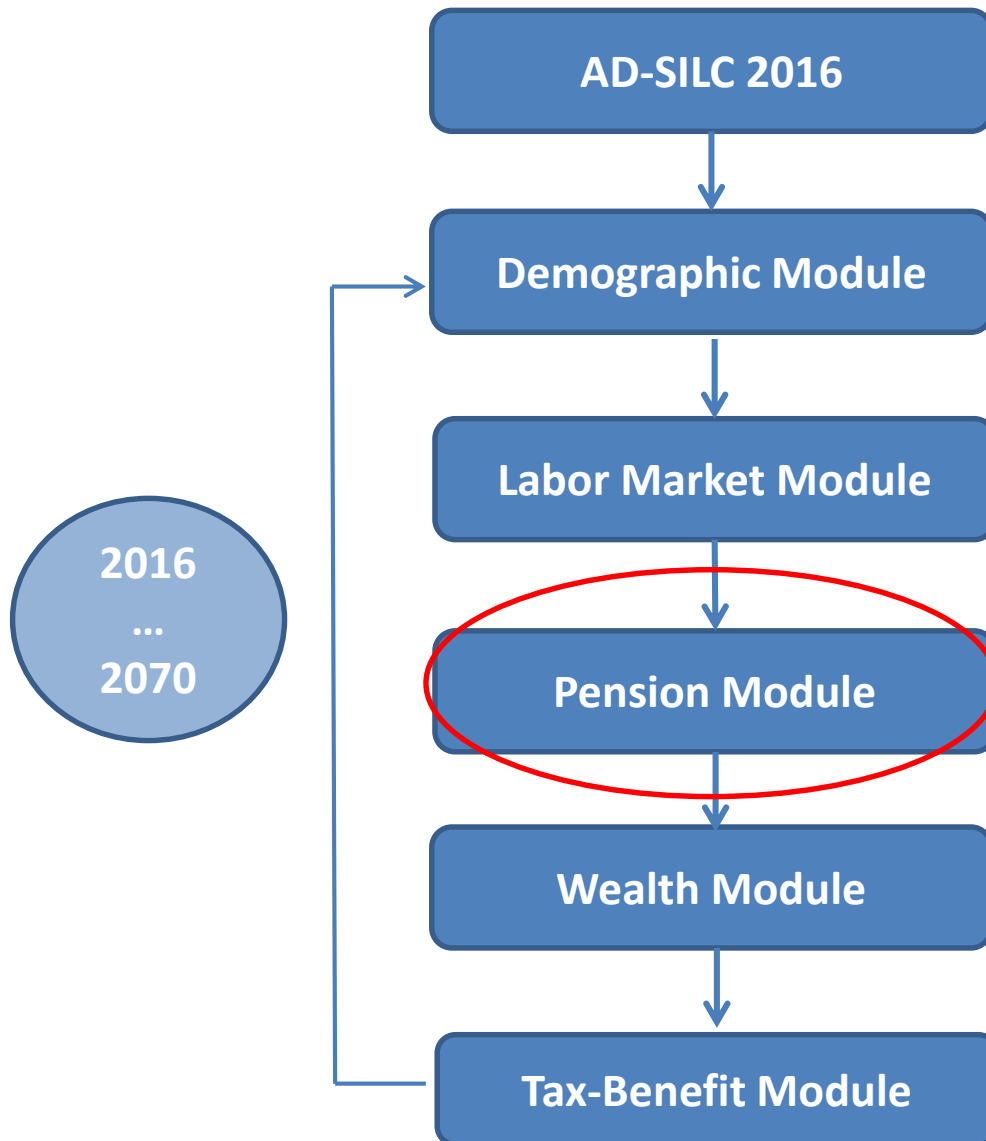


Outline

- Structure of the Pension Module
- Preliminary results – Pension Module

- Structure of the Tax-Benefit Module
- Preliminary results – Tax-Benefit Module

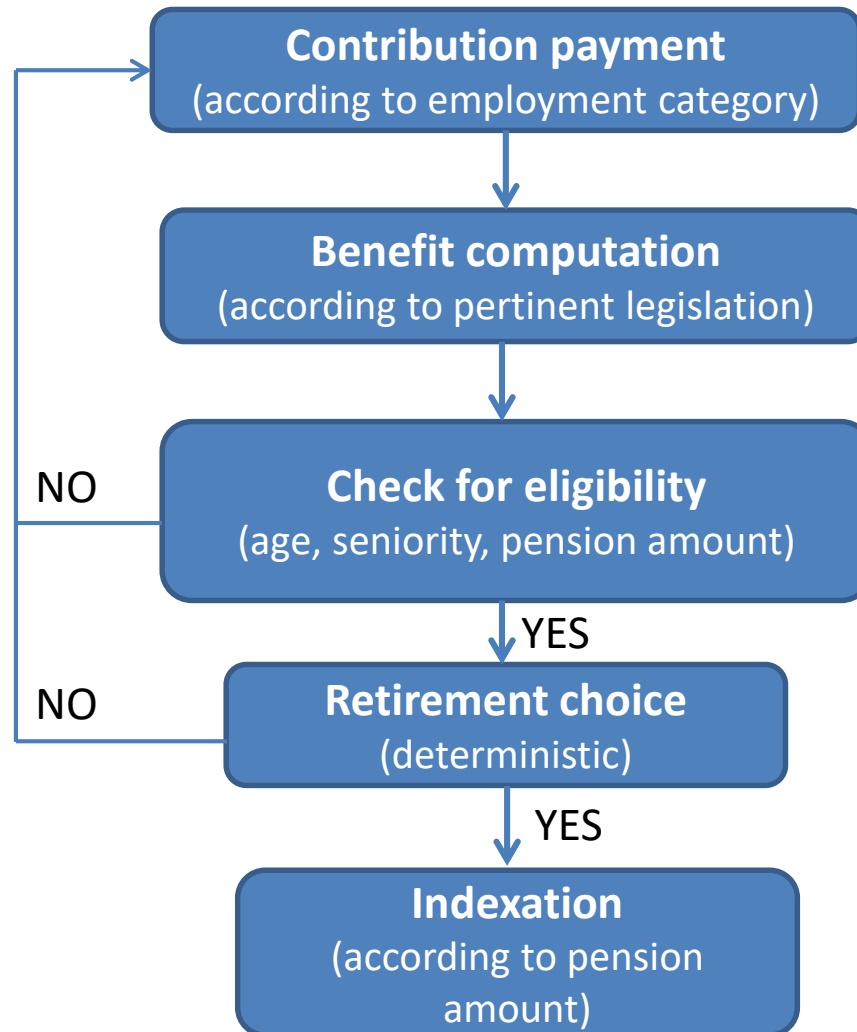
The Modules of T-DYMM



The Pension Module

Public scheme (1)

Old-age / Seniority Pensions



The Pension Module

Public scheme (2)

Retirement choice

- Deterministic: in results shown here, all access retirement as soon as requirements are met*
- Assumption seems acceptable as of today, as age requirements have raised rapidly in the past few years, especially for women
- As Notional Defined Contribution (NDC) rules phase in, average pensions are expected to lower and a strong economic incentive to postpone retirement to increase benefits will kick in

* Only exceptions for workers that meet criteria for “*Quota 100*” and Seniority for early workers (*lavoratori precoci*), for which a 75% probability is assumed

The Pension Module

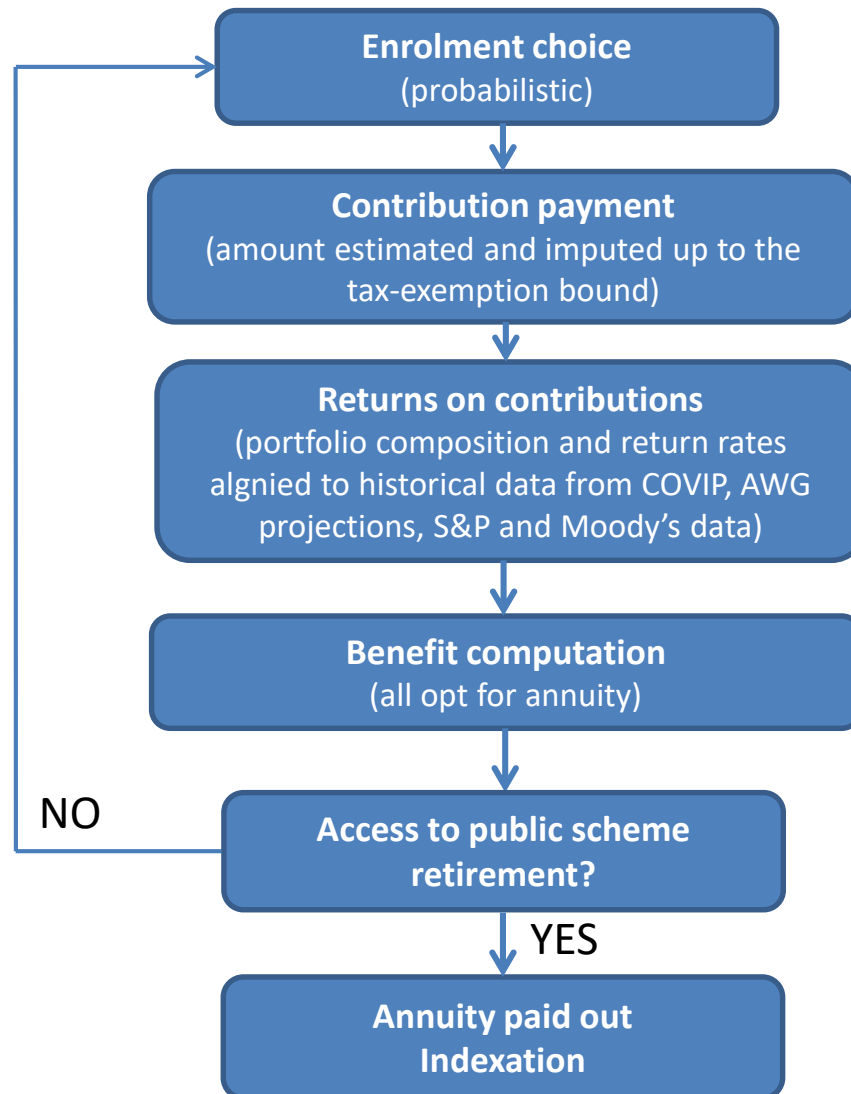
Public scheme (3)

Other benefits simulated

- Supplementation to a minimum for pensions (*integrazione al minimo*)
- Inability pensions (*invalidità previdenziale*):
 - Severe inability (*Assegno ordinario di invalidità*)
 - Total inability (*Pensione di inabilità*)
- Survivor pensions (*pensione di reversibilità, pensione indiretta*)

