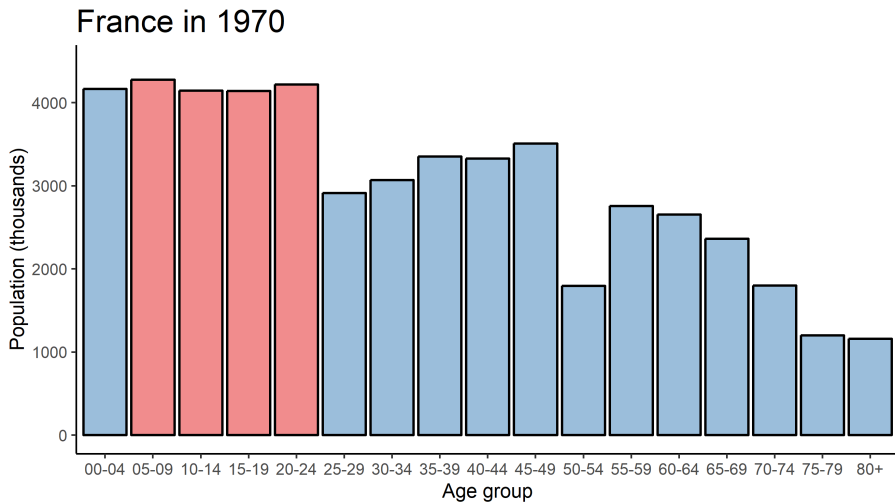
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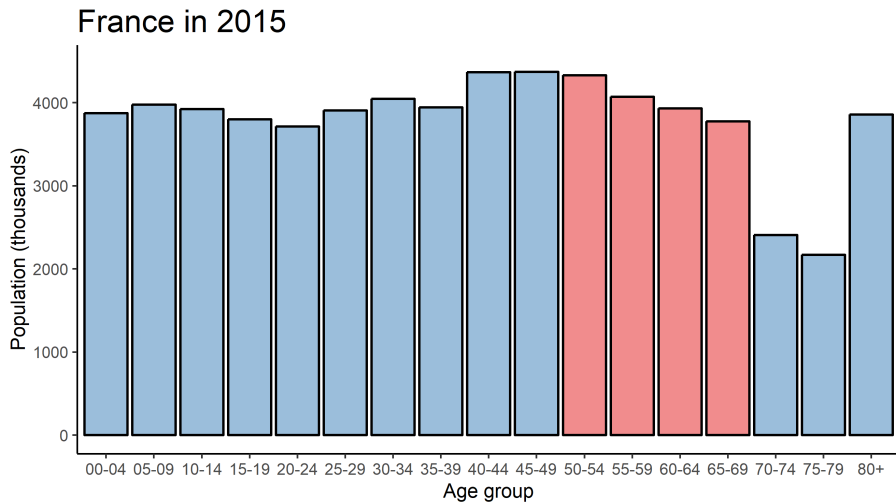
Aging population in these countries

Old-age dependency ratio

From the *baby-boomers'* coming...

France in 1970

... to their retirement

France in 2015

The impacts of an aging population

- Aging directly affects the economy: Dedry et al. (2017); Futagami and Nakajima (2001); Schmidt and Vosen (2013); Razin et al. (2002)

Figure: Chloe Swarbrick in New Zealand Parliament on October 5, 2019

- But also **indirectly through institutional changes**: Busemeyer et al. (2009); Gonzalez-Eiras and Niepelt (2012); Jäger and Schmidt (2016); Sørensen (2013)
  - Due to the existence of **age-related conflict within the public policy**

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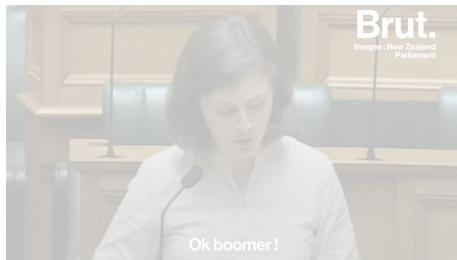

