



IRPET Istituto Regionale
Programmazione
Economica
della Toscana

The intergenerational redistribution of the pension system in the dynamic microsimulation model IrpetDin

Winter Microsimulation Workshop

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M.L. Maitino and L. Ravagli

Outline

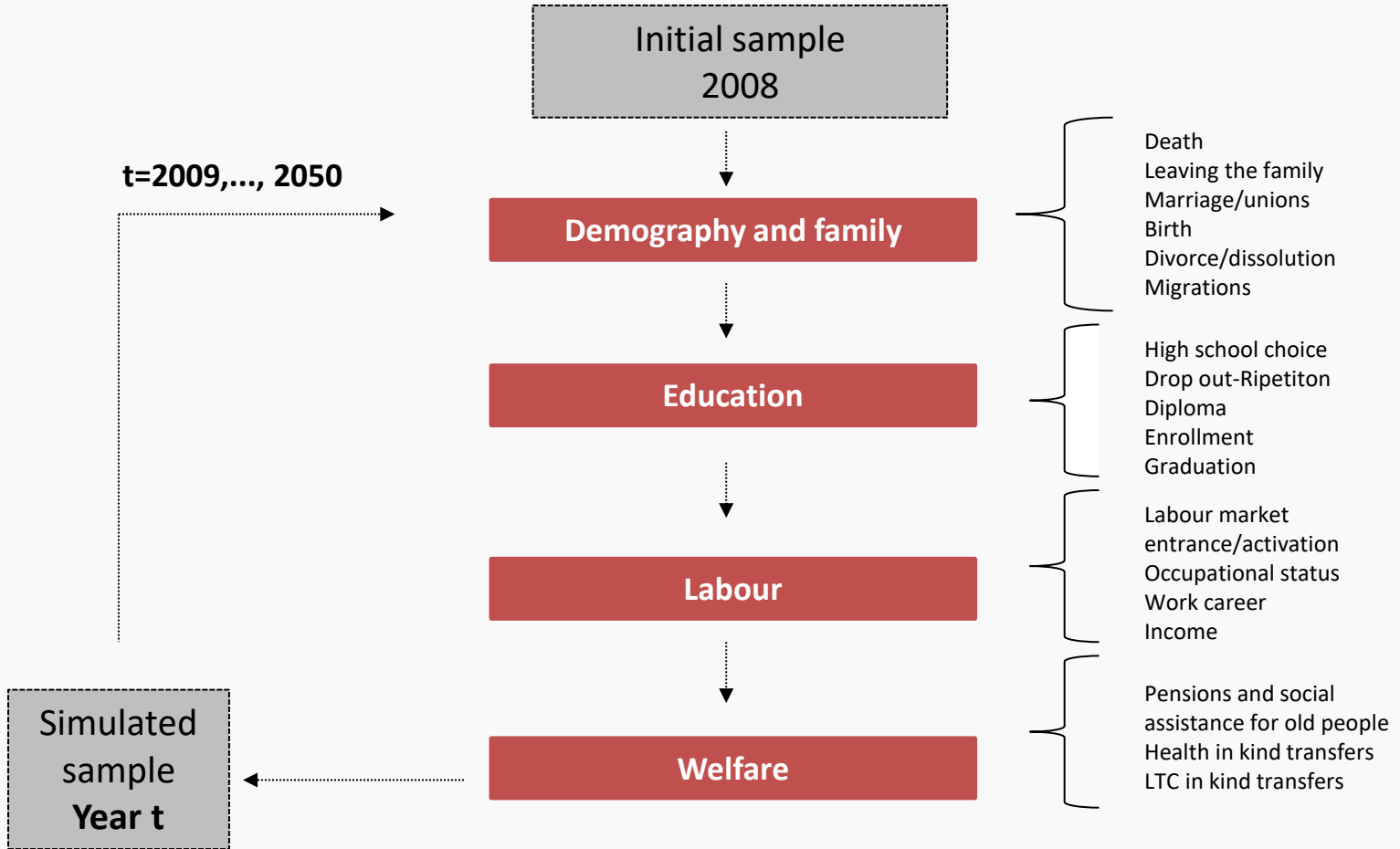
- IrpetDin's structure and functioning
- Italian long run demographic dynamics projected by IrpetDin
- The intergenerational redistribution of the pension system
- An evaluation of the most recent Italian pension reforms

IrpetsDin's structure and functioning

IrpetDin: general features

- **Population based:** ageing and adjustment of a cross sectional sample of the entire population
- **Database:** EUSILC 2008
- **Closed model:** except newly born children and migrants, the model only uses a fixed set of individuals
- **Dynamic ageing:** produces a longitudinal database of histories of each individual in each period of the simulation
- **Probabilistic:** transitions among states are made through probabilistic methodologies → Monte Carlo technique
- **Discrete time:** transition and updating for each year
- **Simulation period:** 2009-2050
- **Territorial coverage:** Italy and the region Tuscany
- **Software environment:** SAS

IrpPetDin: modules



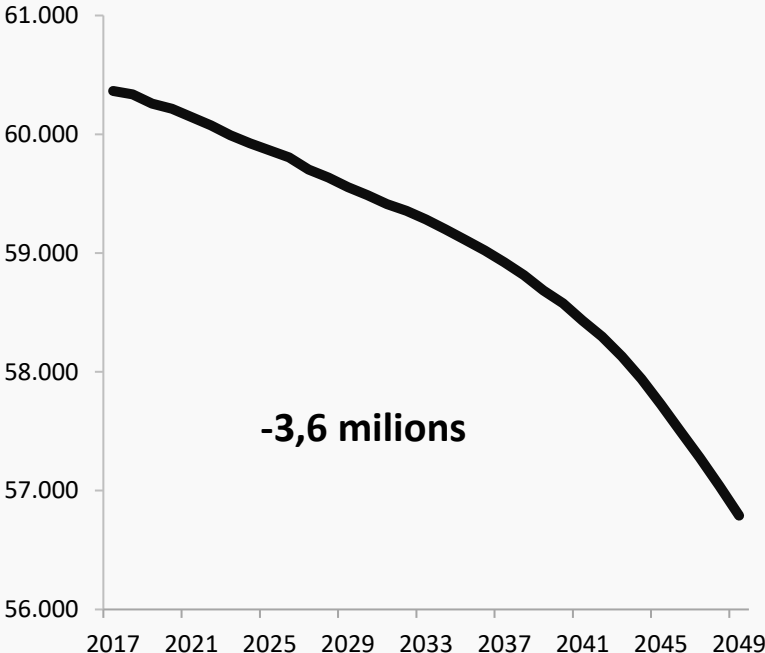
**Italian long run demographic dynamics
projected by IrpetDin**

