Fostering delayed retirement in Spain: A micro simulation exercise using the MCVL

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Motivation

- Paper *NOT* presented: Estimating retirement probabilities and the effect of reforms

- Motivation: Get your comments on our current dilemmas on building a Dynamic MS on pensions

- Outline: Discussing issues on
  - Basic structure of the model / available data bases
  - Estimating the behavioral equations in the pension module

1. Basic structure and available data bases

- Basic structure
  - Demographic module: education, household formation and birth, mortality.
  - Labor market module: labor transitions and wages
  - Pensions module: Retirement probability and pension rights
- Demographic and labor market module:
  - EUHP (1994-2001). 8.000 households
    - (+) : individual and Household data
    - (-): Very short panel: no data on past working career
  - LCS (2004-08) 16.000 households
    - (+) : individual and Household data
    - (-) : NO data on individual income
    - (-): Very short panel: no data on past working career
- Pension module:
  - MCVL (Continuous working life sample). 1 million (4% of Social Security affiliates)
    - (+/-) Administrative data
    - (-) : NO household data
    - Panel (peculiar: all past info on selected sample)
      - Affiliation from around 1960
      - Contributions from 1980
      - Pensions from 1996
- Matching:
  - Working career… not even category
  - ¿Stability?
- Macro module: AWG scenarios

2. Estimating the behavioral equations in the pension module

The key transition probability in the pension module. Depending on

- Socioeconomic characteristics
- Retirement incentives to capture the effect of reforms
- Dealing with different pathways to retirement

- Dealing with different pathways to retirement:
  - Identify it ex-ante and ex-post
  - ¿all voluntary? ¿Joint estimation?
  - Method: Duration or multinomial model
  - If panel data: ¿how to capture the cycle?
  - Relevant variables to estimate and to match data sets
- Relevant reforms

Labour Status	Retirement path	Eligibility requirements / rules determining benefits (2007)
Disabled	Disability*	At age 65 disability pensions are converted into retirement pensions, but keeping the same benefit level
Unemployed	Back to work (all)	
	Early retirement from age 60 (Old system)	Minimum *n* = 30 8% penalty per year until age 65 (gradually reduced to 6% if *n*≥*40*)**
	Early retirement from age 61 (New system)	Minimum *n* = 30 7.5% penalty per year until age 65 (gradually reduced to 6% if *n*≥*40*)**
	Regular retirement at 65	(See conditions bellow)
Worker	Special retirement at age 64	No early retirement penalty Substitution contract in the same firm
	Early retirement from age 60 (Old system)	8% penalty per year until age 65
	Regular retirement from age 65 (includes delayed retirement)	<65: Reduced age for special professional activities with no penalty Age 65: Minimum *n*=15 (the last 15) >65: Increases beyond 100% of *RB* by 2% per year (3% if *n*≥40)
	Partial retirement**	From age 60 Minimum *n* =15 years Part-time work and proportional reduction of pension If age < 65 substituting contract No early retirement penalty
Retired	Flexible retirement	Part-time work and proportional reduction of pension

MCVL difficulties

- Difficulties
  - Censored data:
  - Relating contribution, affiliation and benefit data from the same individual all defined with different time periods/units: difficult avoiding a wrong correspondence between working time and contribution per unit of time.
  - Variable indicating part time not completely reliable
  - Only unemployment time receiving benefits registered. ¿Non contributed years counted as unemployment?
  - Many empty contribution bases. We fill empty contributions

Filling contribution holes

1. Contributing (time work exist)
   1. Data from the same individual and year
   2. Average value for the last 15 years
2. Not working in the last 15 years: "*lagunas*" minimum contribution (BR not affected)

Table 2. Distribution of new entries by pathways (Spain 2002-2007 MCVL).