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Research questions

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

2. To what extent the age structure can influence the institutions that play a role in the income allocation ?

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What I do

- Focus on two mechanisms:
  - ▶ Direct cohort effect: factor accumulation
  - ▶ **Indirect policy mechanism**: age-structure affects policy and institutions

- OLG model calibration to analyze the co-movement between labor share and age structure
  - ▶ Focus on France and the United-States
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  - ▶ **Sources**: population growth *vs* survival rate
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Contributions

1. Build a theoretical framework in which the firms shift away from labor towards capital
   - ▶ due to changes in labor market institutions endogenously determined by the age structure of the population

2. Quantify the role of population growth and survival rate on the labor share; and the mechanisms through which they operate

3. Identify the **boomers' cohort** as
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Overview

Overview

Overlapping generations model

- Standard 2-period OLG model with logarithmic utility function and CES production function
  - Key parameter: **capital-labor elasticity of substitution** (σ)

- Closed economy and capital fully depreciates between two periods: $R_t = r_t$ and $K_t = S_{t-1}$

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

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Demography and labor share

- Demographic dynamics: $\begin{cases} N_t^y = n_t N_{t-1}^y & \text{with } n_t > 0 \\ N_t^o = p_t N_{t-1}^y & \text{with } p_t \in (0,1] \end{cases}$

$\Rightarrow$ Old-age-dependency ratio:

$$\frac{N_t^o}{N_t^y} = \frac{p_t}{n_t}$$

- CES production function, so the labor share:

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

with $\sigma \in \mathbb{R}_+^\star \backslash \{1\}$ the capital-labor elasticity of substitution

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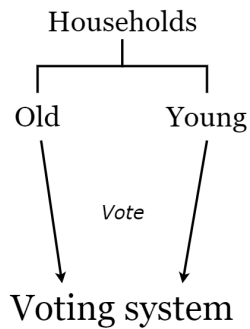
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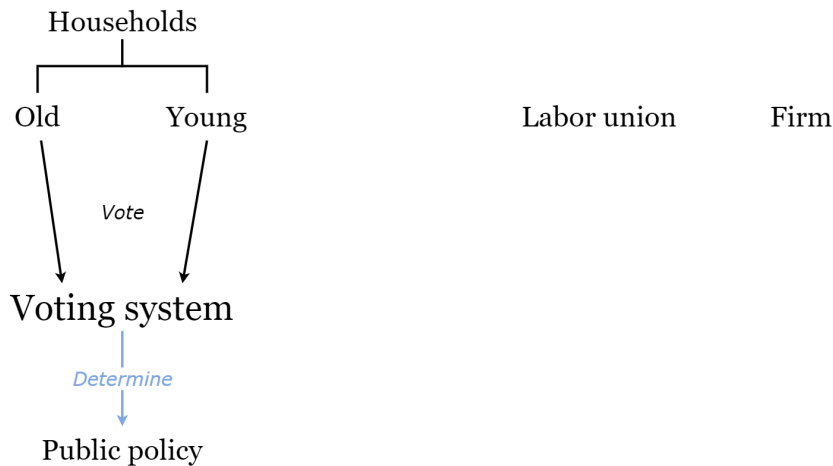
Diagram of the model

