THE NEW REVALUATION AND SUSTAINABILITY FACTOR OF THE SPANISH PENSION SYSTEM

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Introduction

The gradual ageing of the population foreseen in the demographic projections available for most developed countries will exert growing pressure on pension systems.[1] Spain is no exception here; the latest projections published by INE (National Statistics Institute) envisage a significant increase in the dependency ratio in the coming decades.

Specifically with a view to counteracting the impact of these demographic shifts, in recent years various pension reforms have been passed in Spain. In 2011, a gradual increase in the statutory retirement age and in the period used to calculate the amount of the pension (the "regulatory base") was introduced, among other changes. More recently, at the end of 2013, a reform was passed that establishes a new revaluation index and regulates the "sustainability factor".[2] Under this reform, from 2014 pensions will be adjusted according to the performance of variables pivotal to the Social Security system, such as revenue, expenditure and the number of pensions, replacing the former system, in force since 1997, which linked pensions to the rate of change of the CPI. Moreover, from 2019, starting pensions will be automatically linked to the increase in life expectancy (the sustainability factor).

This article describes this reform, placing it in context, and analyses its potential impact. In particular, the second section examines population ageing in Spain and the latest public pension reforms. The third section describes in detail the 2013 reform, while the last section analyses its effects and draws some conclusions.

Background to the reform

In recent decades Spain has undergone a radical demographic transformation, characterised by three factors: a sharp fall in the birth rate; higher life expectancy; and a shift in net migration which was highly positive in the years of economic growth but which has been negative since 2009. First, the birth rate, which has gradually fallen from over 18 births per 1,000 persons in 1975 to barely ten at present. INE projects that this rate will continue to decline, stabilising at around eight births per 1,000 persons in the long term.[3] Second, life expectancy, which has risen significantly in recent years and is expected to continue to do so in the future. Specifically, today's 65-year-olds can expect to live three years longer than those who were 65 in 1991, and five years less than those who will be 65 in 2050. Lastly, net migration, which was highly positive in the years 2000 to 2009 but then turned negative as the economic crisis unfolded.[4] In 2013 there was a net outflow of more than 250,000 immigrants, most of whom were working age. According to INE projections, between 2013 and 2022 there will be 2.5 million more emigrants than immigrants.

The combination of these three factors has transformed the Spanish population pyramid, which has gradually become narrower at the base and wider at the top. The projections available point to this process intensifying in the coming years (see Chart 1).