Year / Retirement Pathway	2002	2003	2004	2005	2006	2007
From disability	**6.86%**	**5.84%**	**4.48%**	**2.33%**	**1.92%**	**0.60%**
Early retirement	**29.42%**	**33.79%**	**33.86%**	**24.02%**	**28.28%**	**26.77%**
Old system: from age 60 on	25.44%	29.50%	27.95%	19.62%	22.57%	20.24%
From unemployment	12.58%	14.10%	14.18%	10.18%	11.21%	10.76%
From employment	12.86%	15.40%	13.77%	9.44%	11.36%	9.48%
New system: from age 61 and unemployment	0.51%	0.92%	1.60%	1.47%	1.88%	2.32%
Special retirement at age 64	2.35%	2.19%	3.40%	2.13%	2.57%	3.14%
Collective wage settlements	0.00%	0.05%	0.06%	0.10%	0.23%	0.27%
Pre-retirement (only if public benefits)	1.12%	1.13%	0.86%	0.70%	1.02%	0.81%
Partial retirement (from employment)	**3.45%**	**5.30%**	**8.10%**	**7.78%**	**11.80%**	**12.82%**
Flexible retirement (from retirement)	**0.24%**	**0.52%**	**0.30%**	**0.31%**	**0.31%**	**0.20%**
Ordinary retirement pensions (Including delayed)	**60.04%**	**54.55%**	**53.26%**	**65.56%**	**57.69%**	**59.60%**
<60	1.14%	1.11%	0.98%	0.81%	1.11%	1.25%
60	0.97%	0.49%	0.49%	0.40%	0.24%	0.20%
61-64	1.83%	1.07%	1.35%	1.09%	1.22%	1.05%
65	44.83%	39.84%	38.25%	43.36%	41.93%	45.43%
>65	11.26%	12.05%	12.19%	19.90%	13.19%	11.66%
Missing age	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Figure 1 Evolution of average retirement age by gender

