From Transfers to Capital: Analyzing the Spanish Demand for Wealth using NTA

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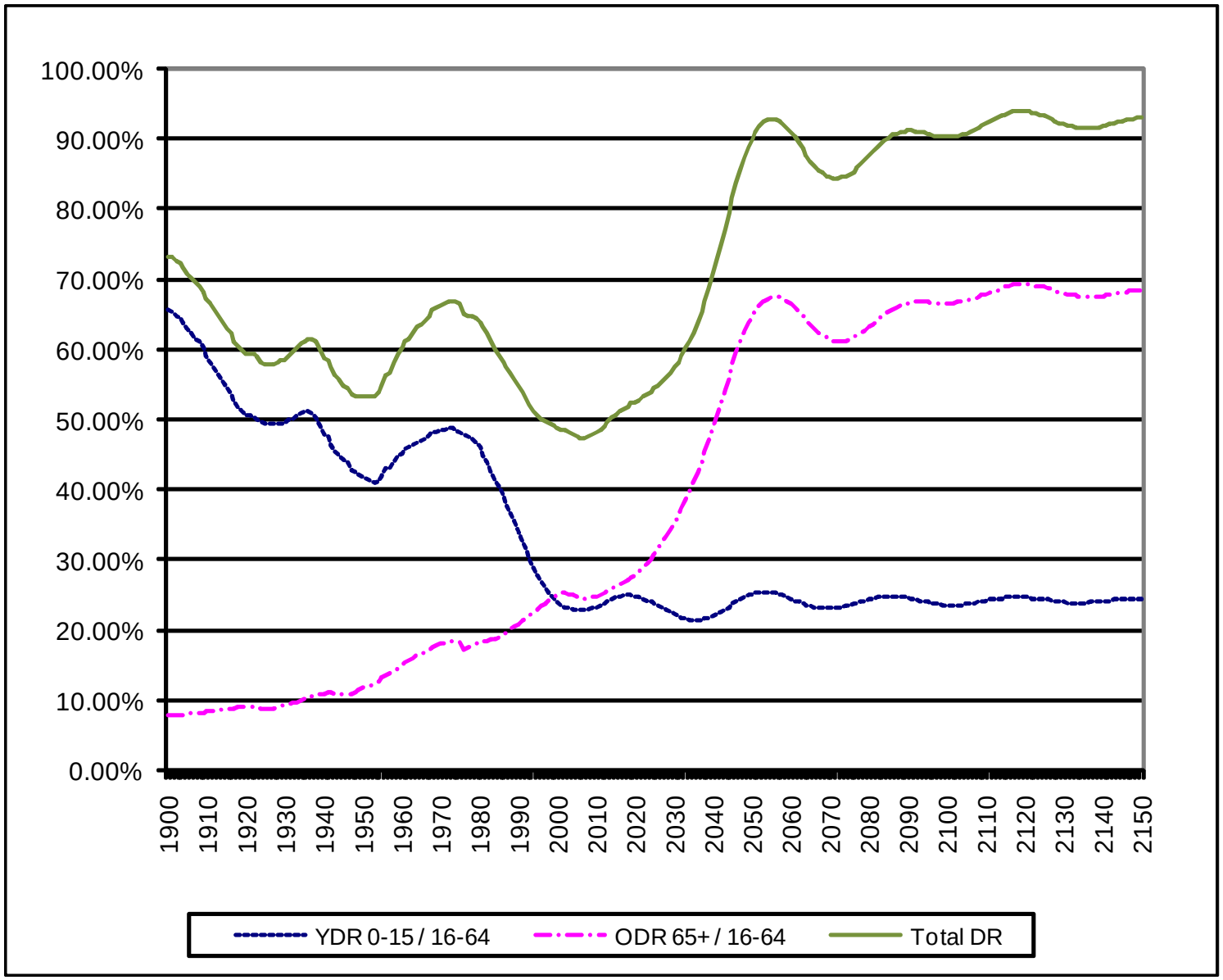
Content

- Motivation: Effects of ageing in the economy (aplication to Spain)
- Metodology
  - Integrate GA and NTA (Partial equilibrium)
    - NTA adds private transfers
    - GA prediction approach
  - We need a General Equilibrium framework: building a GE model using/calibrating NTA estimates

Motivation: Past and future demographic evolution is Spain

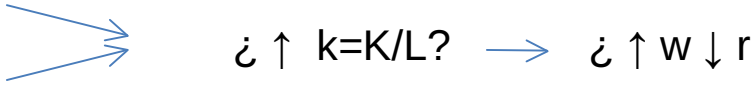


Motivación

- The main issue: Effects of population ageing on the economy and the sustainability of the welfare state