The exogenous variables of the baseline scenario

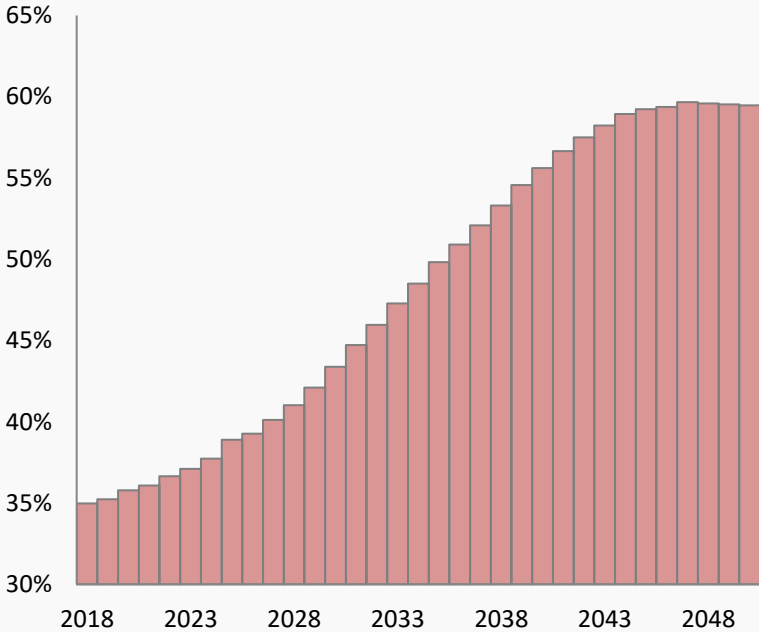
DEMO	Life expectations	Official forecasts ISTAT 2017-2065, central scenario	ISTAT
	Fertility	Official forecasts ISTAT 2017-2065, central scenario	ISTAT
	Migrations	Official forecasts ISTAT 2017-2065, central scenario	ISTAT
MACRO	Real GDP growth rate	+1% until 2050	IRPET macro model
	Nominal GDP growth rate	+2,8% until 2050	IRPET macro model
	Growth of annual labour units (ALU)	+0,3% until 2050	IRPET macro model
	Productivity	+0,7% until 2050	IRPET macro model
	ALU/Employed people	-0,2% until 2020, then stable	Our assumption
	Wages growth	Nominal GDP	Our assumption
WELFARE	Threshold and minimum	Inflation	IRPET macro model
	Pension amount growth	Inflation	IRPET macro model
	Health and LTC costs growth	Nominal per capita GDP growth rate	Our assumption

A decreasing and older population

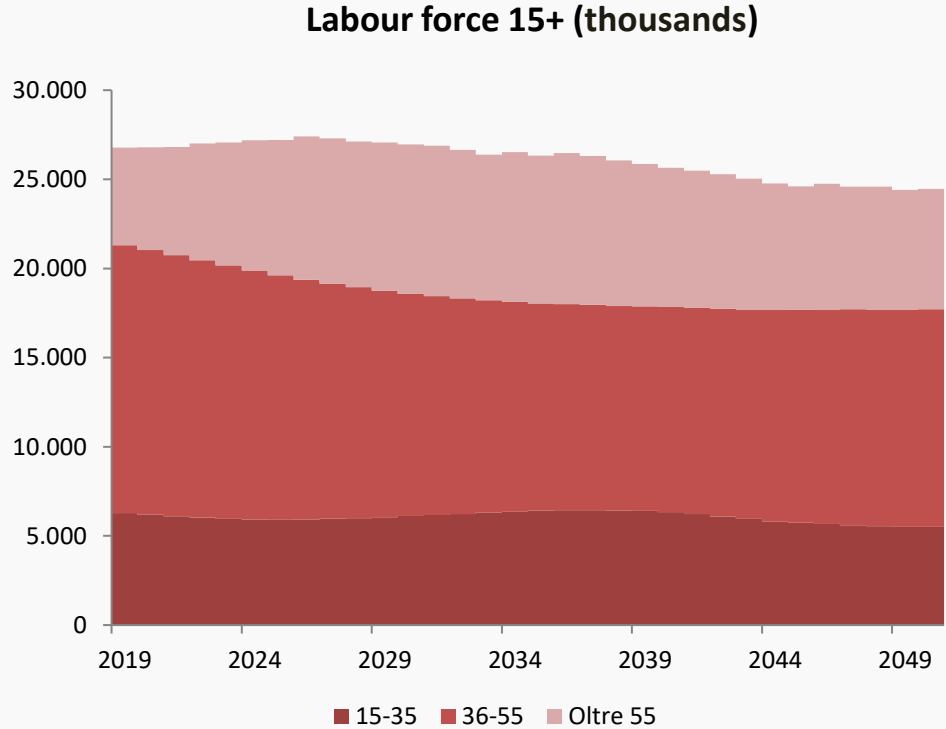
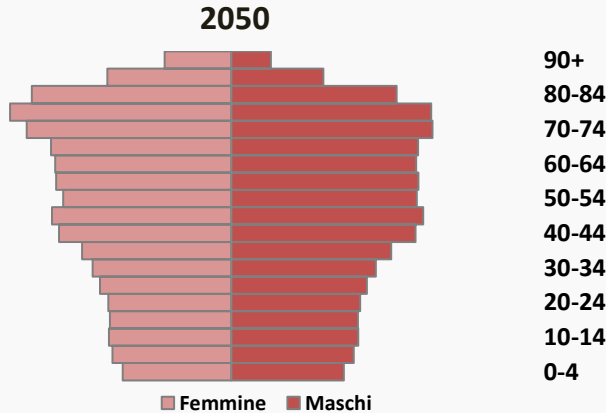
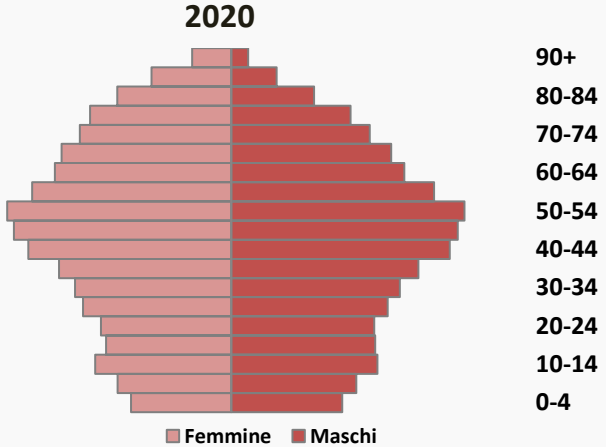
Population (thousands)



