

Inter-generational conflict and the declining labor share

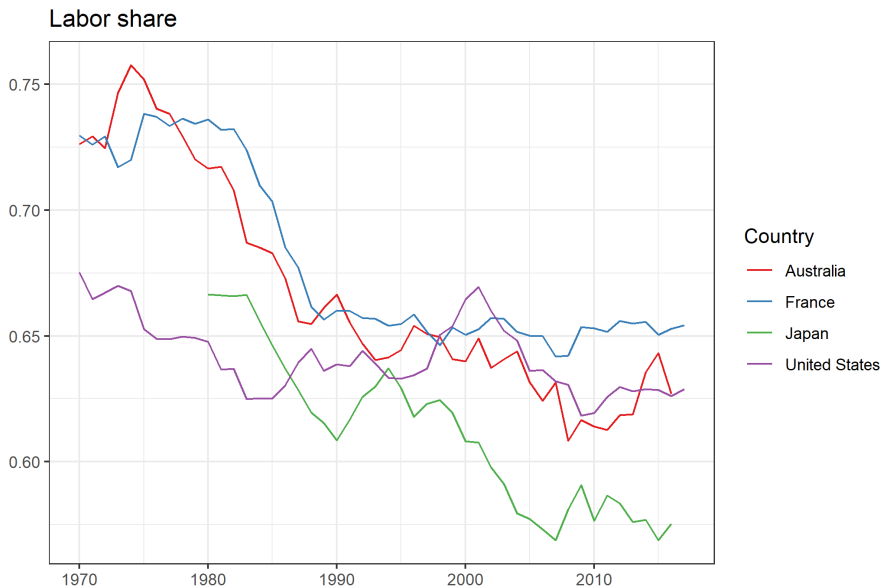
Fabien Petit¹

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

October 21, 2020



Declining labor share in high-income countries



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- Main determinants:

- ▶ Globalization: Autor et al. (2020); Jayadev (2007); Pica (2010); Young and Tackett (2018)
- ▶ Biased technical change: Acemoglu (2002); Acemoglu (2003); Karabarbounis and Neiman (2014)
- ▶ Institutions: Bentolila and Saint-Paul (2003); Blanchard (1997); Caballero and Hammour (1998)

- Literature on the labor share has paid hardly any attention to demography !

- ▶ only Schmidt and Vosen (2013)

⇒ Why would this matter ?

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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. \(2002\)](#)

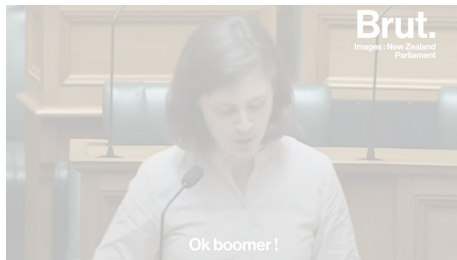


Figure: Chloe Swarbrick in New Zealand Parliament on October 5, 2019

- 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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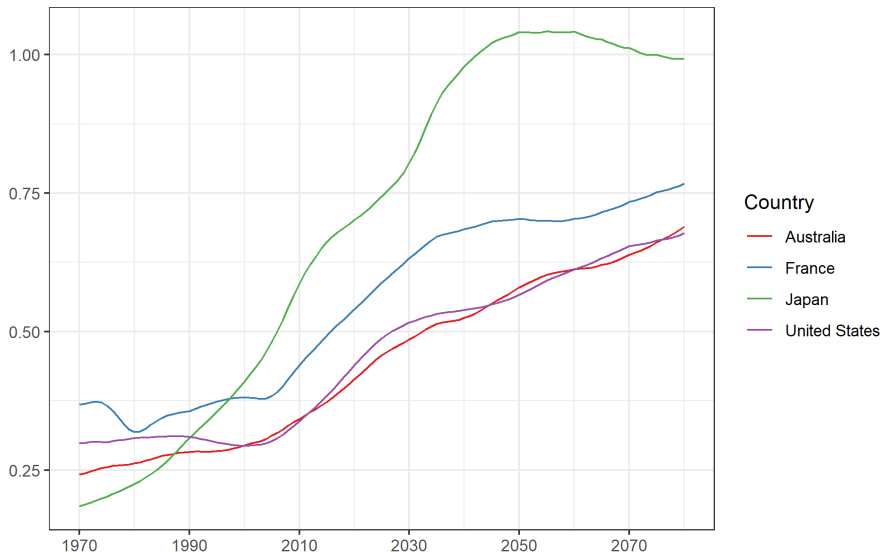


