Projecting Pension Expenditure in Spain: On Uncertainty, Communication and Transparency

Rafael Doménech and Ángel Melguizo
Economic Bureau of the Prime Minister, Spain

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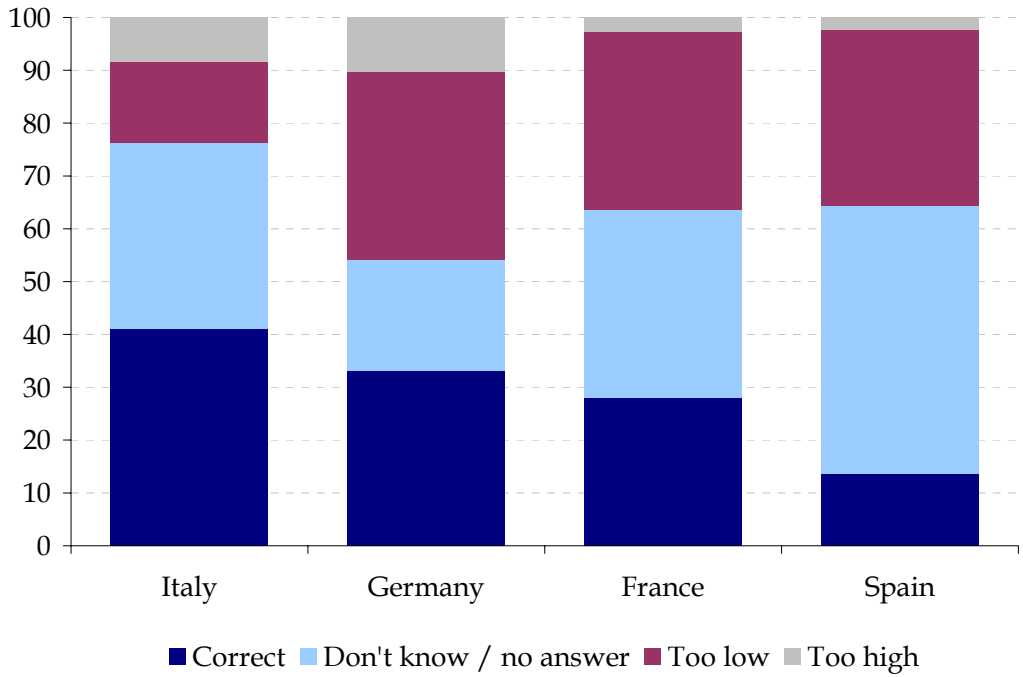
Motivation

Figure 1. Knowledge about the pension contribution rate

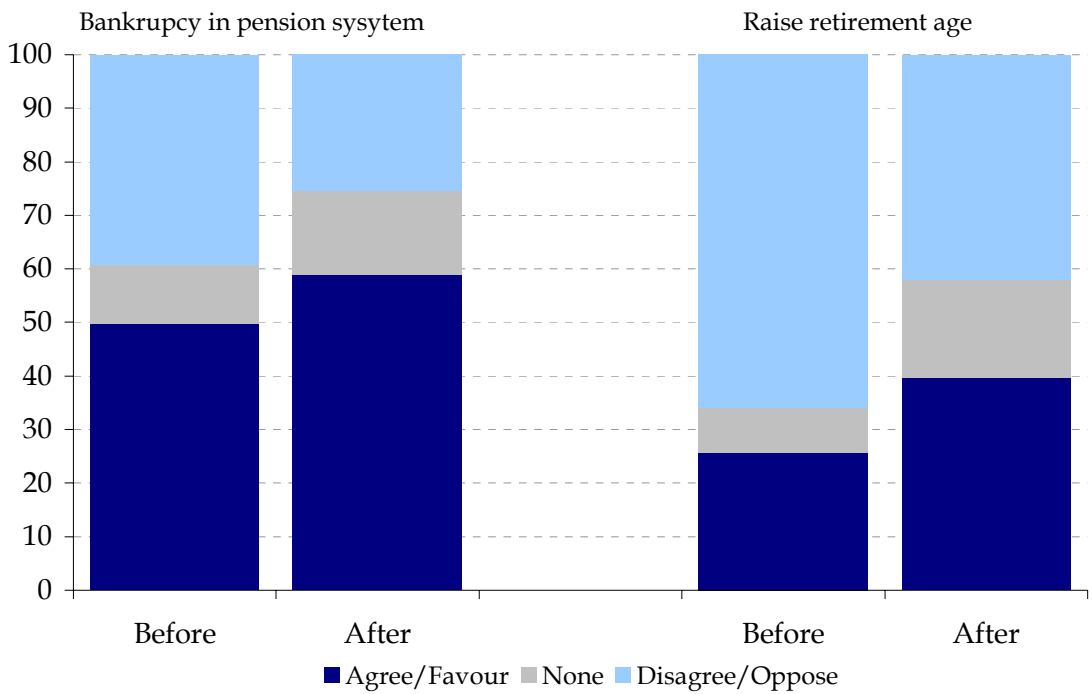


Source: Boeri, Börsch-Supan and Tabellini (2001)

- The significant advances in the literature on the effects of ageing upon pension expenditures contrast with the lack of knowledge among non-specialists.
- This lack of knowledge is visible even in basic issues (social contributions rate, PAYG functioning, etc.).

Motivation

Figure 2. Opinions on pension reform before and after deliberations



Source: Tomorrow's Europe Deliberative Poll (2007)

- However, despite this high lack of knowledge, citizens demand information.
- Support for reforms, even among those who bear their short-term costs, significantly increases (or opposition decreases) with more information.
  ➔ Communication is crucial to implement reforms.

