



Dipartimento
del Tesoro



Fondazione
Giacomo Brodolini

THE TREASURY DYNAMIC MICROSIMULATION MODEL (T-DYMM): POLICY OPTIONS TO THE TEST

Final conference of the MOSPI project

Social protection in a Changing Labour Market - Policy evaluation using T-DYMM

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Outline

- T-DYMM: history and general features, dataset and modular structure, recent innovations
- Policy options tested: extension of unemployment insurance coverage, “Guaranteed Pension”, results

General features of T-DYMM

- It is a Dynamic Microsimulation Model (medium and long-term projections)
- Socio-economic events occur according to transition probabilities (estimated externally)
- It uses alignment procedures on demographic and macroeconomic dimensions

Development of T-DYMM

- T-DYMM has been developed in 3 phases:
 - 1° European Project (**2010-2012**): based on MIDAS-IT (derived from MIDAS-BE) and EconLav, developed in Liam 1.0
 - 2° European Project (IESS, **2014-2016**): new and improved data, move to Liam 2.0, update of legislation, addition of private pension module, unemployment benefits
 - 3° European Project (MOSPI, **2019-2021**): new and improved data, improvement of sample representativeness, inclusion of working pensioners, expansion of Disability Module, development of a Tax-Benefit Module, a Wealth Module and a Migration Module

The AD-SILC dataset – main structure

- The core of T-DYMM's dataset is composed by matching:
 - **Survey data** contained in the European Union Statistics on Income and Living Conditions (EU-SILC), delivered for Italy by the Italian National Institute of Statistics (ISTAT)
 - **Administrative data** from the Italian National Institute of Social Security (INPS)
- The merging procedure is conducted through individual tax codes (*codici fiscali*) that are subsequently anonymized. We call the merged dataset **AD-SILC**
- As of today, SILC waves 2004-2017 are used. Merged with INPS, they make up a total of 6,182,926 observations over the 1922-2018 period

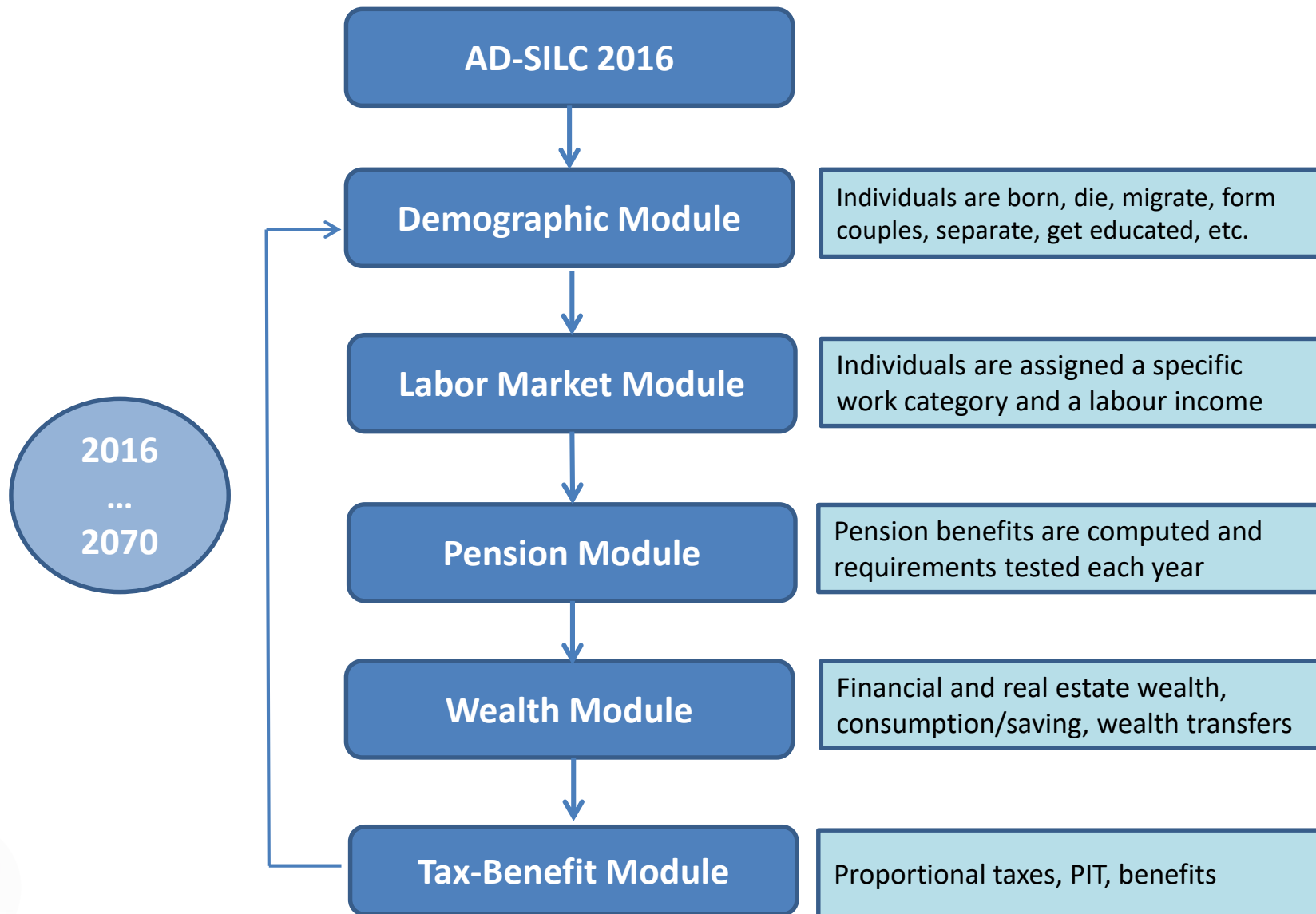
The AD-SILC dataset – MOSPI innovations

- Merge of information from **Tax Returns** and **Cadastre** (Finance Department) for the 2010, 2012, 2014 and 2016 corresponding SILC waves
- Statistical matching to include information from the Survey on Household Income and Wealth (**SHIW**) conducted by the Bank of Italy

