Instruments for improving the equity, transparency and sustainability of pay-as-you-go pension systems (1)

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1. MOTIVATION BEHIND THE PHD THESIS

One of the main problems facing the defined-benefit pay-as-you-go pension system is the political risk to which it is subject, a risk which should be understood along the lines as defined by Diamond (1994), referring basically to decisions taken by politicians tied to their traditional planning horizon (maximum four years), which is clearly much shorter than the planning horizon of the pay-as-you-go pension system.

The most negative face of political risk is what Valdés-Prieto (2006) terms «populism in pensions». Populism as regards pensions is defined as a form of competition between politicians in which voters are offered subsidies or higher pensions without appreciating that it is they themselves who will pay through higher taxes, higher contributions, higher inflation or lower economic growth. Once the elections are over, the populist politician presumably obtains his more or less ephemeral reward, but the cost to the pension system becomes structural.

Besley & Prat (2005) explain that another big problem for public (and private) pension systems is their inability to develop a credible institutional framework for contributors and pensioners in that promises of payment may be reasonably respected. Boeri *et al.* (2001) note that the European pay-as-you-go pension model suffers from serious credibility problems, and the public system in Spain is no exception. Holzmann (2007) claims that constant tinkering with parametric reforms lowers the credibility of pension systems. This credibility problem may be associated with what is known as reputational risk, which can be the result of actions that help give pension systems a bad image and give contributors a reason not to contribute or to change to other systems, should that option be available to them.

The growing social demand for transparency in the financial management of public and mandatory systems, the advantages of immunising the pay-as-you-go system against some of the political risk it faces, and the desire to gain credibility among participants (contributors and pensioners) by reconciling their expectations to the economic realities of the pension plan all call

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for new management tools to be applied to the pay-as-you-go pension system.

The actuarial balance sheet, notional defined-contribution accounts (NDCs) and automatic balance mechanisms provide a suitable answer to all these three issues and also supply a positive incentive to improve financial management by eliminating or at least minimising the traditional difference between the planning horizons of electors, politicians and the system itself.

2. OBJECTIVES

The main objectives of this PhD thesis, which also determine its three-chapter form, are as follows:

1. To demonstrate, by indirect means, the actuarial (im)balance of the Spanish pension system in its current configuration.
2. To measure the degree of aggregate economic risk to which pensioners would be exposed when applying formulae for calculating retirement pensions based on notional accounts.
3. To show the usefulness of the actuarial balance sheet as an indicator of the transparency, solvency, sustainability or financial solidity of any pay-as-you-go pension system, and as an instrument capable of providing positive incentives to improve financial management by eliminating or at least reducing the traditional difference between the planning horizons of politicians and the system itself.
4. To compile an actuarial balance sheet for the Spanish contributory retirement pension system for the years 2001-2006, based on official figures.
5. To show the usefulness of the automatic balance mechanisms (ABMs).
6. To determine the advisability of applying an automatic balance mechanism in the Spanish public contributory retirement pension system so as to adjust or stabilise it with the aim of guiding it onto the road to long-term financial stability and neutralising the effects of ageing, changes in socio-economic conditions and the persistent increase in longevity and reducing populism in pensions.

The first two objectives are included in the first chapter of the thesis. The second chapter covers the third and fourth objectives, while the last two objectives are dealt with in the third chapter.

3. MAIN CONTRIBUTIONS

Chapter 1 is directly related to the paper by Vidal-Meliá *et al.* (2006) and shares a common aim, that of measuring the degree of aggregate economic risk to which the pensioner would be exposed when applying formulae for calculating retirement pensions based on notional accounts.

This chapter aims to perfect the scenario generation technique used for projecting macroeconomic indices by adjusting the future stochastic process to the past stochastic process for the variation in GDP and salaries. In addition, the number of possible scenarios that could arise each year for each formula for calculating pension is increased to ten thousand in order for the results to gain in robustness. Also, three new, more up-to-date projections are used as average values for determining the fate of the indicators from Alonso and Herce (2003), MTAS (2005) and EU (2005).

The utility of the pension is also analysed in both objective and subjective terms, taking the individual's risk aversion into account.

The message to be understood from the results of this chapter is clear. If the projections used are even minimally close to the truth, the pension system in its current configuration will accumulate a major additional financial imbalance in the future, which, to be resolved, would require either a considerable reduction in the initial pension or a combination of severe parameter adjustments.

Another aspect connected to the paper by Vidal-Meliá *et al.* (2006) is that a sensitivity analysis is carried out of the anticipated and unanticipated changes in survival rates, expected average growth and the base macroeconomic projection.

Chapter 2 shows the usefulness of the actuarial balance sheet as an indicator of the solvency, sustainability or financial solidity of any pay-as-you-go financed pension system. The actuarial balance sheet is an instrument that may also

supply a positive incentive to improve the financial management of social security by minimising the difference between the planning horizon of politicians and that of the system itself. With that aim the chapter develops the main accounting entries, placing special emphasis on the most novel entries on the pay-as-you-go balance sheet, known as the *Contribution Asset* and the *Hidden Asset*.

On a theoretical level, both concepts are compared and explained, and an analysis of the Contribution Asset is developed for the case of a defined-benefit pay-as-you-go system. Chapter 2 also proves, for the case of an overlapping generations model in the stationary state described, that the Contribution Asset and the Hidden Asset could coincide when *r* (rate of interest) = G (growth in the wage bill). By definition the Contribution Asset is not dependent on the interest rate in the financial market. The Hidden Asset, in contrast, despite being applied to the pay-as-you-go system, must use the discount rate observed in the financial markets in order to be determined in dynamically efficient economies. The Hidden Asset is a more theoretical or academic concept and is difficult to apply when compiling an actuarial balance sheet using real data. In situations where there is an imbalance in the pension system, it is not a good indicator of the system's solvency.

On the applied side, this chapter offers the first estimate, based on official data, of the actuarial balance sheet of the Spanish pay-as-you-go contributory retirement pension system so as to provide an additional solvency indicator for the system. The balance sheet for the Spanish pension system is a novelty since there is only one country —Sweden since 2001— which presents one periodically. This chapter also includes a comparative study of the Swedish actuarial balance sheet (published officially by the Swedish Social Security Administration) and the Spanish actuarial balance sheet (estimated by the author, based on official figures) for the years 2001-2006.

Finally, Chapter 3 deals with the trend in some advanced countries of attempting to apply the actuarial solvency analysis methodology to the field of public pay-as-you-go pension system management. This chapter contains a precise definition of the concept of the automatic balance mechanism as applied to pension systems and an analysis of the mechanisms used in Sweden, Canada, Germany, Japan and Finland.

The automatic balance mechanism (ABM) is a set of predetermined measures established by law to be applied immediately as required according to the solvency or sustainability indicator. Its purpose, through successive application, is to re-establish the financial equilibrium of pay-as-you-go pension systems with the aim of making those systems viable without the repeated intervention of the legislators.

The main contribution of this chapter is of the applied type, since it provides detailed options for the design of a mechanism in the case of Spain: The mechanism should be of the hard response type, in which pensions are reduced and contributions increased simultaneously. The mechanism would need to set a more sustainable, realistic and equitable actuarial structure for the pension system: 40-45 (years of contributions and full working life), 65-70 (retirement age), 80-85 (theoretical replacement rate)— which would restore balance by reducing the expected IRR for contributors.

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