Motivation

Economists should **improve their communication** strategies in order to increase the society's understanding of the implications of ageing:

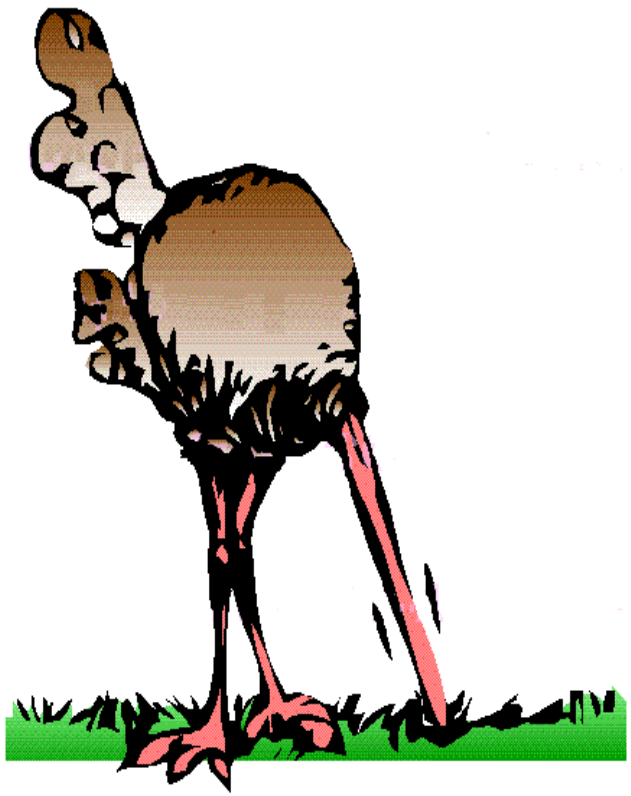
- Agree on a common set of indicators on the social security outlook.
- Confidence intervals: projection errors should not justify inaction.

The **aim of this paper** is to suggest a set of indicators and a suitable method of representing their uncertainty to improve the communication strategies, taking the Spanish public pension system as workhorse.

Motivation

Spanish pension system is particularly interesting for several reasons:

- in surplus since 1999, in contrast to previous projections,
- projection errors are used to avoid the discussion about the future of the system,
- Spanish economy has benefit from an unpredicted supply shock,
- however, most projections predict one of the highest increases in public expenditure among EU countries due to ageing,
- the discussion about the challenges of the Spanish system has been less far-reaching than in other European economies.



Outline

1. Projection methodology.

2. Results.

3. Policy implications.

4. Concluding remarks.

1. Projection methodology: Aggregate accounting

- We opt for the aggregate accounting methodology (instead of life-cycle or general equilibrium models) based on its popularity (AWG, CBO) and simplicity.

- Public pensions expenditures over GDP can be decomposed in institutional, socio-economic and demographic factors based on:

$$\frac{G_t^{pens}}{P_t GDP_t} \equiv \frac{L_t^{pens}}{L_t^{+65}} \frac{L_t^{+65}}{L_t^{16-64}} \frac{L_t^{16-64}}{L_t^{s}} \frac{1}{1-u_t} \frac{\left(\frac{G_t^{pens}}{P_t L_t^{pens}} \right)}{\left(\frac{GDP_t}{L_t} \right)}$$

  - Take-up ratio: proxy of the pension system coverage (institutional rules).
  - Old-age dependency ratio (demography).
  - Employment rate: participation and unemployment (socio-economy).
  - Benefit ratio: real average pension over productivity (institutional rules and macro).

1. Projection methodology
Data and assumptions: demography

Table 1. Main projection assumptions

Demographic scenarios		
	Demo 1	Own elaboration, based on Eurostat (2004)
	Demo 2	INE (2008) and own elaboration
	Demo 3	Own elaboration, based on INE (2005)
Socio-economic scenarios		
	Macro 1	Constant participation rates from 2010
		Constant unemployment rates from 2010
	Macro 2	2006 Swedish participation rates in 2030
		2006 US unemployment rates in 2030
	Macro 3	2006 Swedish participation rates in 2060
		2006 US unemployment rates in 2060
Institutional scenarios		
	Institut 1	Pension increases over productivity (13%, as 1996-2006)
	Institut 2	Constant benefit ratio from 2025
	Institut 3	Pension decreases over productivity (-13%)
Common assumptions		
	Short-term macroeconomic scenario 2007-2010: Stability programme	
	Productivity growth: 1,5 per cent from 2015	
	Convergence to unitary take-up ratio in 2060	
	Constant social taxes over GDP from 2006	

- We use three alternative demographic scenarios. Fertility, mortality and migration assumptions are summarized in the dependency ratio.

1. Projection methodology
Data and assumptions: macroeconomy

Table 1. Main projection assumptions

Demographic scenarios		
	Demo 1	Own elaboration, based on Eurostat (2004)
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	Demo 3	Own elaboration, based on INE (2005)
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	Macro 1	Constant participation rates from 2010
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Common assumptions		
	Short-term macroeconomic scenario 2007-2010: Stability programme	
	Productivity growth: 1,5 per cent from 2015	
	Convergence to unitary take-up ratio in 2060	
	Constant social taxes over GDP from 2006	

- We define three alternative economic scenarios. Participation and unemployment rates, by age and sex, in Spain are set constant or converging with Nordic countries and US rates (in 2030 or 2060).

