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SWM ECON

Economics

Reforming EU Pension Systems: Equity and Sustainability in Conflict

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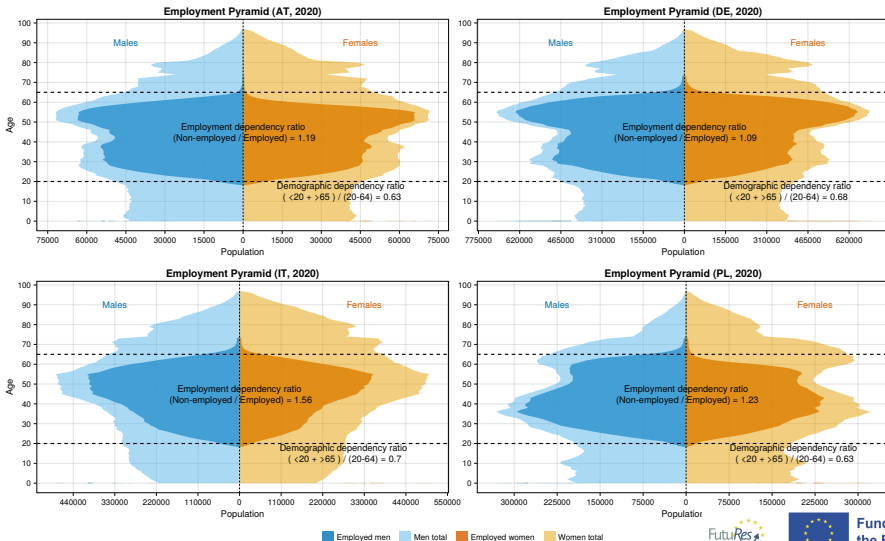
Outline

- 1 Motivation
- 2 A general pension framework
- 3 Economic model
- 4 Pension reforms
- 5 Results
- 6 Summary

Section 1

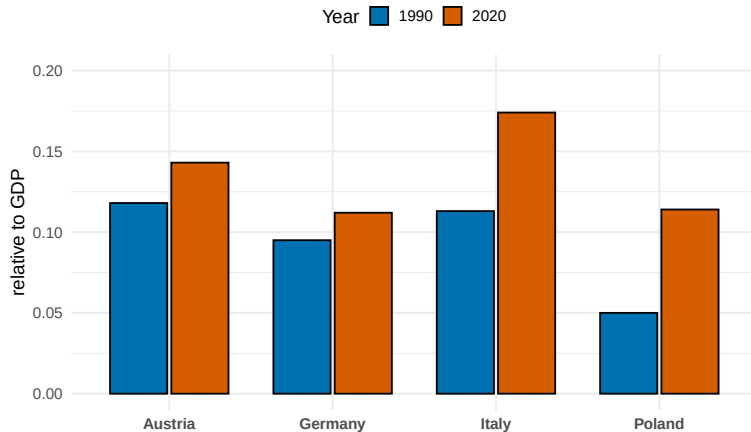
Motivation

challenge for pensions: beyond demographics



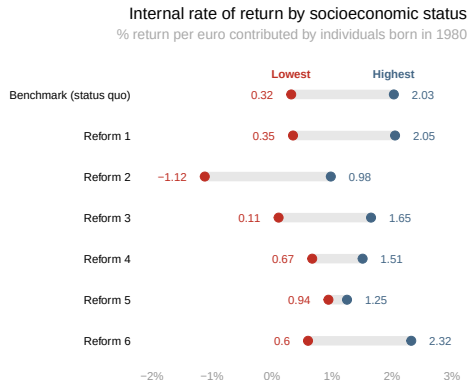
Costs of pensions

Public Expenditure on Pensions



Source: OECD. Pensions at a Glance

Distributional consequences of pensions



Notes: Lowest SES group reflects individuals with less than a secondary education, early entrance into the labor market, early retirement age, but on average, longer working lives. Their life expectancy is close to five years lower than the average. Highest SES group represents individuals with college education, late entry into the labor market, later exit from the labor market, but a working life that is close to one year shorter than the average. Their life expectancy is close to three years higher than the average. Benchmark (status quo): Austrian pension system, Reform 1: Maximum contribution rate cap (SF), Reform 2: SF + normal retirement age delayed by 5 years, Reform 3: SF + same work length of 45 years, Reform 4: SF + Ayuso, Bravo, and Holzmänn (2017) proposal, Reform 5: SF + Sánchez-Romero and Prskawetz (2020) proposal, Reform 6: SF + front loading.