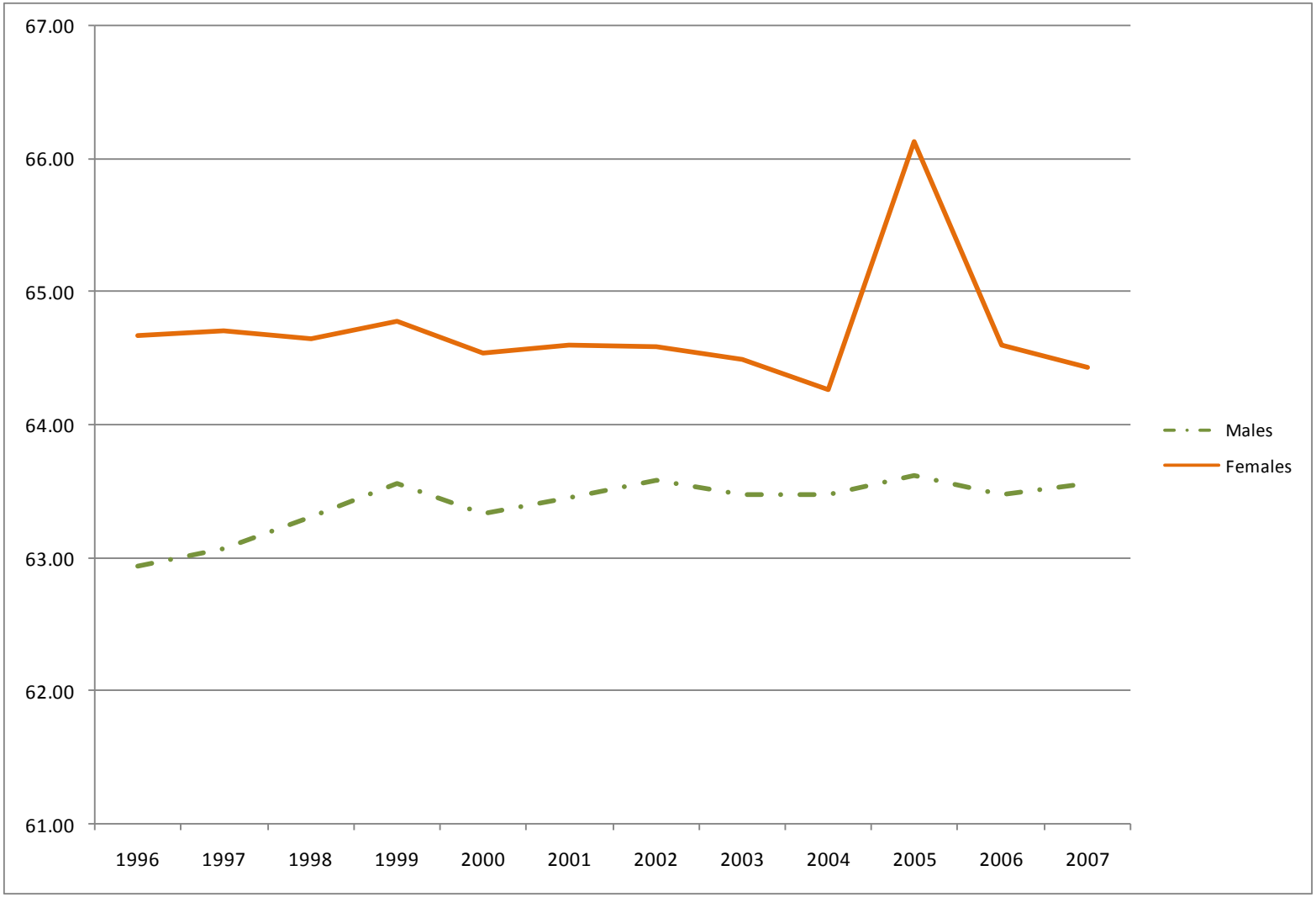
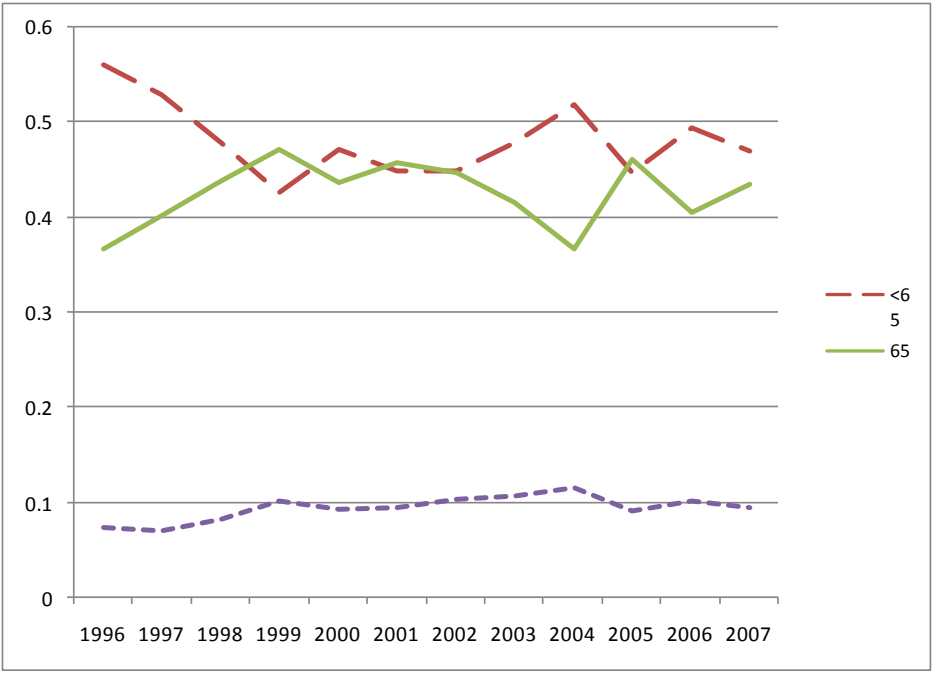
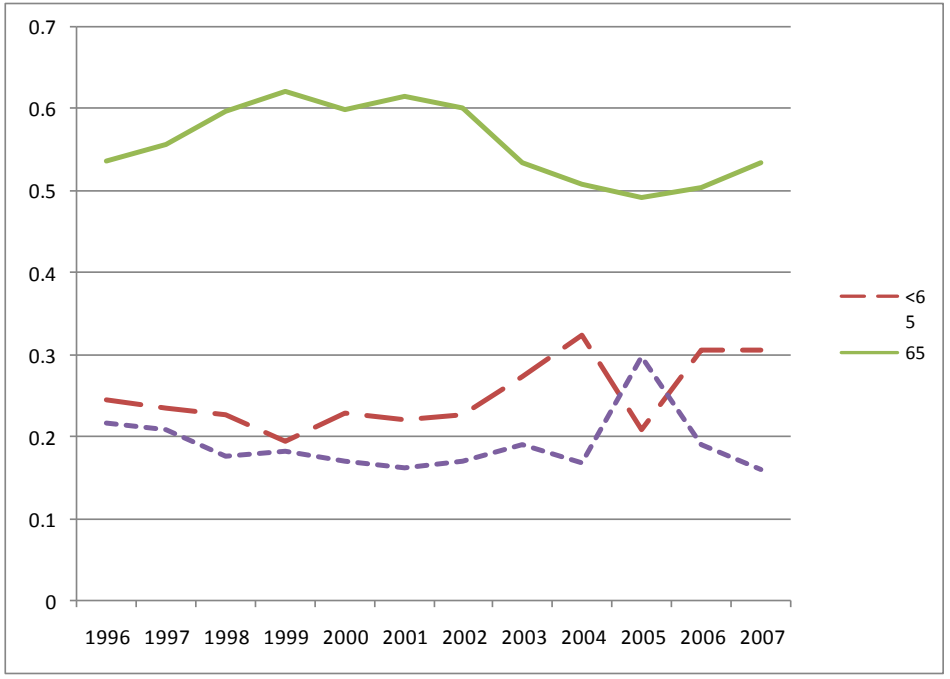