1. Projection methodology
Data and assumptions: institutions

Table 1. Main projection assumptions

Demographic scenarios	
Demo 1	Own elaboration, based on Eurostat (2004)
Demo 2	INE (2008) and own elaboration
Demo 3	Own elaboration, based on INE (2005)
Socio-economic scenarios	
Macro 1	Constant participation rates from 2010
	Constant unemployment rates from 2010
Macro 2	2006 Swedish participation rates in 2030
	2006 US unemployment rates in 2030
Macro 3	2006 Swedish participation rates in 2060
	2006 US unemployment rates in 2060
Institutional scenarios	
Institut 1	Pension increases over productivity (13%, as 1996-2006)
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Institut 3	Pension decreases over productivity (-13%)
Common assumptions	
Short-term macroeconomic scenario 2007-2010: Stability programme	
Productivity growth: 1,5 per cent from 2015	
Convergence to unitary take-up ratio in 2060	
Constant social taxes over GDP from 2006	

- We use three alternative institutional scenarios, which differ in pension levels over productivity (increasing, constant or decreasing benefit ratio).
- Our approach is respectful with the main institutional features of the Spanish pension system (contributions, fund, financing sources, pension categories).

Outline

1. Projection methodology.

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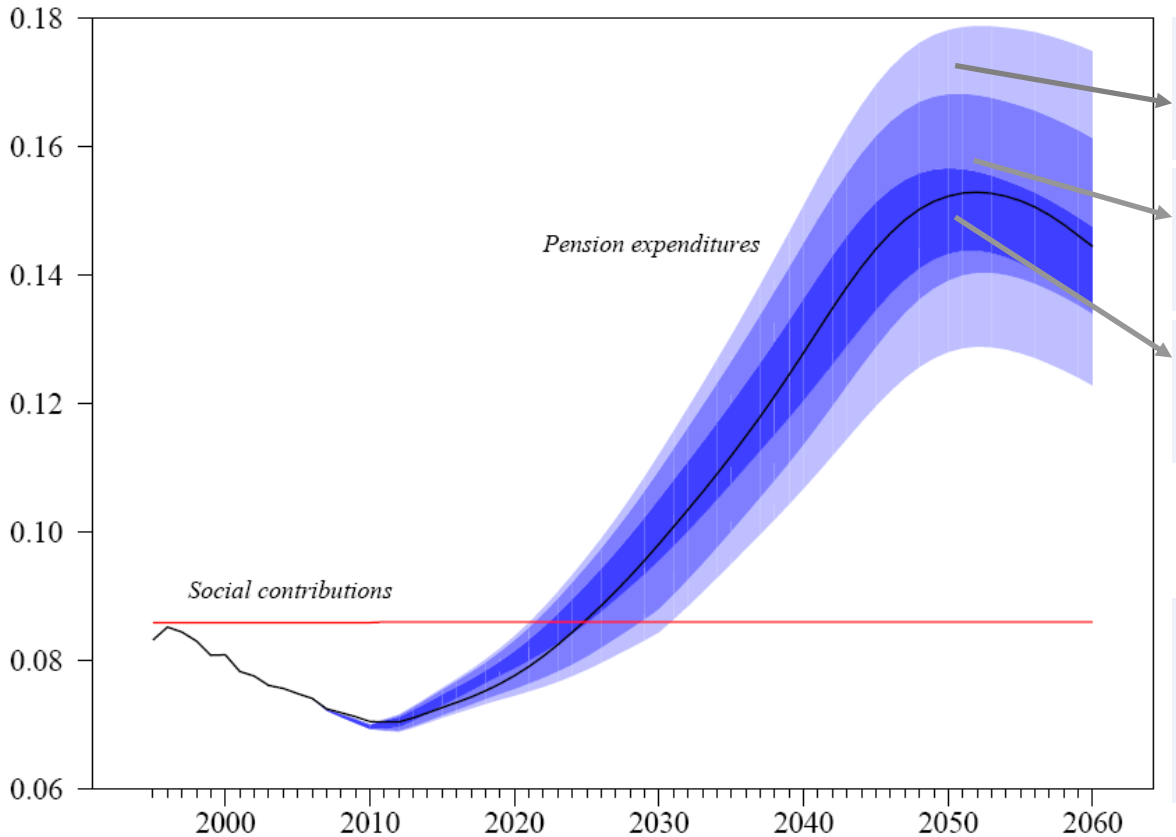
2. Results: Pension expenditure scenarios, Spain 2006-2060

Figure 4. Public pension expenditure projections, 1995-2060
(GDP share)