Households

Old   Young
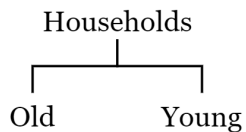
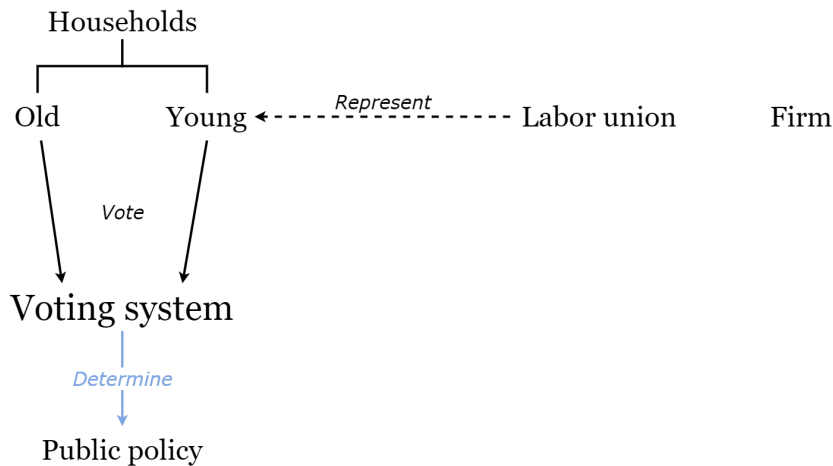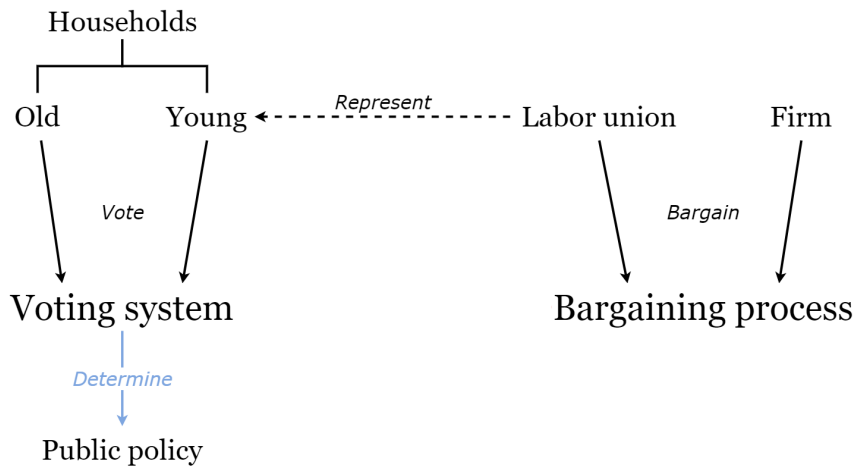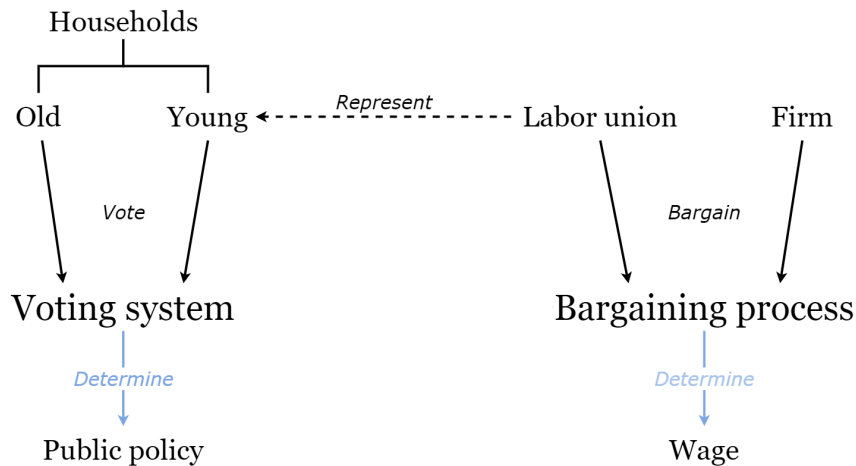Labor union   Firm

