



LABORatorio R. Revelli
Center for employment studies

***LaborSim:
An Agent-Based Microsimulation of
Participation Rates in Italy***

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Parma – 15 aprile 2005



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Goal

A tool to make projections of participation and employment rates in Italy in next decades, under easy-to-change scenarios and behavioural hypotheses.



menu of the presentation

- Background issues: Ageing population and low participation rates
- Crucial areas: (Demography,) retirement rules and retirement behaviour, life course perspective
- LaborSim: Design and implementation
- First results with some standard scenarios



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Background issues. Ageing and low participation in Italy

Italy has one of the oldest populations among Oecd countries. The ~~old age dependency rate~~ was 26% in 2000 (EU-18: 18%, USA: 14%), it is expected to rise over 60% by 2050.

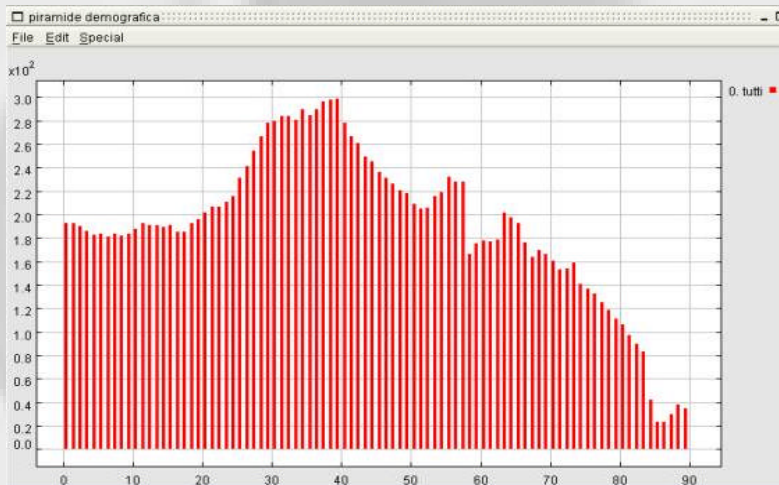
At the same time, participation rate is among the lowest, particularly for women and the elderly. At Stockholm the EU fixed a target of 50% participation rate for people aged 55-64. In Italy the figures are below 30%, and have decreased during all the Nineties.

people aged 65+

people aged 16-64



Age distribution of Italian Population, 2003

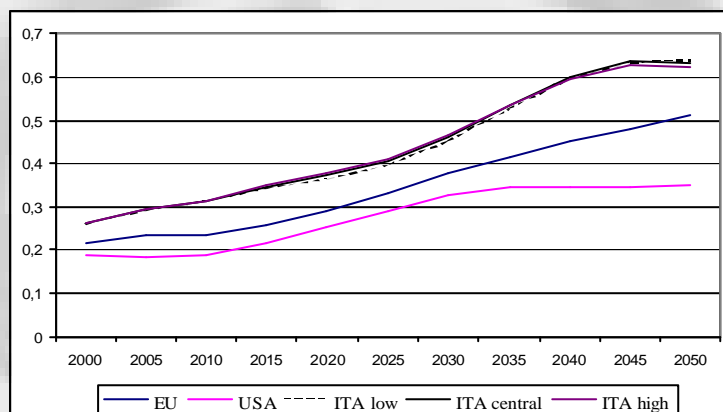


source: LaborSim elaboration on Istat projections

background issues: ageing (2/8)



Old age dependency ratio projections, 2000-2050 Italy, EU and USA

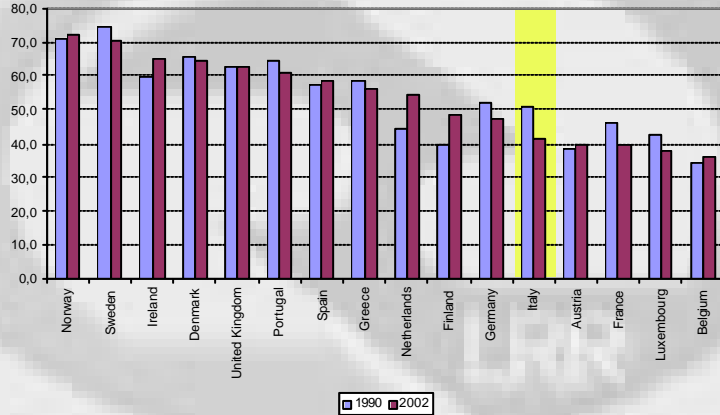


source: Istat for Italy, United Nations for EU and USA

background issues: ageing (3/8)



