Changes in the income distribution of the Dutch elderly between 1989-2020: a microsimulation

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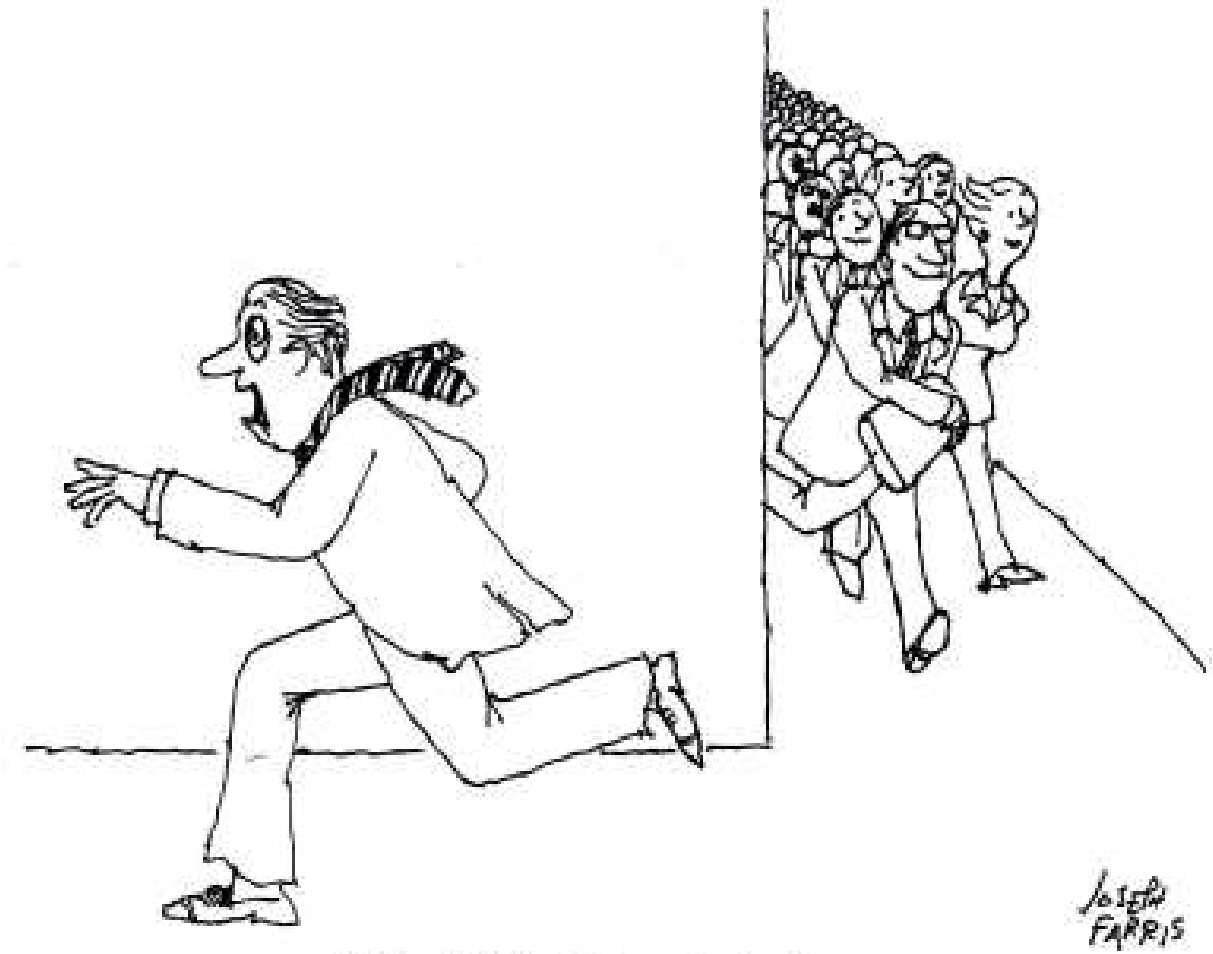
Network for Studies on Pensions, Aging and Retirement

Motivation



"Run! 73 million baby boomers are about to retire!"

Motivation

‘Commissie Goudswaard’: sustainability of the second pillar pension system. Trade-off pension ambition and pension risk

Description of the income distribution of previous and next generations of retirees

- Longevity
- Demographic composition
- Labour market positions

Outline

Literature

Data

Model

Estimation results

Simulation results

Conclusion

Predictions of income and inequality

The Netherlands
Dessens and Jansen (1997), Van Sonsbeek (2009)

Other countries
Flood et al. (2006): The income of the Swedish baby boomers.
MIDAS: Dekkers et al. (2008), Pensim2: Emmerson et al. (2004), Zaidi and Rake (2001), DYNAMITE: Ando et al. (2000, 2004), O'Donoghue (2001)

Our contribution:

- Predict future income distribution of elderly in the Netherlands using a dynamic microsimulation model, taking into account unobserved heterogeneity, and persistency and heteroskedasticity of income shocks.