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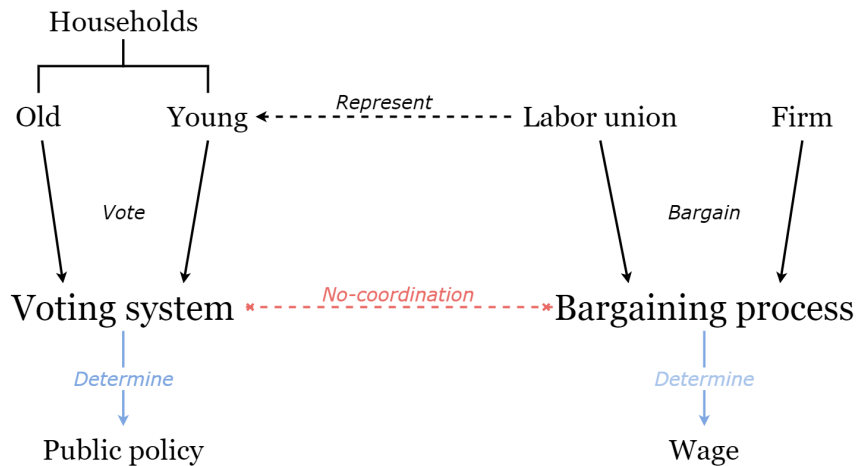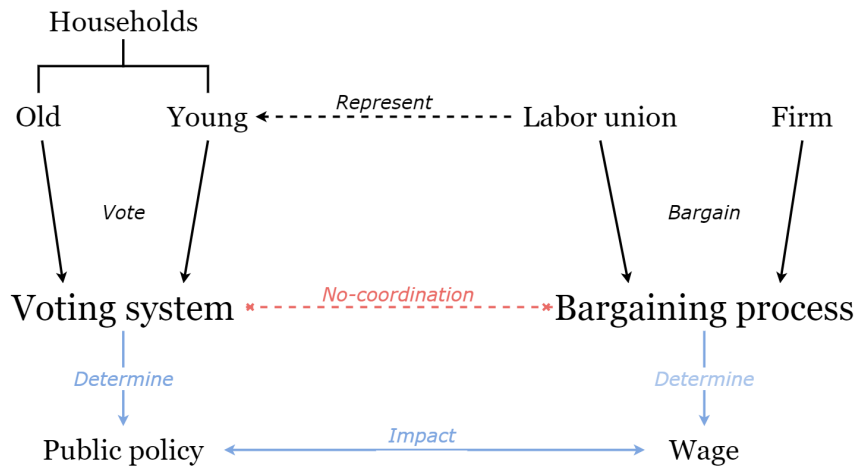
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Public policy preferences

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

- Maximization program characterizing the equilibrium policy choices in period t:

$$\max_{\tau_t, b_t, h_t} W(\tau_t, b_t, h_t; \eta_t, u_t, w_t, Y_t, N_t^y, N_t^o)$$

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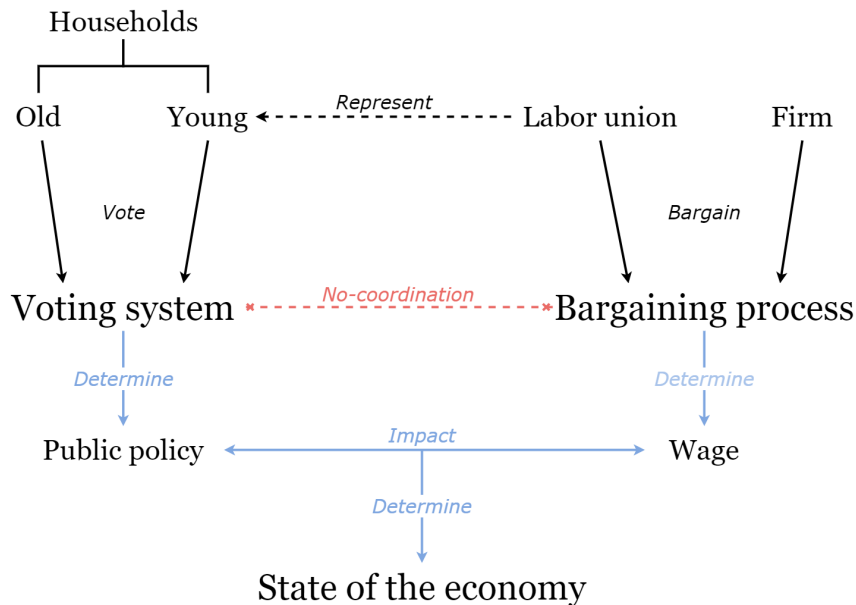
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- Political weight of the youth:

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

  ▸ $\omega \geq 0$ the *relative ideological spread-out* of the elderly w.r.t. the youth
  ▸ $\alpha \in (0, 1)$ the discount rate

- The political weight of the youth depends on
    ▸ the old-age-dependency ratio p_t/n_t;   −
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Wage bargaining