- Effects of population ageing on the economy

  – L scarce
  – K relatively abundat

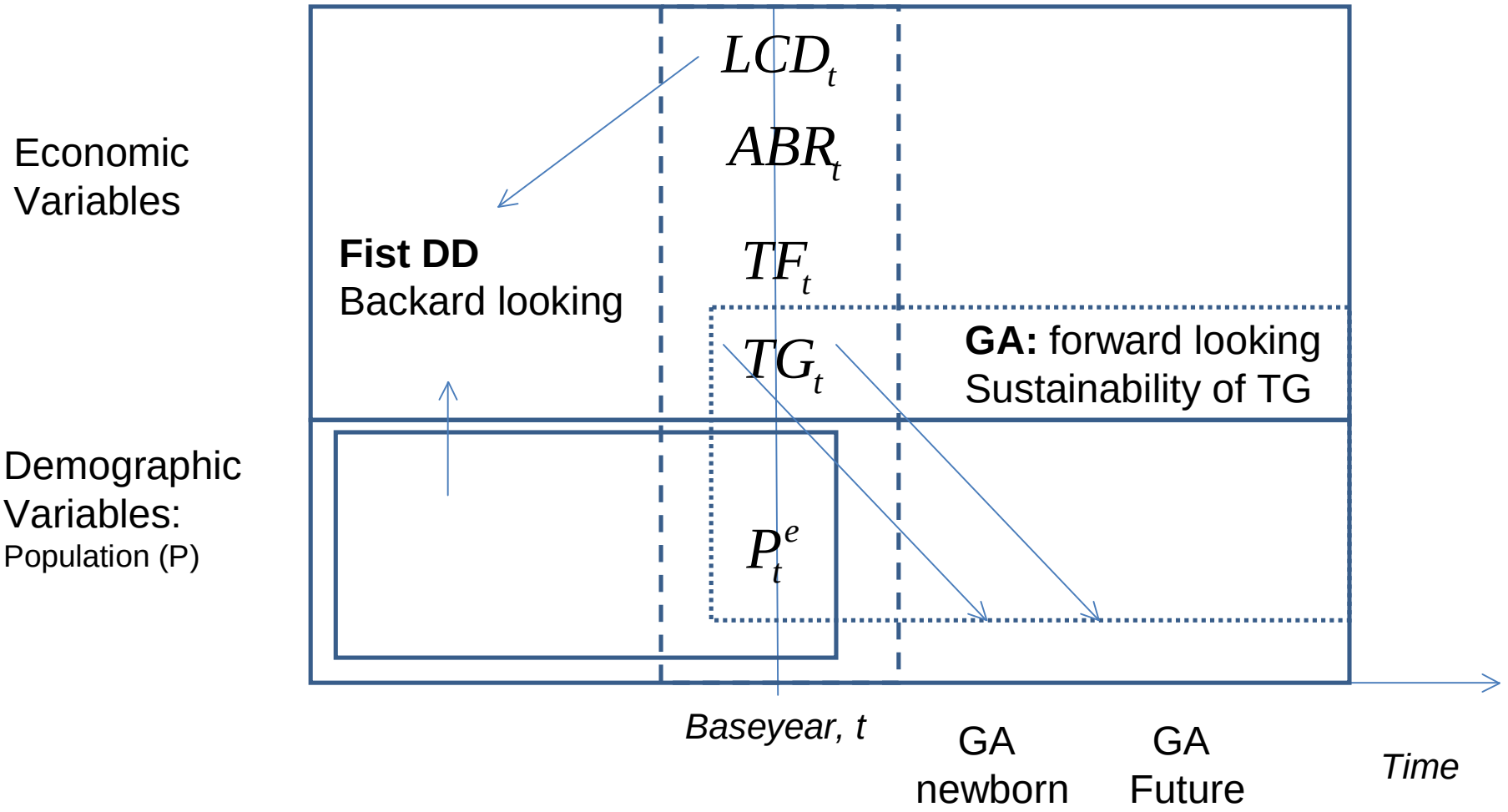
  Effects depend on:
  – Preferences on savings: retirement/bequest/precaution motive + intergenerational transfers
  – Other endogenous variables

- Effects on budget depend on:
  – Increase in demographic dependency and…
  – Increase in ratio benefit receivers/tax payers (wage us the tax base, so…)