Data

Dutch income panel 1989-2007
(Inkomens Panelonderzoek, IPO)

- Administrative data
- Follows households and their income over time
- Attrition only as a result of emigration or death
- Institutional households are included

Population register 1995-2007
(Gemeentelijke Basis Administratie, GBA)

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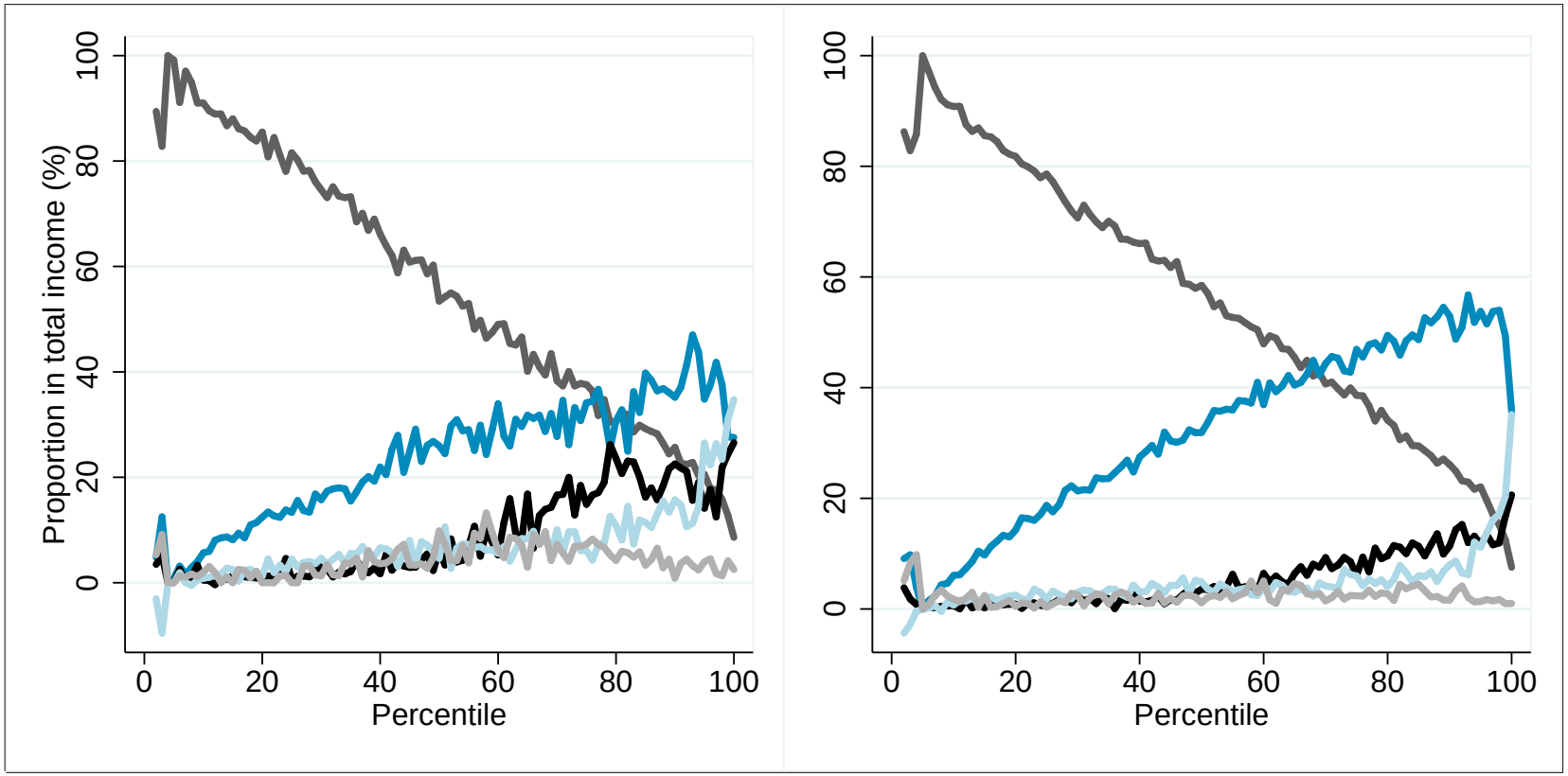
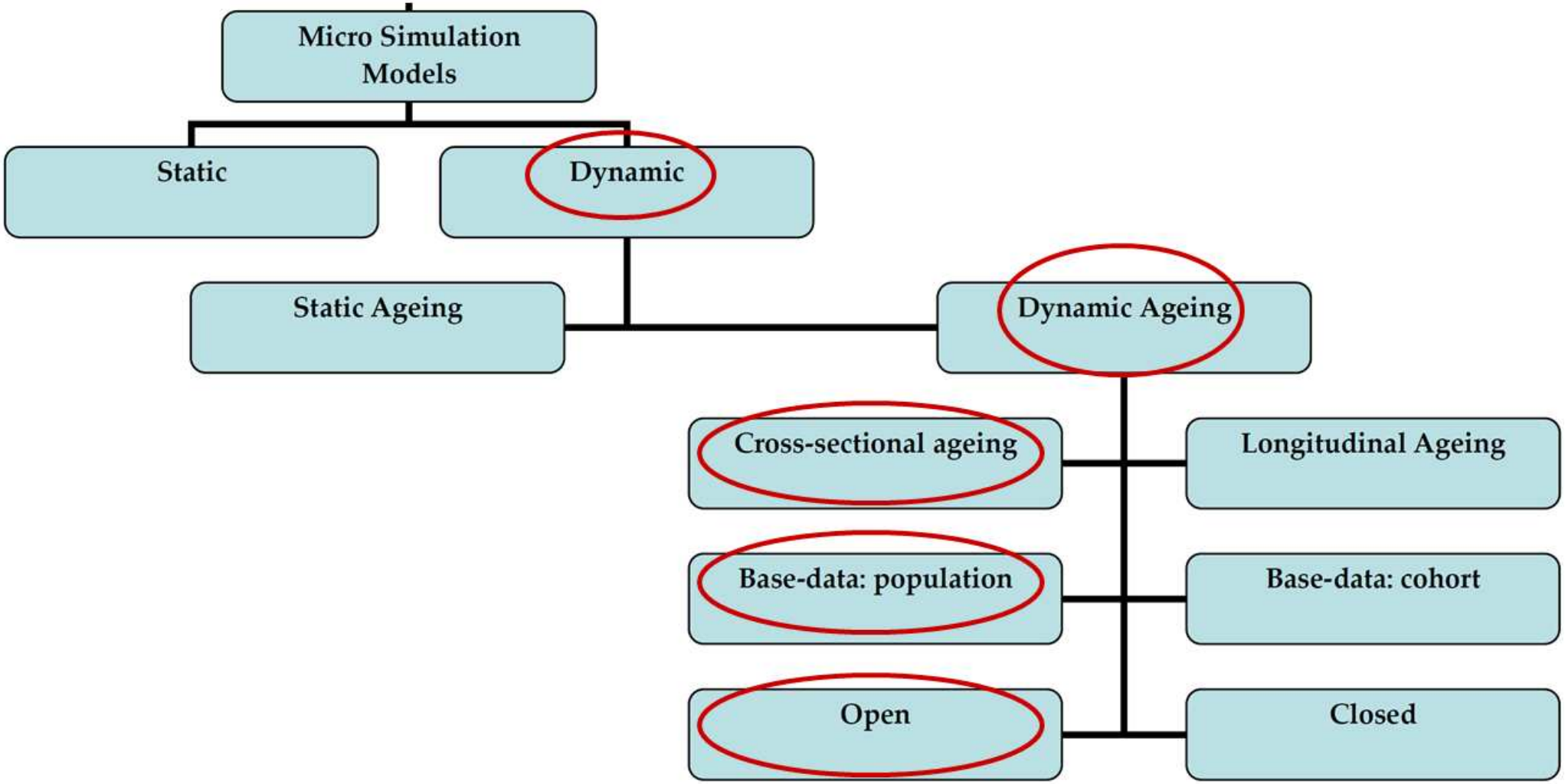
Composition age 65-90