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

- Maximization program characterizing the equilibrium wage:

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- *Public policy equilibrium*, the net replacement rate in unemployment is a function of the labor income, the unemployment rate and the **youth political power** η_t

- Comparative statics depend on the **capital-labor elasticity** (σ)

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Overview

OLG model calibration

- Objectives:
  1. **Match the dynamics** of the labor share over the period 1970-2010
  2. **Model predictions** of the labor share over the period 2010-2080

- Following the methodology of Gonzalez-Eiras and Niepelt (2012) with **four sequences of model predictions**
  - 1st sequence: 1970, 2010, 2050, ...
  - 2nd sequence: 1980, 2020, 2060, ...
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Data

	Variable	Source
K	Capital stock at constant 2011 national prices	PWT 9.1
Y	Real GDP at constant 2011 national prices	PWT 9.1
emp	Number of persons engaged	PWT 9.1
θ	Share of labor compensation in GDP	PWT 9.1
τ	Government revenue as a share of GDP	OECD
N^y, N^o	Demographic data	UN WPP 2017

Notes: Adjustment method of the labor share: self-employed income as a compensation. The demographic data correspond to the "medium variant" estimates from the United Nations.

Parameters

|	Parameter	France	United States
ϕ	Capital share in 1970	0.270	0.325
γ	Relative bargaining power of the union	0.500	0.500
α	Discount rate	0.669	0.669
σ	Capital-labor elasticity of substitution	1.321	1.234
ω	Relative ideological spread-out	0.983	1.533
β	Preference for government health expenditure	0.739	0.138
A	Scale parameter of the production function	23.891	22.840

Notes: Single-equation estimation of σ from the two first-order conditions of the profit maximization with normalized CES production function. σ estimates are significant at $p < 0.1$ for France and $p < 0.05$ for the United-States.