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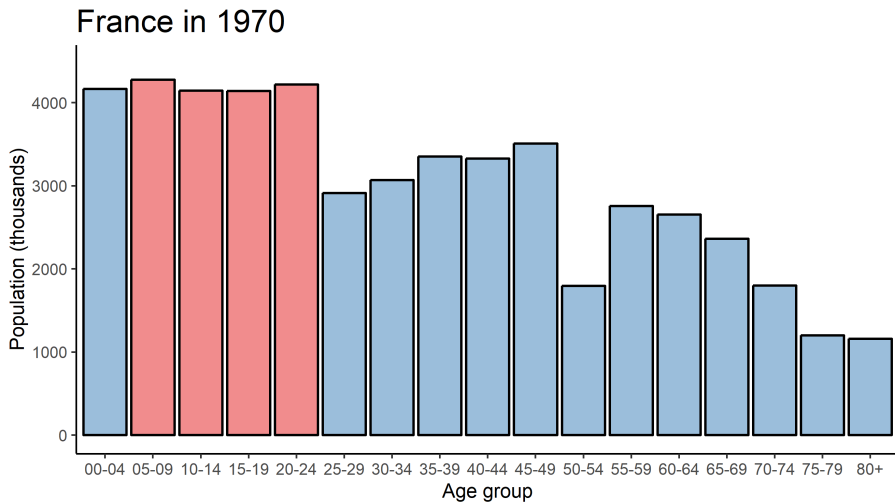
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Aging population in these countries

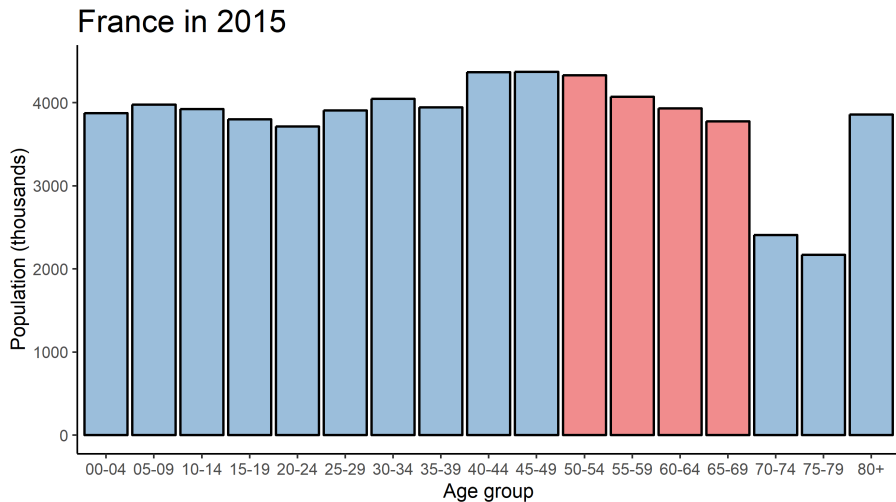
Old-age-dependency ratio



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



... to their retirement



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

- Build an **OLG model** with (indirect) policy mechanism
 - ▶ The youth face an unemployment risk and use their political power to raise the unemployment benefits
 - ⇒ Consequences for wage bargaining and labor share
- **Calibrate** the model to analyze the co-movement between labor share and age structure
- **Counterfactual analysis** to quantify the role of the indirect policy mechanism

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Contributions

1. Build a theoretical framework with a **new policy mechanism** to explain the declining labor share
 - ▶ Changes in labor market institutions are endogenously determined by the age structure of the population through voting
2. Identify the **boomers' cohort** as
 - ▶ the **winner** of the inter-generational conflict;
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- 1 Introduction
- 2 Theoretical framework
- 3 Quantitative analysis
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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 $K_t = S_{t-1}$
- Two cohorts: continuum of homogeneous agents
 - ▶ **Young**: supply labor inelastically, earn income, pay taxes, consume and save for retirement
 - ▶ **Old**: earn the return of their savings, pay taxes, consume and derive utility from the government health spending