Source: Sánchez-Romero, Schuster and Prskawetz (2024)

- agents with high SES receive a higher IRR than those with low SES
- pension reforms often decrease IRR for both groups
- pension reforms may increase differences of IRR b/w low and high SES groups

Contribution of our paper

- Study **4 European countries** that differ in their pension system and replacement rate of pensions — **offer a unified framework** to study different pension systems

Questions:

- 1 how different pension systems react to demographic change and
 - 2 how pension reforms differ across pension systems?
- Ageing is **heterogeneous**, model **non stable population**, allow for **idiosyncratic shocks**(unemployment, health, mortality)
 - Calibrate model using **microsimulations** and **Bayesian melding**
 - Evaluate pension reforms at **different dimensions** (macroeconomic indicators, fiscal & social benefit outcomes, distributional outcome, welfare)

Section 2

A general pension framework

A general pension framework (pension point system)

The evolution of the pension benefits at age a (B_a) in any country is given by

$$B_{a+1} = \begin{cases} (B_a (1 + \hat{r}_a) + \mathbf{1}_{\text{employed}} \cdot \text{wage}_a \cdot \text{accrual}_a) \cdot \text{Retirement adjustments}_a & \text{if not retired,} \\ \max(B_a, \text{Min. benefits}) & \text{if retired.} \end{cases}$$

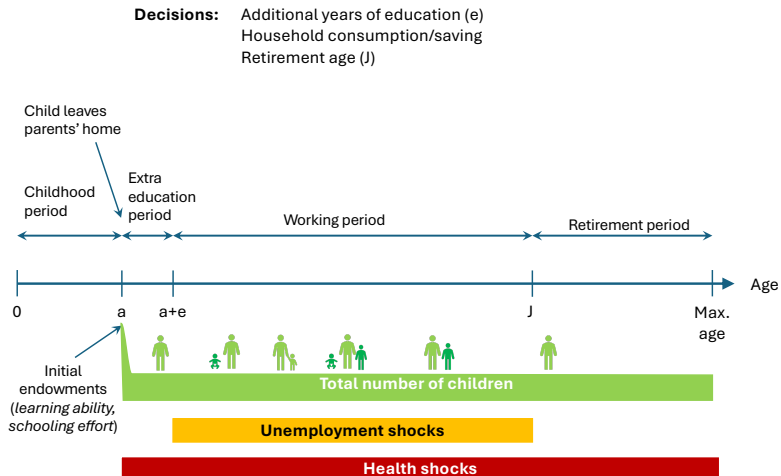
where $\hat{r}_a$ is the pension capitalization rate.

Both the **accrual rate** and **retirement adjustments** change depending on the pension system (NDC or PAYG-DB).

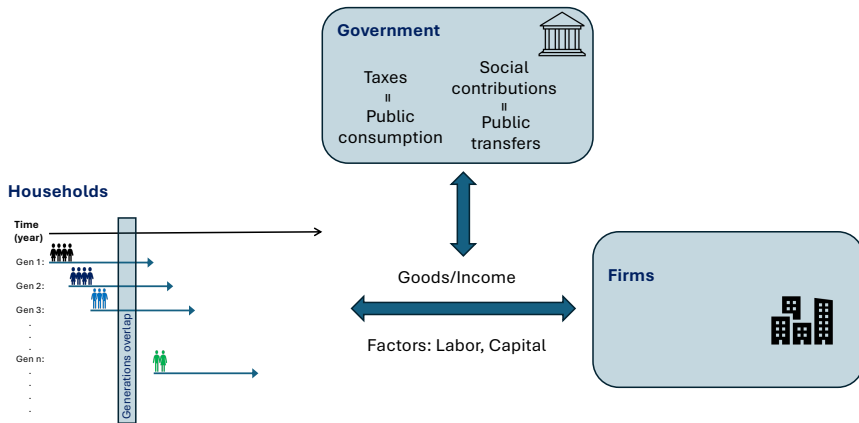
Section 3

Economic model

Lifecycle model (generation's perspective)



Two-gender overlapping generations (OLG) model with realistic demography



Section 4

Pension reforms

Pension systems (status quo)

	Austria PAYG-DB 	Germany PAYG-DB 	Italy NDC 	Poland NDC 
Replacement (45y)	71.1%	44.1%	57.5%	44.0%
Contribution rate	29.5%	17.0%	26.7%	17.8%

Note: For cross-country comparison, all numbers are adjusted to the total labor cost of a worker + government contributions.