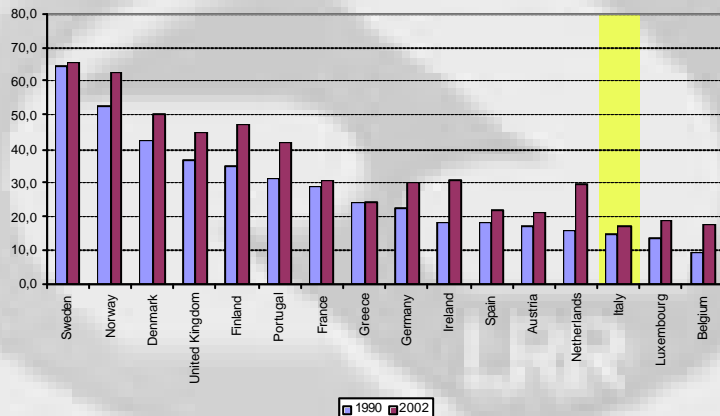
Employment rates for people aged 55-64 Males - 1990-2002



background issues: participation (4/8)



Employment rates for people aged 55-64 Females - 1990-2002

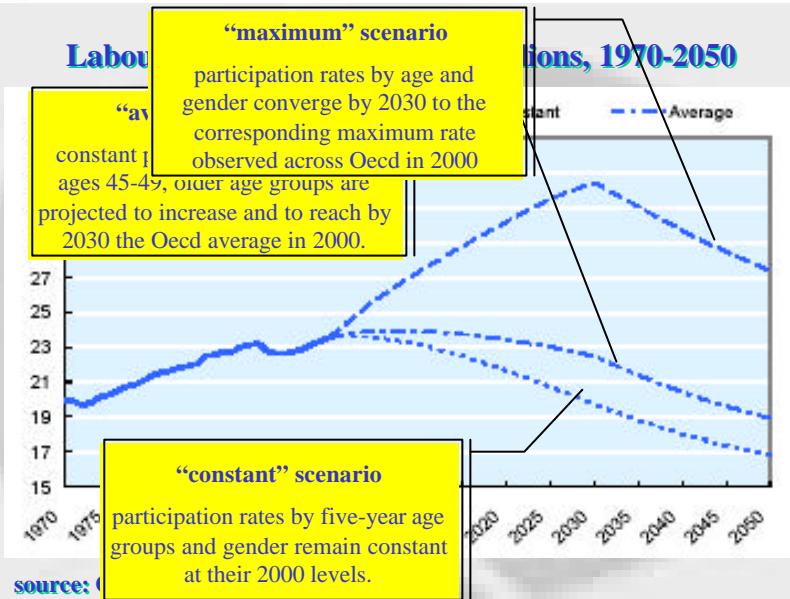


background issues: participation (5/8)



Labour

Projections, 1970-2050



background issues: projections (8/8)



Crucial areas

Who are the main actors, where is the stage

Life course perspective

Institutional context
and policies

Family structure
and network

Individual characteristics

crucial areas: intro (1/8)



a snapshot on education (1/3)

Employment rates by education, ages 50-59, year 2002 (ranking in parenthesis)

	All	Less than upper secondary	Upper secondary level	Third level
S	82 (1)	74.4 (1)	81.8 (1)	91.2 (1)
DK	79.5 (2)	66 (4)	80.3 (2)	88.2 (3)
UK	71.5 (4)	53.6 (7)	76.3 (3)	82.5 (9)
P	67.8 (6)	66.3 (2)	74.1 (4)	85.2 (4)
IRL	61.4 (9)	52.5 (9)	68 (9)	80.2 (11)
FIN	73.1 (3)	66.3 (2)	71.9 (6)	84.1 (5)
NL	68.5 (5)	55.7 (6)	74.1 (4)	83.5 (6)
E	54.5 (13)	48.3 (12)	64.3 (11)	82.6 (8)
D	67.6 (7)	51.9 (10)	68.2 (8)	82.4 (10)
EL	55.4 (12)	53 (8)	51.7 (15)	76 (14)
F	65.3 (8)	56.7 (5)	69.2 (7)	79.5 (12)
A	61.1 (10)	49.8 (11)	61.8 (12)	79.5 (12)
I	51.5 (15)	42.3 (14)	67.4 (10)	83 (7)
L	56.4 (11)	43.3 (13)	59.4 (14)	89.1 (2)
B	52.8 (14)	40.1 (15)	60.6 (13)	73.2 (15)
Coeff of variation	0.142	0.175	0.116	0.055