Demographic dependancy (over 65+/15-64)



A shrinking workforce



The intergenerational redistribution of the pension system

Italian pension rules, in brief (ordinary regime)

Type of pensioner

DB pensioners → with more than 18 years of social contributions in 1995

NDC pensioners → workers who started working after 1995

Mixed pensioners → workers with less than 18 years of social contributions in 1995

Eligibility criteria

Old age pension

Age: **67**

Years of social contributions:

20

Seniority pension

Years of social contributions:

42,3 for women

43,3 for men

Pension amount

$$P_{DB} = y * r * e$$

y = average labour income last 15/10/5 years

r = rate of return

e = number of working years

$$P_{NDC} = mc * t$$

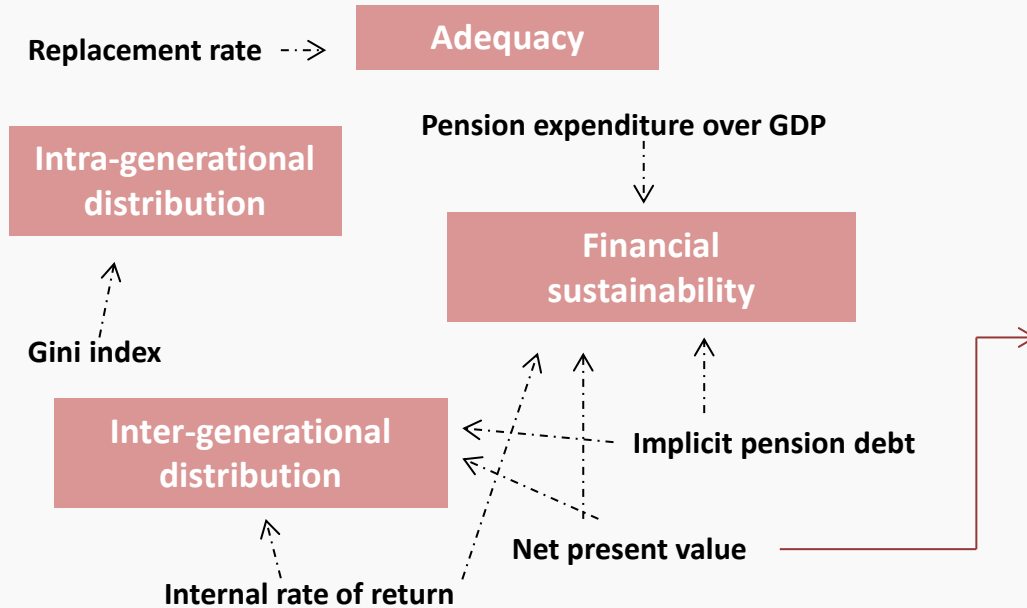
mc = total amount of social contribution capitalised

t = transformation coefficient

*Age and n° of years of social contributions are automatically **adjusted** every two years with **life expectations***

*Transformation coeff. automatically **adjusted** every two years with **life expectations***

Indicators for the evaluation of the pension system



$$NPV_i = \frac{\sum_{k=a_r}^{a_r+A_r} \frac{1}{(1+r)^{k-a_r}} P_{i,k}}{\sum_{k=a_w}^{a-1} \frac{1}{(1+r)^{a_w-k}} C_{i,k}}$$

where:

a_w is the age at retirement

a_r is the age at the first work

r is the discount rate

$P_{i,k}$ is the pension benefit

$C_{i,k}$ is the social contributions paid

A_r is the expect age at retirement

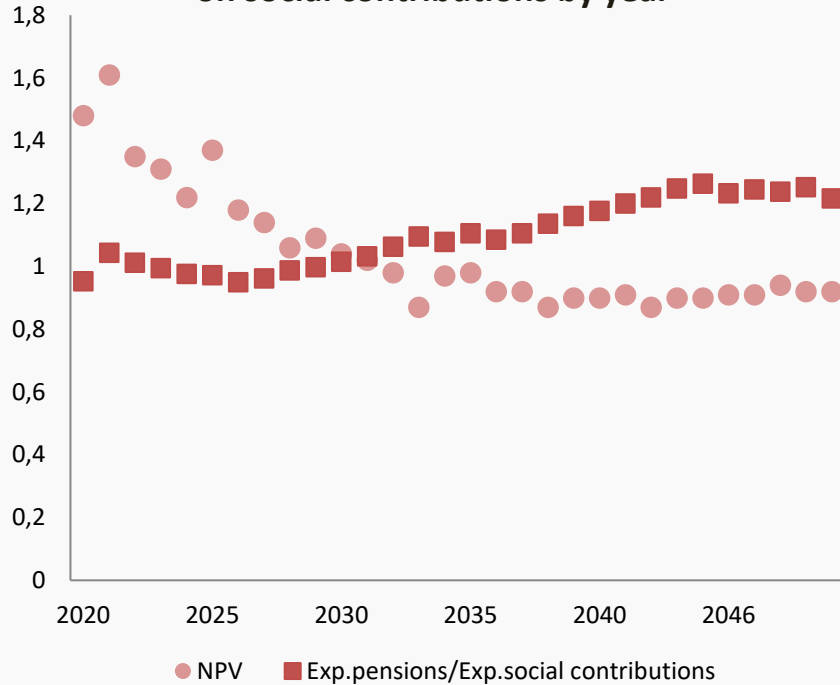
Pension rules

Life lenght

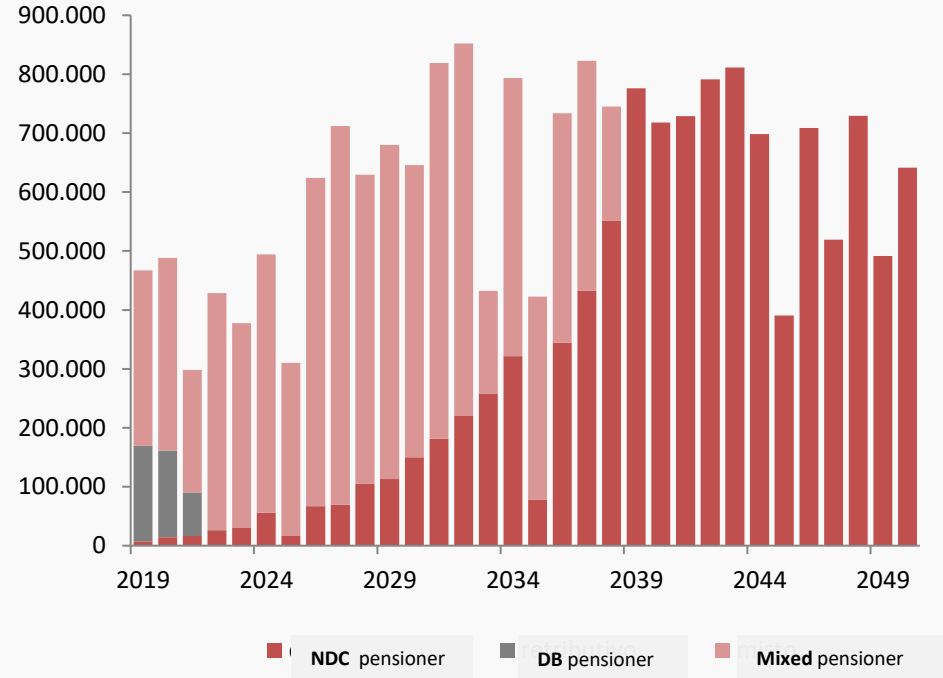
Work careers and normative on social contributions