Figure 2 Share of new entries to retirement by age and sex (2002-2007)

a) Males



b) Females



b) Handling multiple retirement paths

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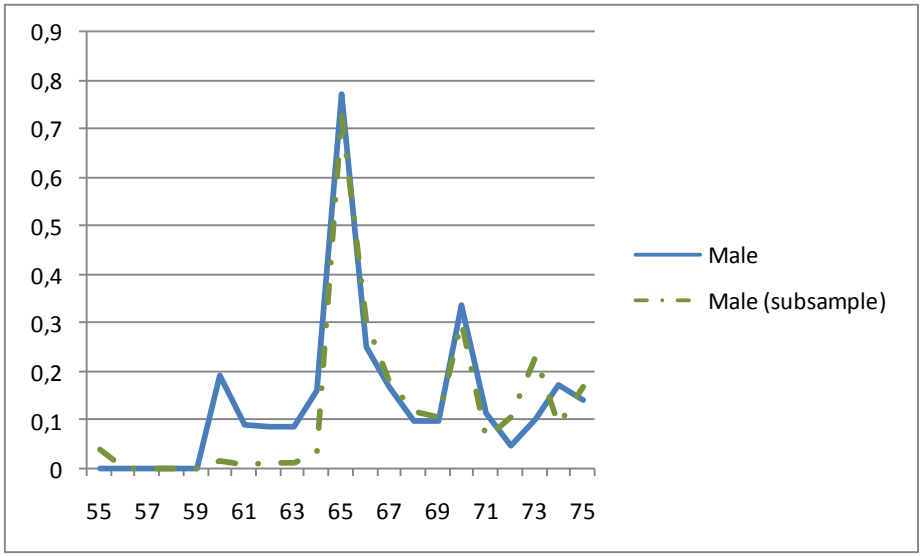
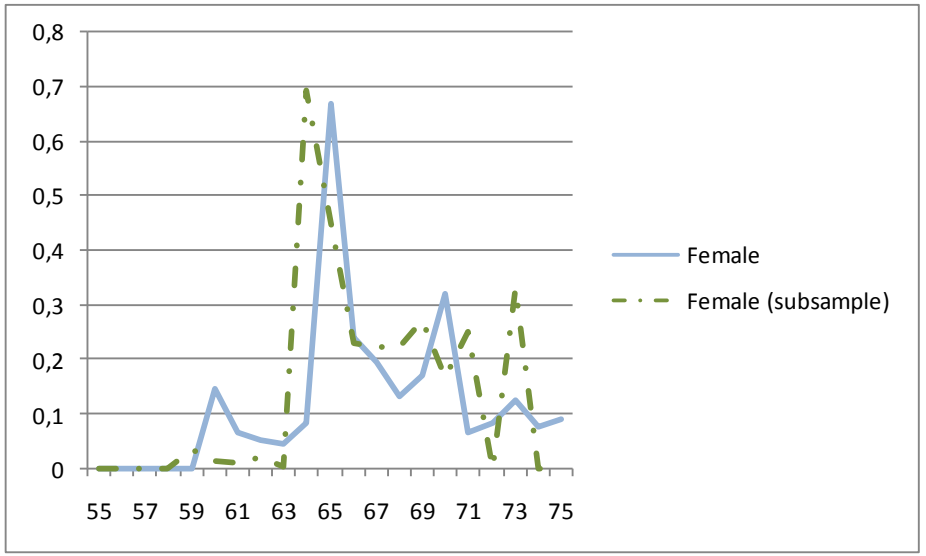
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Figure 3 Observed hazard rates by gender (sample versus subsample)