Macro data and alignments

- Exogenous data are used to align a number of patterns within the simulations:
 - **Europop projections:** mortality rate, fertility rate, immigration and emigration by gender
 - **Ageing Report** assumptions: employment rate, inflation, GDP, productivity, disability rate, returns on risk-free assets
 - **Italian Finance Department:** number of households paying rents, total beneficiaries of specific tax expenditures and substitute regimes
 - **ISTAT:** probability to leave household of origin, age and country of birth of migrants, education, acquisitions of houses, average propensity to consume
 - **INPS:** occurrence of disability allowances
 - **COVIP** (Italian Vigilance Committee on Private Pension Plans): enrollment in private pension plans

The Modules of T-DYMM



Institutes simulated in T-DYMM

PENSIONS

- Old-age/seniority pensions and supplementation to a minimum for pensions (*Integrazione al minimo*)
- Inability Pensions:
 - Severe inability (*Assegno ordinario di invalidità*)
 - Total inability (*Pensione di inabilità*)
- Survivor Pensions (*Pensione di reversibilità, Pensione indiretta*)

SOCIAL ASSISTANCE AND OTHER BENEFITS

- Unemployment benefits (*NASPI, Dis-COLL*)
- Disability allowances
 - Civil disability pensions (*Pensione di invalidità civile and assegno sociale sostitutivo*)
 - Attendance allowances (*Indennità di accompagnamento and indennità di frequenza*)
- Tax bonuses (*Bonus 80/100 euro*)
- 14th month pension (*Quattordicesima*)
- Old-age support measures: social allowance (*assegno sociale*), integrations and augmentations to social allowance and *integrazione al minimo*
- Family benefits (*assegni al nucleo familiare*)
- Minimum income schemes
 - *Sostegno per l'Inclusione Attiva* (SIA, 2017)
 - *Reddito di Inclusione* (REI, 2018)
 - *Reddito di Cittadinanza* (RdC, from 2019 onwards)

What policy options for the MOSPI?

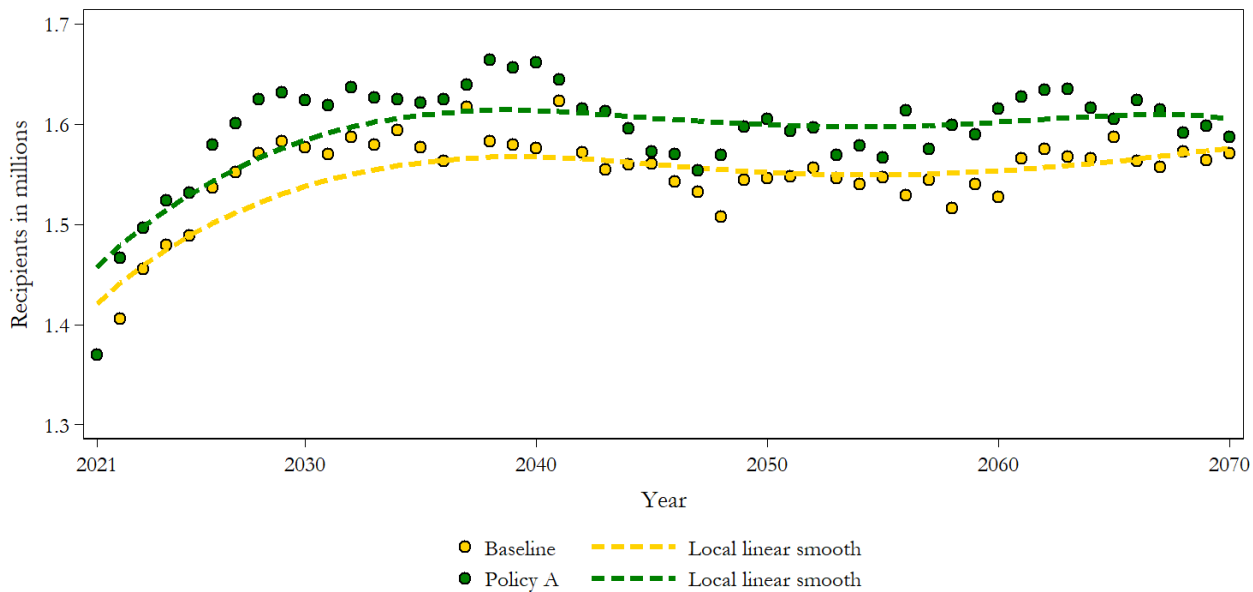
- “Fragile workers” are the focus, with an outlook on future pension incomes
 - Policy option A (extension of unemployment insurance): intervention ex ante
 - Policy option B (guaranteed pension for NDC workers): intervention ex post
- We chose to elaborate on policy options that were already in the political debate and test:
 - Their effect on the target group
 - Their effect on wider population groups
 - Their feasibility in terms of additional expenditure required
- Policy options are tested in the 2022-2070 period against T-DYMM’s baseline. Both are based on the same set of alignments (assumptions underlying the 2021 Ageing Report)
- No behavioural response is simulated

Policy Option A: description

- Extension of NASPI to “parasubordinate” (*co.co.co*) workers, thus abolishing the Dis-COLL
 - Benefits last longer
 - Figurative contributions are paid out
- Introduction of ISCRO 2.0, “unemployment benefit” to self-employed workers
 - Modelled after ISCRO (2021 Budget Law), € 250-800 for maximum 6 months
 - Different from ISCRO, ISCRO 2.0 is directed to all self-employed workers, instead of VAT ID holders enrolled in INPS separate management scheme
 - Instituted for the whole 2022-2070 period
 - No expenditure cap
 - Figurative contributions are paid out

Policy Option A: results (1)

Recipients of unemployment benefits (million)



- Policy option A extends the number of recipients of unemployment benefits by 3% compared to the Baseline