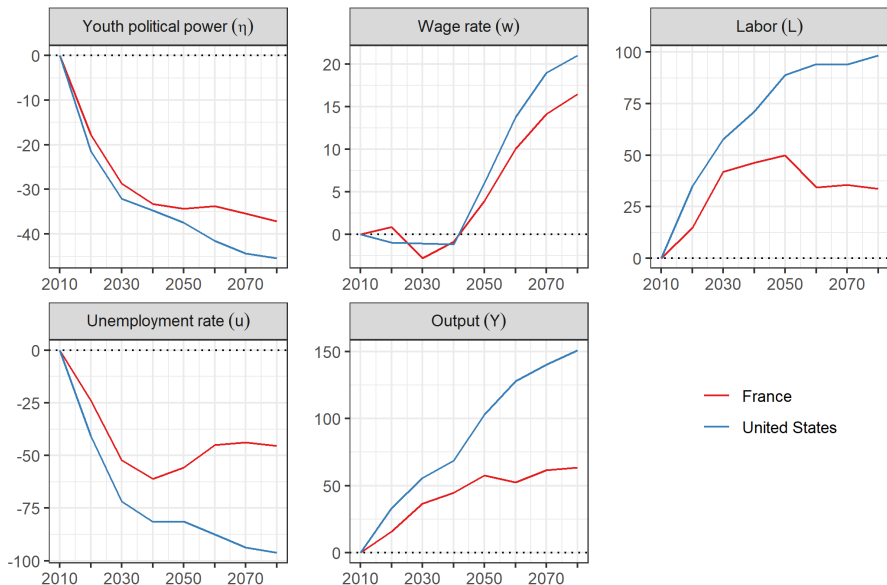# Model predictions of the labor share

Labor share

Determinant variables over the period 1970-2010
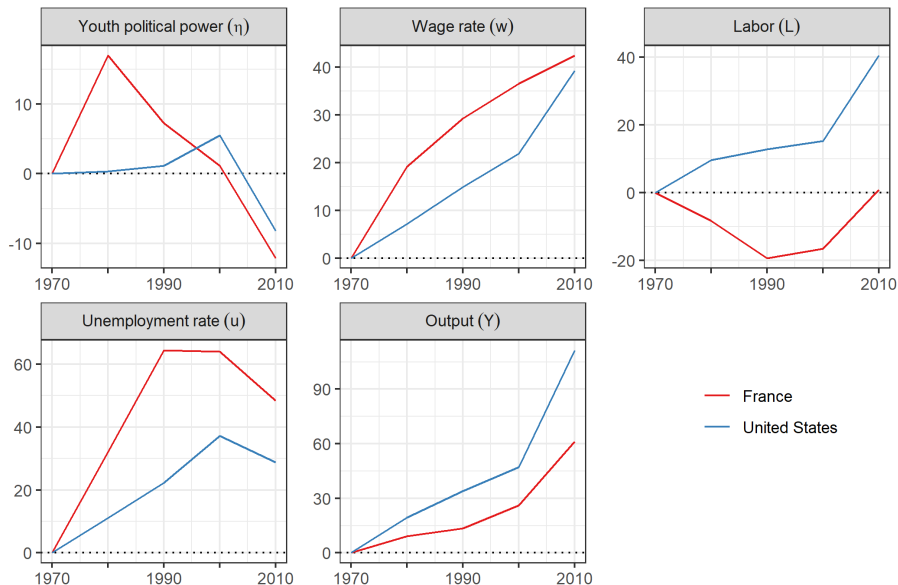
Determinant variables over the period 2010-2080

Counterfactual and aging effect decomposition

- Objectives: quantify the role of the aging population
    - **Sources**: population growth (n) *vs* survival rate (p)
    - **Transmission channels**: direct (n, p, N^y, N^o) *vs* indirect (η)

- **Intuition**: *what would have happened in terms of model predictions if this effect/channel was neutralized ?*
    - Suppose that the concerned variables remain at their 1970's level

|	Variable	France	United-States
p_{1970}	Survival rate in 1970	0.417	0.476
n_{1970}	Population growth in 1970	1.134	1.597
p_{2010}	Expected survival rate in 2010	0.583	0.561
$\frac{p_{1970}}{n_{1970}}$	Old-age-dependency ratio in 1970	0.368	0.298
η_{1970}	Youth political power in 1970	3.846	3.008