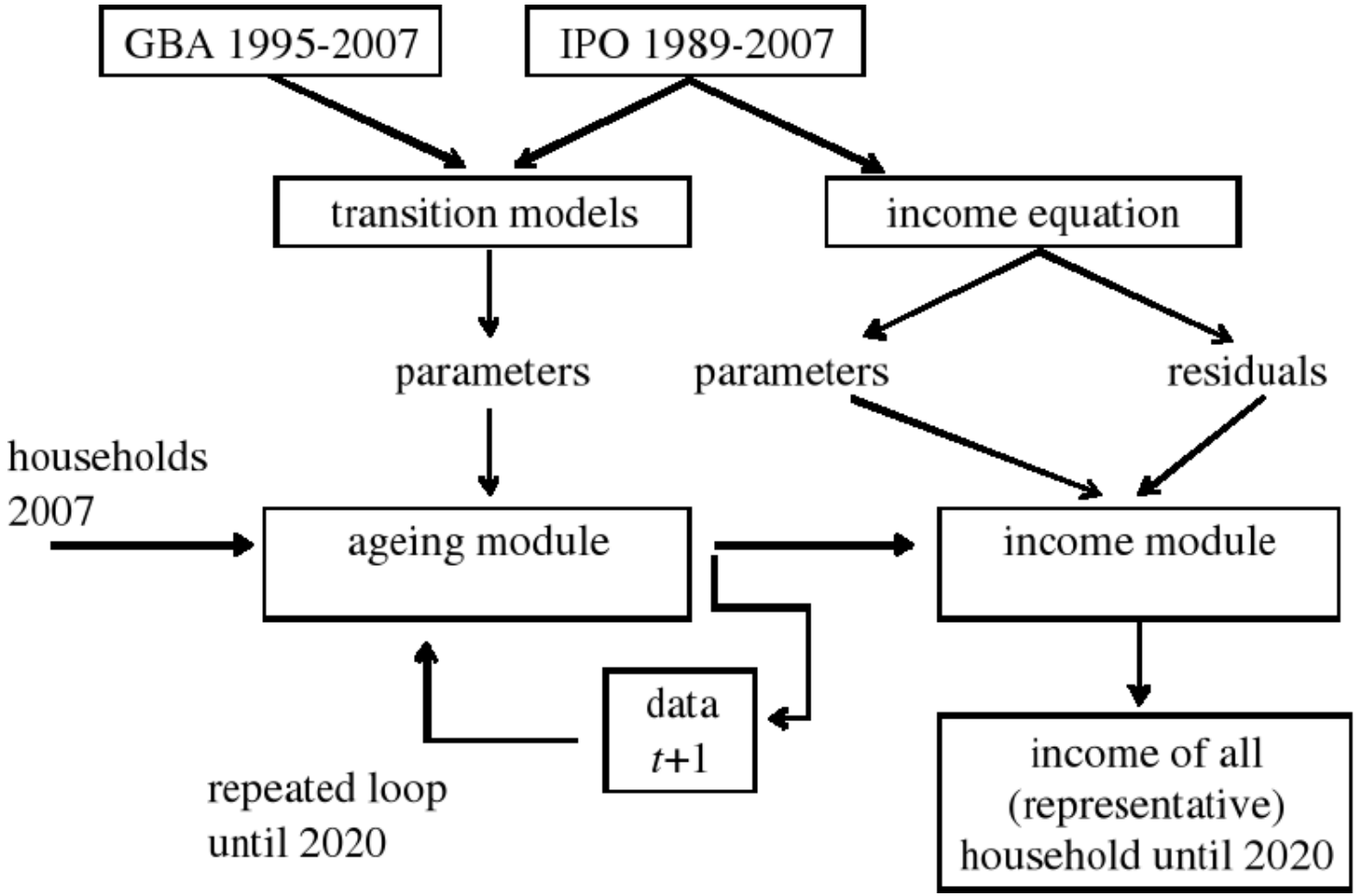
State Pension
Occupational Pension
Labour
Capital income and profit
Transfer income

Model classification



Source: Dekkers and Belloni (2008). A classification and overview of micro simulation models, and the choices made in MIDAS.

Microsimulation model



Income equation

Income equation, FE model

$$y_{it} = \alpha + \beta x_{it} + \mu_i + v_{it} \tag{1}$$

Three specifications:

1. Age and period effects (Deaton Paxson, 1994)
2. + Demographic variables
3. + Labour market status

Income shocks

Error terms might follow an autoregressive scheme

$$v_{it} = \rho_{it,1} v_{i,t-1} + \rho_2 v_{i,t-2} + \epsilon_{it} \tag{2}$$

Persistency of a shock may depend on age

$$\rho_{it,1} = \rho_{0,1} + \rho_{1,1}(age_{it}/10) + \rho_{2,1}(age_{it}/10)^2 \tag{3}$$

Future income shocks are drawn from the empirical distribution of idiosyncratic residuals.
Distribution of income shocks may be different for households with different characteristics.