Source: Eurostat, LFS 2002

crucial areas: education (2/8)



a snapshot on education (2/3)

Distribution of people aged 55-64, by educational attainment, year 2000

	Den	NL	Fra	Irl	Ita	Esp	Por	Aus	Fin	Ger
Education										
Third level (Isced 5-7)	25%	-	16%	13%	4%	9%	4%	4%	25%	21%
Second stage (Isced 3)	42%	-	6%	24%	17%	6%	2%	59%	33%	55%
Less than second stage (0-2)	31%	-	77%	62%	77%	84%	92%	36%	40%	23%

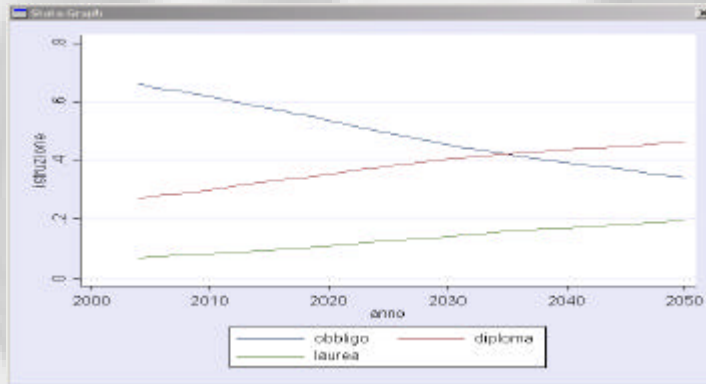
Source: our elaborations on ECHP, wave 7

crucial areas: education (3/8)



a snapshot on education (3/3)

Distribution of people aged 55-64, by educational attainment, 2000-2050



Source: LaborSim elaboration on Istat data

crucial areas: education (4/8)



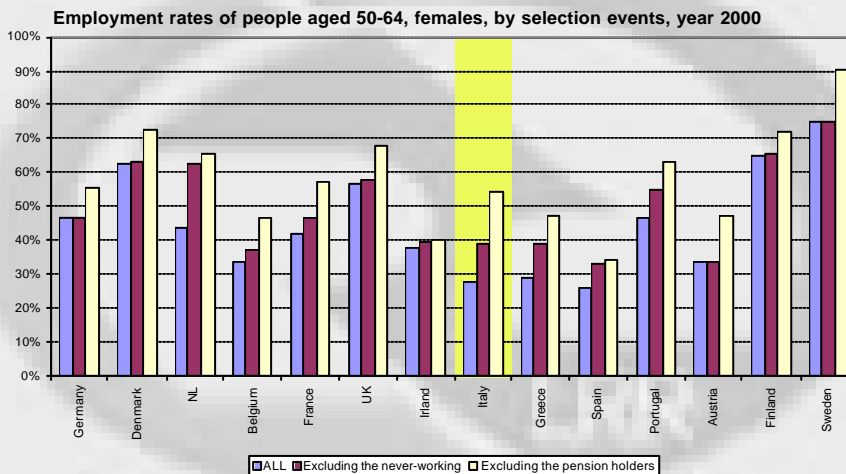
a life course perspective

- ❖ Participation choices should be viewed in a life cycle perspective: existing low employment rates can be the effect of choices made in the past.
- ❖ From a microeconomic point of view, and for forecasting purposes, the cross sectional employment rate is not a measure of interest. Cohorts are the correct unit of analysis.
- ❖ Past choices and past events matter also in presence of hysteresis: individuals may remain trapped in inactivity because of market frictions and/or because of rigidities in the legislation.

crucial areas: life course (5/8)



past choices, past events (1/3)

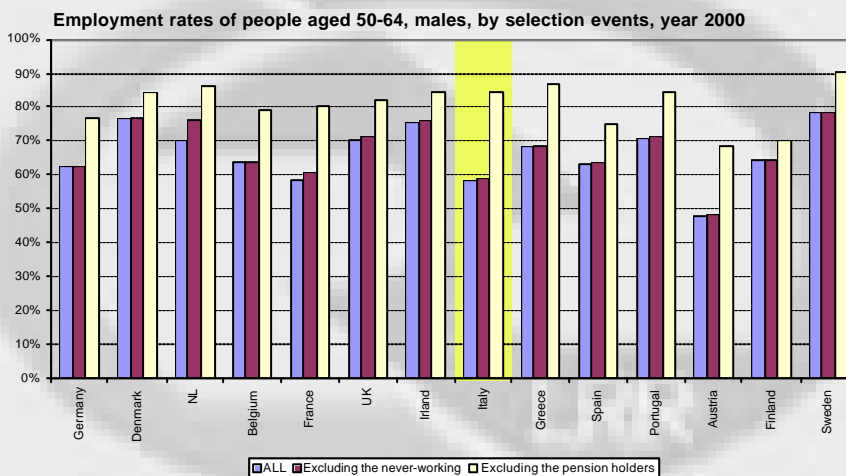


Source: our elaborations on ECHP, wave 7

crucial areas: life course (6/8)



past choices, past events (2/3)