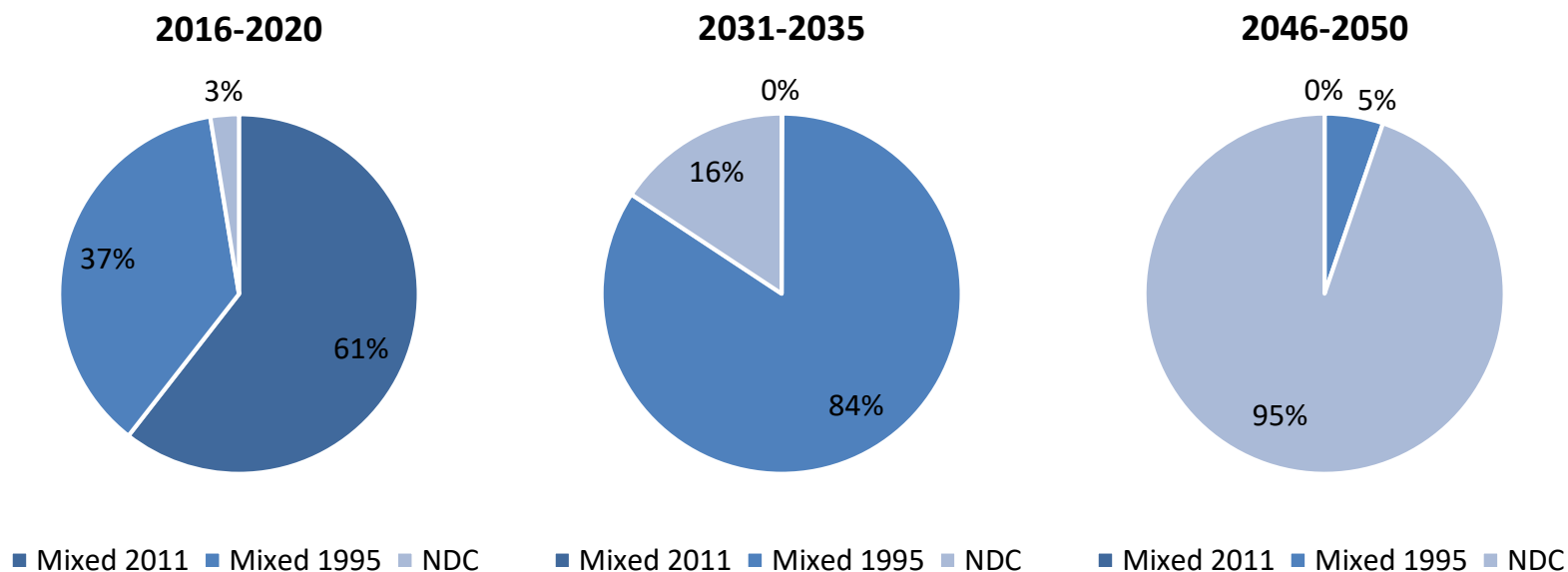
The Pension Module

Private scheme



Sample evolution: computation rules (1)

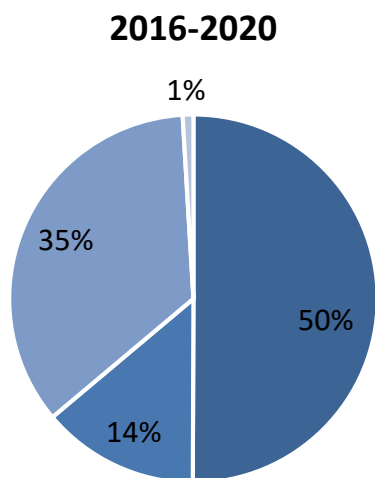
New pensioners



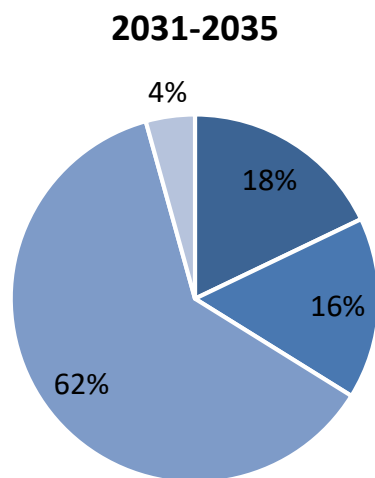
- By 2050, nearly all new pensioners will have their benefits computed entirely according to NDC rules

Sample evolution: computation rules (2)

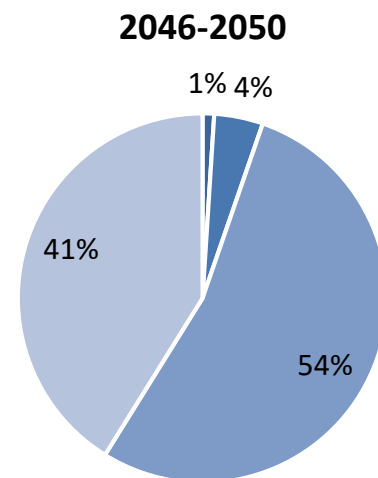
Stock of pensioners



■ DB ■ Mixed 2011
 ■ Mixed 1995 ■ NDC



■ DB ■ Mixed 2011
 ■ Mixed 1995 ■ NDC



■ DB ■ Mixed 2011
 ■ Mixed 1995 ■ NDC

- Looking at stocks, in 2050 there is still a large portion of pensioners that receive a benefit partially computed according to the old Defined Benefit (DB) rules

Sample evolution: retirement criteria (1)

Retirement criteria (2020):

Simulated:

- **Old age 1:** (NDC) 64, 20 years of contribution, 2.8**Assegno Sociale* (AS)
- **Old age 2:** 67, 20 years of contribution, 1.5*AS (only NDC)
- **Old age 3:** (NDC) 71, 5 years of contribution

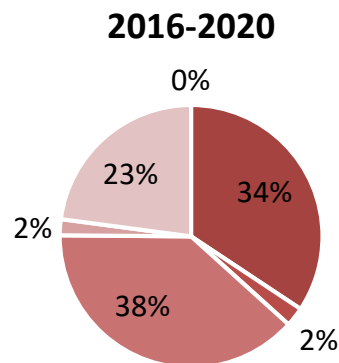
- **Seniority:** 41 years 10 months of contribution (F), 42 years 10 months of contribution (M)
- **Seniority – young workers:** 41 years of contribution, 12 months of contribution before turning 19
- **Seniority – ‘Quota 100’:** 62, 38 years of contribution

Not simulated:

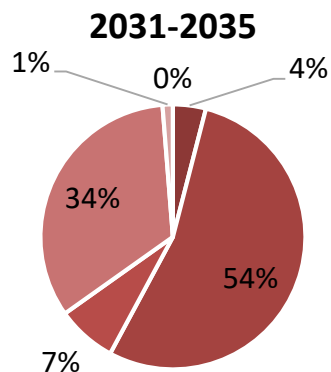
- **APE:** 63 years, under specific circumstances
- **‘Opzione donna’:** 58 years (59 for self-employed), 35 years of contribution, with switch to NDC rules; only accessible to female workers

Sample evolution: retirement criteria (1)

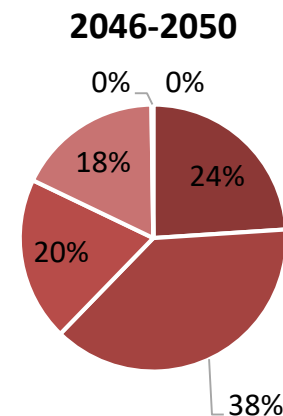
New pensioners



- Old age 1
- Old age 2
- Old age 3
- Seniority
- Seniority - young workers
- Seniority - Quota 100



- Old age 1
- Old age 2
- Old age 3
- Seniority
- Seniority - young workers
- Seniority - Quota 100

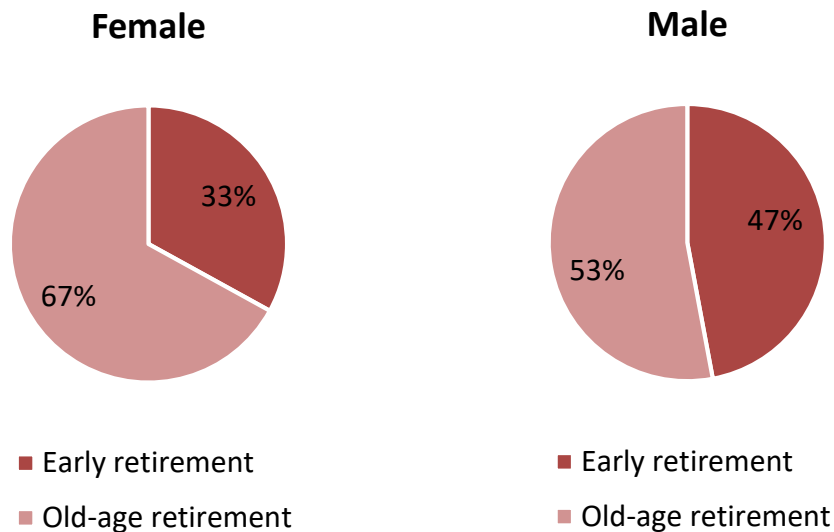


- Old age 1
- Old age 2
- Old age 3
- Seniority
- Seniority - young workers
- Seniority - Quota 100

- Early retirement loses relevance over time as criteria become harder to meet

Sample evolution: retirement criteria (2)

New pensioners, 2016-2050



Early retirement: Old age 1 + all Seniority
 Old-age retirement : Old age 2 + Old age 3