NTA and GA an integrated view

Standard NTA: Baseyear Cross Section

$$LCD_t = ABR_t + TG_t + TF_t$$



GA/NTA indicators

- Tipical GA sustainability indicator
  - PV future net deficits/PV future GDP
  - = “Intertemporal” Debt/ “Intertemporal” GDP
  - Evolution of Budget balance/GDP
- NTA indicators: Base year and changing population
  - “Economic” Support Ratio (ESR)
    - L/C (weighted by NTA profiles)
    - Another option: LCD/LCS = Aggregate - LCD/aggregate + LCD (LCS)
  - Evolution of financing sources of LCD
  - Sustainability Indicators GA

$$1 = \frac{TG}{LCD} + \frac{TF}{LCD} + \frac{ABR}{LCD}$$

$$\frac{LCD}{Y_l} = \frac{TG}{Y_l} + \frac{TF}{Y_l} + \frac{ABR}{Y_l}$$

- Issues
  - 3-4 “economic sustainability” indicators
  - (NTA) TG is “zero” in a closed economy , but still interesting its evolution
  - General equilibrium AND wealth account missing

NTA in general equilibrium –OLG model

Theoretical framework:

Standard OLG model = The neoclassical model at work to analyse effects of demographic changes on the Economy

- Life cycle model to obtain endogenous individual savings
- Population dynamics: Interaction among generations:

Main result: Capital per worker and the resulting wages and interest rate

- Other possible endogenous decisions: Labour supply

What about transfers?:

- Intergenerational interfamily transfers (IIT)
  - For those to be endogenous you need private "motives"
    - Forward altruism towards children: feeding, educational expenditure, bequest
    - Backward altruism towards the elderly : gifts
  - Public sector intervention on those transfers (not endogenous usually)
- What about ageing, Is it also endogenous? Endogenous fertility and mortality
- Start simple: What would happen to capital if the observed NTA transfers profiles are exogenous or almost so?

Modelling private transfers

Start simple: observed NTA transfers profiles, exogenous or almost so?

Observed NTA transfers

- "some" forward altruism towards children:
  - (Intra-household transfers): health education and other gives utility to parents, as (also exogenous share of private/public):

$$\lambda_{t,x} = 1 + \sum_{s=T_w}^{x} \theta_{x-s} \frac{l_{t-x+s,s}}{l_{t,x}} l_{t,x-s} \hat{f}_{t-x+s,s} I_{x-s<T_w}. \qquad \text{(A-15)}$$

  - Bequest (inter-household) are accidental, due to uncertain life expectancy (no NTA data for this)
- Backward altruism towards the elderly: gifts (inter-hh transfer)
  - (inter-hh, Inter-vivos transfers) Actual Spanish NTA data: The elderly parents give (net) positive transfers to their offspring, even when they are retired.
  - We assume transfers are dependent on –proportional to- the share of public resources received by the elderly (widowhood and retirement)

Table 2: UN SNA Classified Tax Revenues and Public Expenditures by Function in 2000

Expenditures	%GDP	
Property income, payable	3.27	
Social benefits other that in kind	12.08	
Pensions	10.18	
Contributory	9.91	
-Retirement	6.20	(6.23)
-Disability	1.73	
-Survivors	1.87	(1.34)
-Maternity	0.11	(0.11)
Non contributory	0.28	
Unemployment	1.38	
Other social protection	0.52	
Other current transfers	1.27	
Government final consumption	17.35	
Education	4.39	(4.45)
Health	5.23	(5.22)
Long-term care	0.33	
Other (in-kind)	7.40	(7.36)
Saving, net	1.46	
Total	35.43	(24.71)

Revenues	%GDP	
Taxes on production and imports	10.31	
Taxes on production and imports	11.46	(7.16)
Subsidies	-1.14	
Property income, receivable	1.12	
Current taxes on income and wealth	10.25	
Taxes on income	9.84	(9.87)
Individual income tax	6.70	(6.71)
Corporate income tax	3.14	(3.16)
Other current taxes	0.41	
Social contributions	12.99	(7.67)
Other current transfers	0.76	
Total	35.43	(24.71)

Modelling public transfers

Public benefits:

- In kind transfers in the cosumption profile
- In cash trasnfers:
  - Retirement pensions: depending on the last 15 years wages
  - Widow pension: related to

Taxes: 2 “PAYGO” (no debt)

- Pensions PAYGO: Social security contribution adjust to finance defined benefit retirement pensions
- The rest:
  - Fixed income and capital tax,
  - Consumption tax (VAT) adjusts to finance the rest of the budget

OLG and NTA budget constraints

NTA: strict flow account

$$\mathrm{LCD}_x = \mathrm{ABR}_x + \mathrm{TG}_x + \mathrm{TF}_x. \quad (4)$$

OLG individuals budget constraints are a “wealth” account:
(4 period model)

$$a_2 = (1 + (1-\tau^i)r)(a_1 + h_1) + (1-\tau^i)(1-\tau^{ss})y_{l1} + \phi_1 - (1+\tau^p)\lambda_1 c_1, \quad (1)$$

$$a_3 = (1 + (1-\tau^i)r)(a_2 + h_2) + (1-\tau^i)(1-\tau^{ss})y_{l2} + \phi_2 - (1+\tau^p)\lambda_2 c_2, \quad (2)$$

$$a_4 = (1 + (1-\tau^i)r)(a_3 + h_3) + (1-\tau^i)b_3 + \phi_3 - (1+\tau^p)\lambda_3 c_3, \quad (3)$$