Pension reforms

	Austria PAYG-DB 	Germany PAYG-DB 	Italy NDC 	Poland NDC 
Minimum Pension (MinPB) 	30.4% ↓ 40%	12.8% ↓ 40%	19.8% ↓ 40%	24.9% ↓ 40%
Progressive Pension (PPB)	Replacement Avg income	1.08x € € 0.67x	1.0x € € € 1.0x	0.9x € € € € € 1.5x
Delayed Retirement (DR)	65 ↓ 70			(60w/65m) ↓ 70
Sustainability Factor (SF)	Contribution rate ≤35%	Contribution rate ≤24%		

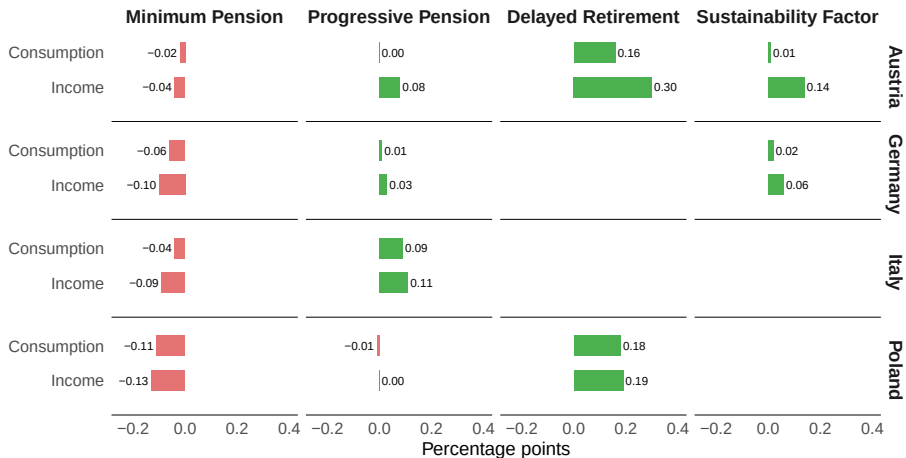
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Section 5

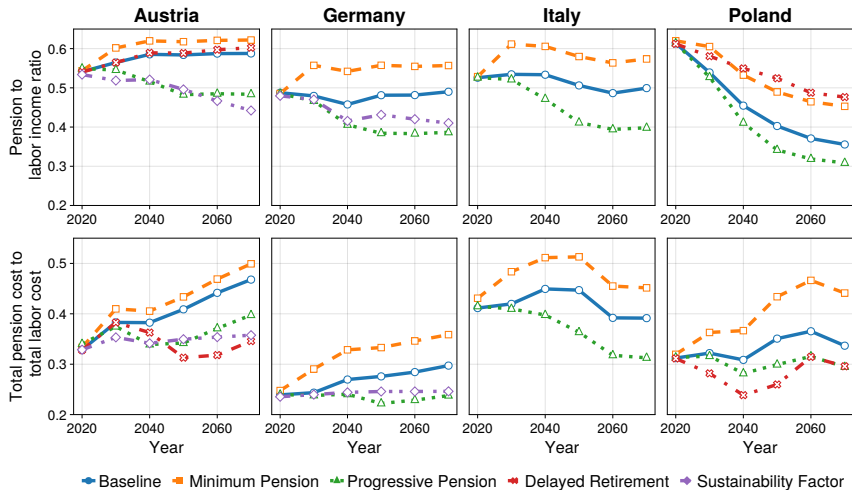
Results

Macroeconomic results (period 2020-2070)