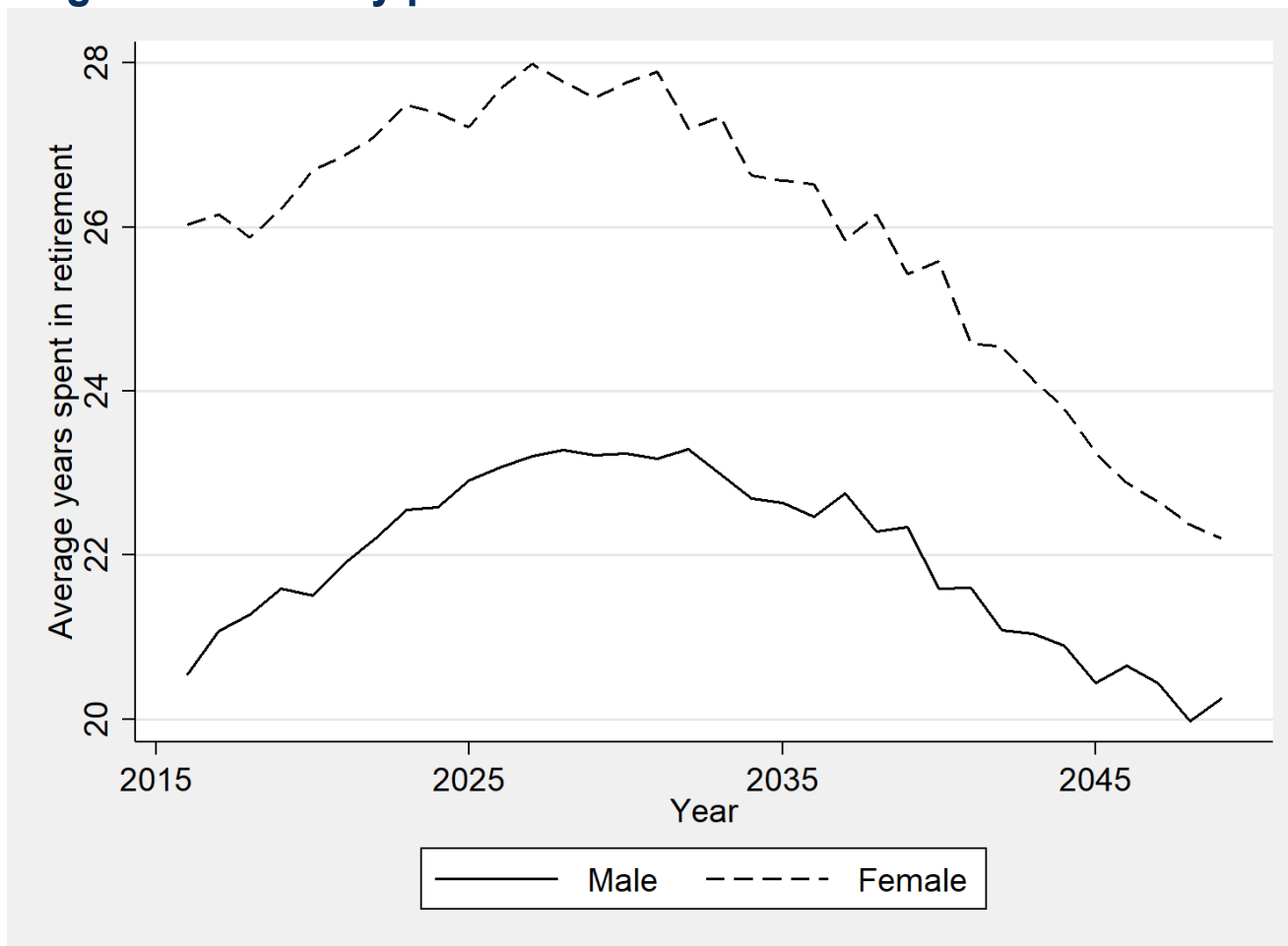
Average retirement age:

- **2019:** 64 (M and F)
- **2046-2050:** 68.3 (M) and 69.6 (F)

- Female workers have a harder time meeting early retirement criteria throughout the simulation period. As a result, their average retirement age rises faster than for their male counterparts

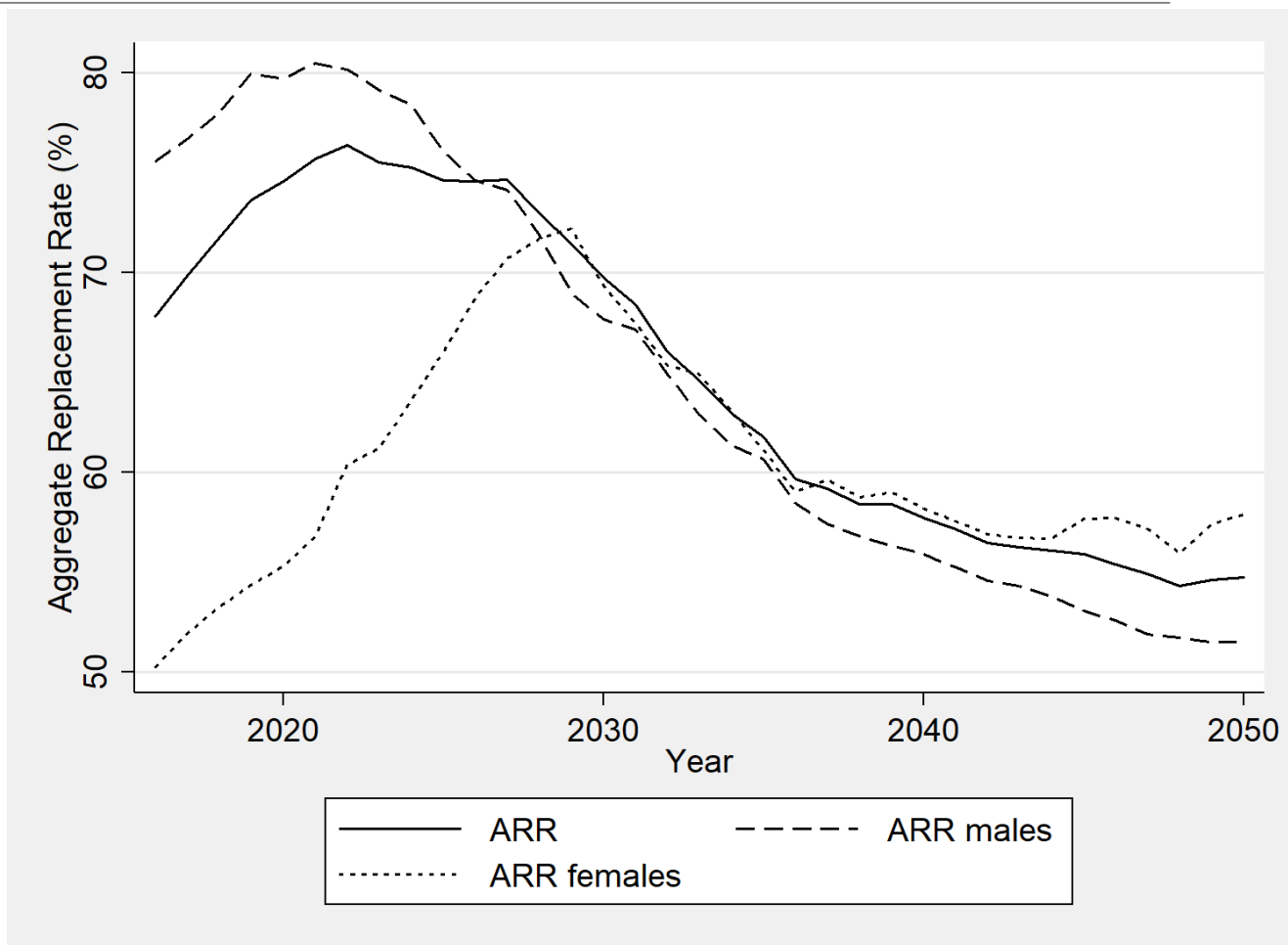
Average time spent in retirement

Stock of old-age and seniority pensioners



- After 15 years of increase in average years spent in retirement, aligned age requirements for retirement to life expectancy and the gradual extinction of ‘baby pensioners’ invert the trend. Differences between genders reduce sensibly

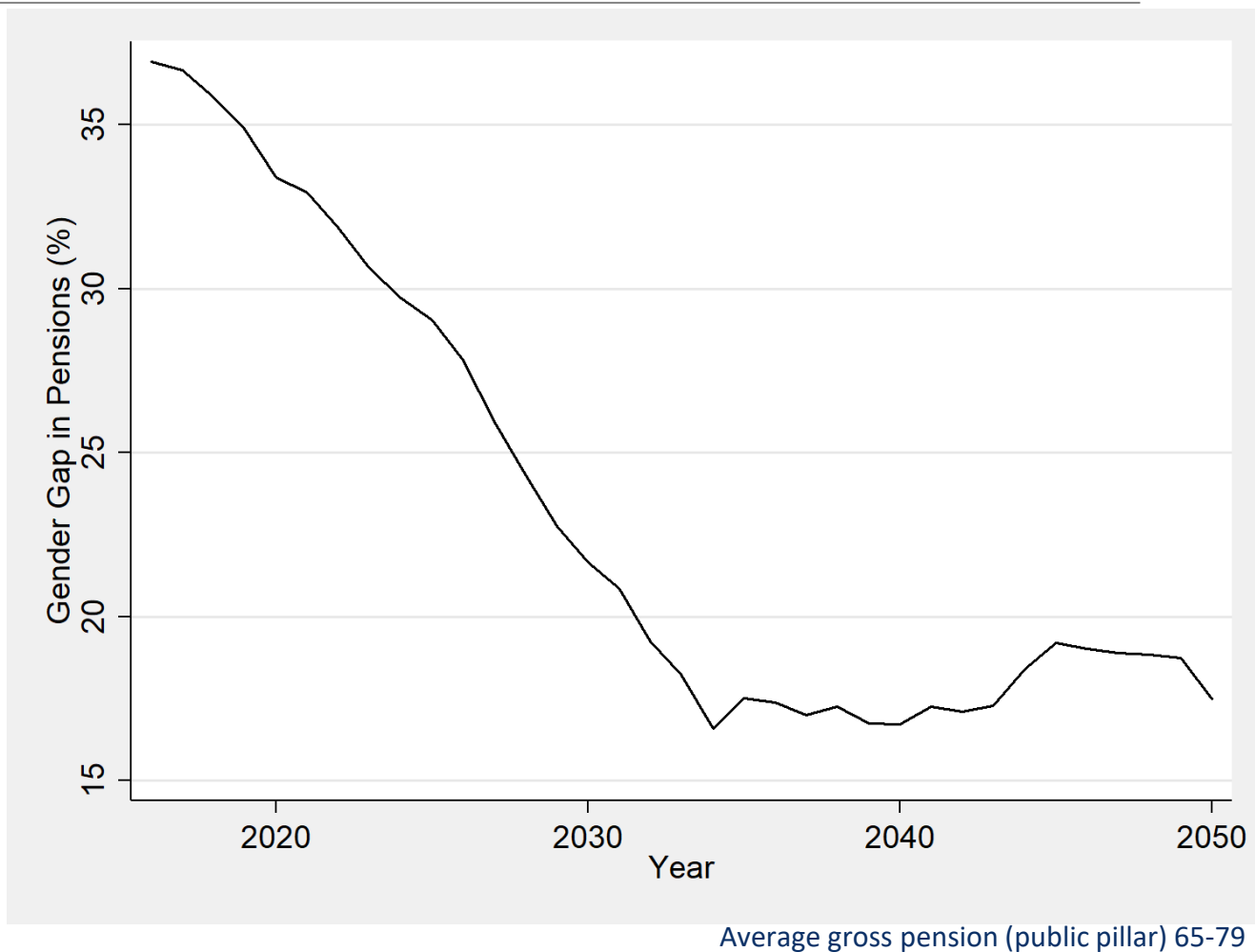
Aggregate Replacement Ratio



Gross median pension income 65-74
Gross median individual earnings from work 50-59