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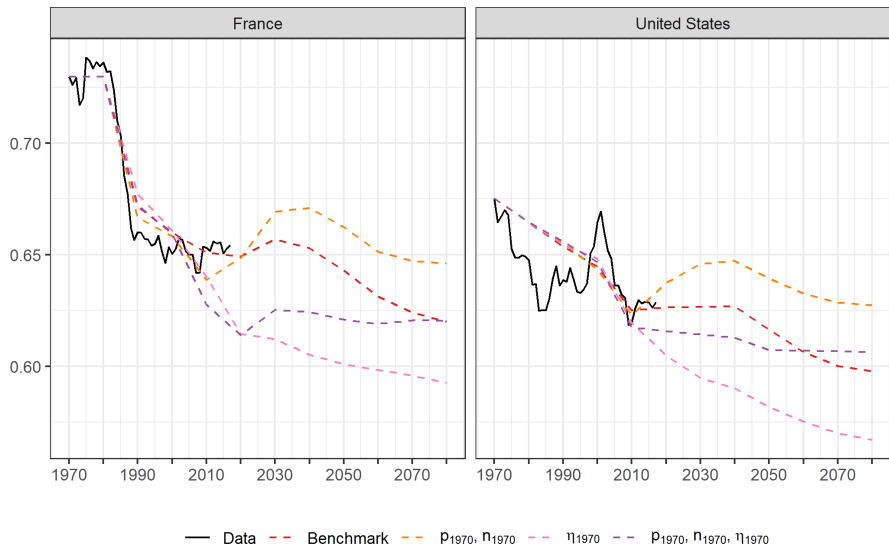
Labor share
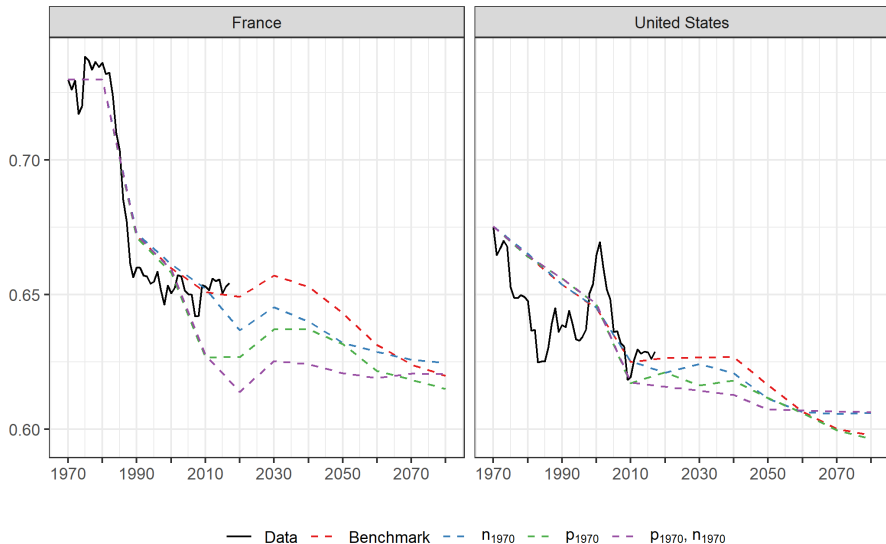
Decomposition: population growth *vs* survival rate
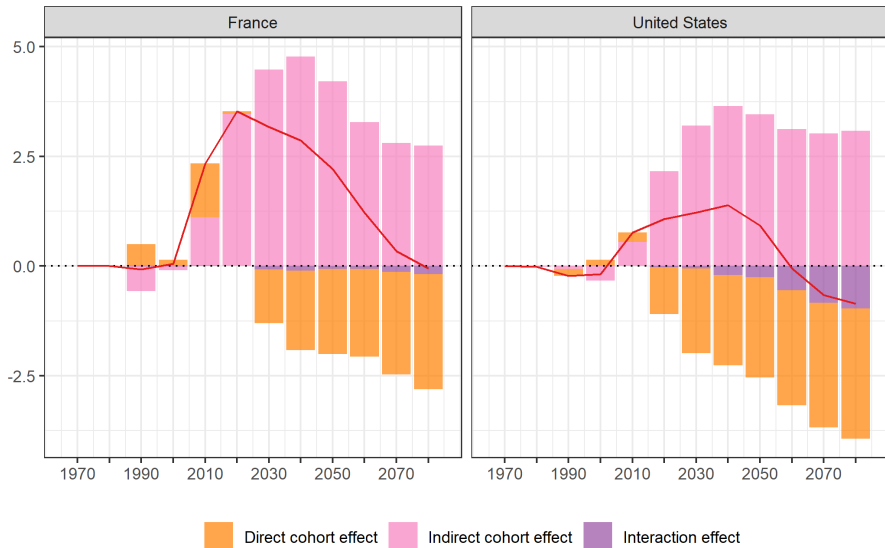
Difference with counterfactual (in pp.)
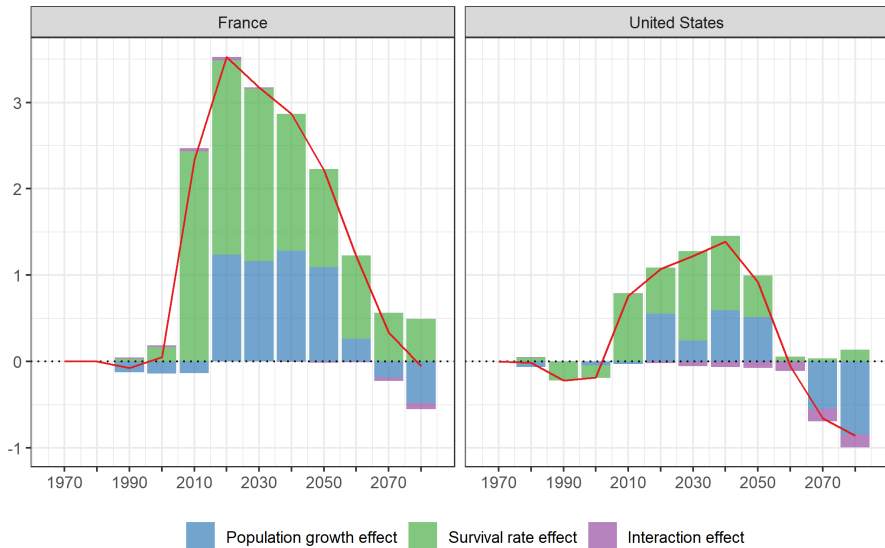
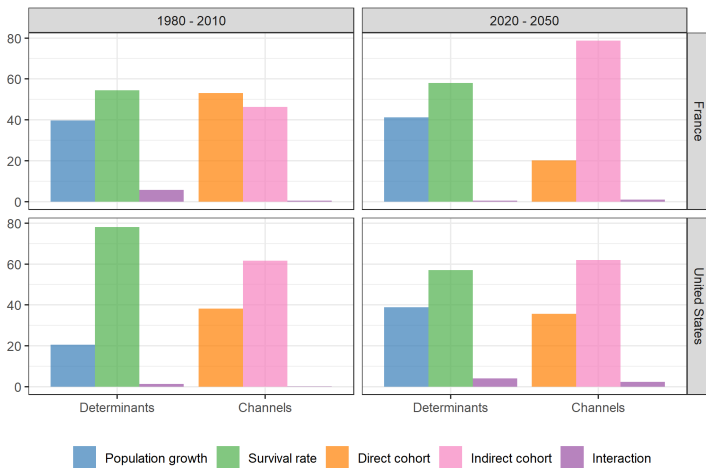# Counterfactual predictions: direct *vs* indirect channel