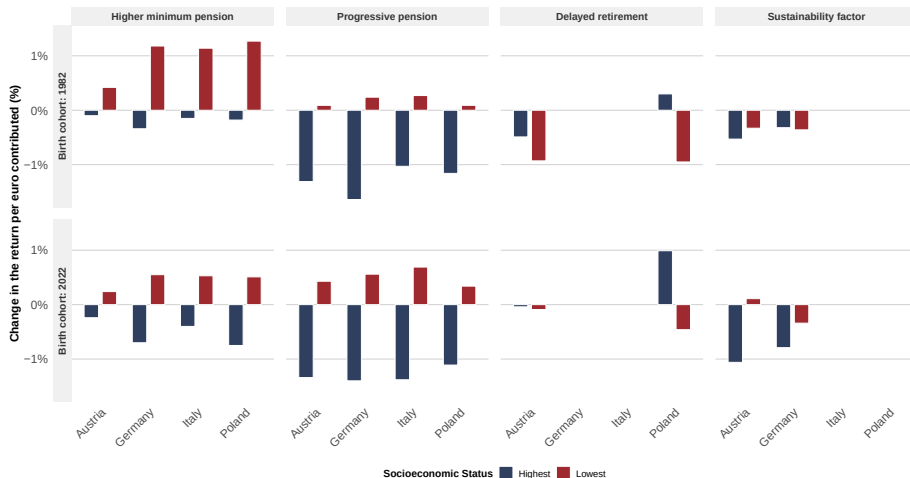
Macroeconomic Impact of Pension Reforms (Per Capita Annual Growth Rates, %)



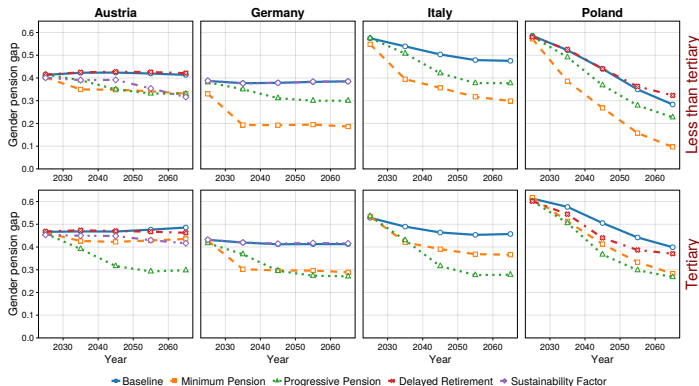
Fiscal outcomes



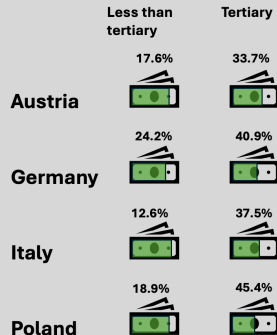
Distributional outcomes: Return per euro contributed (IRR)



Distributional outcomes: Gender pension gap



Gender wage gap



Source: OECD (2023) Education at a Glance

Note: We consider all women and men regardless of the number of years worked

Summary

Minimum Pension Benefits (MinPB)

Sustainability

national income
consumption
pension-income ratio
contribution rate



Equality

low IRR
high IRR
low GPG
high GPG

Progressive Pension Benefits (PPB)

Sustainability

national income
consumption
pension-income ratio
contribution rate



Equality

low IRR
high IRR
low GPG
high GPG

Delayed Retirement (DR)

Sustainability

national income
consumption
pension-income ratio
contribution rate



Equality

low IRR
high IRR
low GPG
high GPG

Sustainability Factor (SF)