Net present value and pension rules

Net present value and exp.pensions on social contributions by year

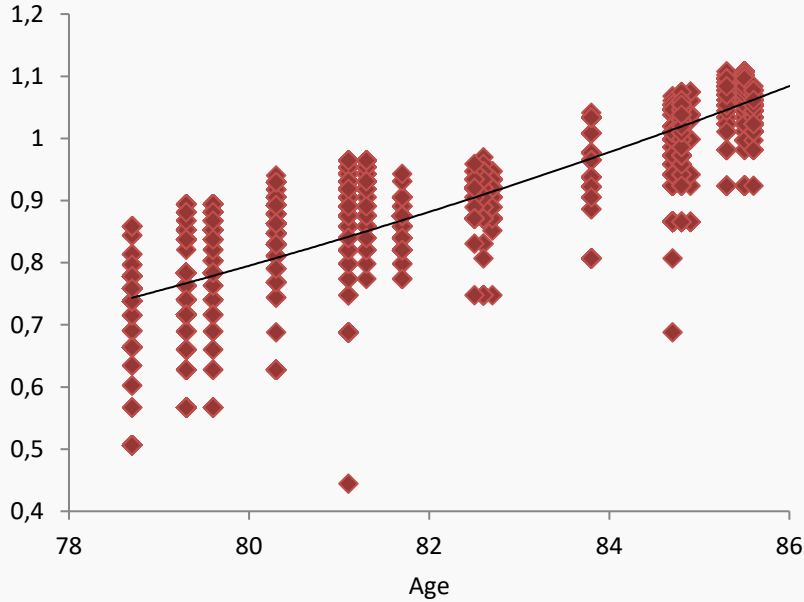


Number of new retirees by year



Net present value and life length

Net present value by age at death

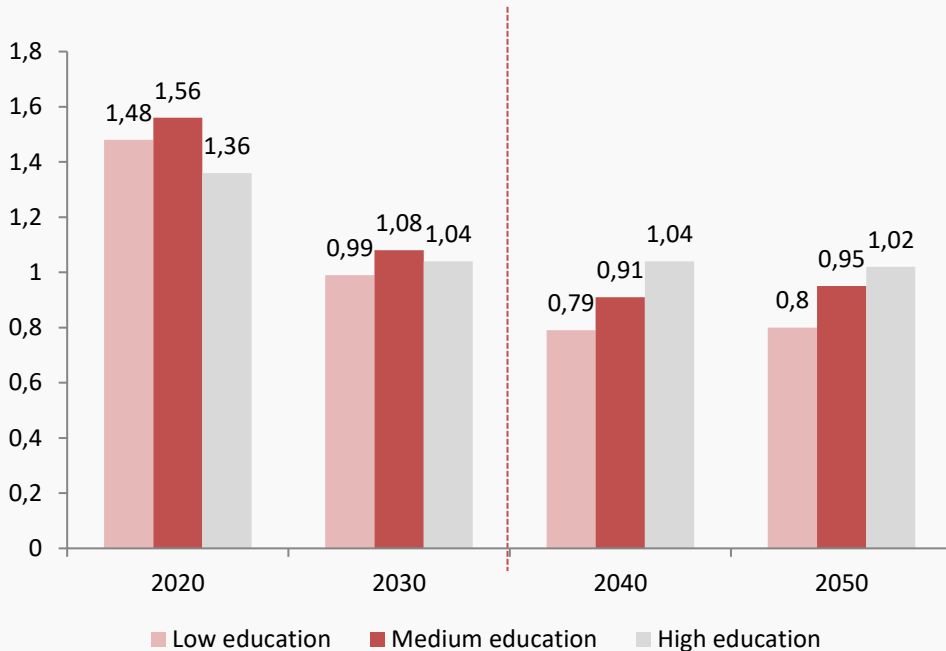


Life expectations by geo.area, education and sex

	Women				Men			
	Low education	Medium education	High education	All	Low education	Medium education	High education	All
North-West	84.7	85.5	86.3	85.2	79.3	81.1	82.7	80.6
North-East	84.9	85.5	86.2	85.3	79.6	81.3	82.6	80.7
Centre	84.8	85.3	86.1	85.2	79.6	81.1	82.5	80.8
South	83.8	84.8	85.6	84.3	78.7	80.3	81.7	79.7
Italy	84.5	85.3	86.0	84.9	79.2	80.9	82.3	80.3

Net present value and education

Net present value by education level and year

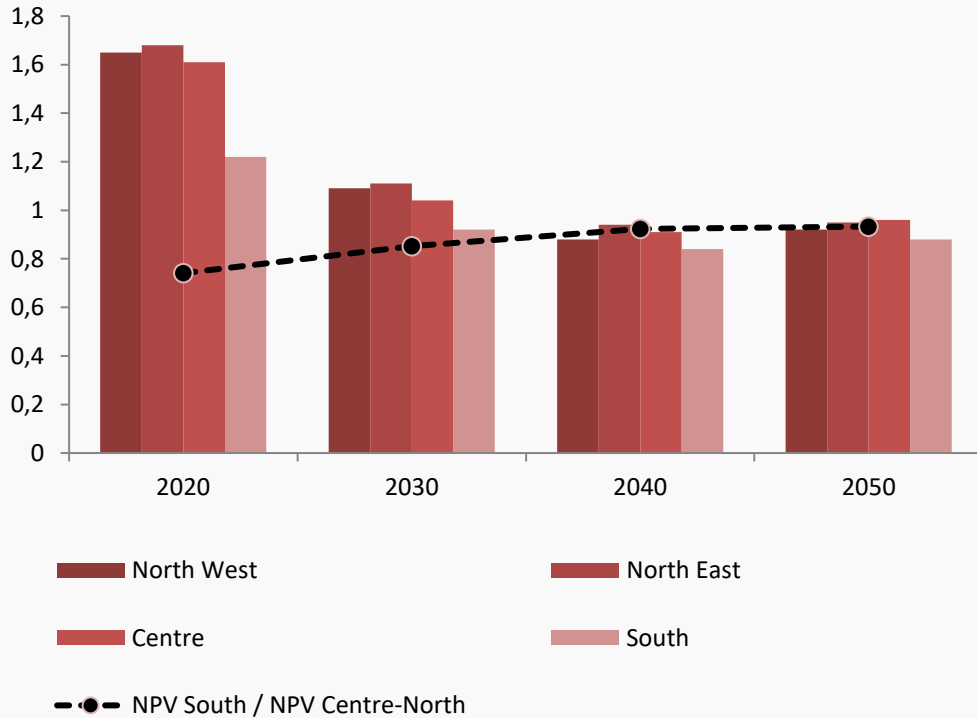


New retirees by education and regime - 2020

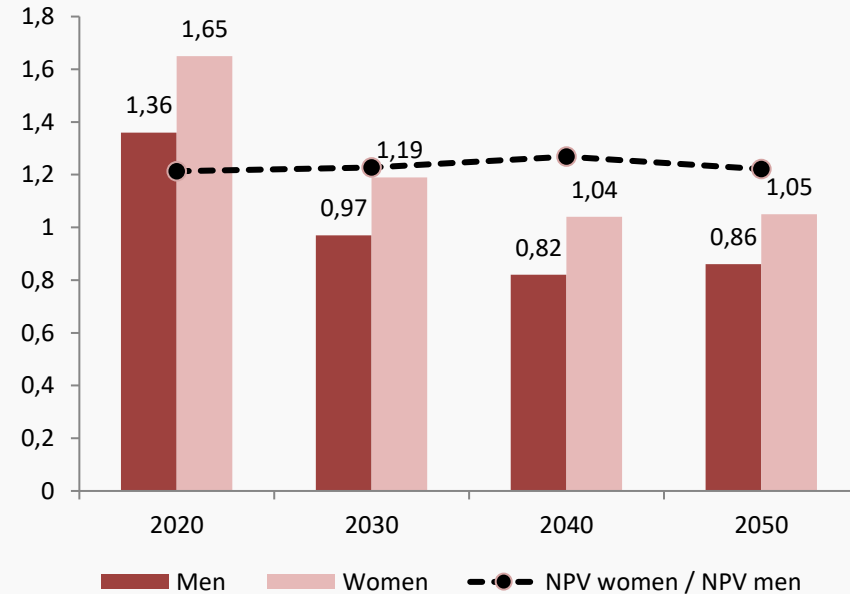


Net present value, sex and geographical area

Net present value by area and year



Net present value by sex and year



**An evaluation of the most recent
Italian pension reforms**

The most recent Italian pension reforms

Fornero reform - Law 214/2011

- **Strong increase in retirement requirements** (for old age and seniority pensions)
- Retirement requirements and transformation coefficients **adjusted automatically to life expectations**
- Partial application of **NDC for workers with more than 18 years of contributions in 1995** (for years after 2011)
- **Abolition** of the so called **“Quote”**
- Ability to exit early if the pension amount exceeds certain thresholds