Source: our elaborations on ECHP, wave 7

crucial areas: life course (7/8)



past choices, past events (3/3)

Employment rates of people aged 50-64, males, by selection events, year 1994-2000

	1994	1995	1996	1997	1998	1999	2000	D
Males								
All	62%	59%	59%	58%	57%	56%	58%	-3,4%
Excluding the never-working	62%	60%	60%	59%	58%	57%	59%	-3,4%
Excluding the pension holders	79%	81%	84%	82%	83%	81%	85%	5,6%
Females								
All	24%	23%	24%	25%	24%	27%	28%	3,8%
Excluding the never-working	36%	35%	35%	36%	35%	38%	39%	2,6%
Excluding the pension holders	50%	51%	49%	50%	49%	53%	54%	4,5%

Source: our elaborations on ECHP, wave 1-7



crucial areas: life course (8/8)



LaborSim: Design and implementation

LaborSim is a supply side model of Italian labour market. “HiFi” focuses are on demography, retirement, education and participation choices. “LoFi” focuses are on migration and unemployment. No focuses on family structure, short term and demand side dynamics.

- ❖ Key features of the model
- ❖ The layout of the simulation
- ❖ The events schedule...
- ❖ ...and the events

LaborSim: intro (1/8)



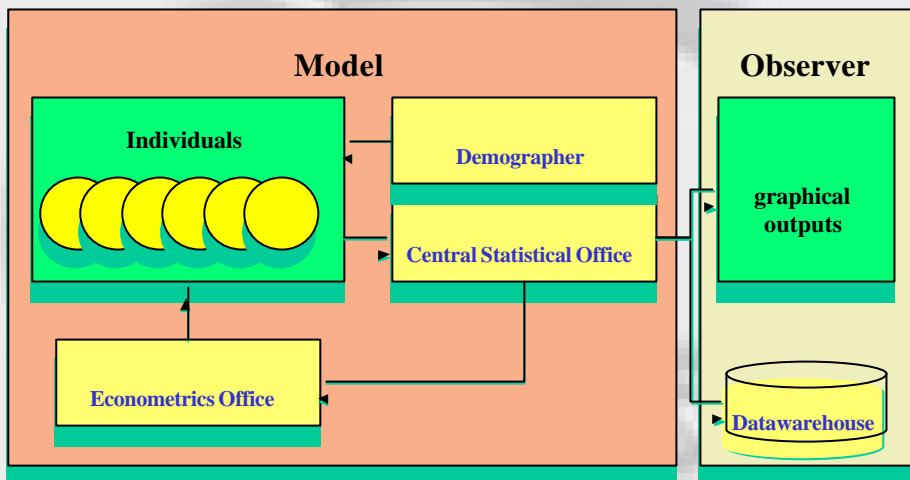
key features of LaborSim

- ❖ It is an agent-based, discrete-time, dynamic ageing microsimulation
- ❖ Has a separated UI, to manage scenarios and simulation data analysis
- ❖ Is highly integrated with empirical data
- ❖ Implements the actual retirement rules, in a flexible way
- ❖ Implements and extends the three Istat demographic projections
- ❖ All crucial behaviours are cohort specific

LaborSim: key feat (2/8)