1. Institutions: pension level.
2. Socio-economics: employment rate.
3. Demography: dependency ratio.

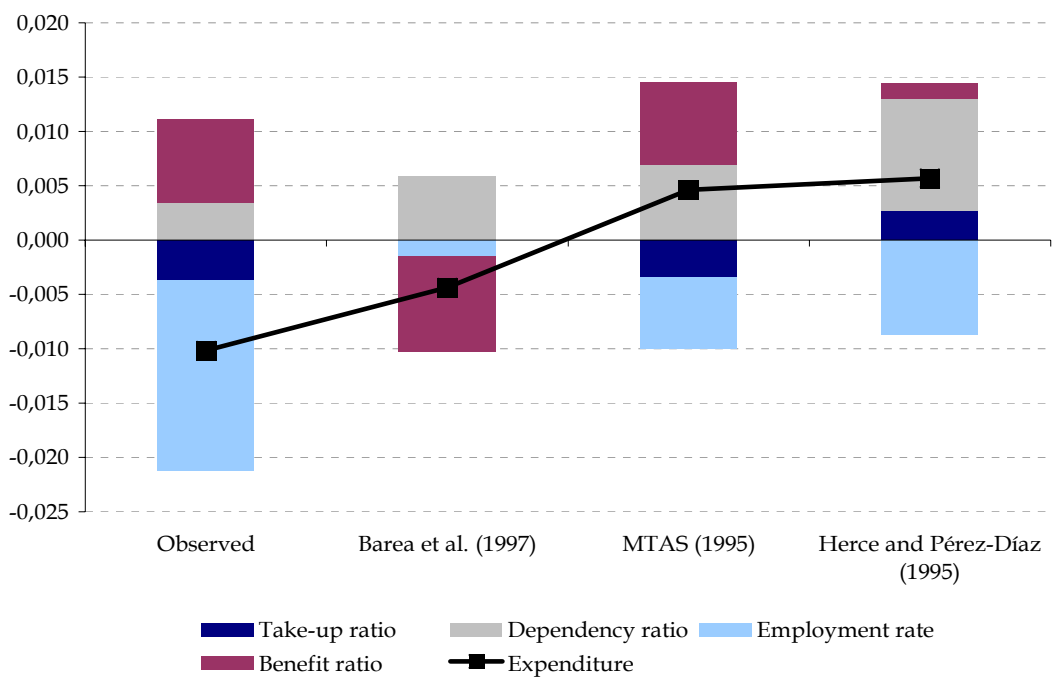
This approach is similar to **fan charts**, very popular for inflation forecasts.

- Within all the plausible assumptions, public pension expenditure in Spain will exceed contributions in the next 15 to 25 years.

2. Results: Pension expenditure, Spain 1996-2006

Social security is in better shape that expected in the 90s. What went *right*?

Figure 8. Actual and projected pension expenditure, 1996-2006
(1996-2006 difference, GDP share)



- We apply the decomposition backwards (1996-2006).
- Deviations stem from a labour supply shock: lower than expected productivity growth (higher benefit ratio) and higher than expected employment rate (**socio-economic component**).

Outline

1. Projection methodology.

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3. Policy implications
Projections, transparency and indicators

1. It should be stressed that these **projections should not be done only when a reform is inevitable**. Instead, they are meant to:

- anticipate challenges, preventing problems hat may arise in the future,
- simulate alternative reforms, to make people better-off,
- increase the transparency of the pension system,

➔ in sum, they strength and reinforce the social safety nets.

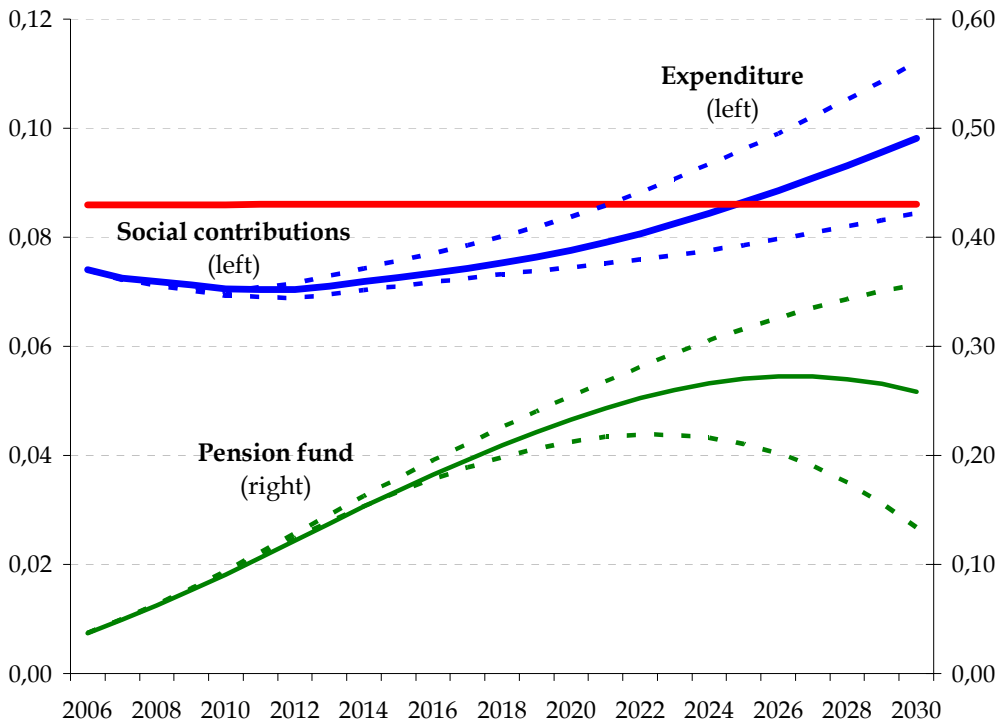
2. It is of the utmost importance to **agree on a set of indicators**. They may display some characteristics (similar to those established in the fiscal rules literature):

- Simplicity: easy to understand by the public opinion.
- Transparency: reproducible.
- Credibility: both of institutions and projections.
- Publicity and periodicity: as a way to improve communication.

3. Policy implications
Indicators for Spain 2006-2006

3. Communication will improve if indicators are accompanied by measures of the surrounding **uncertainty** (from assumptions or based on statistical methods).