In NTA terms

easy for kids:

$$\underbrace{c_0 + g_0}_{\mathrm{LCD}_0} = \underbrace{g_0}_{\mathrm{TG}_0} + \underbrace{\theta_0 c_1}_{\mathrm{TF}_0},$$

OLG - NTA budget constraints

$$\underbrace{c_0 + g_0}_{\text{LCD}_0} = \underbrace{g_0}_{\text{TG}_0} + \underbrace{\theta_0 c_1}_{\text{TF}_0},$$

$$\underbrace{c_x + g_x - y_{l_x}}_{\text{LCD}_x} = \underbrace{r a_x - s_x + (1+r)\frac{q_x}{p_x} a_x}_{\text{ABR}_x}$$
$$+ \underbrace{g_x - \tau^i \left(r(a_x + h_x) + (1-\tau^{ss}) y_{l_x}\right) - \tau^{ss} y_{l_x} - \tau^p \lambda_x c_x - \tau^c \frac{r+\delta}{1-\tau^c}(a_x + h_x)}_{\text{TG}_x}$$
$$+ \underbrace{(1+r)h_x - (1+r)\frac{q_x}{p_x} a_x + \phi_x - (\lambda_x - 1)c_x}_{\text{TF}_x}. \quad (12)$$

$$\underbrace{c_3 + g_3}_{\text{LCD}_3} = \underbrace{r a_3 - s_3 + (1+r)\frac{q_3}{p_3} a_3}_{\text{ABR}_3}$$
$$+ \underbrace{g_3 + b_3 - \tau^i \left(r(a_3 + h_3) + b_3\right) - \tau^p \lambda_3 c_3 - \tau^c \frac{r+\delta}{1-\tau^c}(a_3 + h_3)}_{\text{TG}_3}$$
$$+ \underbrace{(1+r)h_3 - (1+r)\frac{q_3}{p_3} a_3 + \phi_3 - (\lambda_3 - 1)c_3}_{\text{TF}_3}. \quad (13)$$

Computing demand for real and transfer wealth

$$a_x = \sum_{s=x}^{3} \mathrm{ABR}_s \prod_{z=x}^{s} \frac{p_z}{1+r} = \sum_{s=x}^{3} \left((1+r)\frac{1}{p_s} a_s - a_{s+1} \right) \prod_{z=x}^{s} \frac{p_z}{1+r}, \qquad (14)$$

Real (S)