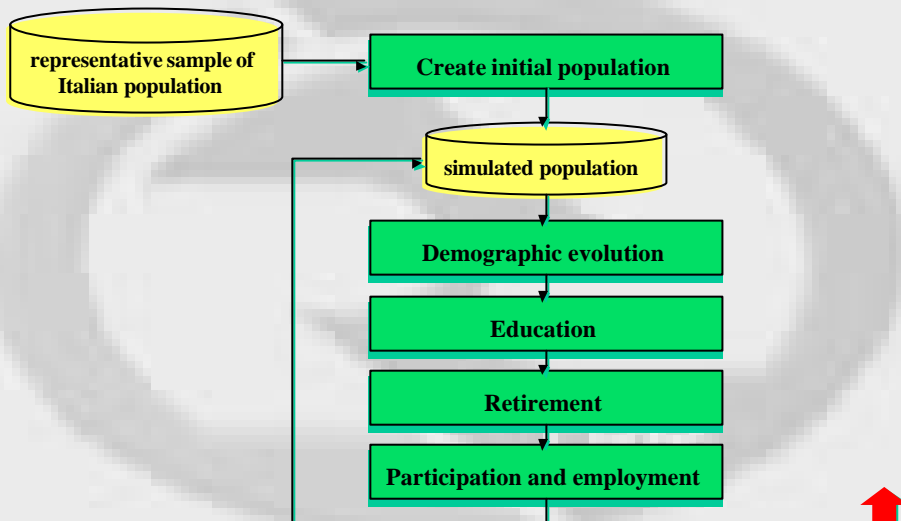
Simulation layout



LaborSim: the layout (3/8)



Events schedule



LaborSim: events (4/8)



First results with some standard scenarios

- ❖ Demography and migrations
- ❖ Education
- ❖ Participation rates with High/Low cohort effects
- ❖ Retirement with different behavioural hypotheses

First results: menu (1/8)



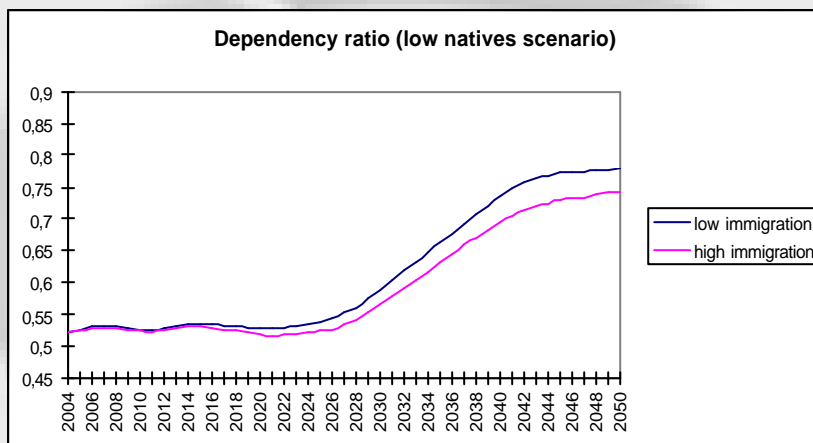
The pyramid 50 years later



First results: demography (2/8)



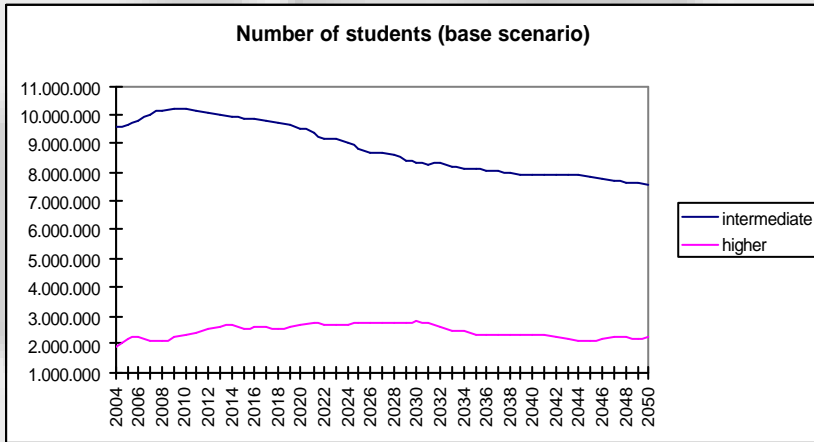
Dependency ratio with H/L immigrations



First results: demography (3/8)



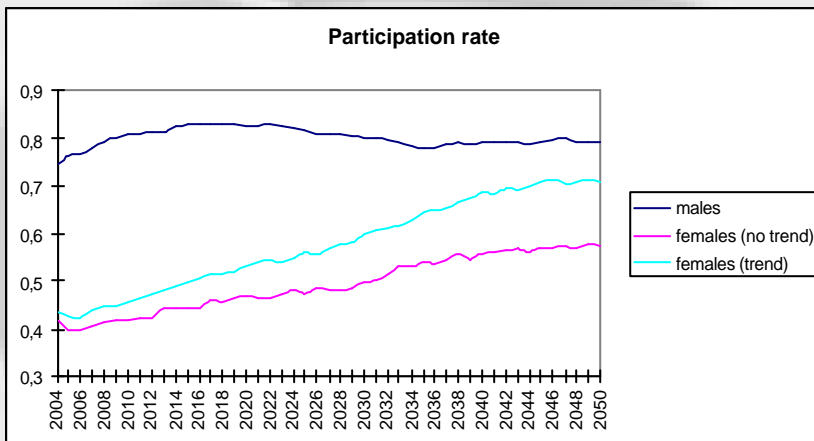
Number of students by education level



First results: education (4/8)