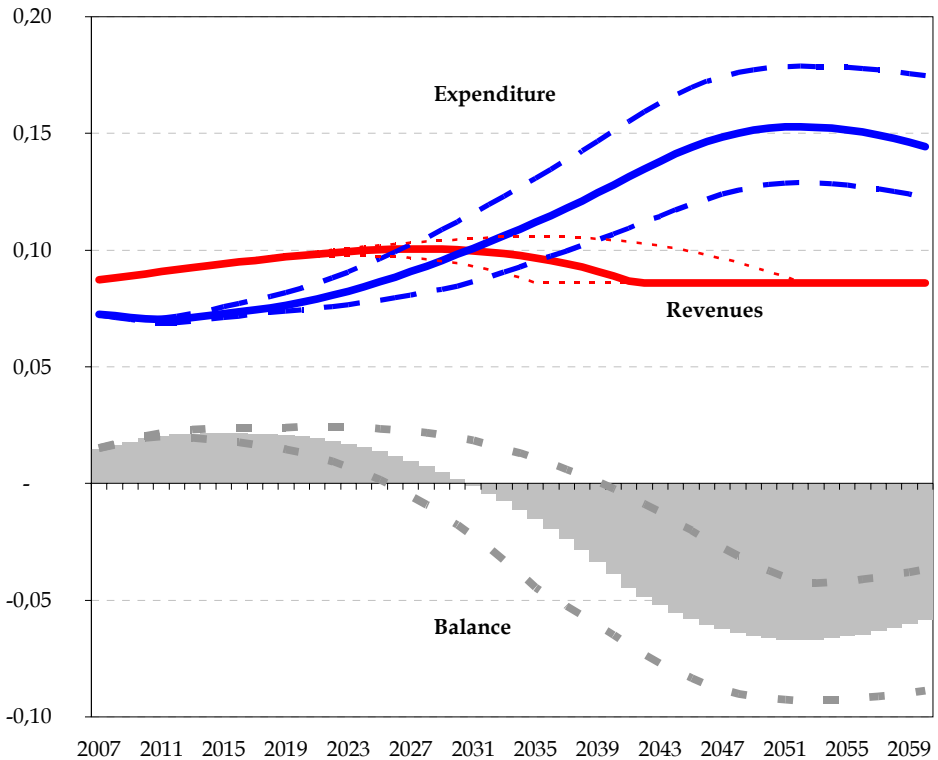
Figure 9. Medium-term indicator
(Central and high/low expenditure scenarios, GDP share)



- Medium-term indicator: will the system be in red? And, if that is the case, will the reserve fund be capable to finance it?

3. Policy implications
Indicators for Spain 2006-2006

Figure 10. Long-term indicator
(Central and high/low expenditure scenarios, GDP share, 2007 present value)



- Long-term indicator: what is the actuarial imbalance of the system? And, how much should pensions or contributions be modified to close it?

3. Policy implications
Indicators for Spain 2006-2006

Table 3. Summary indicators of the pension system

(Central and high/low expenditure scenarios scenarios)

	High-expenditure	Central	Low-Expenditure
Key facts			
Year Expenditure > Revenues	2022	2025	2031
Year Fund=0	2035	2041	2052
Accumulated debt until 2060			
(annual GDP share)	2,6%	1,1%	-0,5%
(2007 GDP share)	98,7%	47,2%	-21,6%
Necessary adjustment(from 2009)			
Revenues (annual)	1,06%	0,45%	-0,17%
Expenditure (annual)	-0,85%	-0,35%	0,13%

- A table summarizing this set of indicators should be published and discussed every year (as is done in the US, by the Trustees).

Outline

1. Projection methodology.

2. Results.

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4. Concluding remarks.

4. Concluding remarks: On communication and indicators

1. There have been **great advances** in public pension projections, but some significant **improvements remain to be done:**

- Dealing with uncertainty (stemming from demography, socio-economy and rules).
- Improving communication (non-technical diffusion of the results).
- Increasing transparency.

2. It should be stressed that pension projections are not made to dismantle the system, it is precisely the opposite: **they are made to strength the system.**

"The biggest risk now facing Social Security is political. Should we consider modest reforms that reduce the expenses or widen the revenue base of Social Security? Sure. But beware of those who claim that we must destroy the system in order to save it. "

Paul Krugman, *New York Times*, May 3, 2004

4. Concluding remarks: On communication and indicators

3. We have suggested a **set of indicators** about the future performance of the Spanish public pension system and a **suitable method** of representing their uncertainty (based on assumption ranges).

- Simplicity: easy to understand by the public opinion.
- Transparency: reproducible.
- Credibility: both of institutions and projections.
- Publicity and periodicity: as a way to improve communication.

- Illustrated for Spain (1996-2006 and 2006-2060)

4. **Further work** is needed:

- Additional indicators (open and closed-group unfunded liabilities, …)
- Instruments to simulate the effects of alternative reforms (incorporating agents' behaviour).
- Extension to other social expenditures.
- Institutional design: rules vs. institutions.

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Annex: methodology

Demography (INE and own elaboration): Population and L16-64

Macroeconomy (MEH and own elaboration): Participation, unemployment, productivity, prices, interest rates

→ GDP and employment

Institutions (no policy change): benefit and take-up ratios

→ Revenues and expenditure

Annex: coverage

Analysis of the contributory public pension system:

- Included pensions: permanent disability, old-age, early retirement and survivors benefits (excluded unemployment benefits, voluntary pensions and non-contributory pensions)
- Social contributions devoted to public pension financing (Spanish Social Security administration estimate)
- Minimum complement fully financed by general revenues from 2012 (*Acuerdo para la mejora y el desarrollo del sistema de protección social*, April 2001)
- Pension fund