- In line with recent trends, the ARR keeps increasing in the first years of the simulation, then decreases and stabilizes around 55%. The gender gap in terms of ARR closes around 2030

Gender Gap in Pensions



- The GGP decreases sharply in the first two decades of the simulation, then stabilizes around 17%

Condition at retirement by birth cohort

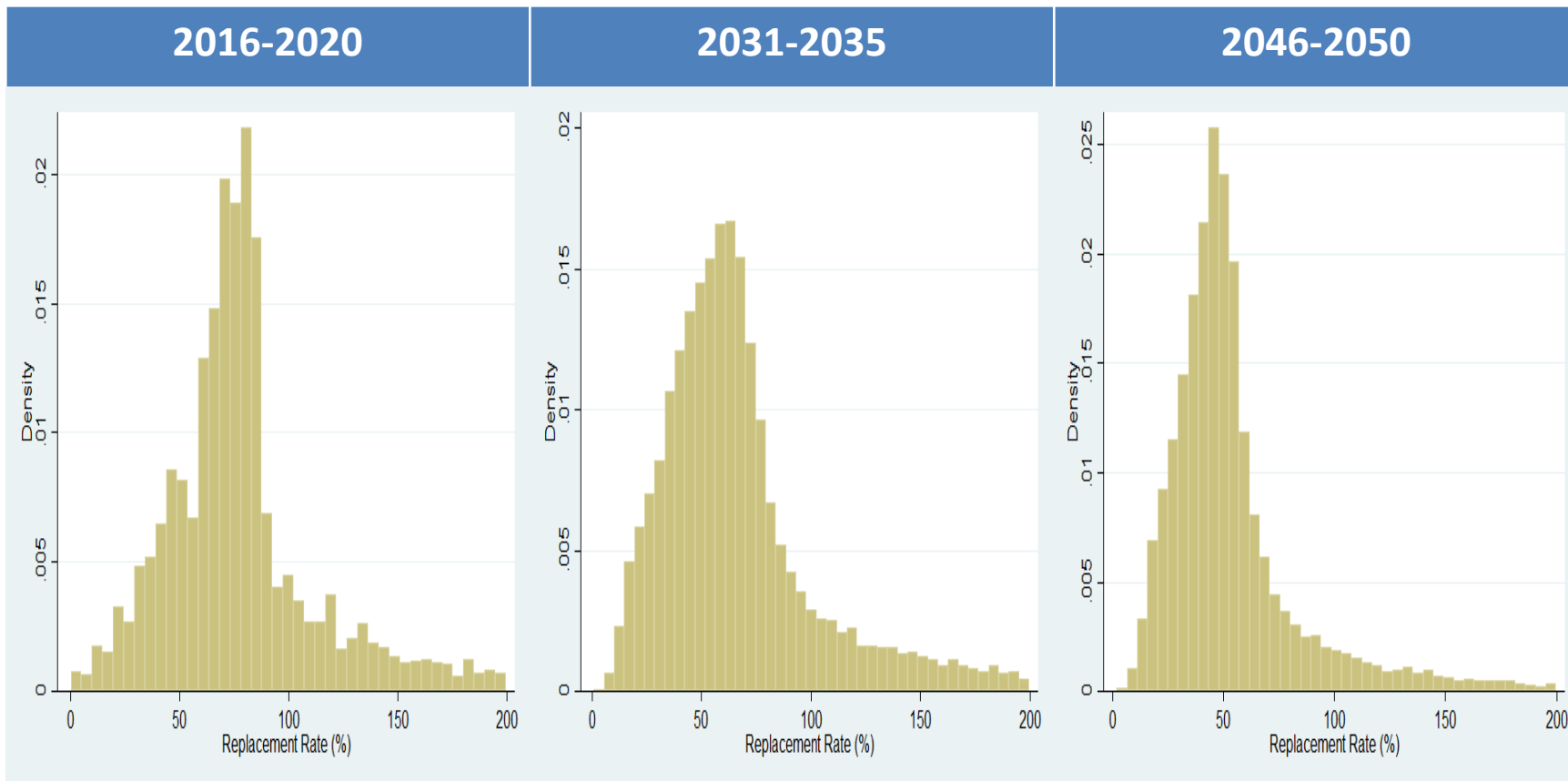
New pensioners

Cohort	Age*	Years of contribution*	Gross replacement rate**	Gross pension / <i>trattamento minimo</i> **
1961-1965	66.6	36	66.2	2.5
1966-1970	67.4	35.2	59.8	2.2
1971-1975	68	34.8	54.5	2.1

*mean

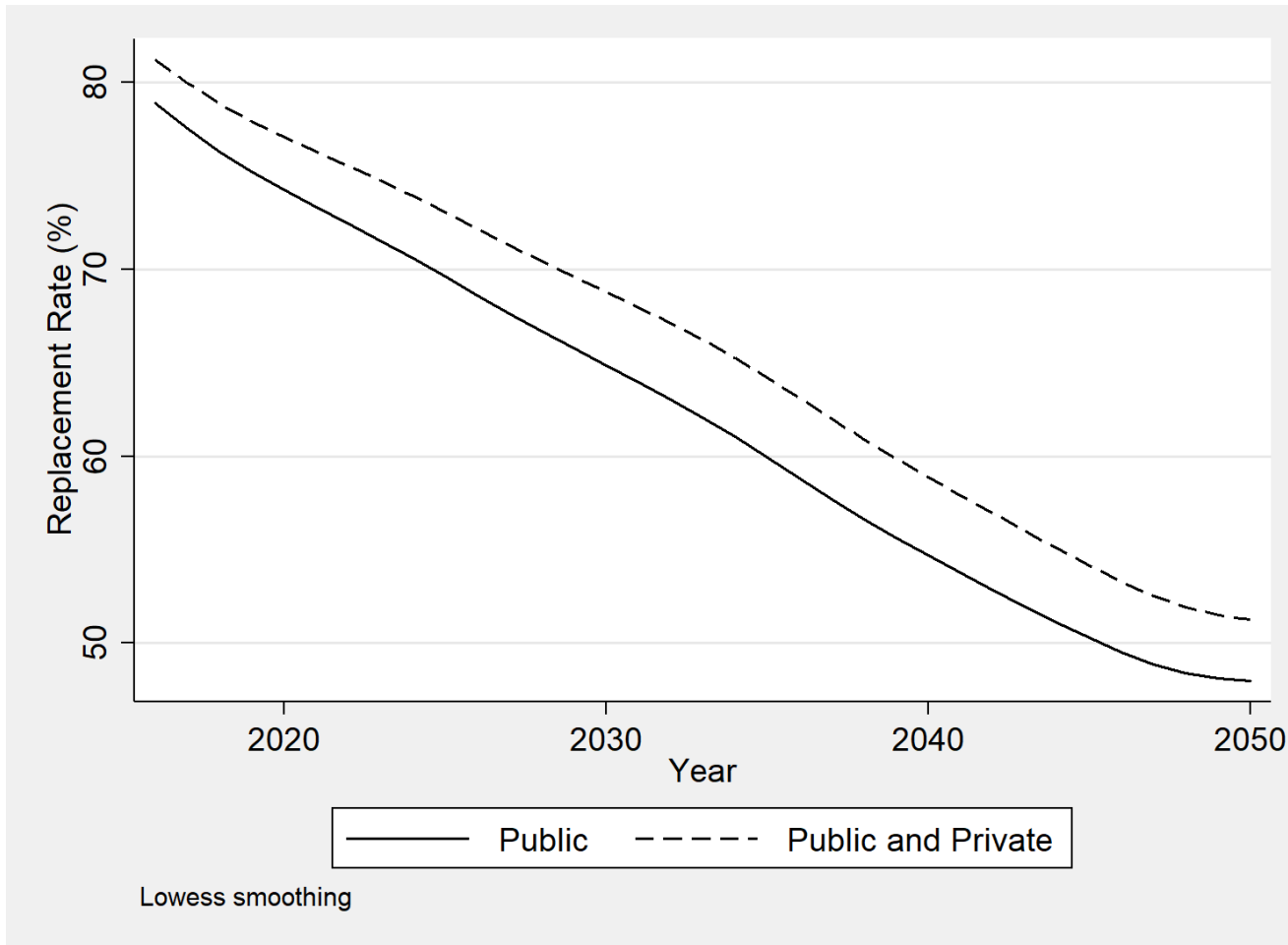
**median

Distribution of the Gross Replacement Rate



The impact of private and occupational pension plans (1)