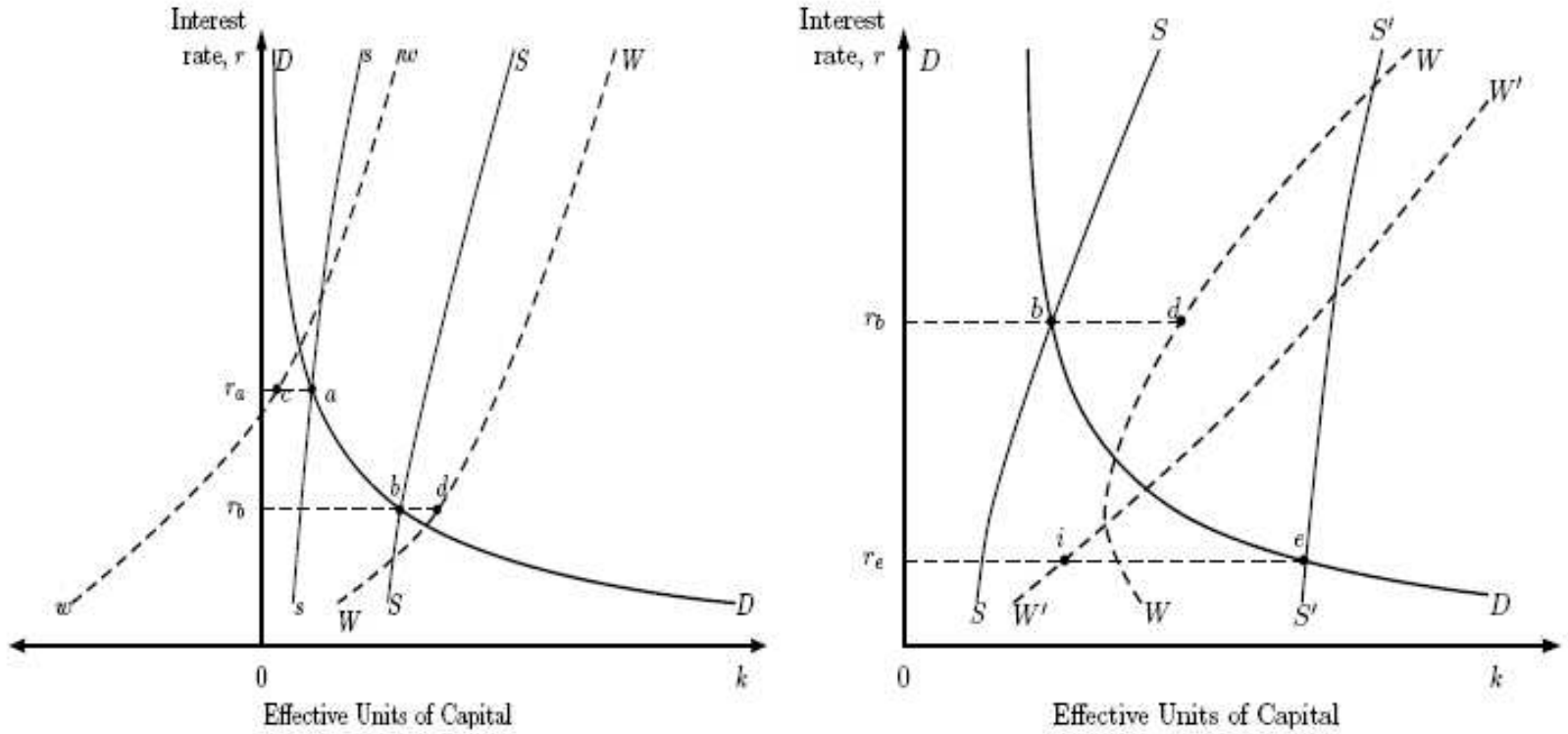
$$w_x = \sum_{s=x}^{3} \mathrm{LCD}_s \prod_{z=x}^{s} \frac{p_z}{1+r} = \sum_{s=x}^{3} (c_s + g_s - y_{l_s}) \prod_{z=x}^{s} \frac{p_z}{1+r}. \qquad (15)$$

Total (W)

$$W = \sum_{x=0}^{3} w_x N_x = \sum_{x=0}^{3} a_x N_x + \sum_{x=0}^{3} t_x N_x = K + T. \qquad (17)$$

Total aggregate

W=K+T



(a) Demographic changes

(b) Transfers changes

Figure 1: Aggregate Demand for Real and Total Wealth (with borrowing constraints and selfish individuals).