Transition models

- Marital status
- Children
- Labour market status

Multinomial logit models

Labour market choices of couples are interrelated

Differential mortality

When we do not take differential mortality into account:
- low income households would survive relatively often,
- high income households would survive relatively less often.

Kalwij et al. (2009) find Q1/Q4

- men: 2.2
- women: 1.7

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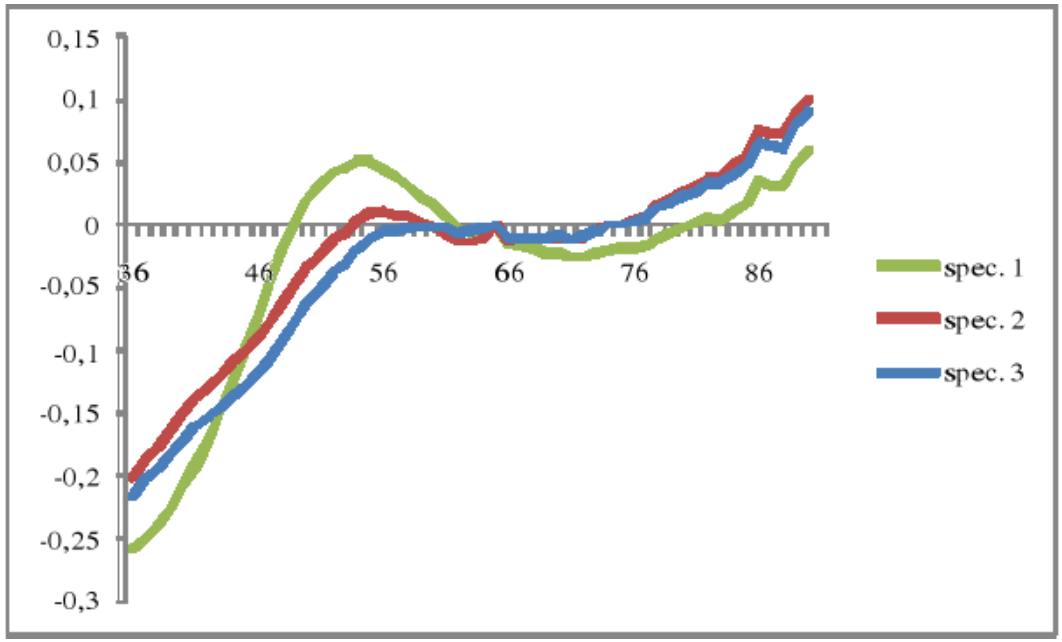
Coefficients income equation