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Demography and labor share

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

⇒ 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 $\sigma \in \mathbb{R}_+^* \setminus \{1\}$ the capital-labor elasticity of substitution

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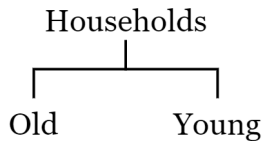
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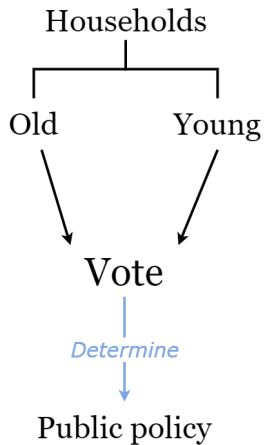
Diagram of the model



Labor union

Firm

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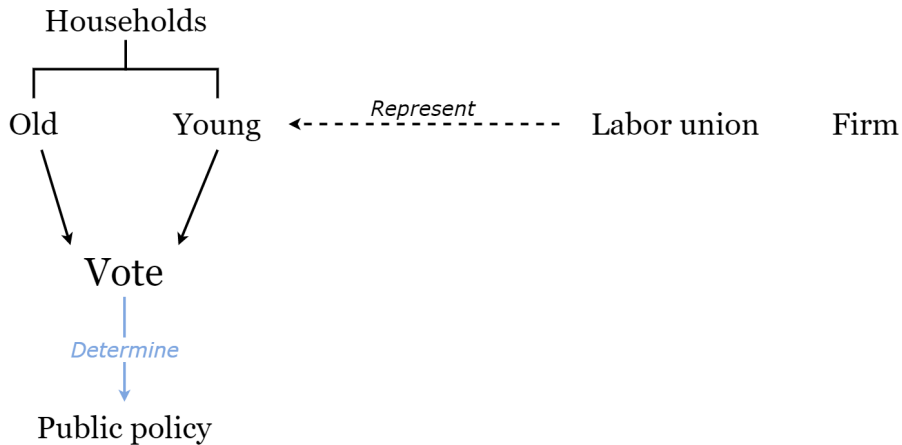


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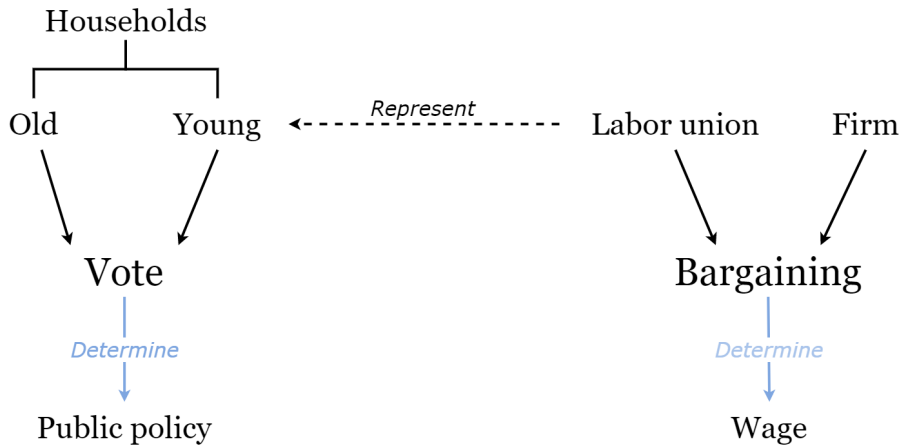