“Quota 100” DL 4/2019

- **From 2019 to 2021**, possibility to retire in advance respect to legal requirements with at least 62 years old and 38 years of contributions = **Quota 100**
- **Interruption until 2026** of the **adjustment to life expectancy** of requirements for seniority pensions

“Quota 102” Budget law for 2022

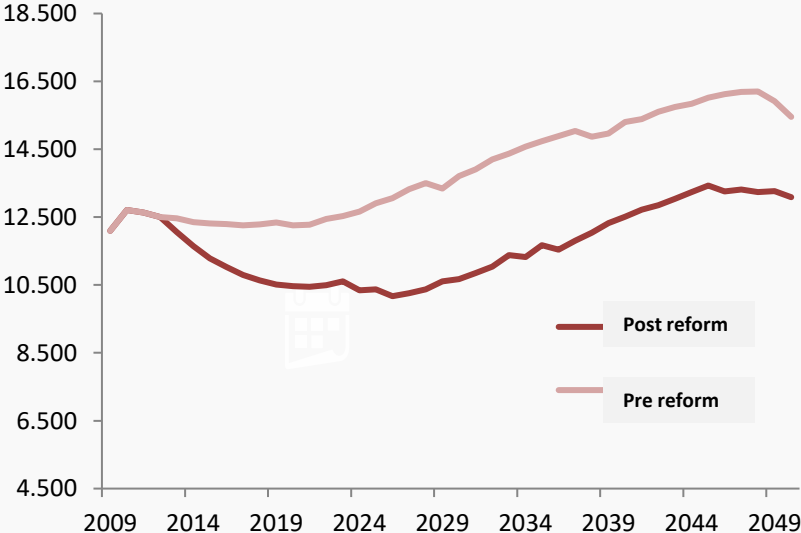
- **For 2022**, possibility to retire in advance respect to legal requirements with at least 64 years old and 38 years of contributions = **Quota 102**

“Quota 103” Budget law for 2023

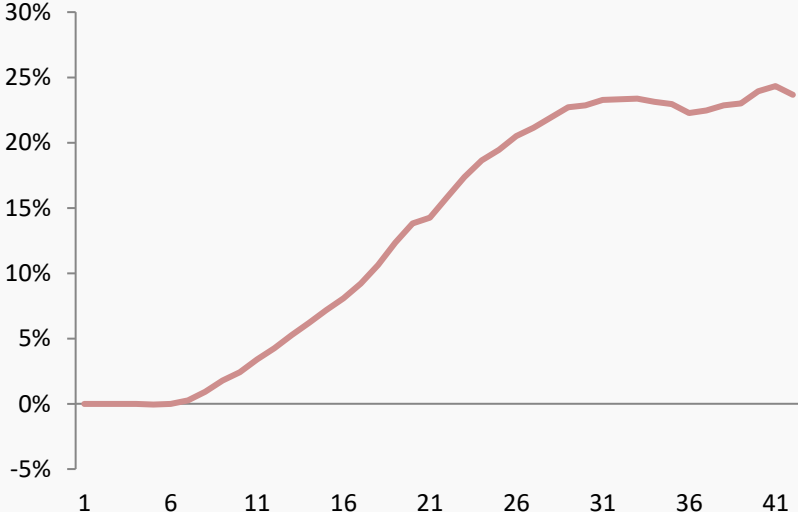
- **For 2023**, possibility to retire in advance respect to legal requirements with at least 62 years old and 41 years of contributions = **Quota 102**

The effect of the Fornero reform (law 214/2011)

Stock of retirees (thousands)