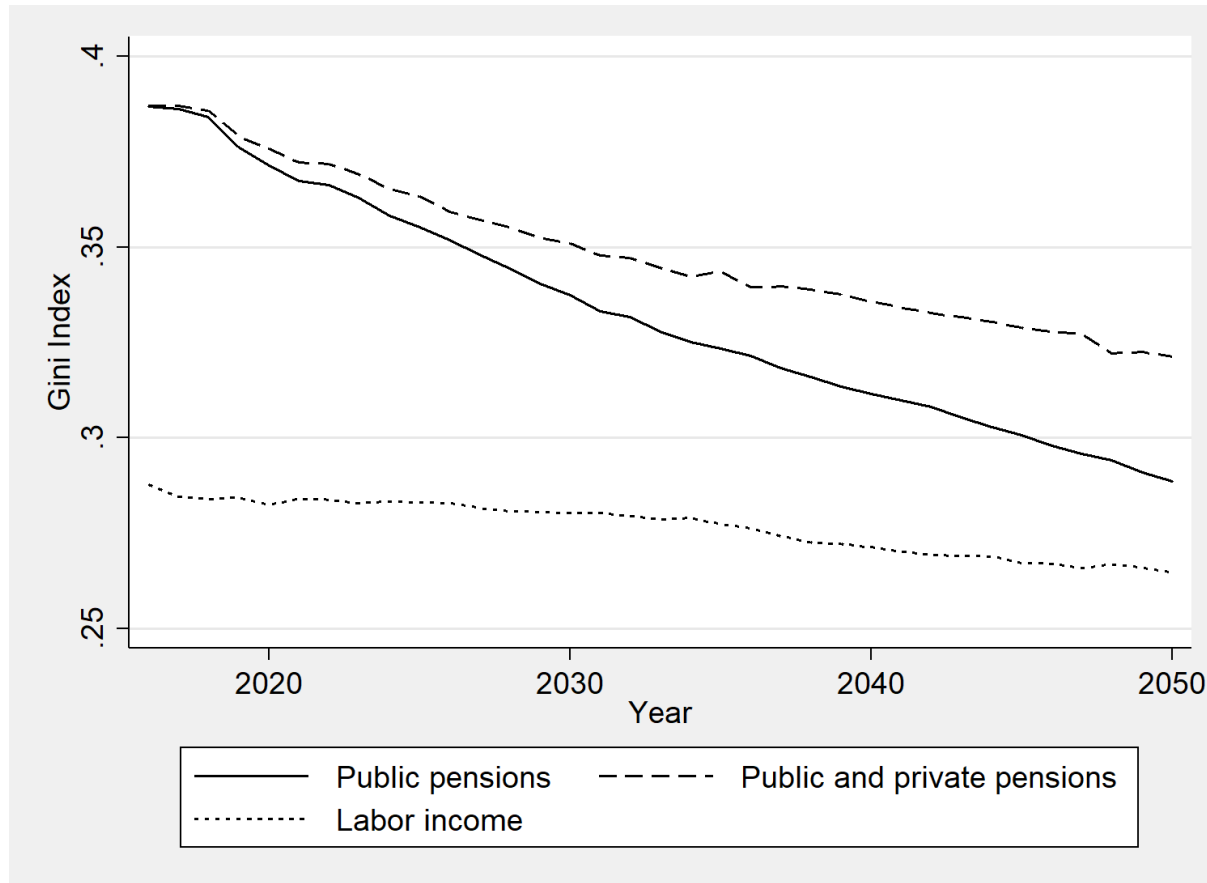
New pensioners. Gross average replacement rate



- Replacement rates decrease and the impact of private pensions stays limited over time

The impact of private and occupational pension plans (2)

Gini index

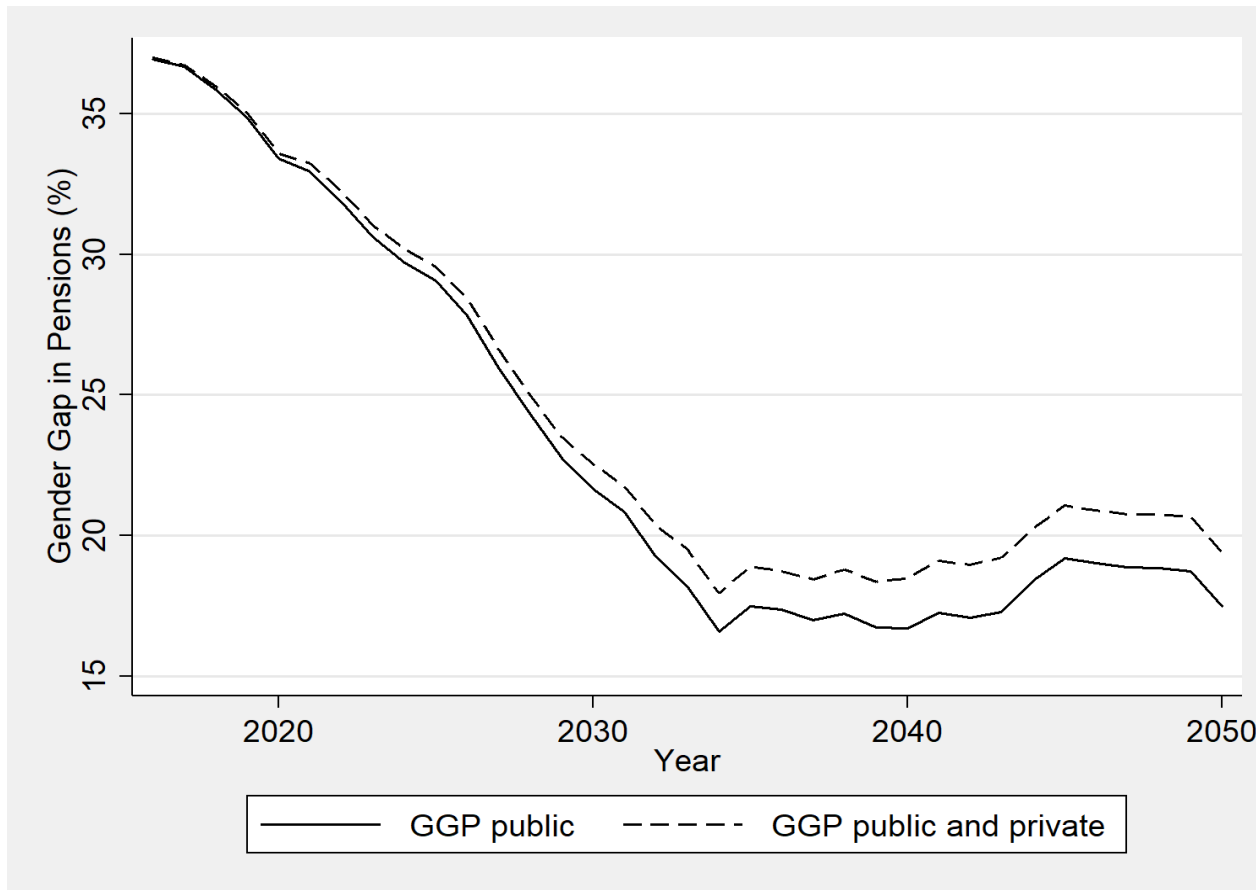


Gross pension incomes for old-age and seniority pensions
Gross labor earnings

- While the average impact is relatively small, the impact on inequality indicators is not negligible

The impact of private and occupational pension plans (3)

Gender Gap in Pensions



Average gross pension (public and private pillar) 65-79

- Private pensions somewhat limit the closing of the gender gap in pensions

The Pension Module: key findings

- Tightening requirements for retirement would impact male and female workers differently
- The gradual phasing-in of NDC rules and less favorable career patterns for younger cohorts would bring a sharp decline in benefit amounts
- The impact of private pensions would stay limited over time, though their effect on inequality is visible
- The gender gap would decrease sharply up until the mid '30s, then stabilize at around 17% (20%, if private pensions are taken into account)

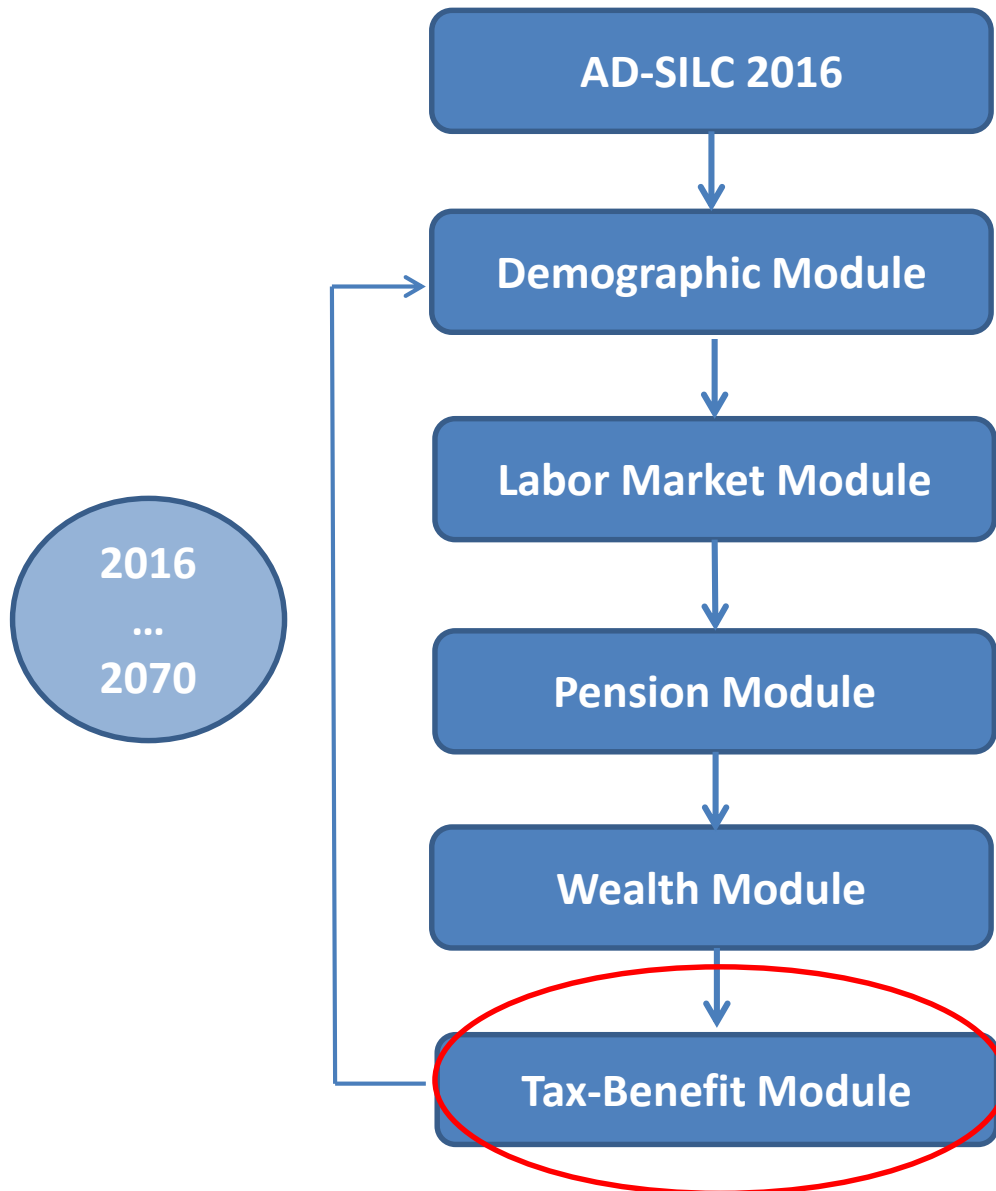
Caveat:

- Workers access retirement as soon as they are entitled to
- Migrants do not carry over any pension rights. Return migration is not simulated

Future Implementations

- Behavioural insights (retirement choice)
 - Have individuals assess their potential replacement rates
 - Introduce a behavioral function
- Attribution of pension rights to migrants
- Enrichment of private pension submodule (involvement of COVIP)

The Modules of T-DYMM



The Tax-Benefit Module (1): sequentiality

Social insurance contributions:

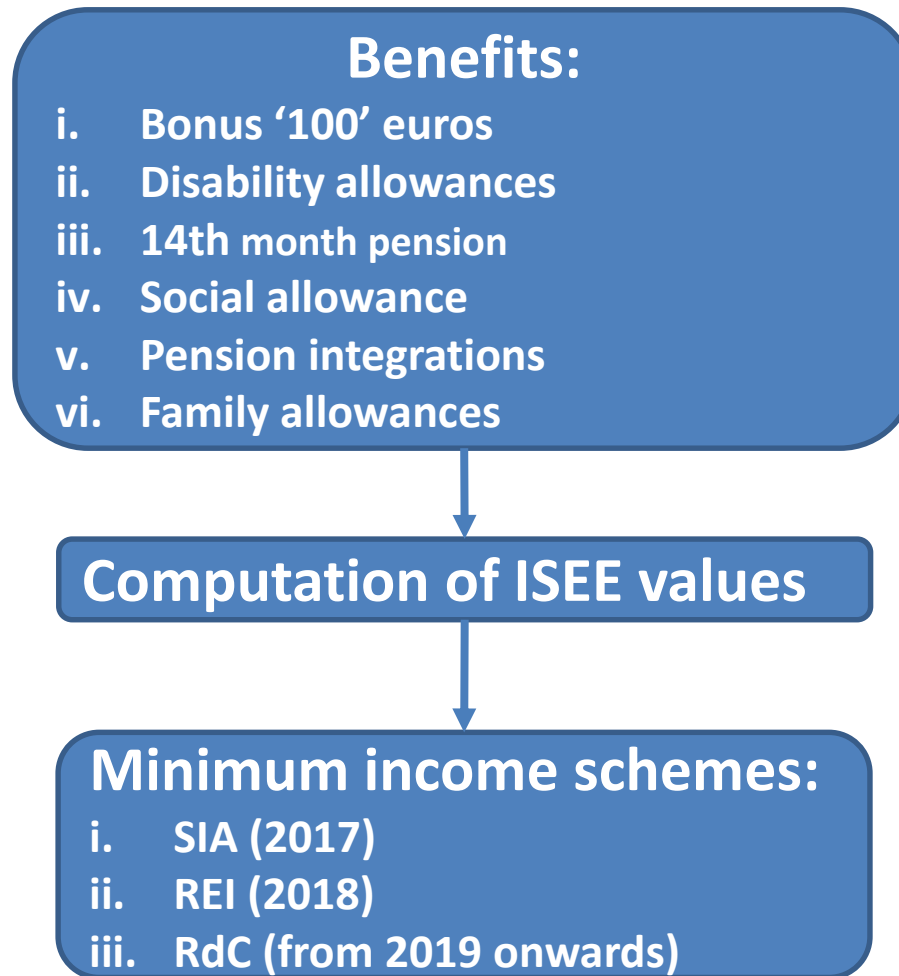
- i. IVS contribution
- ii. Non-IVS contribution

Proportional taxes:

- i. Capital income and gains
- ii. Private pensions (II and III pillars)
- iii. Self-employment income subject to *regime forfetario*
- iv. Rental income subject to *cedolare secca*
- v. Productivity bonuses

Personal income Tax (IRPEF)

The Tax-Benefit Module (2): sequentiality



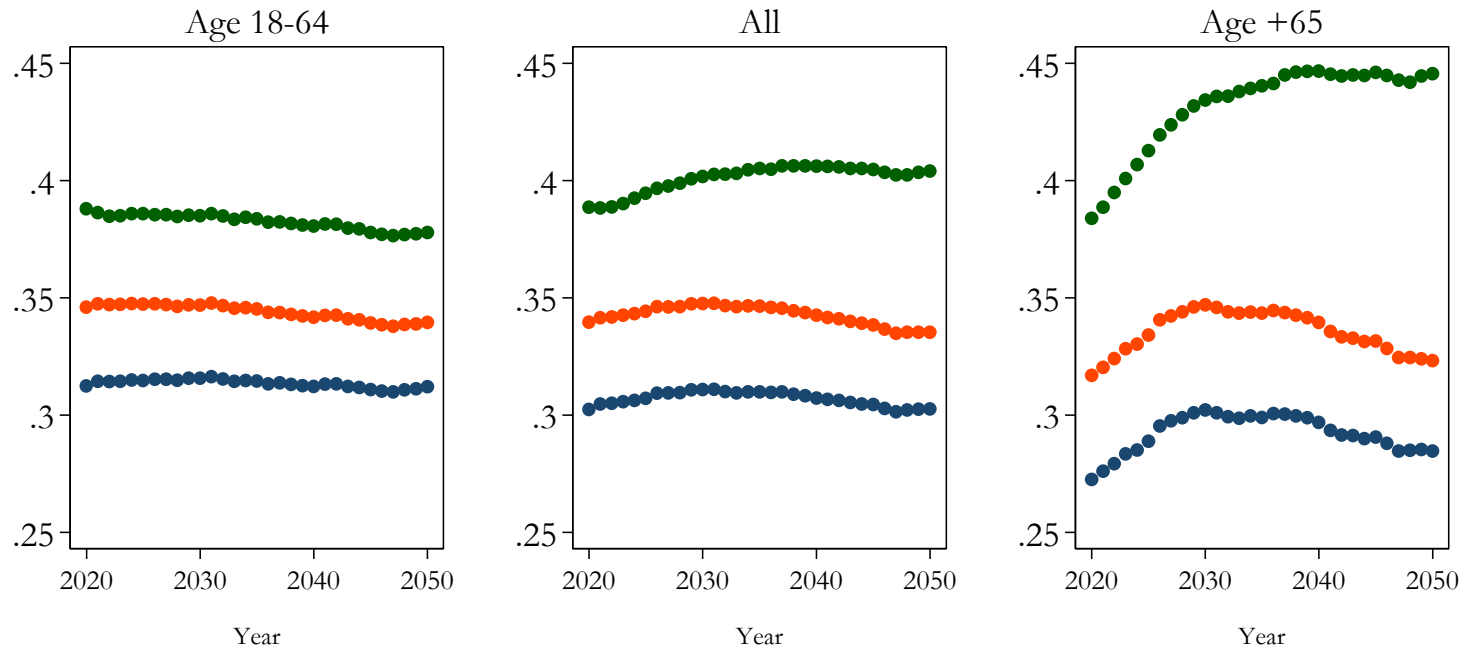
The Tax-Benefit Module: key assumptions

- After 2023 (horizon of latest DEF) all tax-benefit parameters and amounts are assumed to follow nominal GDP growth
- Recipients of specific income components:
we take as reference their number as of 2019 and align it to the:
 - population growth at the individual level by sex and age group (disability allowances);
 - population growth at the household level (rental income subject to *cedolare secca*)
 - self-employed population growth (self-employment income subject to *regime forfetario*)
 - employee population growth (productivity bonuses)
- We assume full take-up rate for each benefit

The Tax-Benefit Module: preliminary results

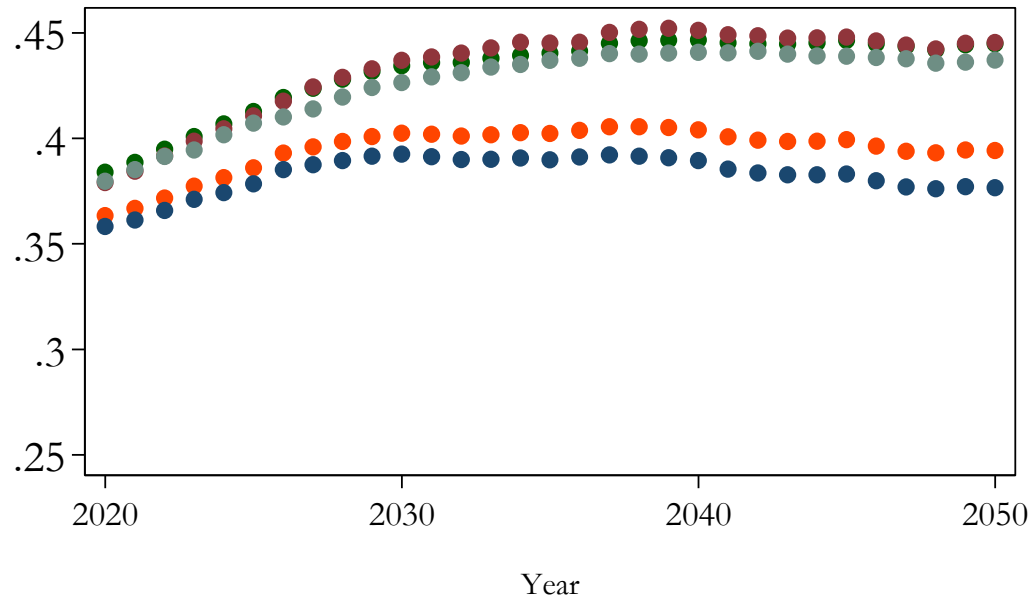
- Unit of analysis: individual
- Income: equivalised using the OECD-modified equivalence scale
- Income definitions:
 - i. Market income+pensions: labour income and productivity bonuses, rental income from residential properties, capital income and gains, retirement income (old-age, survivors' and inability pensions), cadastral income (main residence and other residential properties), private pensions (II and III pillars)
 - ii. Market income+pensions+benefits (i.e. gross income after benefits)
 - iii. Market income+pensions+benefits-taxes (i.e. disposable income)

Gini index of equivalised income



- Market income+Pensions
- Market income+Pensions+Benefits
- Market income+Pensions+Benefits-Taxes