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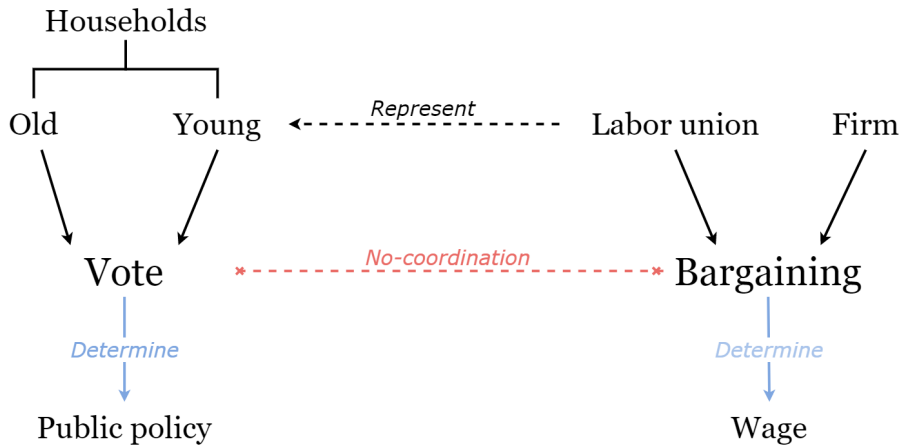


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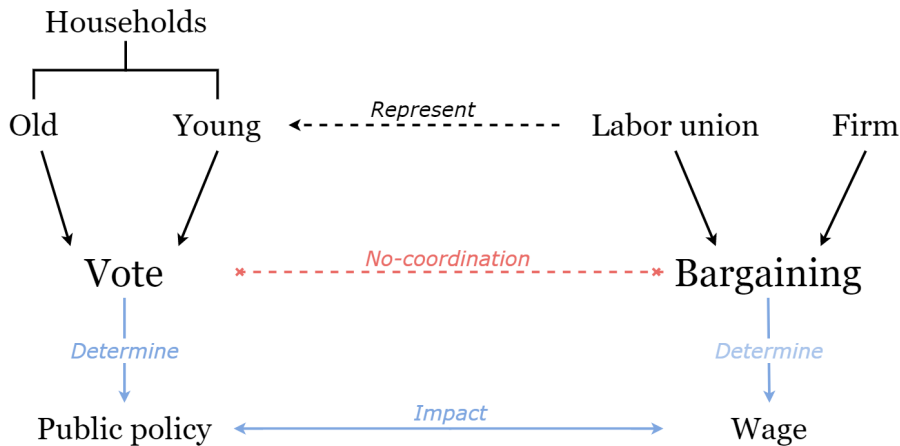
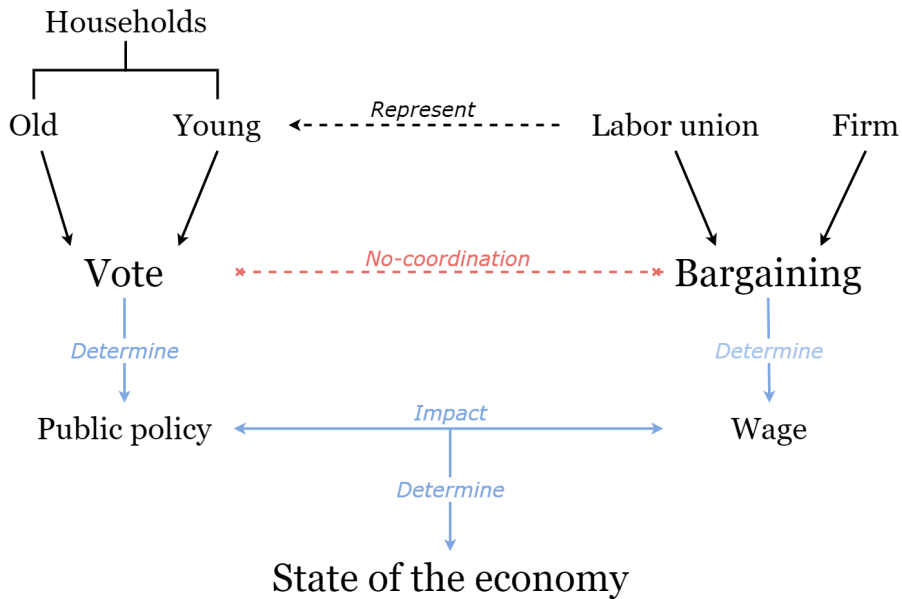