a) Males **b) Females**





3. Methodology

2 decisions

- Main decision

$$Y_i = \begin{cases} 1 \text{ if } Y_i^* > 0 \text{ (retirement in 2007)} \\ 0 \text{ otherwise (working in 2007)} \end{cases}$$

- Control for old system (Eklöf and Hallberg, 2006)

- Two equations, sequential estimation

$$w_i = \begin{cases} 1 \text{ if } w_i^* > 0 \text{ (path of retirement in 2007 : old system)} \\ 0 \text{ otherwise (path of retirement in 2007 : standard)} \end{cases}$$

$$w_i^* = \delta_1 Z_i + \varepsilon_i$$

$$Y_i^* = \beta_1 SSW_i + \beta_2 \left(w_i I_i^{OS} + (1 - w_i) I_i^{std} \right) + \beta X_i + u_i$$

- Other studies for Spain:
  - Boldrin and Jiménez-Martín (2004) and Jiménez-Martín (2006) in Gruber and Wise (2004)
  - García-Pérez et al. (2009) joint determination of the exit rate from employment and unemployment, using a duration model
  - Argimon et al (WP BdE 2009): small effect of incentives. Paths?
  - Isabel Cairó (2010): Partial versus full retirement.

Incentive variables

- Social Security Wealth: expected present value of future pension benefits in case of retirement at age, *h*, higher than the actual age (*a*), as:

$$SSW_h = \sum_{s=h+1}^{S} \gamma^{s-a} \pi_s B_s(h)$$

- S: maximum age of certain death
- Gamma : Time discount factor
- Pi : Conditional survival probability at age *s* for an individual alive at age *a*
- B : pension expected at age *s>h* in case of retiring at age *h*

- SSAcrual (SSA): increase in SSW froma a to a+1.
- Peak value (PV): max SSW difference in SSW h to a.
- Implicit tax –PV/w*
- Option value (OV): Max difference in:
  - utility (linear implies that dif SSW = PV
  - Includes lost wages

$$OV_h = \sum_{s=h+1}^{S} \gamma^{s-a} \pi_s w^*(h) + zPV_h$$

4. Results

Identification problem:

- As wealth increases, more leisure demanded if normal good (Positive sign)
- ¿What about tastes for work:?
  - Tastes for work decreasing with age but ¿linear?
  - Tastes for work, ¿increasing with income? (Negative sign)

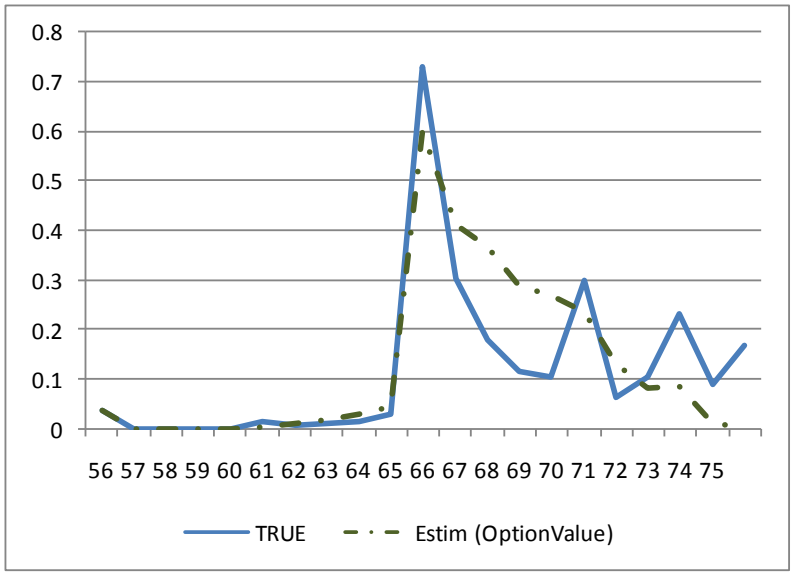
- We do not have wealth. We use SSW, but
  - SSW: only from labor income ad interacts with age and wage
  - Incentives derived from SSW
  - Introduce uncensored wage to capture both effects?