Policy Option A: results (2)

Characteristics of ISCRO 2.0's recipients *vis-à-vis* self-employed workers, by decade of simulation

•Recipients of ISCRO 2.0

	Average age	Sex		Area of birth			Educational achievement			Work category	
		Females	Males	Italian	EU	non-EU	Elementary and compulsory	Upper secondary	Tertiary	Artisans, dealers and farmers	Professionals
2022-2030	53.3	57%	43%	88%	3%	9%	46%	38%	16%	82%	18%
2031-2040	56.0	59%	41%	85%	5%	10%	43%	43%	14%	86%	14%
2041-2050	55.7	65%	35%	81%	4%	15%	35%	47%	18%	85%	15%
2051-2060	55.4	66%	34%	75%	6%	19%	35%	45%	20%	84%	16%
2061-2070	56.8	70%	30%	66%	7%	27%	35%	48%	18%	86%	14%

•Self-employed workers

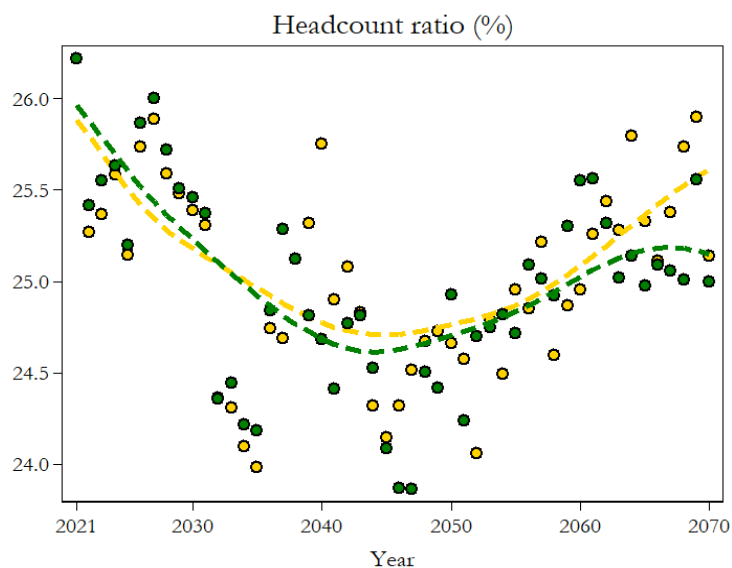
	Average age	Sex		Area of birth			Educational achievement			Work category	
		Females	Males	Italian	EU	non-EU	Elementary and compulsory	Upper secondary	Tertiary	Artisans, dealers and farmers	Professionals
2022-2030	49.3	38%	62%	89%	2%	8%	26%	46%	27%	74%	26%
2031-2040	49.4	41%	59%	84%	3%	13%	22%	48%	30%	73%	27%
2041-2050	48.2	44%	56%	79%	4%	17%	21%	48%	31%	75%	25%
2051-2060	48.0	45%	55%	75%	4%	21%	22%	48%	30%	77%	23%
2061-2070	47.9	45%	55%	73%	4%	23%	24%	47%	29%	78%	22%

- Recipients of ISCRO 2.0 are older, less educated, more often women, non-Italians, artisans, dealers and farmers

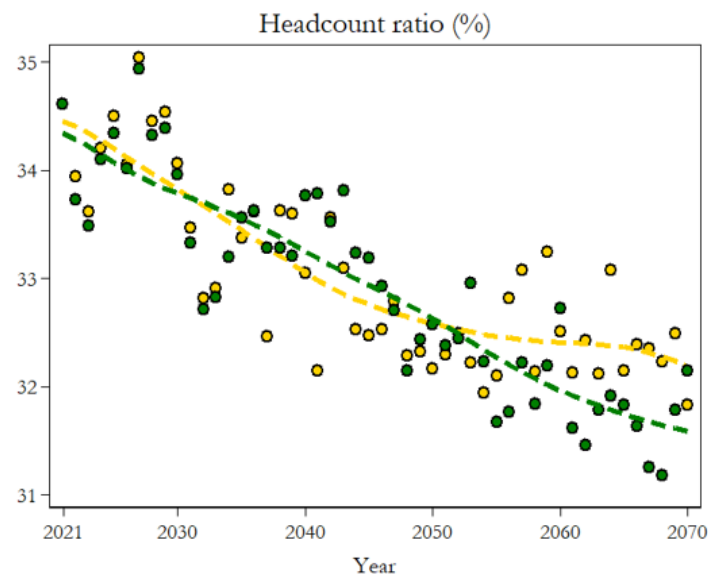
Policy Option A: results (3)