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Public policy preferences

- Age-related conflict within the public policy
 - ▶ Young desire more **unemployment benefit** (b)
 - ▶ Old desire more **health spending** (h)
 - ▶ Both desire less **taxes** (τ)
- Maximization program characterizing the equilibrium policy choices with **probabilistic voting**:

$$\begin{aligned} \max_{\tau_t, b_t, h_t} W(\tau_t, b_t, h_t; \eta_t, u_t, w_t, Y_t, N_t^y, N_t^o) \\ \text{s.t. } \tau_t Y_t = b_t u_t N_t^y + h_t N_t^o \end{aligned}$$

where η_t is the **political weight of the youth**

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Political weight of the youth (η)

- Political weight of the youth:

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

- The political weight of the youth depends on
 - ▶ the old-age-dependency ratio p_t/n_t ; —
 - ▶ their life expectancy p_{t+1} and the discount rate α ; +
 - ▶ the relative sensitivity to policy changes ω —

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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:

$$\begin{aligned} \max_{w_t} & \left(L_t [U_t^{y,e} - U_t^{y,u}] \right)^\gamma \left(Y_t - w_t L_t \right)^{1-\gamma} \\ \text{s.t.} \quad & U_t^{y,e} - U_t^{y,u} = \log \left[\frac{(1 - \tau_t) w_t}{b_t} \right] \end{aligned}$$

- ▶ $\gamma \in (0, 1)$ the relative bargaining power of the union
- ▶ $\frac{b_t}{(1 - \tau_t) w_t} \in (0, 1)$ the net replacement rate in unemployment

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Equilibrium

- *Labor market equilibrium*, the wage and employment are functions of the net replacement rate in unemployment
- *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)

⇒ Turn to quantitative analysis

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OLG model calibration and predictions

- 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 \(2012\)](#)

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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

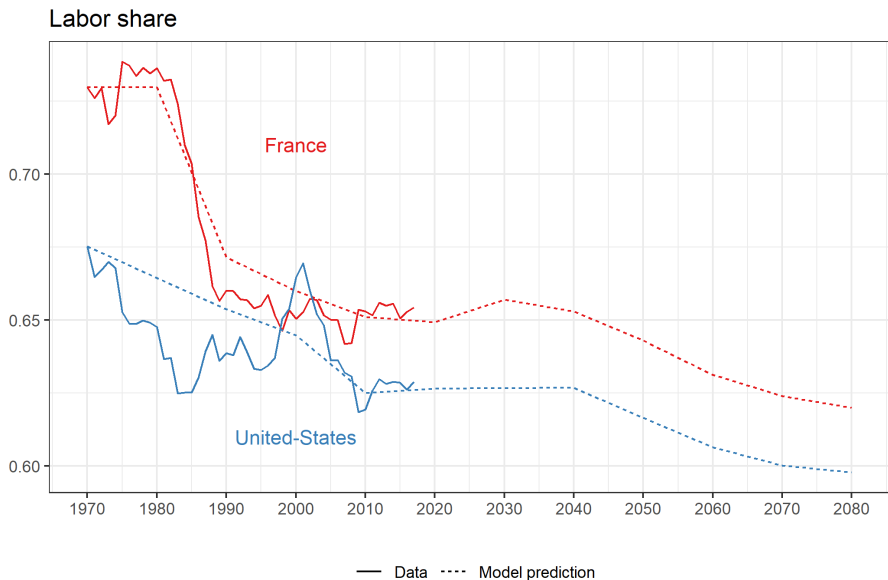
Notes: Adjustment method of the labor share: self-employed income as a compensation. The demographic data correspond to the “medium variant” estimates from the United Nations.