Identification problem: ¿How do we interpret the signs?

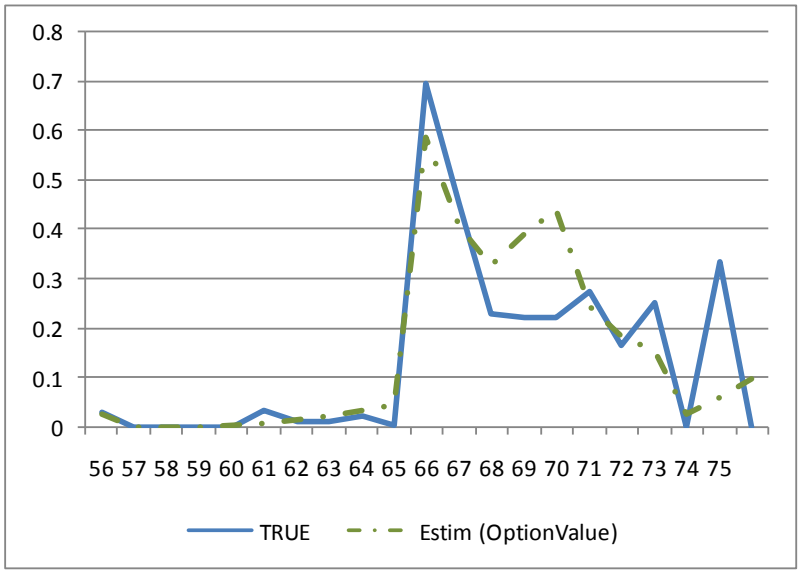
Figure 4 Observed versus estimated hazard rates by age and gender

a) Quadratic age.