Effect on poverty risk for target group

•Self-employed



•Recently unemployed

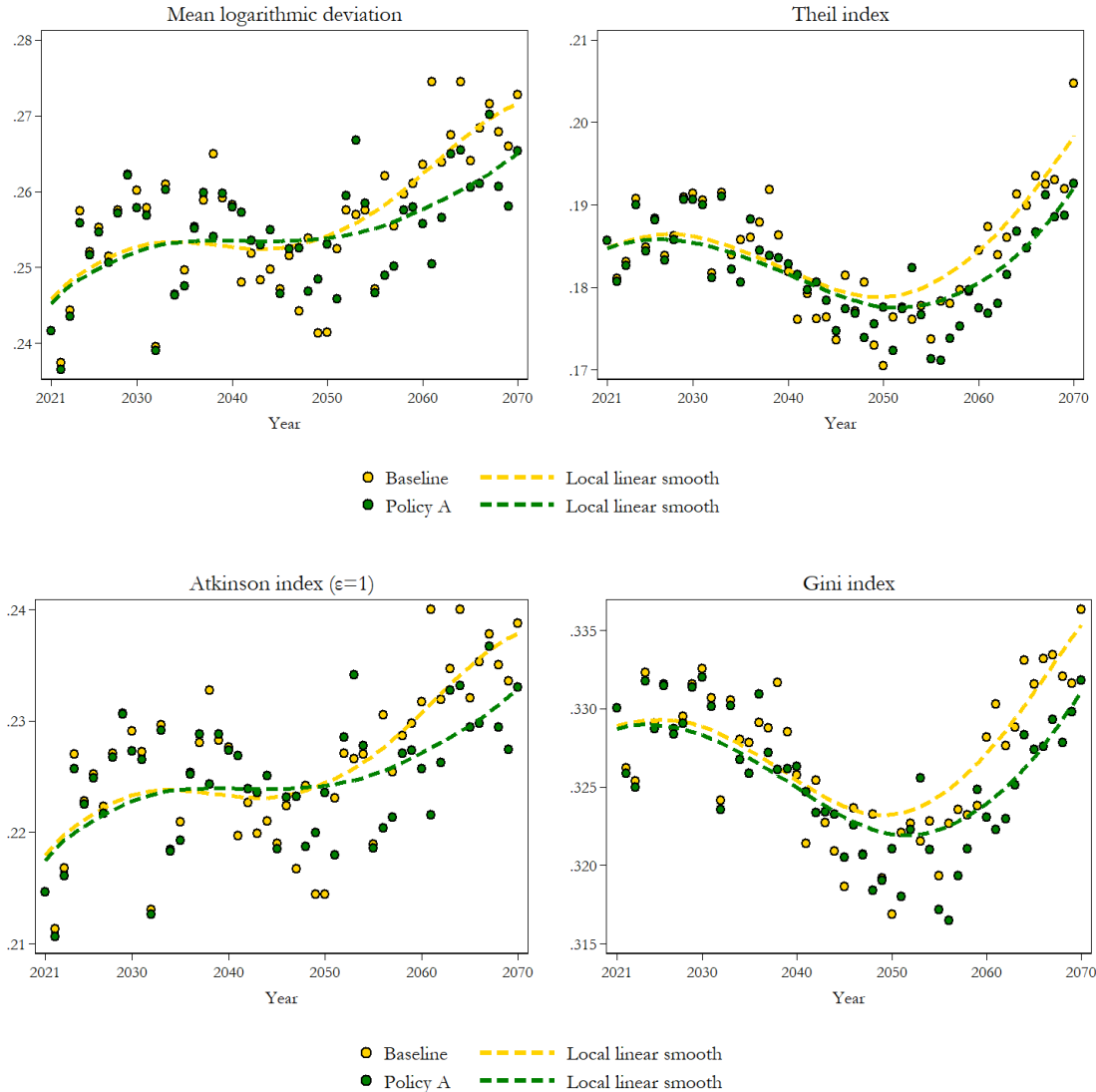


● Baseline - - - Local linear smooth
● Policy A - - - Local linear smooth

- Poverty risk for the target group is slightly lower under Policy option A, especially at the end of the simulation period, when unemployment risks for the elderly are higher under the current macroeconomic assumptions

Policy Option A: results (4)

Effect on inequality for the recently unemployed

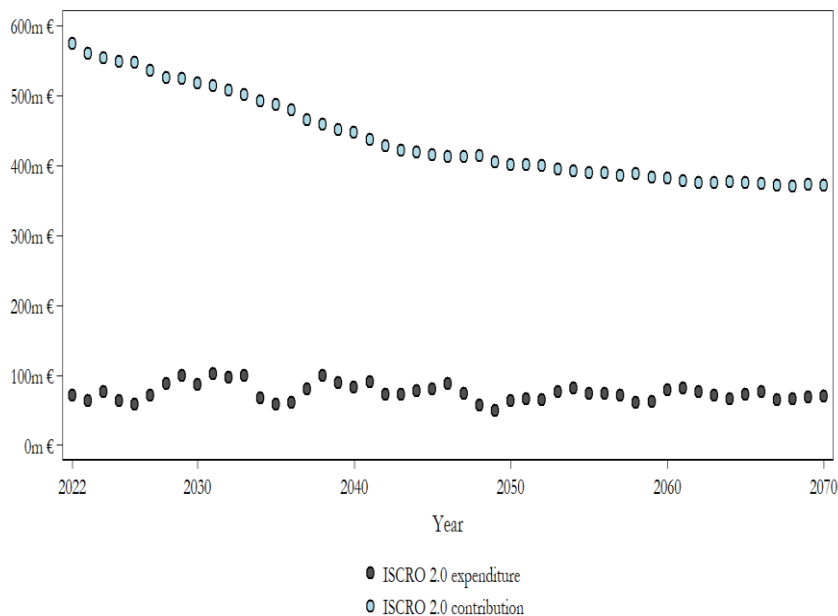


- The unemployed are more equal under Policy option A, as all categories of workers are now entitled to some unemployment benefit

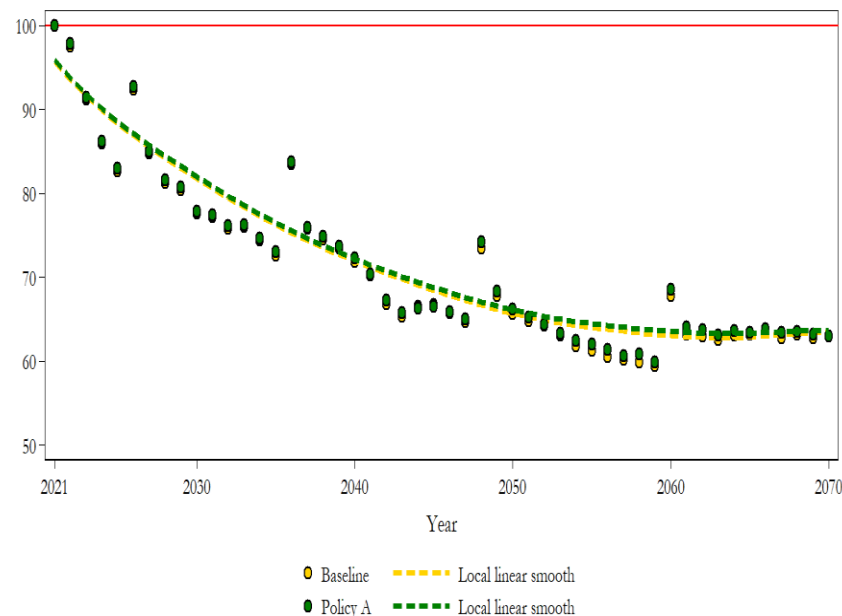
Policy Option A: results (5)