- Age coefficients

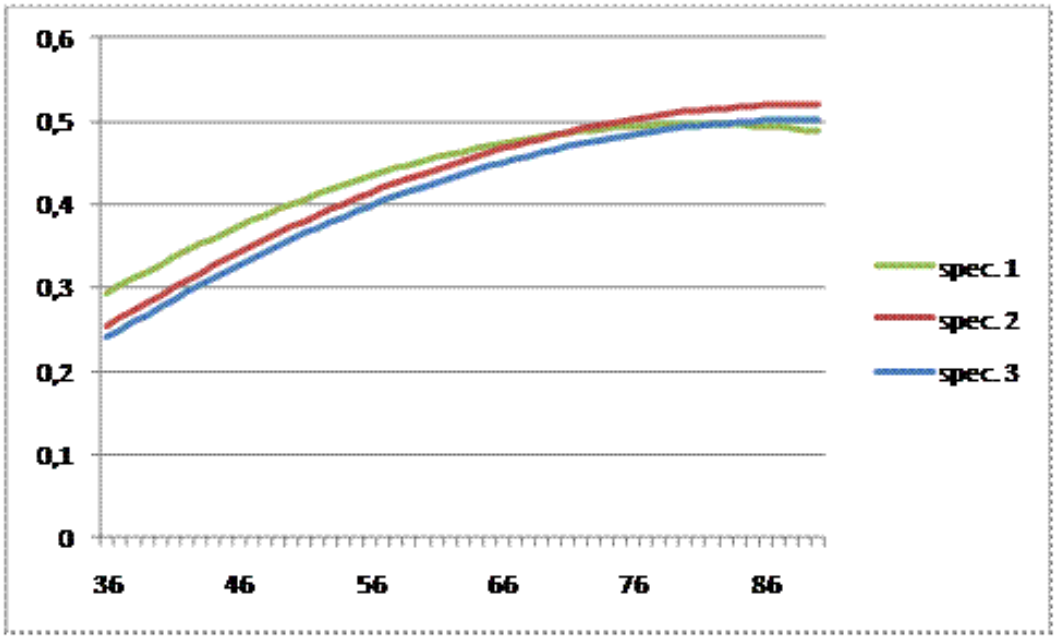


- Demographic variables
- Labour market status

Persistency of income shocks

$$v_{it} = \rho_{it,1} v_{i,t-1} + \rho_2 v_{i,t-2} + \epsilon_{it}$$

$\rho_{it,1}$



$\rho_2 \quad 0.06 \quad (0.001)$

Heteroskedasticity

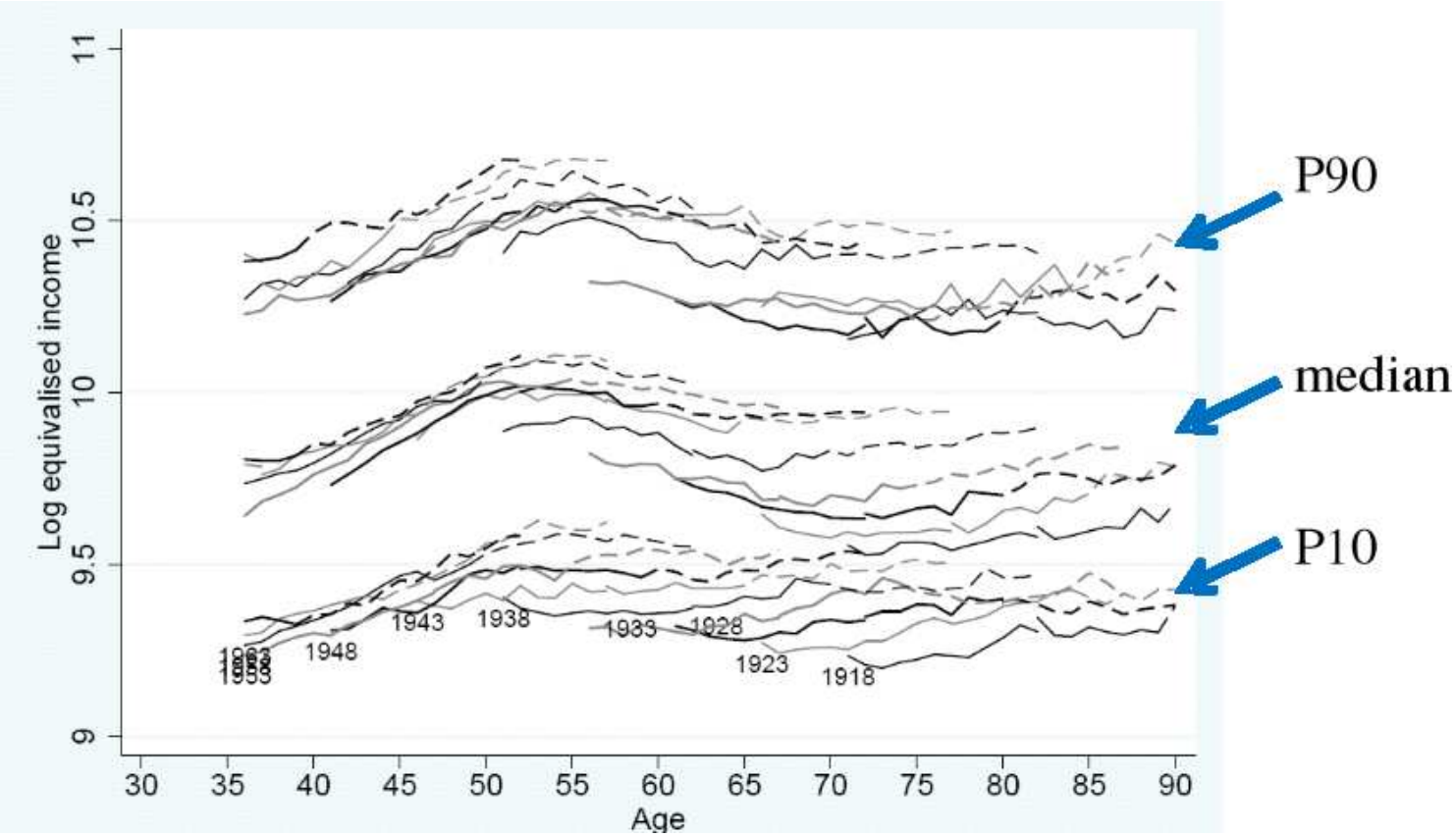
Standard deviation of residuals is 40% higher in 'young' households (age key person ≤ 65), and is higher in households without labour or occupational pension income