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

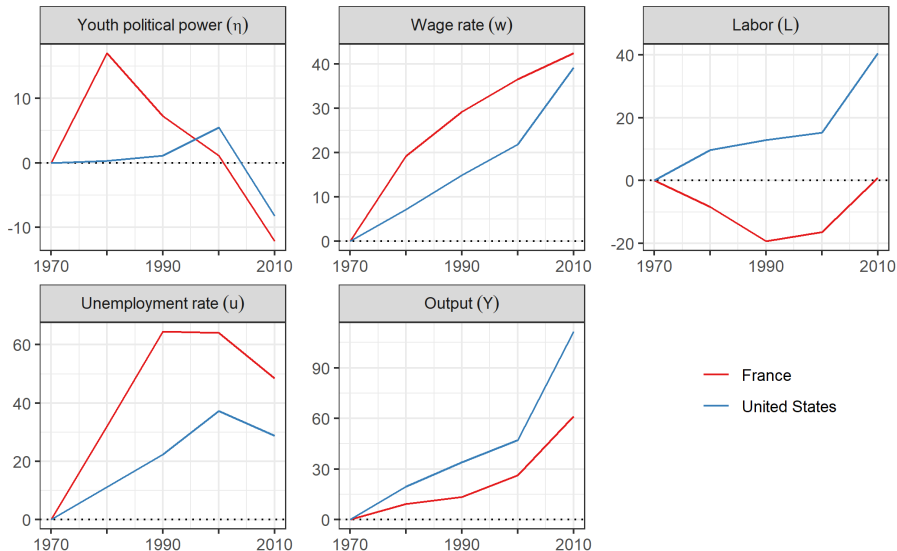
Notes: Single-equation estimation of σ from the two first-order conditions of the profit maximization with normalized CES production function. σ estimates are significant at $p < 0.1$ for France and $p < 0.05$ for the United-States.

Model predictions of the labor share



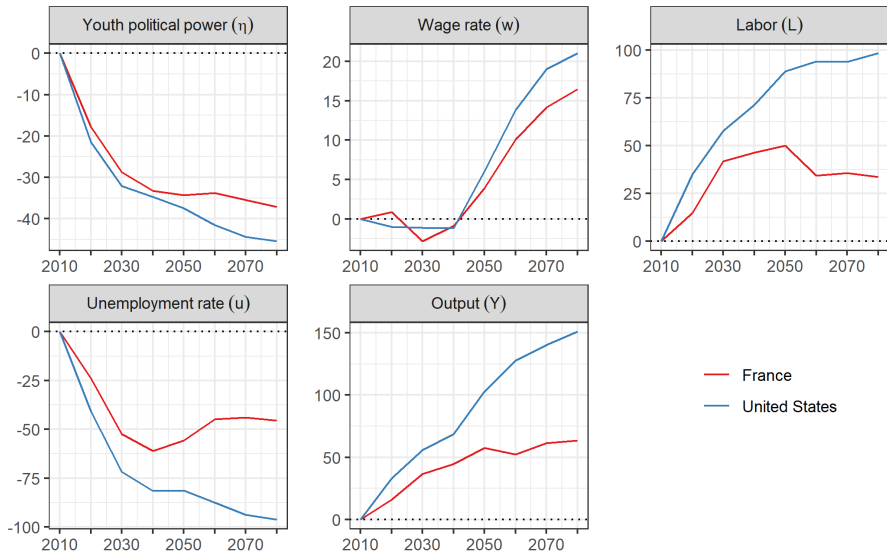
The young boomers (1970-2010)

Deviation from the 1970's value of determinant variables (in %)



The retired boomers (2010-2050) and afterwards (2050-80)

Deviation from the 2010's value of determinant variables (in %)