Effect on expenditure

• Additional expenditure and additional revenues from ISCR0 2.0, million euros



• Social expenditure index for active individuals (aged 18-SPA), 2021=100



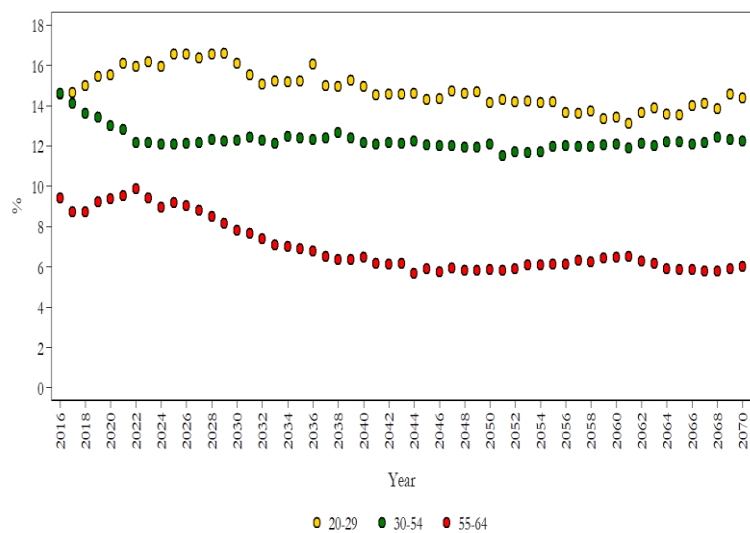
Note: Values are discounted to year 2021 using the nominal GDP growth rate. Social expenditure includes pension benefits, unemployment benefits, family allowances, minimum income benefits and child benefits

- For all simulation years, additional revenues are much higher than additional expenditure
- Additional social expenditure under Policy option A is minimal; Policy option A would slightly decrease access to the *Reddito di Cittadinanza*

Policy Option B: description (1)

- Introduction of a minimum pension (*Pensione di Garanzia, PdG*) for NDC workers in line with the computation logic underlying the NDC scheme
- NDC schemes can (theoretically) promise actuarial neutrality and sustainability while burdening contributors (workers) with two essential risks:
 - Individual performance in the labour market (poor careers will result in poor pensions)
 - Systemic performance (notional returns on contributions in the Italian NDC system is set equal to the five-year moving average of nominal GDP growth)

•Quota of working poor in the Baseline scenario (2016-2070)



•Nominal GDP growth rates, baseline scenario (1996-2070)



Policy Option B: description (2)

- Under Policy option B, within a certain limit, the policy maker sets to **relieve workers of (individual and systemic) underperformance risks**
- Same as the actual NDC pension, the PdG pension is a function of the number of years of contribution and of life expectancy at retirement (the conversion coefficient applied is the same), but for each year of work, a minimum salary and a minimum return rate (instead of the actual salary and the actual notional return rate) is considered for the computation of the Guaranteed Pension
- The **minimum salary** is arbitrarily set at **15,000 euro** in 2015 (60% of median labour income according to INPS data) and updated each year to nominal GDP growth
- The **minimum return rate** is arbitrarily set at **3.5%** annually
- Upon retirement, if Guaranteed Pension > Actual Pension, pensioners are entitled to a supplementation
- Measures can be put in place to incentivise work and discourage evasion, but they have not been tested in T-DYMM at this time

Policy Option B: results (1)

Effect on gross pension/*trattamento minimo* ratio by birth cohort, new pensioners

Birth cohort	Open-ended		Fixed-term		Self-employed	
	Baseline	Policy option B	Baseline	Policy option B	Baseline	Policy option B
1960-1964	2.8	2.8	0.5	1	1.3	1.4
1965-1969	2.6	2.6	0.7	1	1.3	1.4
1970-1974	2.5	2.5	0.8	1	1.3	1.7
1975-1979	2.4	2.4	1	1.3	1.3	2
1980-1984	2.4	2.4	1.2	1.5	1.4	2.1
1985-1989	2.4	2.4	1.1	1.4	1.4	2