Annex: recent reforms

Recent social security reform in Spain
Main contents and potential impact

	Contributions	Expenditure	
		Take-up	Benefit ratio
Temporal disability			
Stricter administrative control	0	--	0
Permanent disability			
Uniformization with retirement pension rules	0	--	--
Retirement pensions			
Minimum eligibility contribution period			
(from 4.700 to 5.475 days)	+	--	0
Stricter criteria for partial retirement			
61 years (from 60)	0	--	0
Contribution period (30 years, form 15)	+	--	0
6 years in the firm	0	--	0
Minimum work-week (from 15% to 25%)	+	0	--
Higher bonuses to extend working life			
Survivors pensions			
Elegibility for common-law marriages	0	+	0

Annex: assumptions

Table A1. Main socio-economic assumptions

Central scenario	2006	2010	2030	2060
Participation rate				
Total	72,2%	75,5%	75,4%	80,0%
Female	61,8%	66,9%	69,1%	77,9%
Male	82,4%	84,0%	81,5%	82,1%
Unemployment rate				
Total	8,3%	7,7%	6,4%	4,0%
Female	11,4%	10,5%	8,0%	3,9%
Male	6,1%	5,6%	5,1%	4,1%

Source: INE and own elaboration

Table A2. Per capita income growth decomposition, 1996-2060

Central scenario, average annual growth, p.p.	GDP/Lpop	GDP/L	L/LS	Ls/L16-64	L16-64/Lpop	GDP	Lpop
1996-2006	2,3	0,1	0,4	1,7	0,1	3,5	1,2
2007-2010	2,1	0,9	-0,2	1,1	0,3	3,3	1,1
2010-2015	1,9	1,3	-0,1	0,3	0,2	2,5	0,7
2015-2020	1,7	1,5	0,1	0,1	0,1	2,2	0,5
2020-2025	1,5	1,5	0,1	0,0	-0,1	1,8	0,3
2025-2030	1,4	1,5	0,1	0,1	-0,2	1,6	0,2
2030-2035	1,3	1,5	0,1	0,2	-0,5	1,4	0,1
2035-2040	1,2	1,5	0,1	0,5	-0,8	1,3	0,1
2040-2045	1,2	1,5	0,1	0,6	-1,0	1,2	0,0
2045-2050	1,4	1,5	0,1	0,5	-0,7	1,3	-0,1
2050-2055	1,7	1,5	0,1	0,4	-0,2	1,4	-0,3
2055-2060	1,9	1,5	0,1	0,2	0,1	1,5	-0,4

Source: INE and own elaboration

Annex: assumptions

Table A3. Institutional assumptions. Recent developments and projections (I)

Take-up ratio: Lpens / L+65				
	Observed	Central	MTAS (2005)	EPC (2006)
1996	1,19			
2006	1,14			
2010		1,13	1,10	1,18
2020		1,10	1,09	1,16
2030		1,08	1,02	1,14
2040		1,05	0,96	1,08
2050		1,03	0,93	1,00
2060		1,00	---	---
Average	1,15	1,06	1,02	1,11

Source: INE, Ministerio de Trabajo y Asuntos Sociales and own elaboration

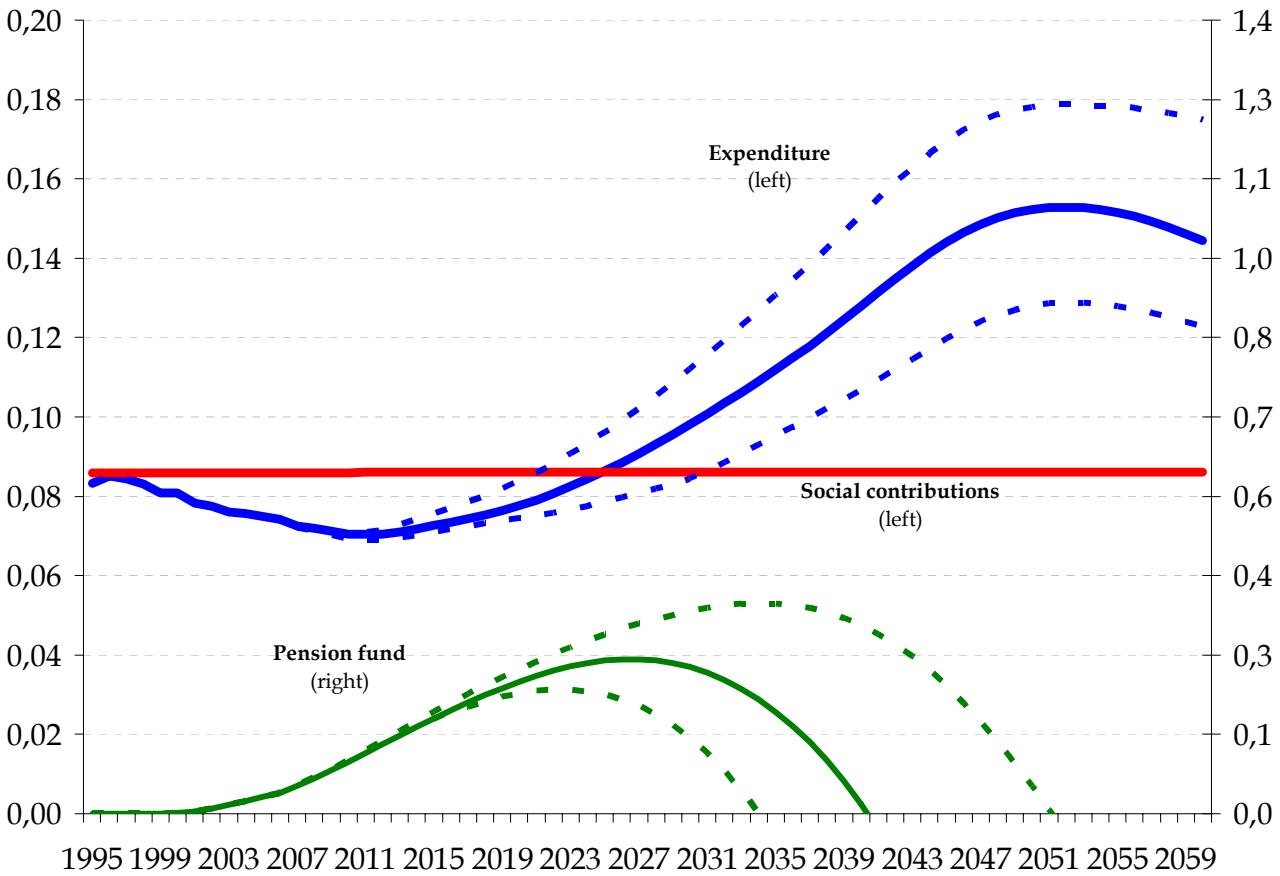
Table A4. Institutional assumptions. Recent developments and projections (II)