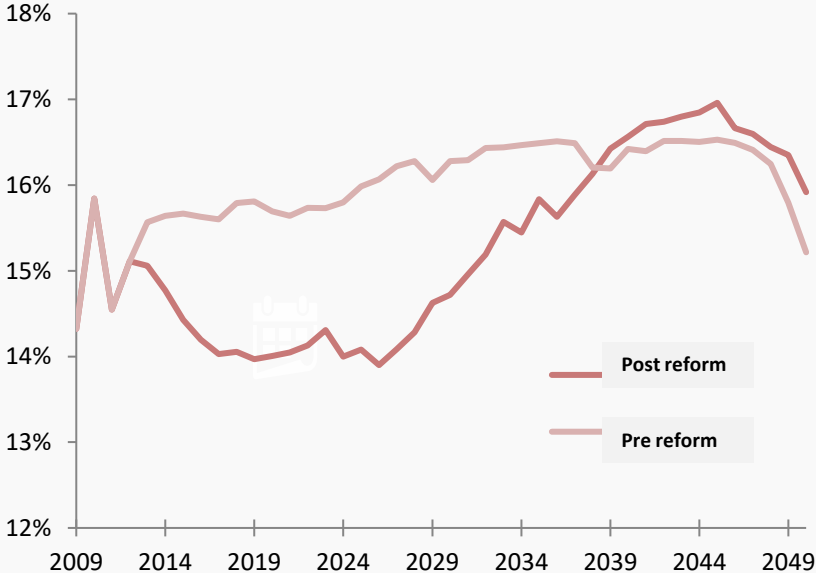


Variation in the pension amount

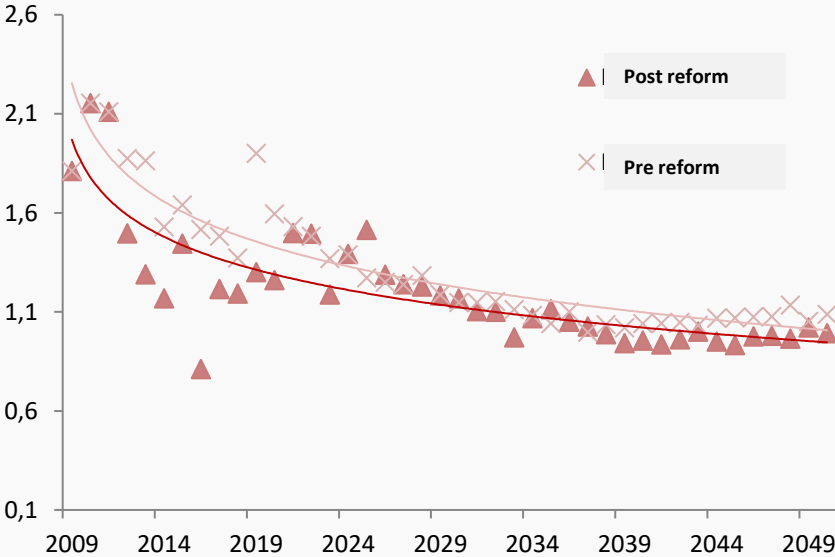


The effect of the Fornero reform (law 214/2011)

Pension expenditure on GDP

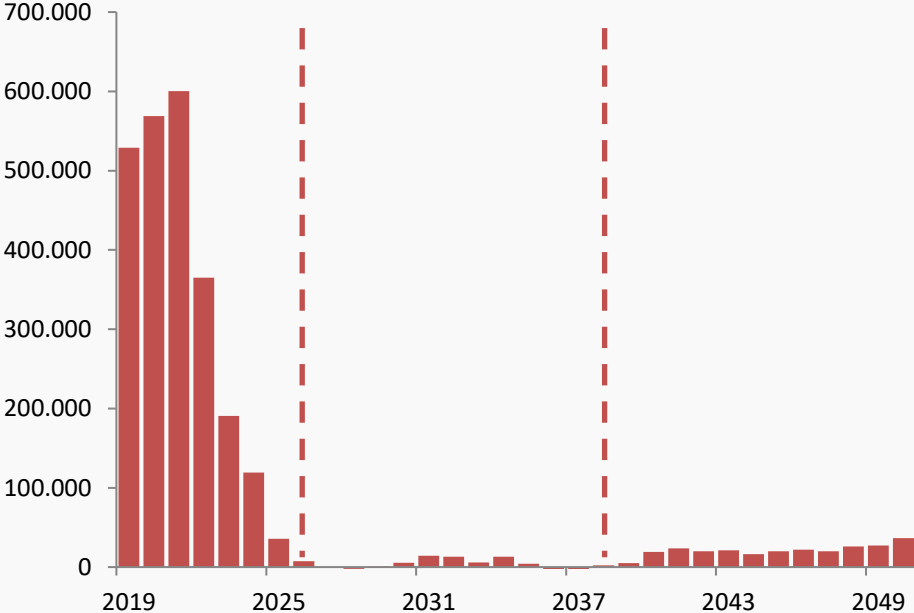


Net present value

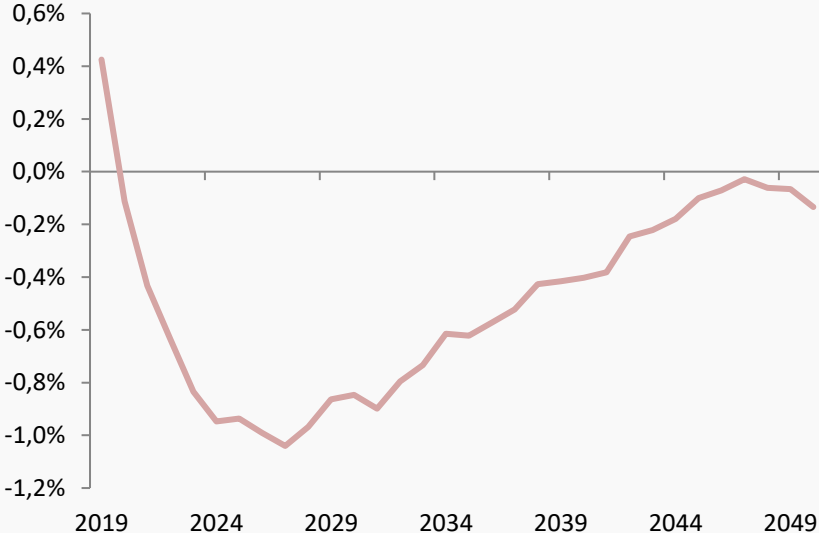


The effect of the reform “quota 100” (DL 4/2019)