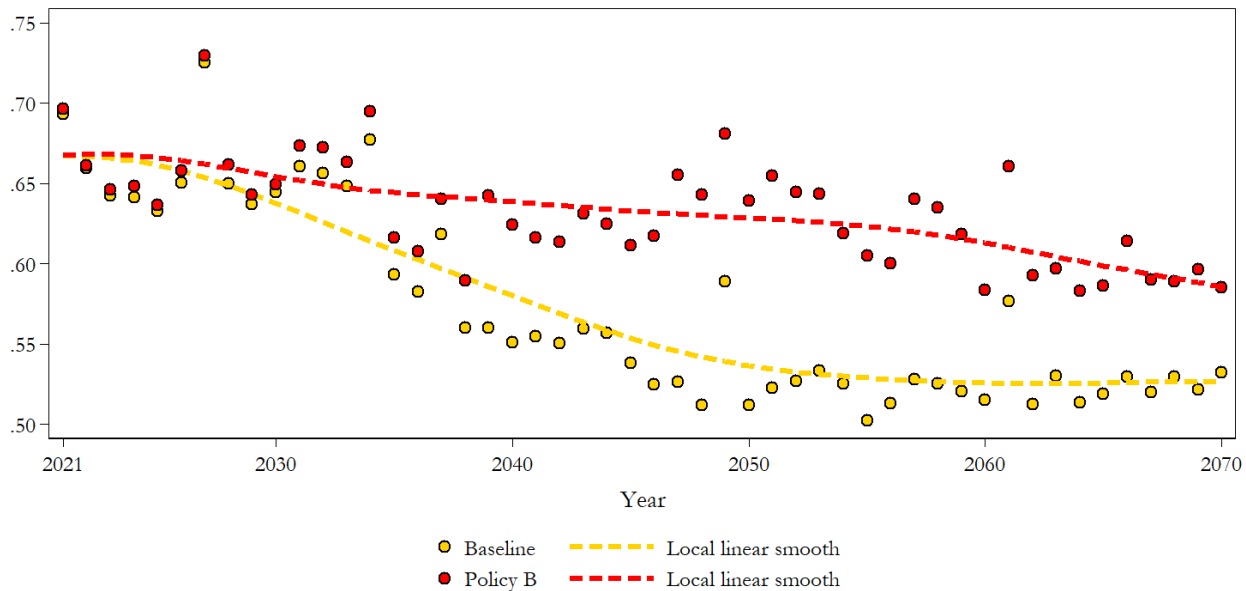
Birth cohort	Male		Female	
	Baseline	Policy option B	Baseline	Policy option B
1960-1964	2.6	2.6	1.9	1.9
1965-1969	2.4	2.4	1.8	1.9
1970-1974	2.5	2.5	1.7	1.9
1975-1979	2.3	2.4	1.7	2
1980-1984	2.4	2.4	1.8	2.1
1985-1989	2.4	2.5	1.8	2

Birth cohort	University degree		Lower than university degree	
	Baseline	Policy option B	Baseline	Policy option B
1960-1964	3	3	2.2	2.2
1965-1969	2.8	2.8	1.9	2
1970-1974	2.6	2.6	2	2.1
1975-1979	2.5	2.5	1.8	2.1
1980-1984	2.5	2.5	1.9	2.2
1985-1989	2.5	2.5	1.9	2.1

- “Fragile workers” are more visibly affected by Policy option B (Fixed-term employees and self-employed workers, women, lowly educated individuals)
- Effect is visible on younger cohorts, as Policy option B operates on NDC workers

Policy Option B: results (2)

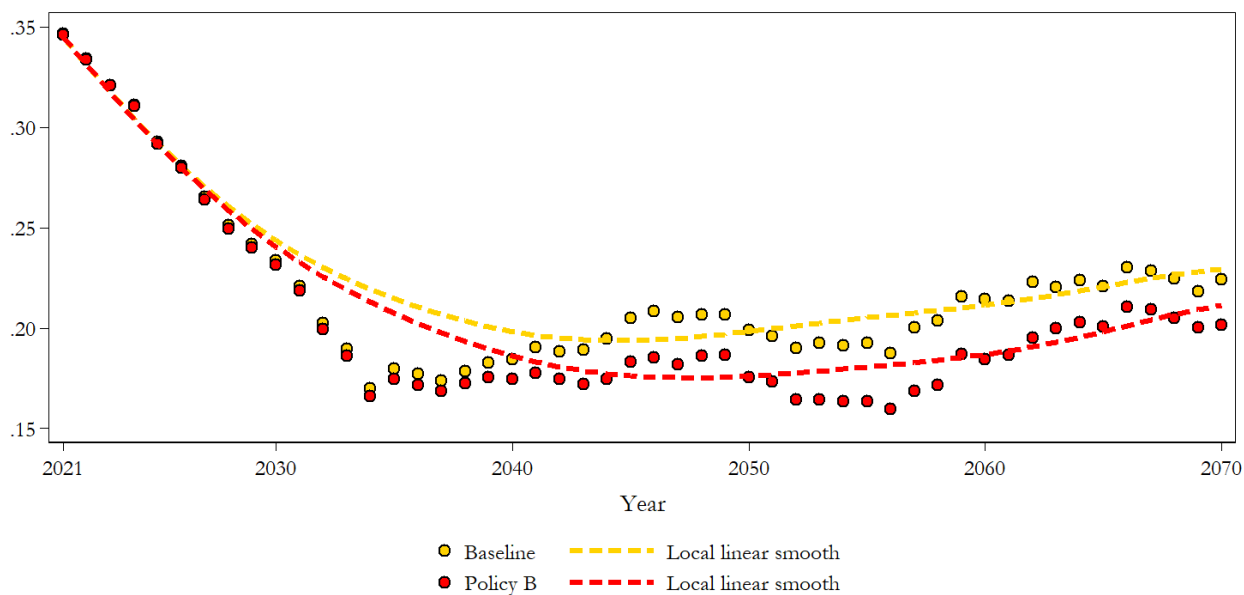
Effect on Replacement Rate, new pensioners



- Policy option B mitigates the overall decrease in replacement rates

Policy Option B: results (3)