Males

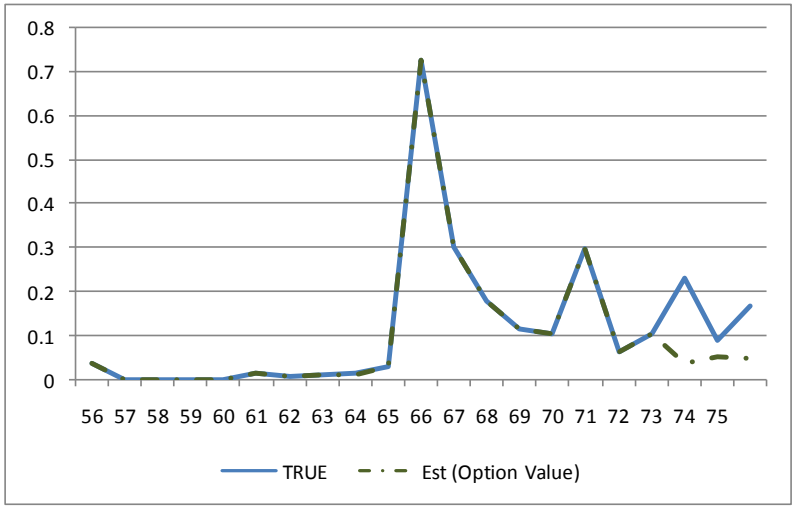


Females

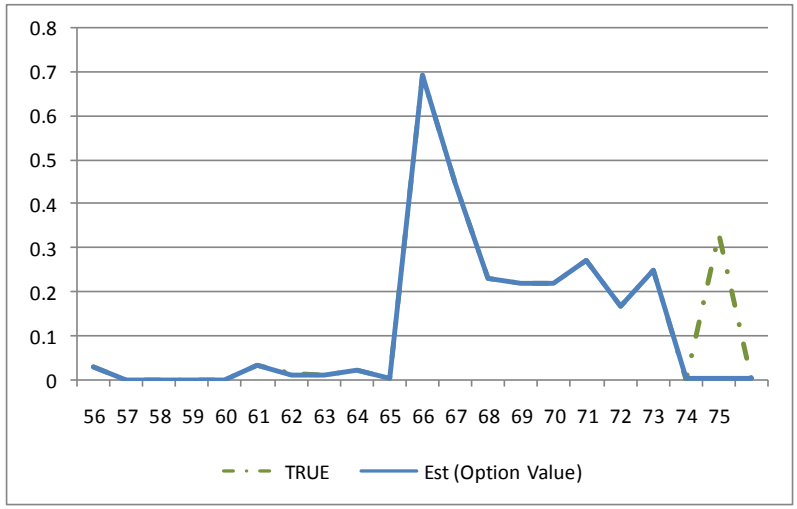


b) Age dummies

Males



Females



Results

- Age significant and the expected sign
  - Age +
  - Age^2 -
  - But unrealistic age profile. Change to age dumies.

OV equation Incentives significant and “correct (–)” sign

- SSW sign and + (leisure normal good)
- Proxy for tastes for work:
  - skilled (sign +)
  - wage* (sig -)
  - college (no sign)
- Share of part time: sign +
- Duration last contract: +
- Duration working life: -
- Males: kids ad home –
- Females: firm type SA +

Scope for reform

Fostering delayed retirement

- Incentives:
  - Present rules no significant effect
  - Reforms: Small impact (below actuarially fair)
- "Full" contributory, Affects retirement age?
  - BR all past wages
  - p(n) lineal –Finland more at the end!
  - No possible ex-ante!!!
- Direct increase in legal age

Table I.1. Weight attached to contribution years in the share of *RB* (several legal scenarios)

	Prior to 1985	**26/1985 Act**	**24/1997 Act**	**Total Proportionality**
Minimum eligibility condition	10 years	15 years	15 years	–
Contribution years	Total *p(n)* (per year)			
10	50% (5.0%)	–	–	–
15	(2.0%)	60% (5.0%) (2.0%)	50% (3.3%)	In 35 years (2.86%) In 40 years (2.50%)
16-25			(3.0%	
26-35		(2.0%)	(2.0%)	