Counterfactual and aging effect decomposition

- Objectives: quantify the role of the aging population
 - ▶ **due to** population growth (n) vs survival rate (p);
 - ▶ **through** factor accumulation (n, p, N^y, N^o) vs policy mechanism (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
$\frac{p_{1970}}{n_{1970}}$	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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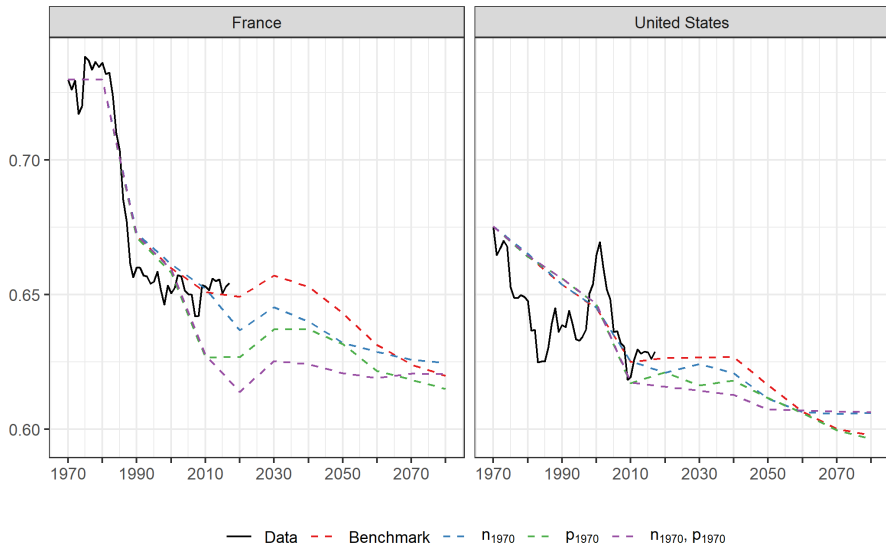
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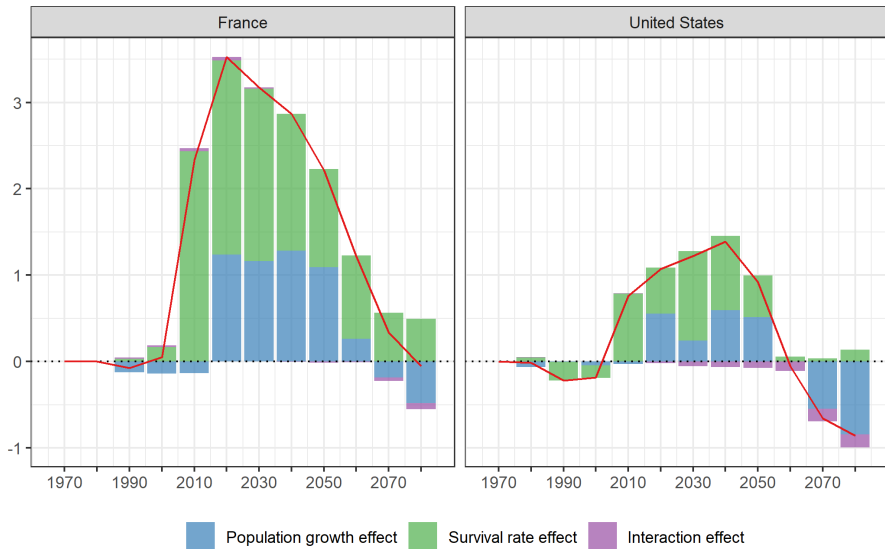
Counterfactual predictions: pop. growth vs survival rate

Labor share

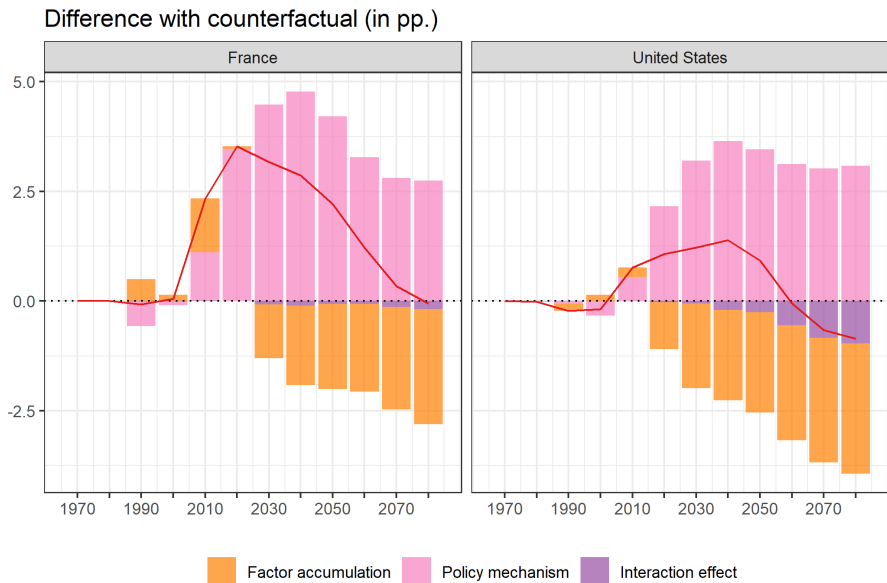


Decomposition: population growth vs survival rate

Difference with counterfactual (in pp.)