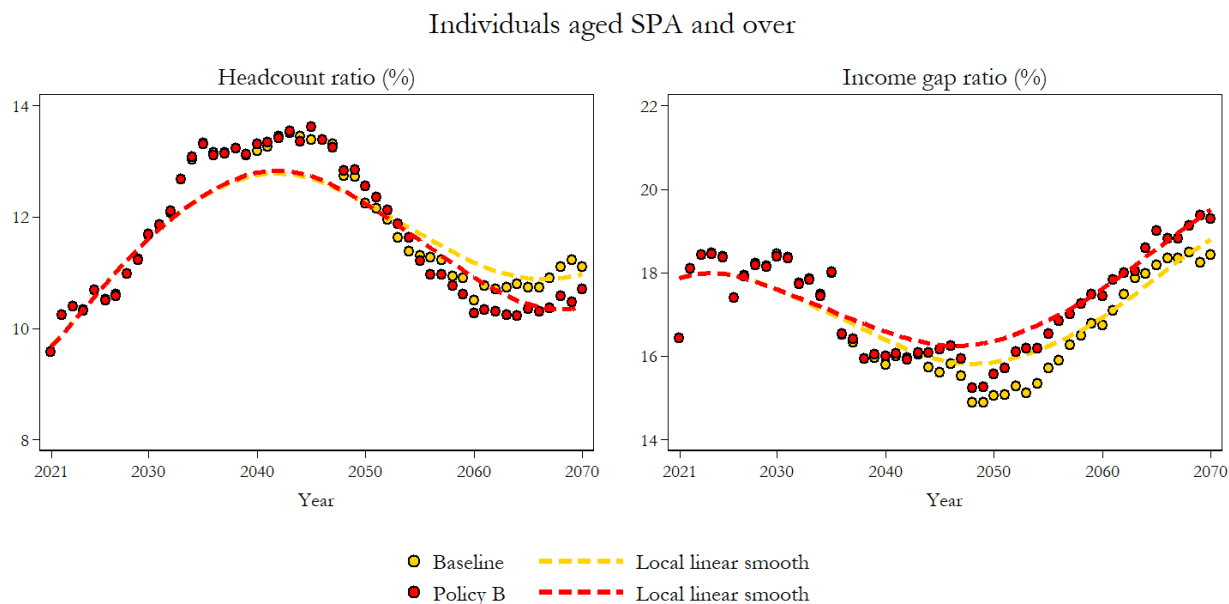
Effect on Gender Gap in Pensions, all pensioners



- Because women are more affected by Policy option B, the Gender Gap in Pensions decreases further than in the Baseline, but the trends are similar

Policy Option B: results (4)

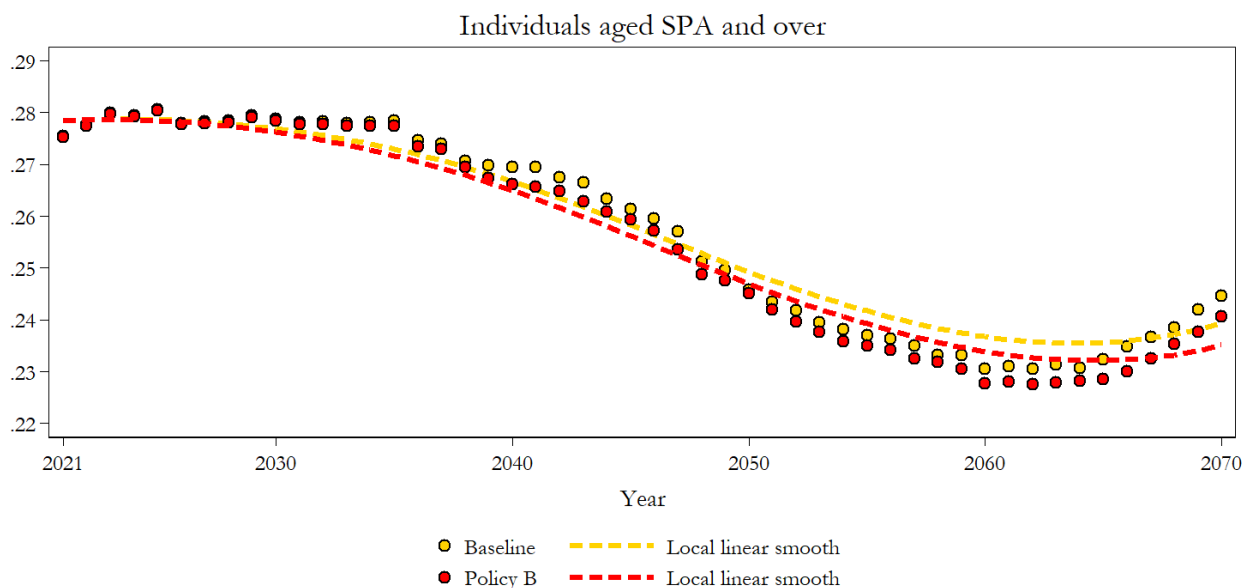
Effect on Poverty Risk and Poverty Gap, elderly people (above Standard Pensionable Age)



- Amongst the poor, Policy option B impacts the ones closer to the poverty threshold. Hence, the quota of individuals at poverty risk decreases, but the poverty gap increases
- The poorest of the poor are not entitled to work-related pensions, therefore are not impacted at all by Policy option B

Policy Option B: results (5)

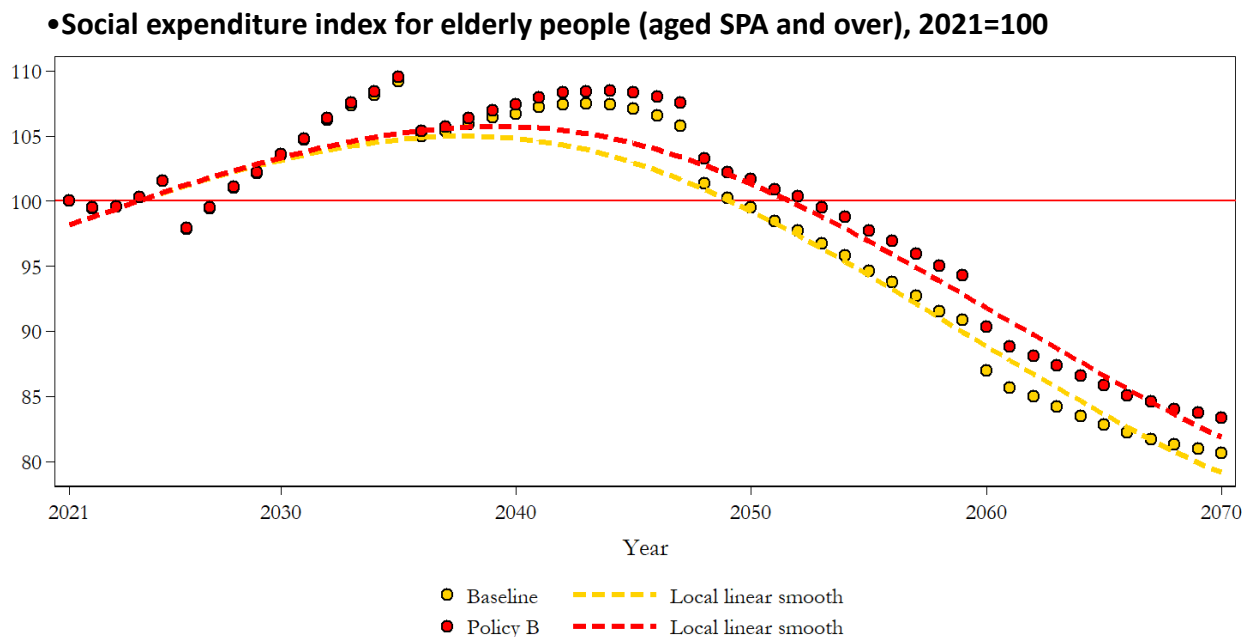
Effect on inequality (Gini index), elderly people (above Standard Pensionable Age)