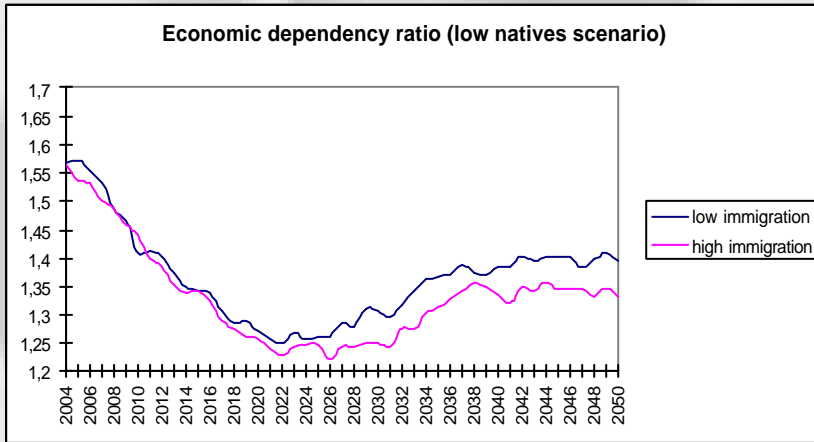
Participation rate by gender, H/L cohort effects



First results: participation (5/8)



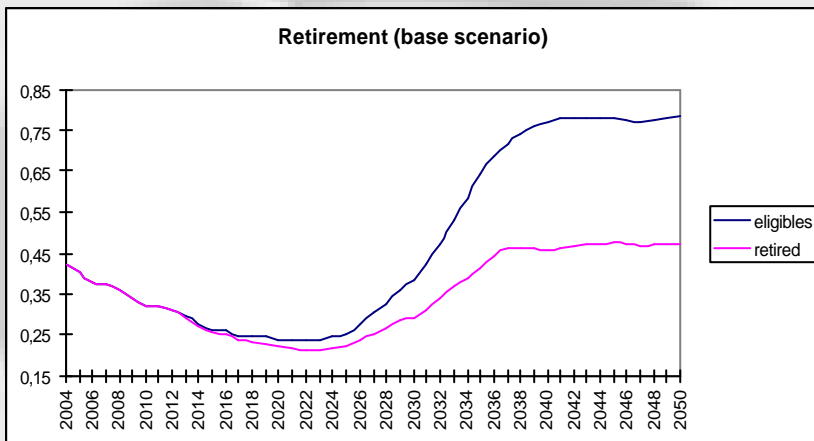
Economic dependency ratio, H/L immigrations



First results: participation (6/8)



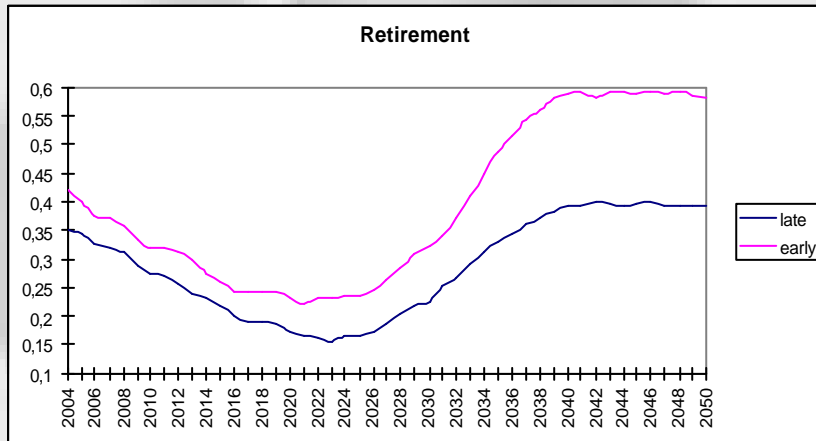
Share of eligible and retired, people aged 55-64



First results: retirement (7/8)



Share of retired, people 55-64, H/L delay



First results: retirement (8/8) 