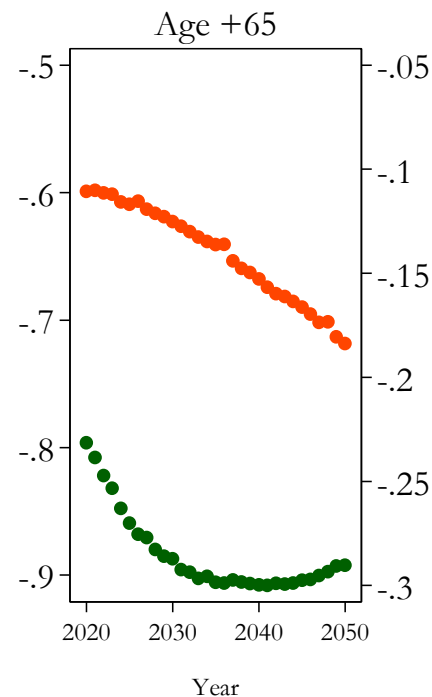
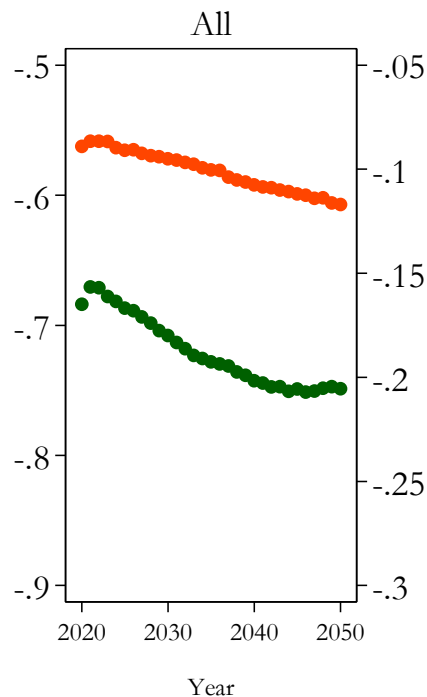
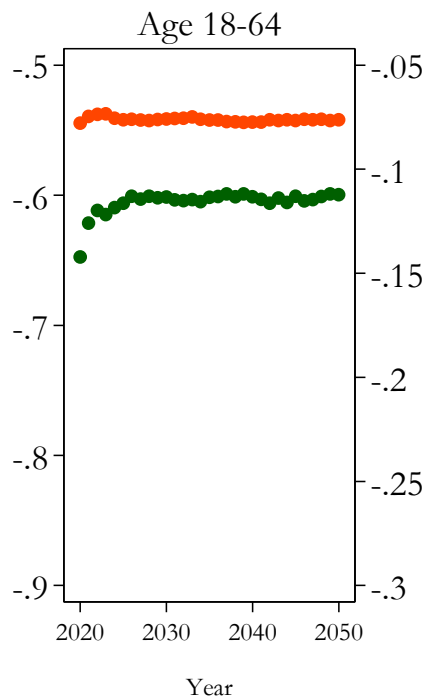
Gini index of equivalised income (Age +65)



- Market income+Pensions (Age +65)
- Market income+Pensions+Social allowance (Age +65)
- Market income+Pensions+Social allowance and integrations (Age +65)
- Market income+Pensions (Age +65, excluding workers)
- Market income+Pensions (Age >= statutory retirement age)

Progressivity effect and average tax rate: from market income+pensions to gross income after benefits

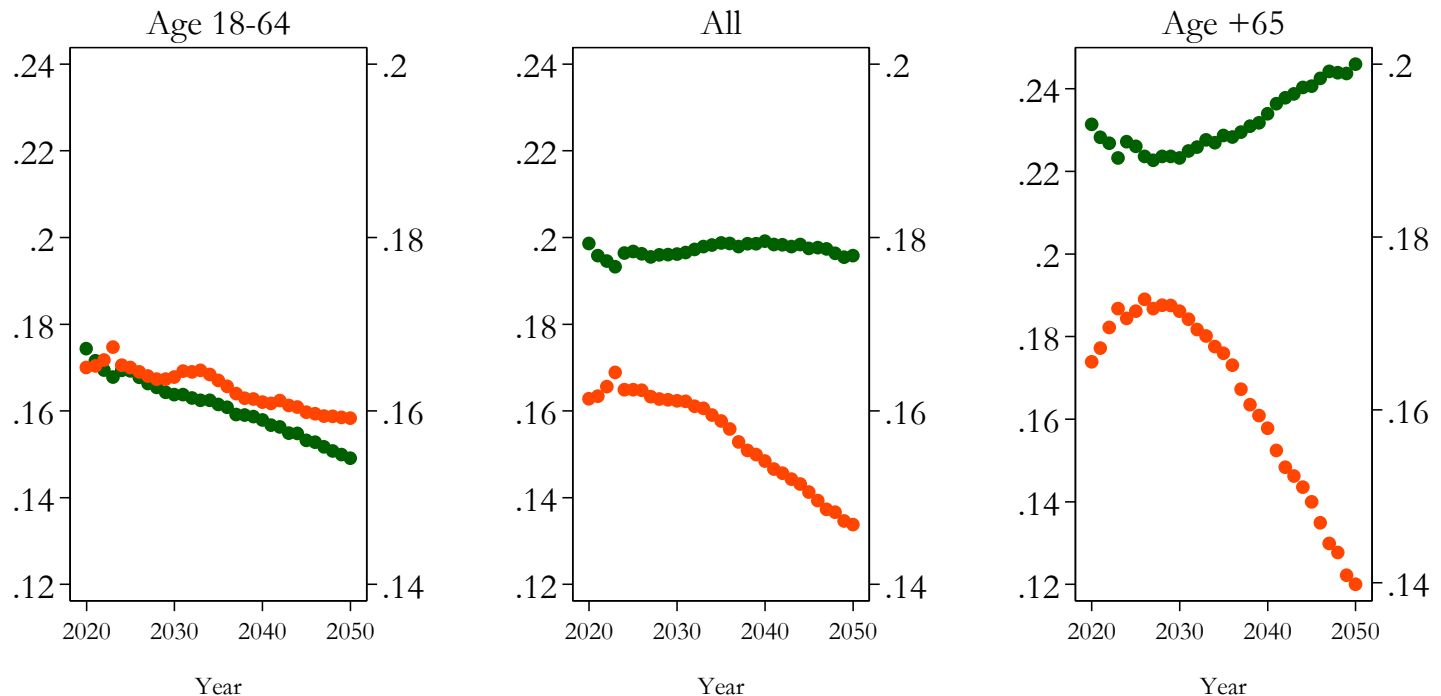
- The lower the progressivity effect, the higher the progressivity of benefits
- The lower the average tax rate, the higher the amount of benefits received on average



- Progressivity effect (left-hand axis)
- Average tax rate (right-hand axis)

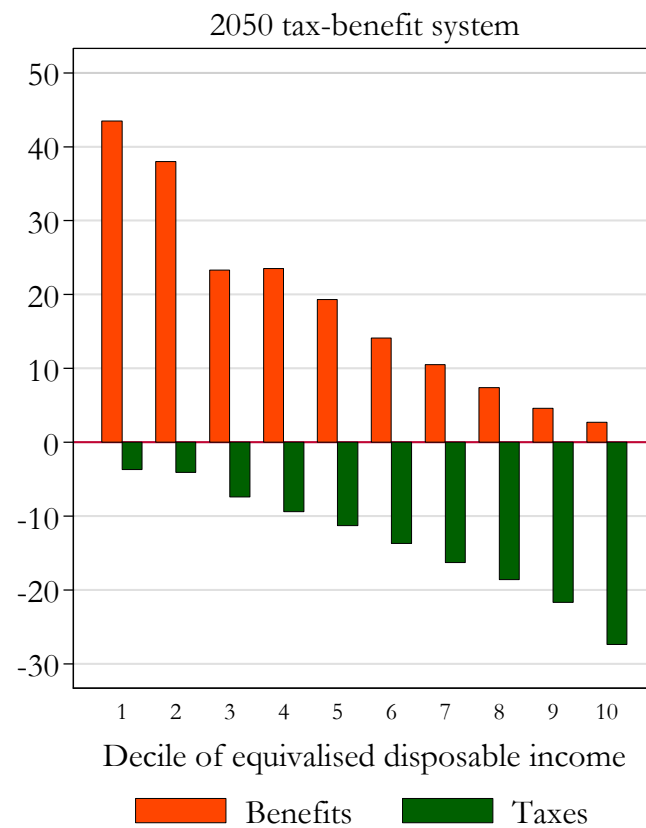
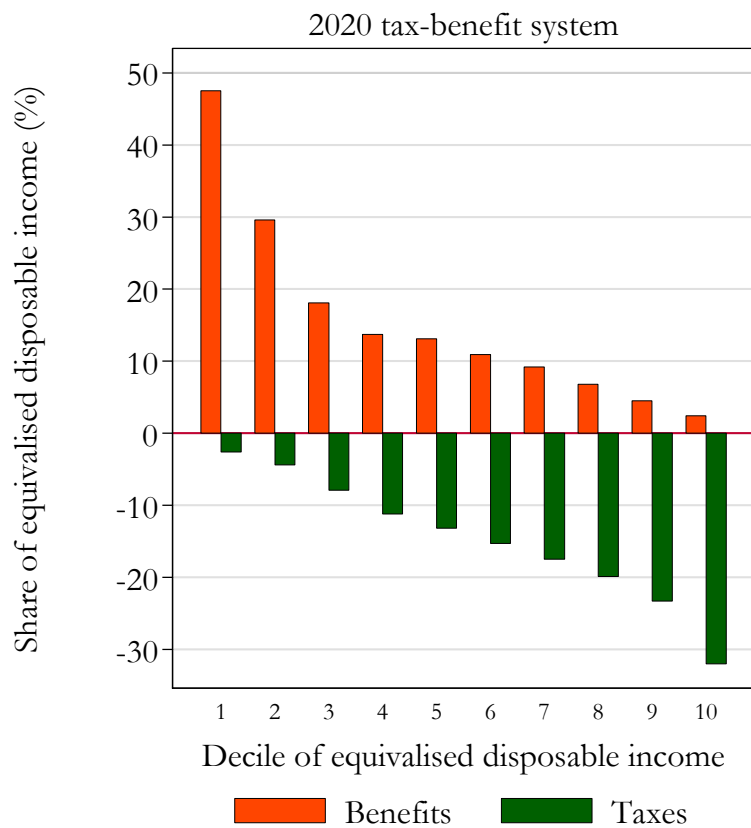
Progressivity effect and average tax rate: from gross income after benefits to disposable income

- The lower the progressivity effect, the lower the progressivity of taxes
- The lower the average tax rate, the lower the amount of taxes paid on average