Sustainability

national income
consumption
pension-income ratio
contribution rate



Equality

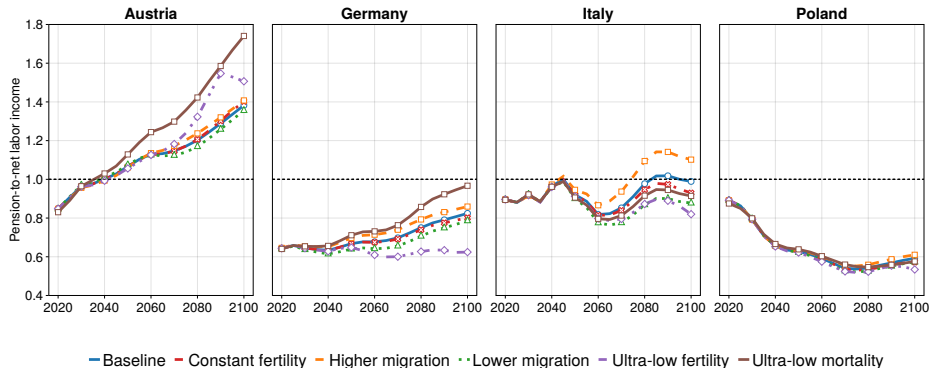
low IRR
high IRR
low GPG
high GPG

Demographic scenarios

- **Constant fertility:** Age-specific fertility rates are assumed to remain at their 2023 levels throughout the projection horizon.
- **Lower migration:** Following Eurostat, net migration is 33 percent lower than in the baseline in each year.
- **Higher migration:** Following Eurostat, net migration is 33 percent higher than in the baseline in each year.
- **Ultra-low fertility:** The total fertility rate (TFR) is assumed to decline to 1.0 by 2035 and remain at 1.0 thereafter.
- **Ultra-low mortality:** Using the Lee–Carter method on Eurostat's projected age-specific mortality rates for 2022–2100, we assume the mortality decline (i.e., the drift term) is twice as large as in the baseline.

The role of demography

- 1 Almost **NO** effect on economic growth between the different demographic scenarios
- 2 However, a huge challenge for **INTER-GENERATIONAL DISTRIBUTION**





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Impact on education

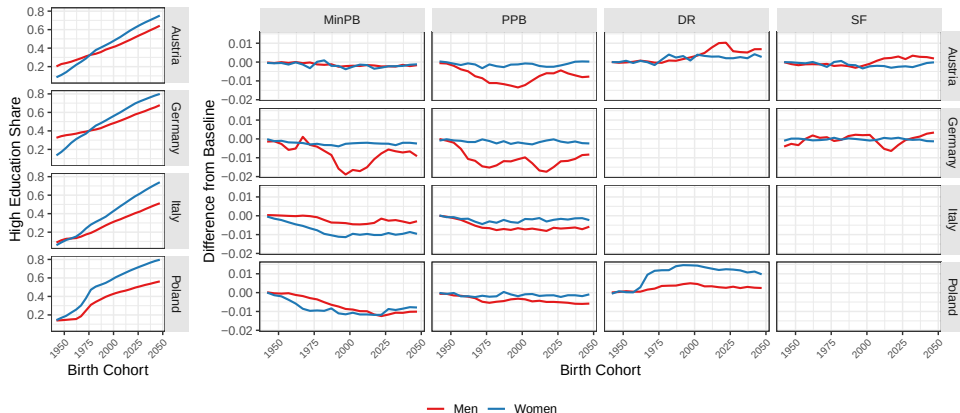


Figure: Share of people in tertiary education by birth cohort, gender, and country under the baseline and pension reforms. *Source:* Authors' simulations, Baseline≡ Wittgenstein Center, Human Capital Data Explorer.

Pension replacement

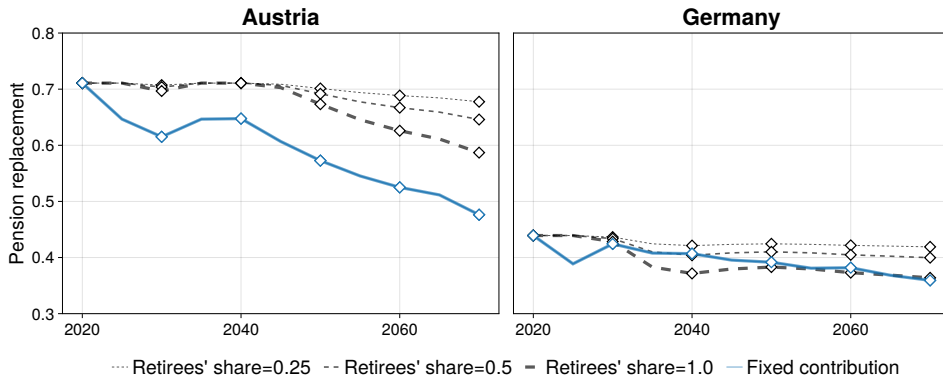


Figure: Pension replacement level from 2020 to 2070 in Austria and Germany under four different sustainability pension reforms.