Average real pension increase (Gpens/pLpens)				
	Observed	Central	MTAS (2005)	EPC (2006)
1996	2,10			
2006	2,06			
2010		1,85	2,30	1,37
2020		1,76	1,67	1,90
2030		1,67	1,80	1,90
2040		1,77	1,70	1,70
2050		1,70	1,50	1,42
2060		1,56	---	---
Average	1,88	1,72	1,79	1,67

Source: INE, Ministerio de Trabajo y Asuntos Sociales and own elaboration

Figure 5. Public pension expenditure and social contributions, 1995-2060

(Central and high/low expenditure scenarios, GDP shares)



Source: INE, Ministerio de Trabajo y Asuntos Sociales and own elaboration

Annex: results

Table 2. Public pension expenditure projection, 2006-2060

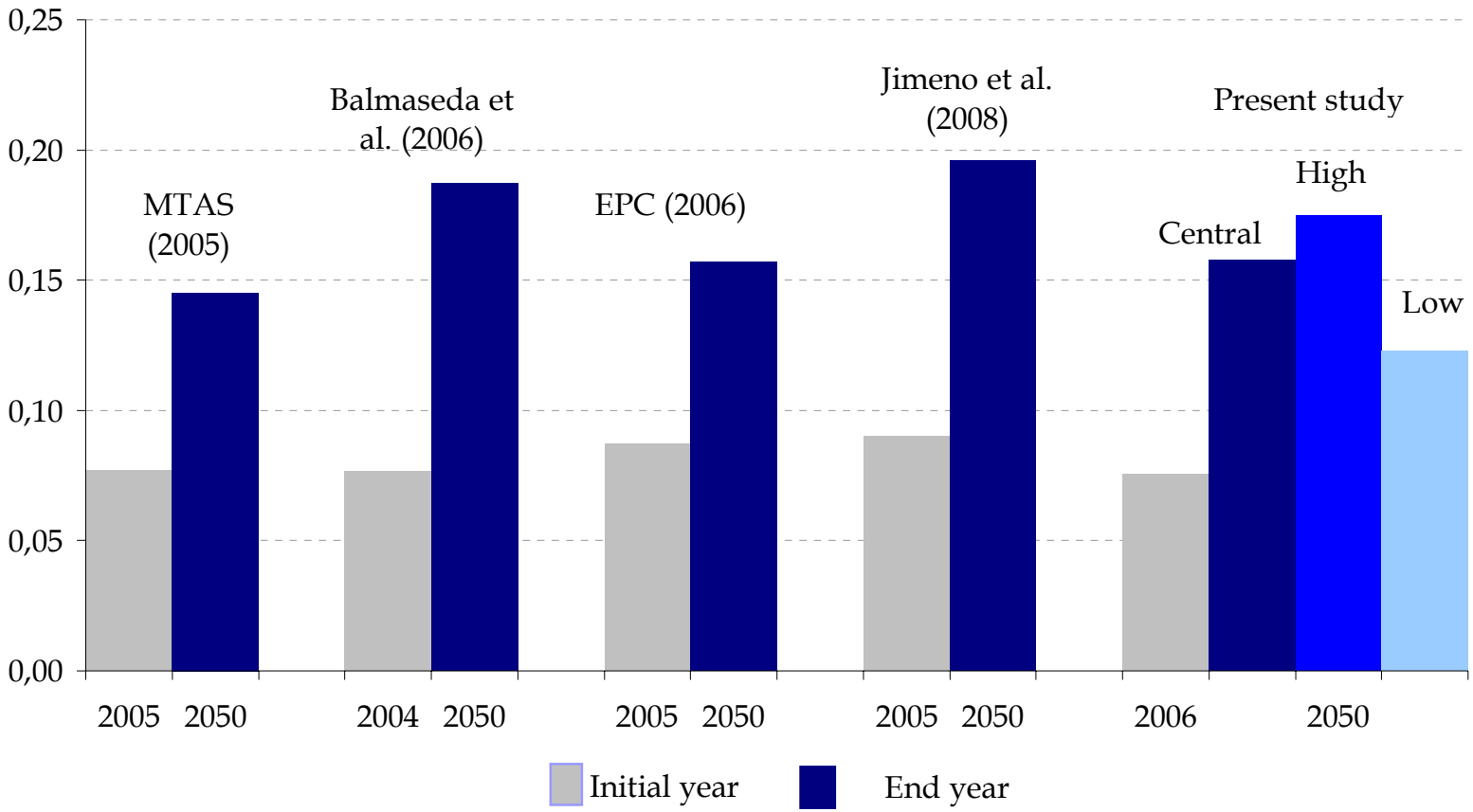
	Expenditure	Pensions / Workers				Benefit ratio
	GDP share	Take-up ratio	Dependency ratio	Employment rate		
	Gpens/P*GDP	**Lpens / L**	Lpens / L+65	L+65/L16-64	L16-64/LS	1 / (1-u)	(Gpens/P*Lpens) / (GDP/L)
Central scenario							
2006	7,6%	0,45	1,14	0,24	1,50	1,09	0,17
2015	7,8%	0,45	1,11	0,26	1,46	1,08	0,17
2030	10,4%	0,58	1,08	0,35	1,47	1,07	0,18
2045	14,9%	0,84	1,04	0,54	1,42	1,05	0,18
2060	15,0%	0,85	1,00	0,59	1,38	1,04	0,18
High expenditure scenario							
2006	7,6%	0,45	1,14	0,24	1,50	1,09	0,17
2015	8,1%	0,46	1,11	0,27	1,41	1,09	0,17
2030	11,7%	0,65	1,08	0,38	1,47	1,09	0,18
2045	17,5%	0,94	1,04	0,58	1,44	1,09	0,19
2060	18,0%	0,94	1,00	0,60	1,44	1,09	0,19
Low expenditure scenario							
2006	7,6%	0,45	1,14	0,24	1,50	1,09	0,17
2015	7,6%	0,44	1,11	0,26	1,42	1,07	0,17
2030	9,0%	0,53	1,08	0,34	1,39	1,04	0,17
2045	12,5%	0,76	1,04	0,50	1,40	1,04	0,16
2060	12,8%	0,79	1,00	0,53	1,42	1,04	0,16