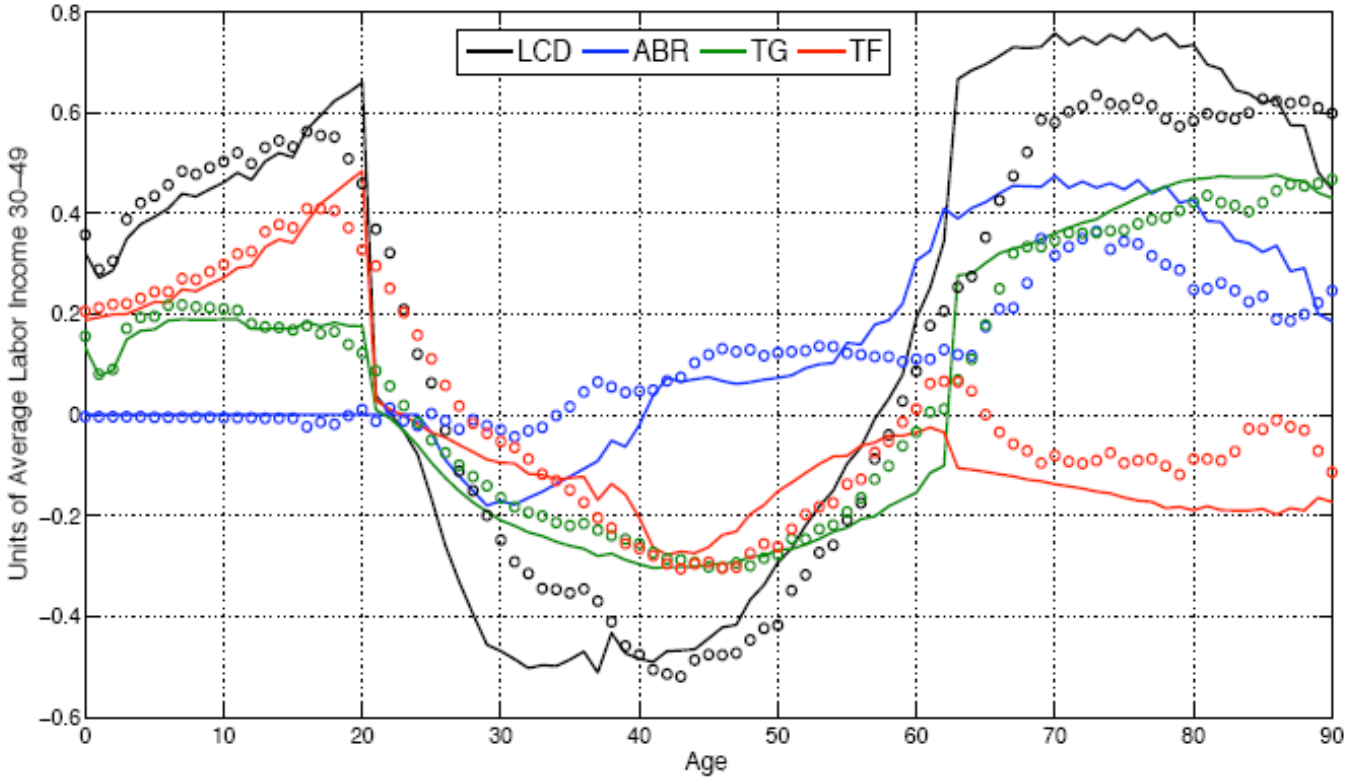


Figure 2: Spain: Actual (o) and Simulated (-) Life Cycle Deficit: Spain, year 2000.

Note: Actual NTA data does not contain bequests whereas our simulated NTA profiles does.