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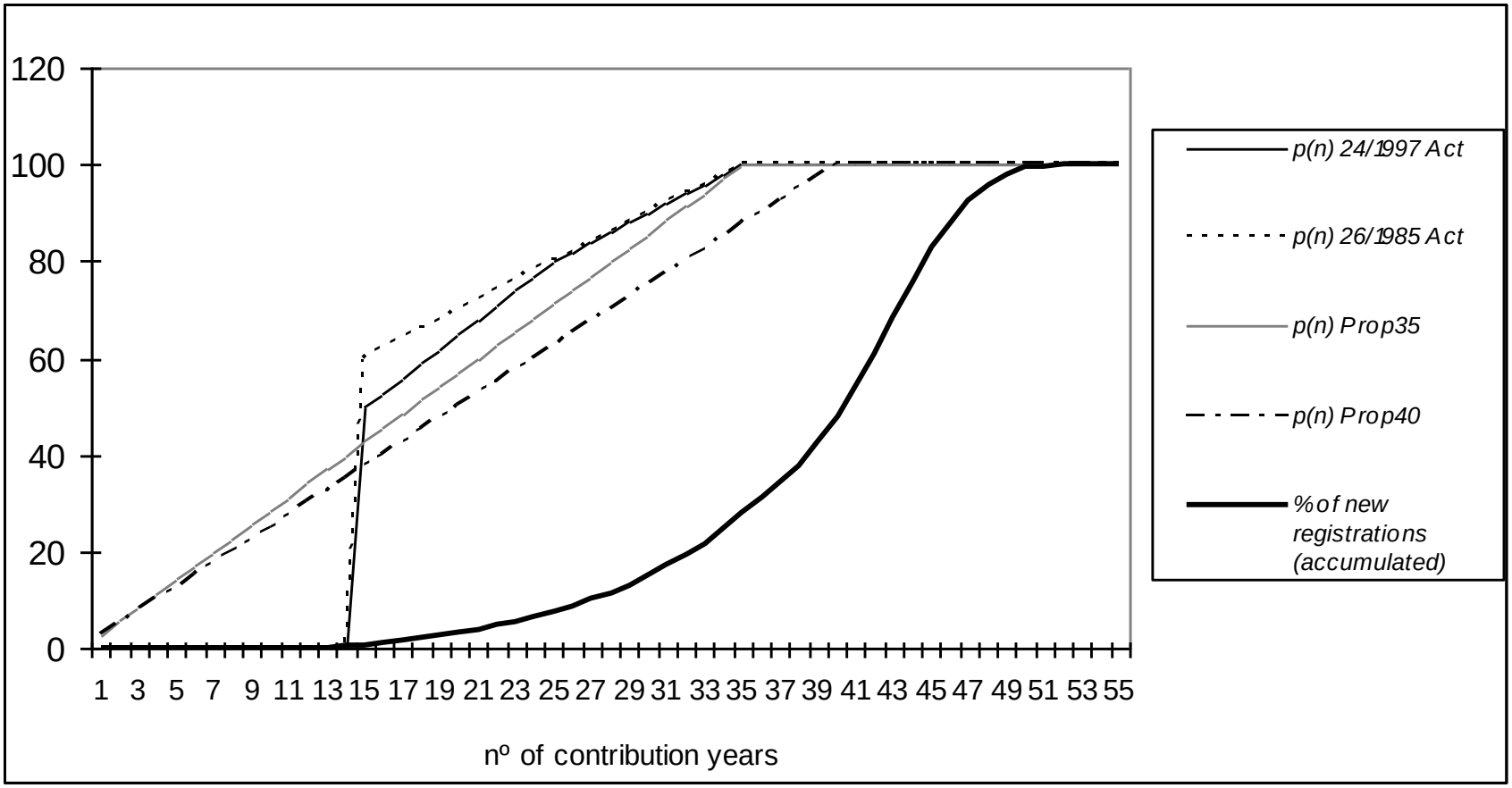

Table 5. Effect on average retirement age (ARA) in policy scenarios

	ARA		Increase in ARA due to reform	
Observed ARA	**Male**	**Female**	**Male**	**Female**
Sample	64.32	65.00		
(Number of observations)	(48,089)	(25,267)		
Subsample	66.13	65.26		
(Number of observations)	(22,357)	(5,961)		
Estimated ARA	**Male**	**Female**	**Male**	**Female**
Baseline	66.02	67.38		
1. Increase *p(n)* above 100% from 2% to 3% per year (*n*≥40)	66.02	67.38	0.00	0.00
2. Retirement age 65 to 67				
a) Effect of changes in incentive	66.55	67.79	0.53	0.41
b) Total affect (delaying age dummies)	67.71	68.48	1.70	1.10
3. Years to compute *RB* from 15 to 25	66.09	67.31	0.07	-0.07
4. Linear *p(n)* maximum 35 years	66.03	67.39	0.01	0.01
5. Linear *p(n)* maximum 40 years	66.08	67.34	0.06	-0.04

Conclusions

- The incentive measures explicitly governed by legislation have a limited impact on retirement decision, this being mostly determined by age.
  - Age is specified as single year dummies it captures most of the significance.
- This conditions results:
  - Incentives to delay retirement:
    - No much scope within the actual system
    - The last reform introduced in Spain fostering delayed retirement, finding a small impact (it affects a small share of pensioners and it is a marginal)
  - Full bismarkianism: cuts pension but uniformly
- Only a direct increase in the normal retirement age would produce a sizeable increase in retirement age.
  - Incentive effects sizable
  - Total effect -age dummies switched accordingly- 1,1 (0,8 total) increase in average retirement age Incentives to delay retirement:
    - No much scope within the actual system
    - The last reform introduced in Spain fostering delayed retirement, finding a small impact (it affects a small share of pensioners and it is a marginal)