$\rightarrow$ incorporate higher income shocks for younger households and for households without labour and/or occupational pension income

Widowhood and occupational pensions

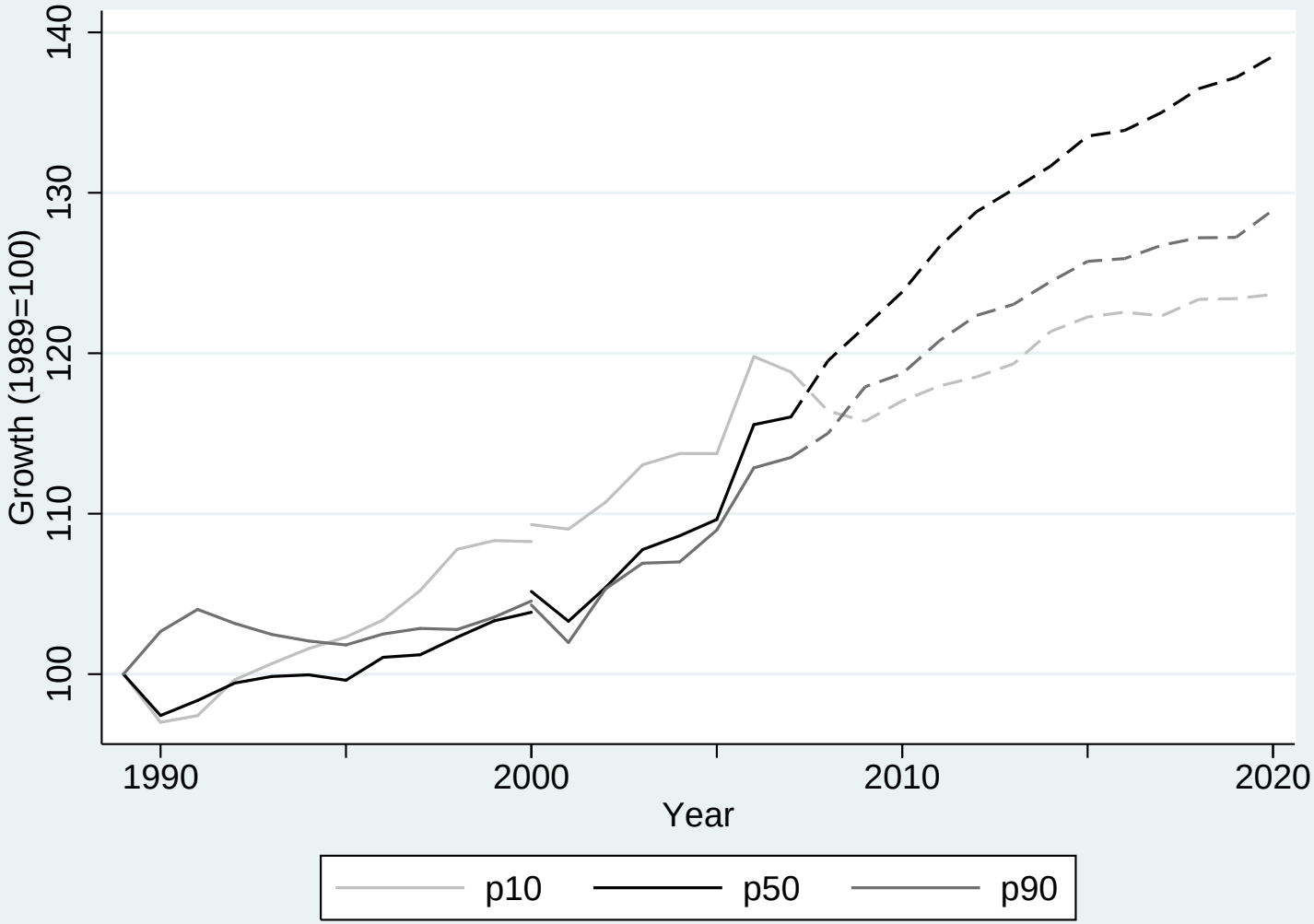
Year	Widows (%)	Occupational pension men (%)	Occupational pension women (%)
2008	39.5	87.0	54.0
2009	39.0	87.5	54.8
2010	37.7	88.0	55.3
2011	36.9	88.0	56.1
2012	35.7	87.6	56.9
2013	34.7	88.1	58.5
2014	33.8	88.8	60.1
2015	33.3	88.9	62.0
2016	32.8	89.5	63.9
2017	32.2	89.8	65.4
2018	31.5	90.0	67.3
2019	31.1	90.6	68.6
2020	30.8	90.9	70.4

Income predictions per age and cohort



Mean income retirees: +12-15%

Income growth age 65-90



Theil decomposition

Increasing inequality between households with and without occupational pension income?