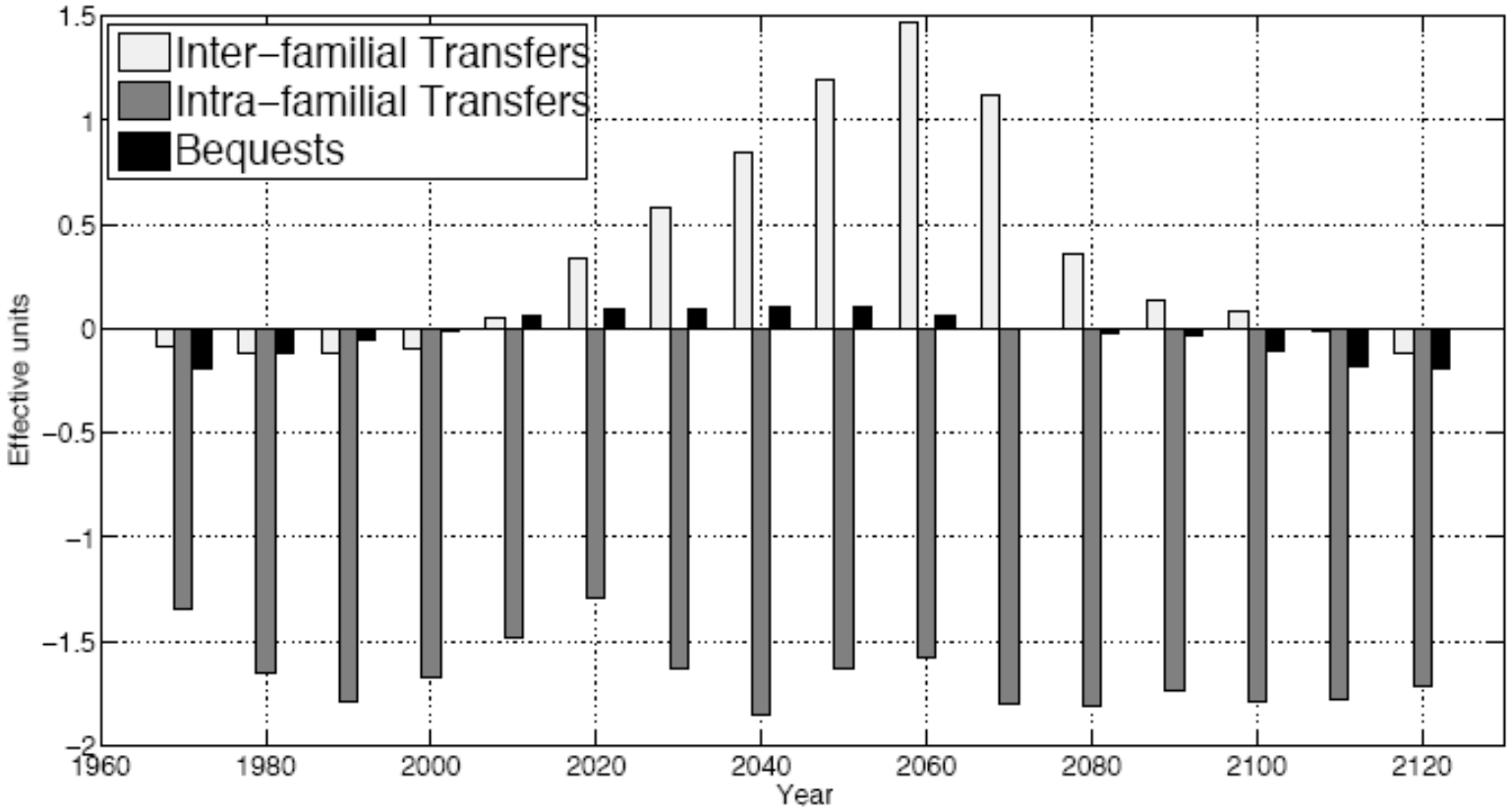


Figure 4: Simulated Aggregate Familial Transfer Wealth: Spain, 1970-2120.

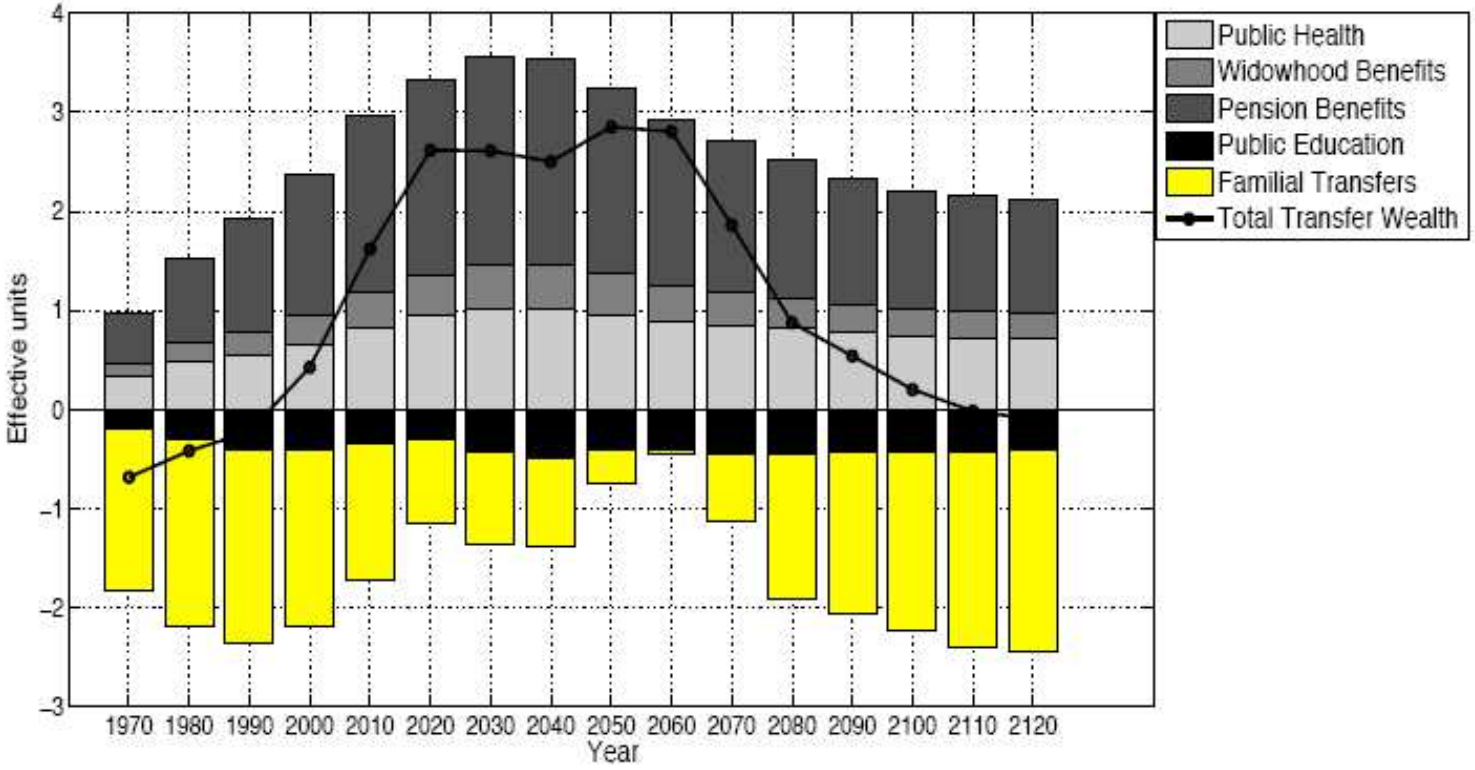


Figure 5: Simulated Aggregate Transfer Wealth: Spain, 1970-2120.