Variation in the stock of pensioners

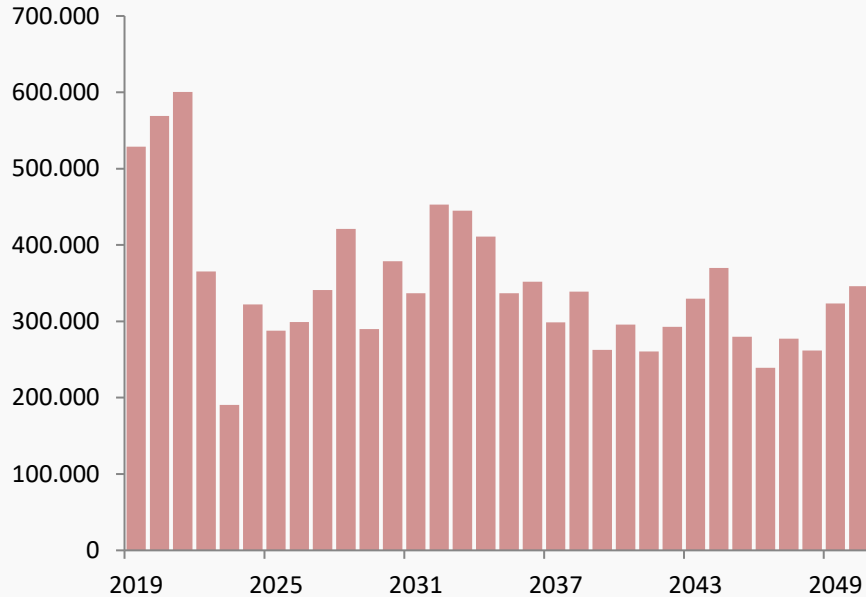


Variation in the pension amount

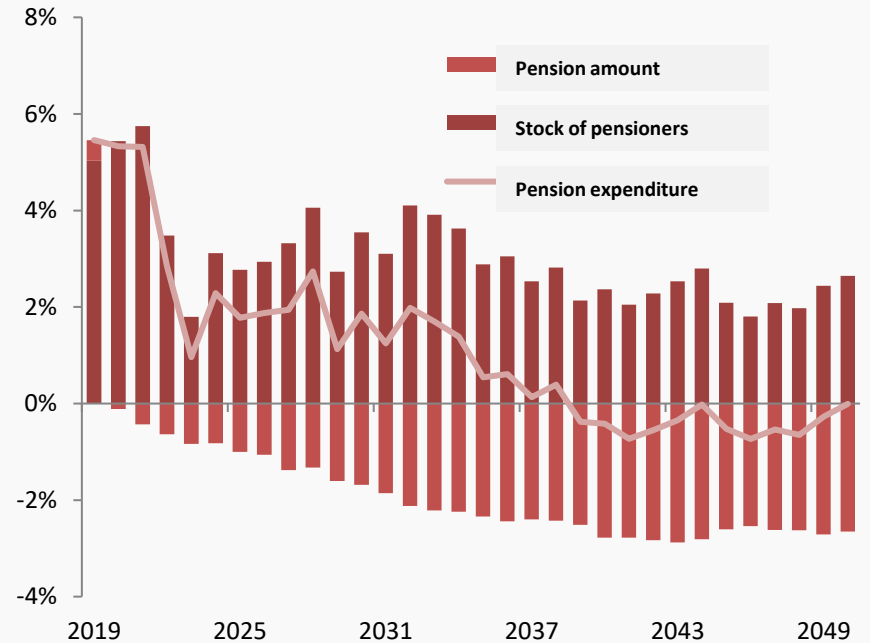


The effects of “quota 100” and suspension of the adjustment to life expectations (d.l.4/2019)

Variation in the stock of pensioners

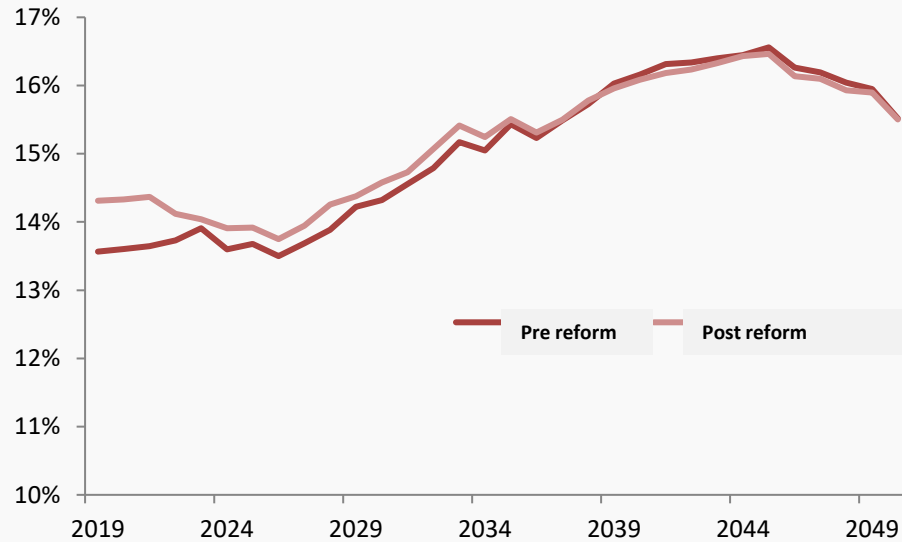


Contribute of the stock of pensioners and of the pension amount to the variation in expenditure

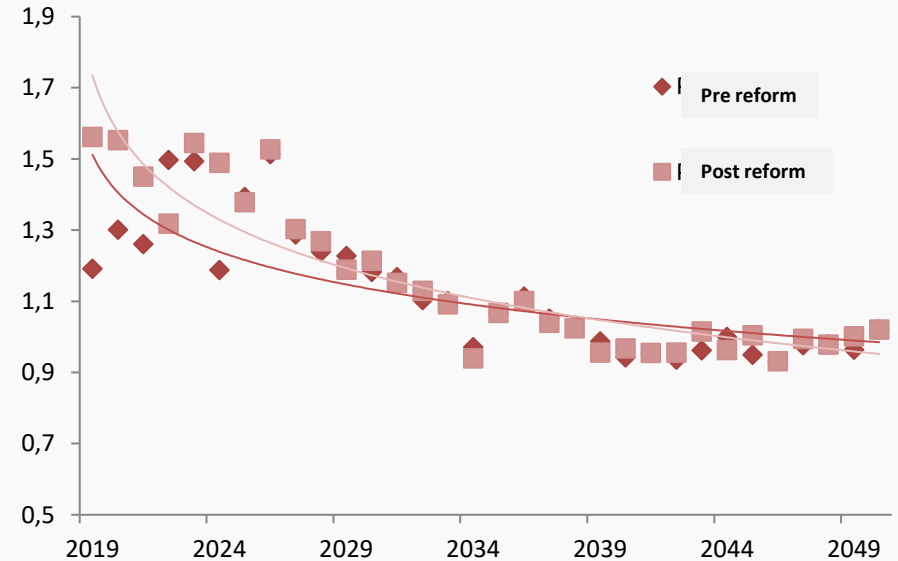


The effects of “quota 100” and suspension of the adjustment to life expectations (d.l.4/2019)

Pension expenditure on GDP



Net present value





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Thanks for your attention

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