Labor share

Decomposition: direct *vs* indirect channel

Difference with counterfactual (in pp.)

Direct cohort effect | Indirect cohort effect | Interaction effect

Decomposition: summary

Aging-effect decomposition by period and country

Overview

Who are the winners of the inter-generational conflict ?

Income ratios in deviation from the 1970's values

Overview

Conclusion

- Age structure affects the income allocation in aging countries
  - ▶ The predominant cohort shapes the institutions in its favor

- The boomers are the winner of the inter-generational conflict
  - ▶ Always have a relatively **greater political weight** w.r.t. to the previous and next generations
  - ▶ Extract income through redistribution

- Biased technical change is a response of firms to income share *grability* of workers (Caballero and Hammour 1998)

⇒ Demographic dynamics may be a determinant of this *grability* and thus be the source of the bias

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Are the results robust to a change in the retirement age ?

- In public debate, it is often argued that the legal retirement age should change (upward) in the future

- Increasing retirement age equivalent to a decline of the survival rate (in terms of the model)

⇒ Counterfactual analysis after 2020, with three *scenarii* compared to the benchmark one

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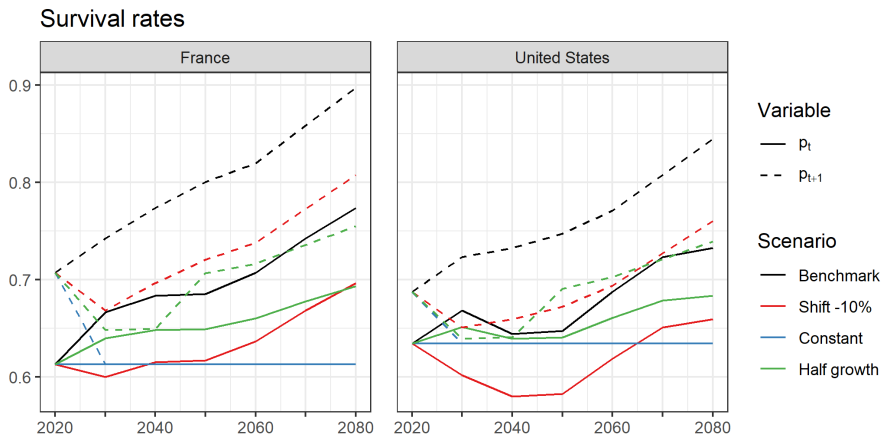
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Survival rates

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Labor share