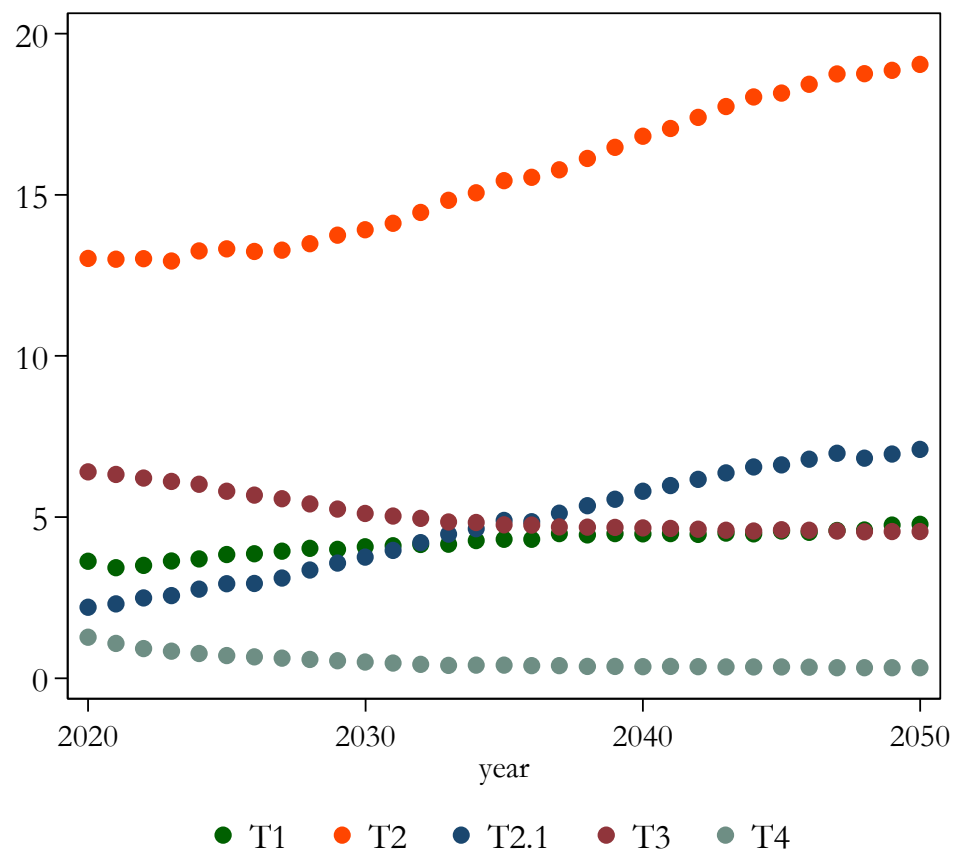
- Progressivity effect (left-hand axis)
- Average tax rate (right-hand axis)

Share of benefits and taxes on equivalised disposable income by decile

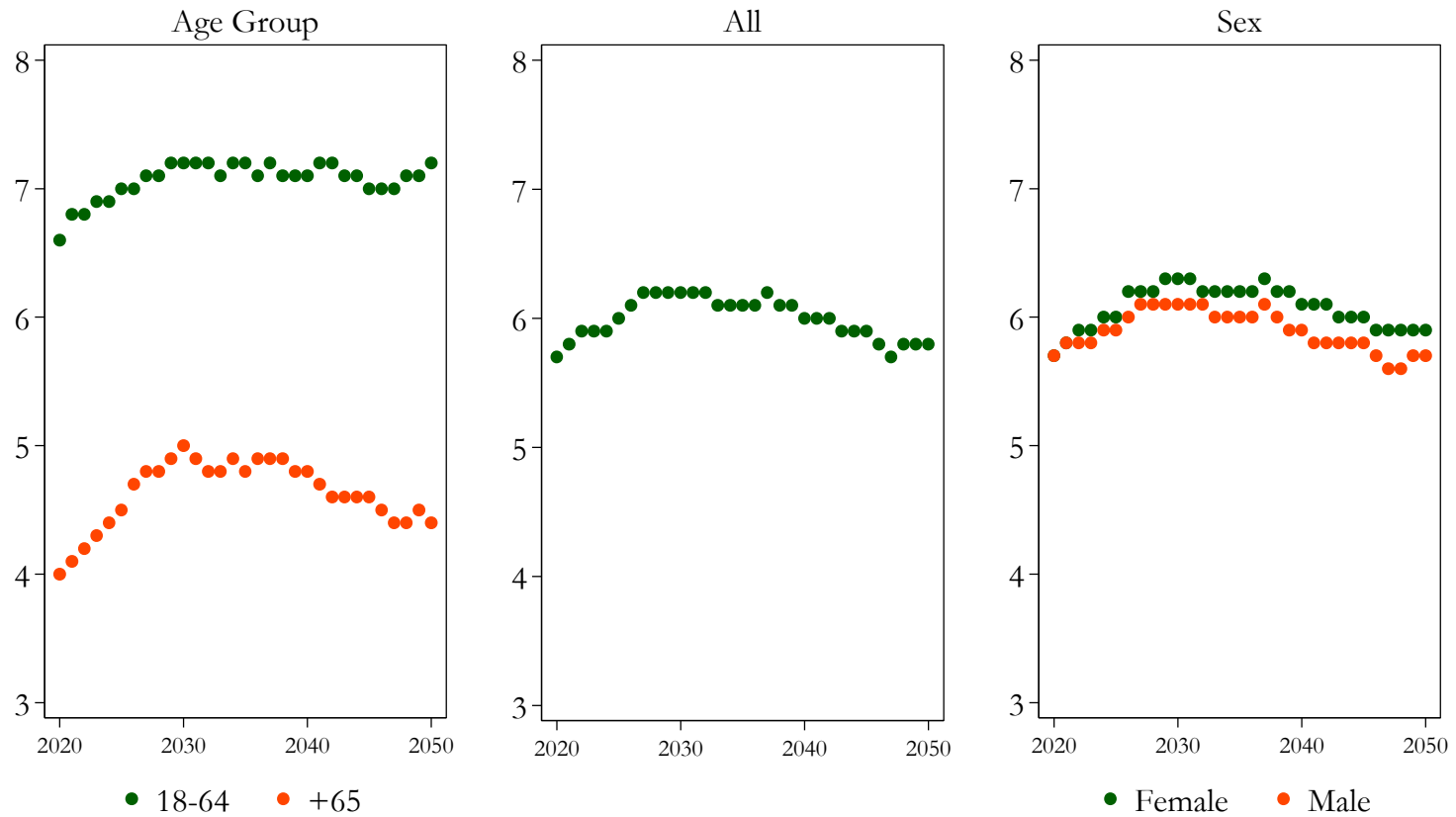


Number of recipients of selected benefits

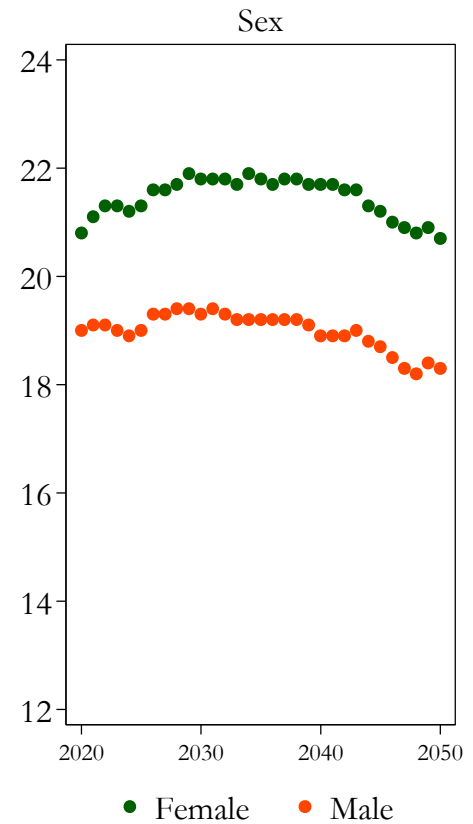
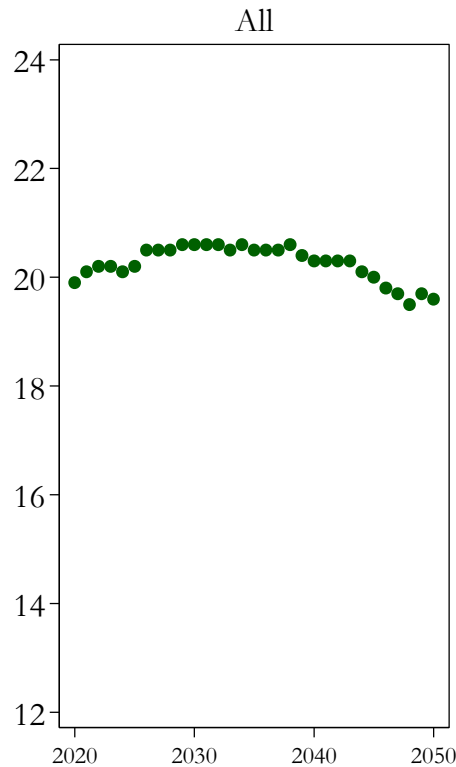
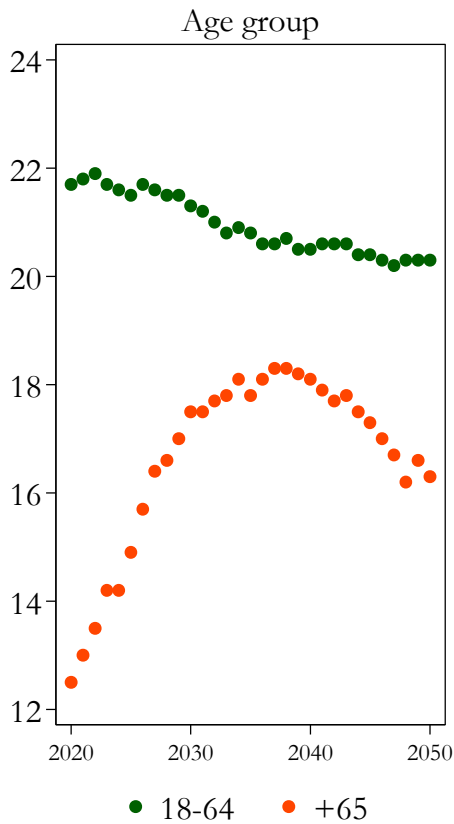
- Legend: **T1**: unemployment benefits; **T2**: social pension, disability allowances and pension integrations; **T2.1**: social pension; **T3**: family allowances; **T4**: minimum income (RdC)
- Note: only one individual per household was counted in T4 and T5



S80/S20 of equivalised disposable income by age group (sex)



AROP of equivalised disposable income by age group (sex)



The Tax-Benefit Module: key findings

- Marked increase in market income inequality among the elderly population
- Overall increase in the redistributive effect of benefits, both in terms of progressivity and average transfer rate
- The elderly population is the primary beneficiary of social protection benefits
- Increased number of recipients of the *Assegno sociale*
- Higher concentration of the tax burden on the non-elderly population
- Steep increase in the risk of poverty of the elderly population, partially offset by the end of the simulation
- Women have a persistently higher risk of being poor with respect to men

Future Implementations

- Housing taxation, VAT, Mother bonus, New born bonus
- Take-up rates: behavioural insights. Should take-up rates for different measures be correlated?
- Policy scenarios