- Policy option B has a minor impact on overall equality indicators
- The decrease in inequality amongst the elderly brought about by NDC rules is confirmed

Policy Option B: results (6)

Effect on expenditure



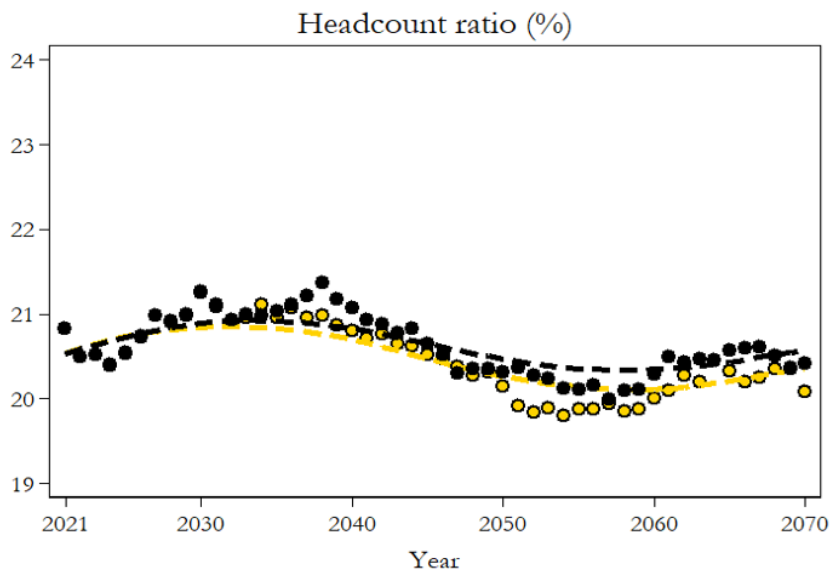
Note: Values are discounted to year 2021 using the nominal GDP growth rate. Social expenditure includes pension benefits, unemployment benefits, family allowances, minimum income benefits and child benefits

- Difference in expenditure is visible but rather limited and the decreasing trend after 2040 is kept intact
- Under Policy option B, expenditure for *assegno sociale* decreases only slightly (less than 2%), as the two institutes have different targets

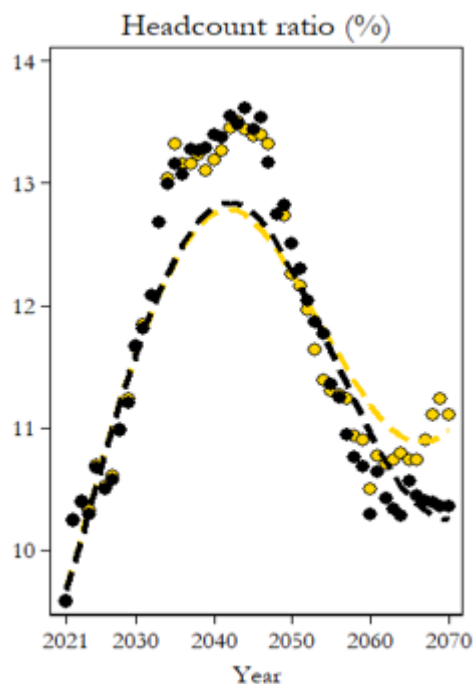
Policy Options A + B

Effect on Poverty Risk

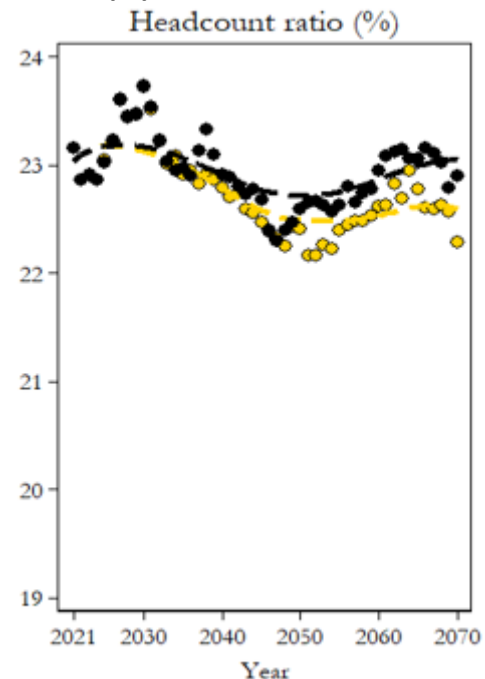
•Overall population



•Elderly population



•Active population



● Baseline - - - Local linear smooth
● Policy A and B combined - - - Local linear smooth

- If Policy options A and B are implemented (Policy option B is much larger), the overall poverty risk increases. Paradox?
- While the elderly fare better in the future because of Policy option B, the poverty threshold (and median income) is increased and the younger population is worse off compared to the Baseline

Further scenarios?

- Sensitivity analysis (alternative labour market and demographic scenarios)
- Heterogeneity in mortality
- Policy options on inheritance tax
- Innovations for private pension scheme (collaboration with COVIP)



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Thank you!

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