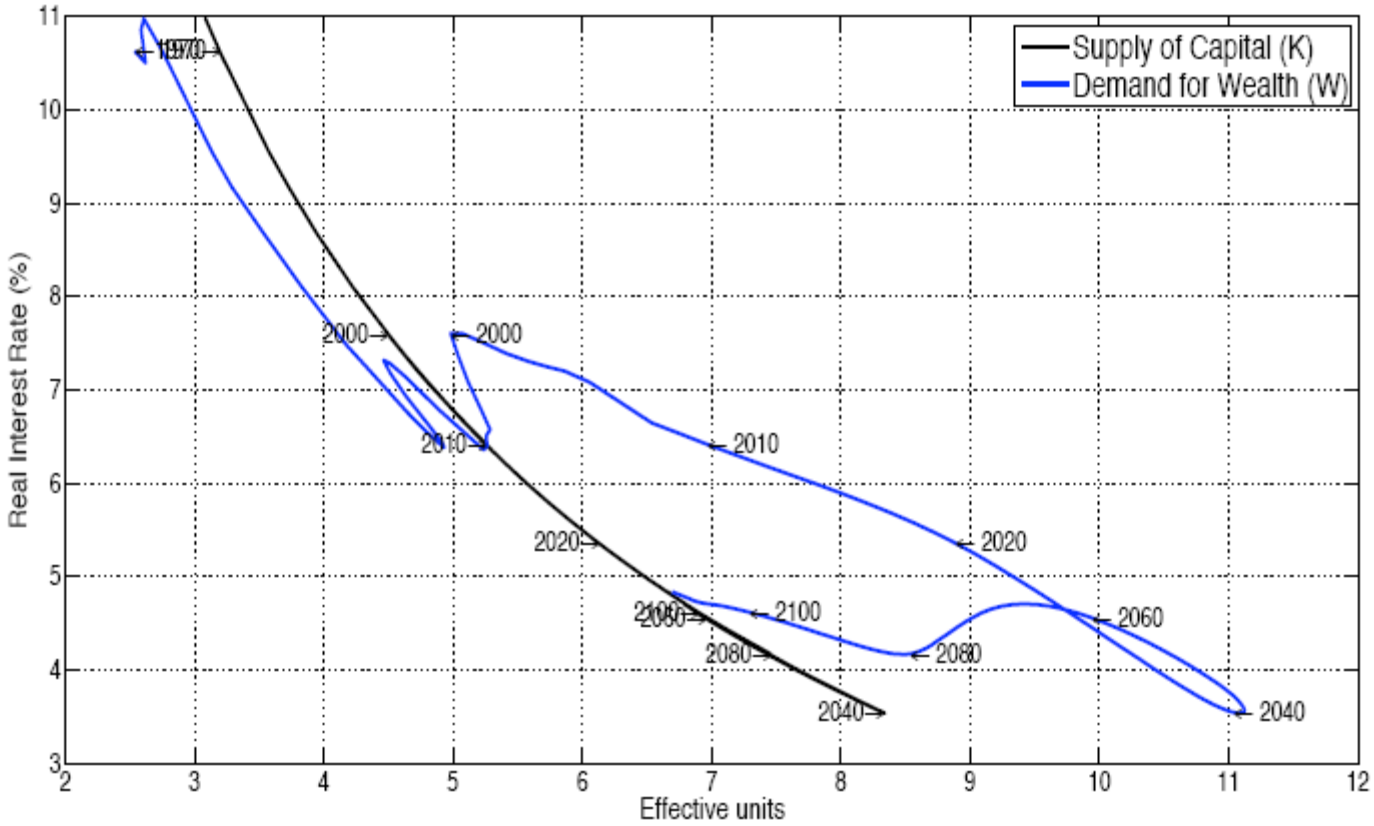


Figure 6: Equilibrium Interest Rate and Demand for Wealth (Total and Real): Spain, 1970-2120.

Conclusion

- Provided the set of transfers by age in 2000 is maintained in the past/future
- The Spanish baby-boom/bust coupled with the generous pension benefits will lead to a progressive decline in the standards (a decrease in disposable income of 6% from 2010 to 2040).
  - Effective capital increases as population at working ages decreases (even with migration) (second demographic dividend, Mason and Lee, 2006).
  - But this is not permanent Thus, salaries and effective capital will decrease, yielding lower aggregate consumption and higher interest rates.
  - Defined benefit pension system implies the
  - On the one side, baby boomers benefit from the current social security system, receiving high benetfis relative to their contributions.
  - On the other side, the baby-bust generation deplete capital, because they receive large amounts of inter-vivos transfers from their parents (baby boomers) relative to what they leave to their children.