Note: Expenditure figures include minimum pensions complement

Source: INE, Ministerio de Trabajo y Asuntos Sociales and own elaboration

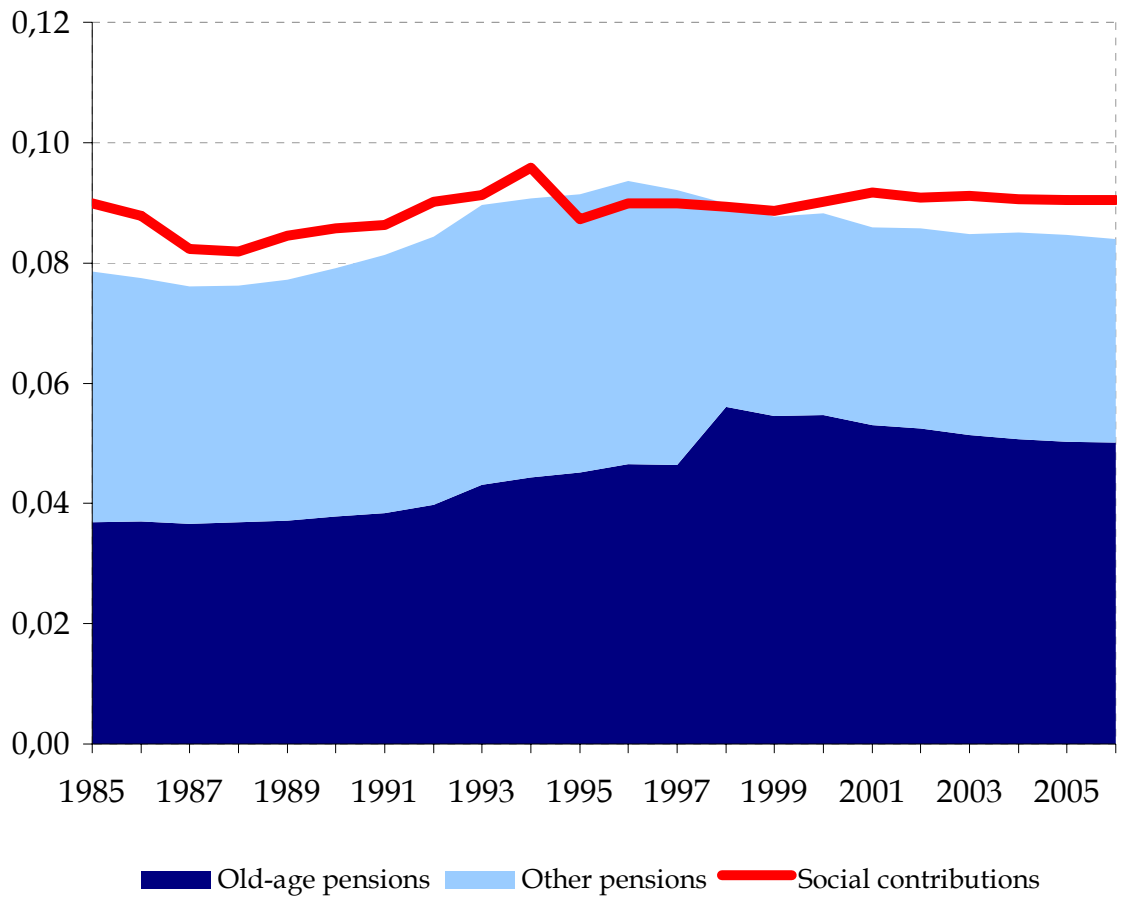
Figure 6. Public pension expenditure projections

(GDP share)



Annex: a bright recent past

Figure 7. Public pension expenditure and social contributions, 1985-2006
(GDP share)



Source: INE and Ministerio de Trabajo y Asuntos Sociales