(Polarization in the distribution of work in Britain, Gregg and Wadsworth, 2004)

Theil index

$$T = \frac{1}{N} \sum_{i=1}^{N} \frac{y_i}{\bar{y}} \log(\frac{y_i}{\bar{y}}) \tag{4}$$

can be rewritten as

$$T = (s_1 T_1 + s_2 T_2) + (s_1 \log(\frac{\bar{y_1}}{\bar{y}}) + s_2 \log(\frac{\bar{y_2}}{\bar{y}})) \tag{5}$$

within group inequality + between group inequality

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Results Theil decomposition

Table 2: Theil decomposition

Year	2010	2015	2020
% Households without occ pension	21	18	15
Average income, households without occ. pension	12608	13448	13859
Average income, households with occ. pension	14825	15776	16030
Theil index, households without occ. pension	0.033	0.039	0.039
Theil index, households with occ. pension	0.013	0.016	0.022
Within group inequality	0.0167	0.0197	0.0240
Between group inequality	0.0020	0.0017	0.0012
% Between group inequality	11	8	5

This table concentrates on the lower half of the distribution and shows the inequality within and between households with and without occupational pension income.

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Conclusion

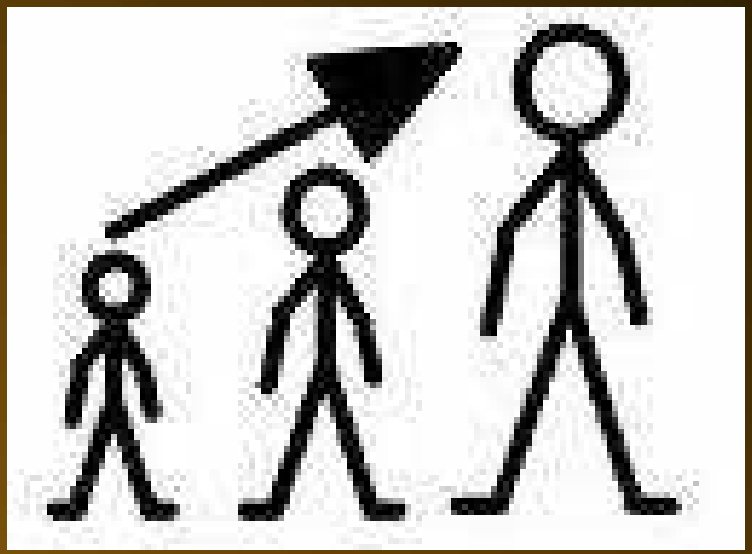
For adequate policies insights into the income distribution of current and next generations of pensioners is necessary

Less widows. More women occupational pension.

Next generations of retirees have higher incomes. 2008-2020: +12-15%

Inequality increases in lower part of the distribution, decreases in upper part.
Inequality between households with occupational pension and inactive households will not increase.

“Fiscalisation”: majority of future retirees will be considerably wealthier than the current ones. This does not increase inequality at the lower part of the distribution further.



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Simulation results age 65-90

Year	Mean	p10	p50	p90	$\frac{p90}{p10}$	$\frac{p90}{p50}$	$\frac{p50}{p10}$	Gini
Specification 3								
2008	20267	12214	17805	31156	2.55	1.75	1.46	0.225
2009	20611	12147	18122	31940	2.63	1.76	1.49	0.230
2010	20875	12280	18443	32162	2.62	1.74	1.50	0.229
2011	21252	12377	18862	32715	2.64	1.73	1.52	0.229
2012	21508	12437	19188	33144	2.66	1.73	1.54	0.229
2013	21754	12522	19396	33332	2.66	1.72	1.55	0.229
2014	21951	12734	19612	33716	2.65	1.72	1.54	0.227
2015	22212	12829	19890	34059	2.65	1.71	1.55	0.227
2016	22301	12860	19943	34105	2.65	1.71	1.55	0.228
2017	22436	12836	20111	34332	2.67	1.71	1.57	0.230
2018	22589	12944	20331	34457	2.66	1.69	1.57	0.229
2019	22672	12949	20434	34463	2.66	1.69	1.58	0.229
2020	22874	12976	20632	34925	2.69	1.69	1.59	0.230

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