Decomposition: factor accumulation vs policy mechanism



Decomposition: summary

Aging-effect decomposition by period and country

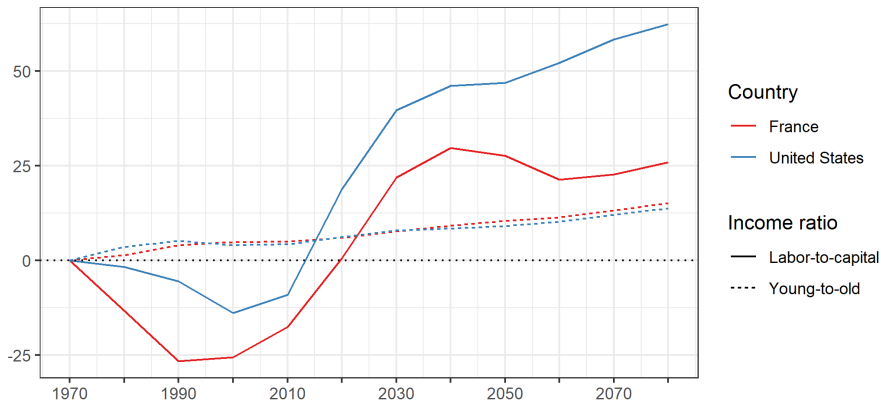


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Who are the winners of the inter-generational conflict ?

Income (per-cohort-member) ratios in deviation from the 1970's value (in %)



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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 *grabability* of workers ([Caballero and Hammour 1998](#))
- ⇒ Demographic dynamics may be a determinant of this *grabability* and thus be the source of the bias

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Probabilistic voting (Lindbeck and Weibull 1987)

- **Opportunistic candidates:** try to maximize their probability of winning the election
 - ▶ Candidates are different in terms of popularity
 - ▶ Idiosyncratic bias among voters for one candidate

⇒ All candidates **choose the same policy platform** g_t^* that maximize the political objective function $W(g_t)$

- The political objective function $W(g_t)$ depends on:
 1. Population share of voters' groups: $N_t^j / N_t \quad \forall j \in \{y, o\}$;
 2. Sensitivity to policy changes: $\omega^j \quad \forall j \in \{y, o\}$

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- The political objective function $W(g_t)$ depends on:
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Probabilistic voting (Lindbeck and Weibull 1987)

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- ▶ where *other terms* encompasses all the terms that are not directly affected by the public policy

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- ▶ where $\omega \equiv w^o/w^y$ the relative sensitivity to policy changes of the elderly;
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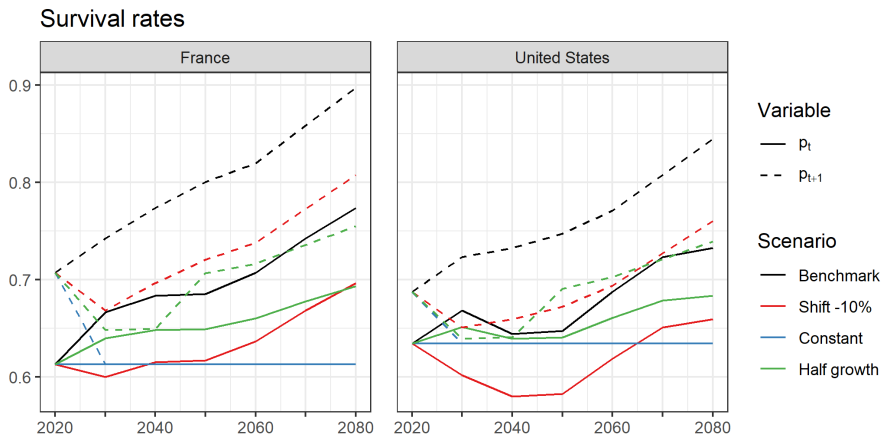
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Labor share