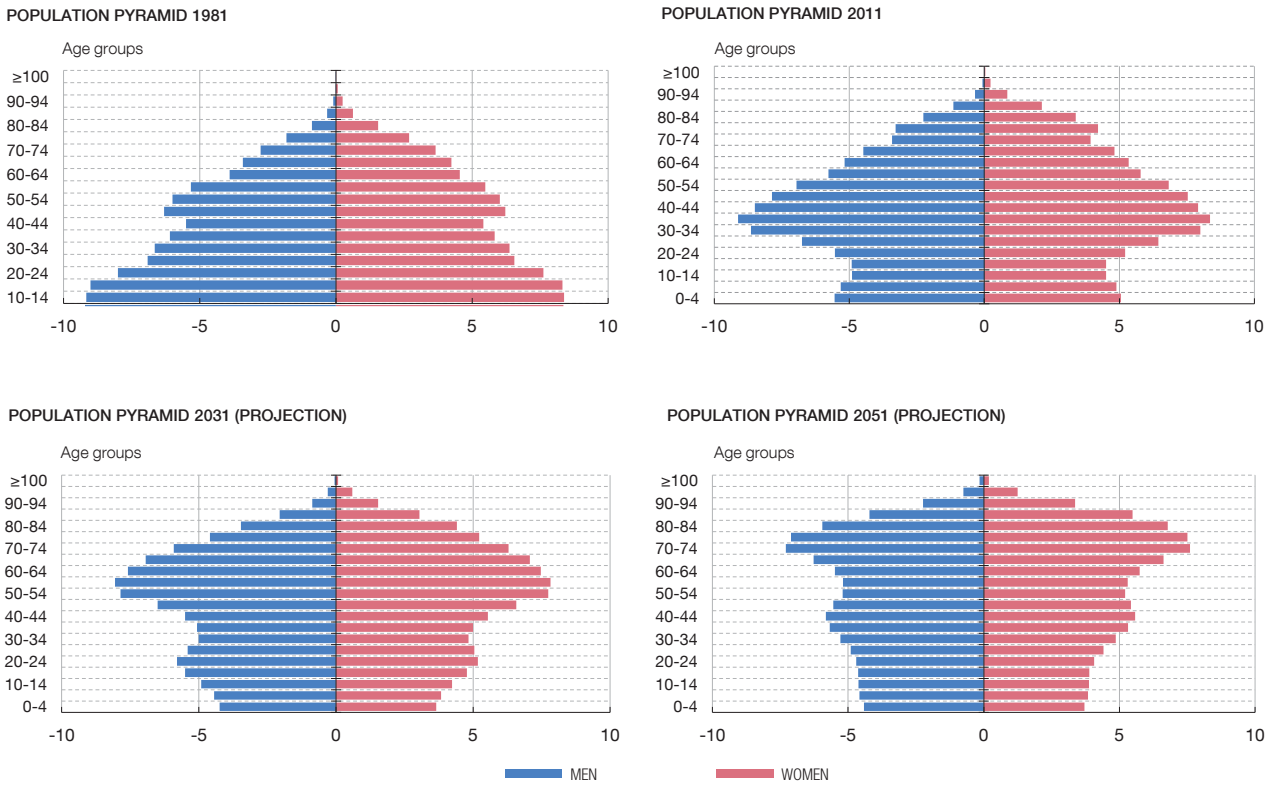
1 For example, in its 2012 report the European Commission's Working Group on Ageing Populations and Sustainability (AWG) estimated that pension expenditure in Spain would rise from 10.1% of GDP in 2010 to 13.7% in 2060.

2 Law 23/2013 of 23 December 2013 regulating the Sustainability Factor and the Revaluation Index of the Social Security Pensions System.

3 These estimates are taken from INE long-term population projections (2012-2052), mortality tables and short-term population projections (2013-2022).

4 According to INE inter-census population estimates, the percentage of foreign nationals in Spain rose from 4.2% in 2002 to peak at 11.7% in 2009. As of 1 January 2014 INE estimates that it was 10.1%.

SPANISH POPULATION PYRAMID: DEVELOPMENT AND PROJECTIONS CHART 1



SOURCES: Population and Housing Census and long-term population projections (INE).

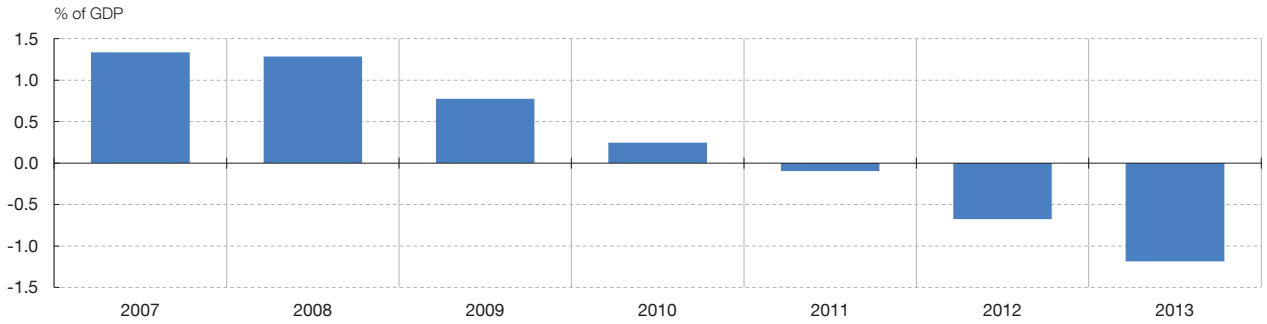
Furthermore, the Spanish pension system is a pay-as-you-go system, which means that the ratio between beneficiaries and contributors is crucial for its financial stability. The economic crisis has had a significant impact on the balance, as there has been a sharp fall in the number of contributors, together with an increase in pension expenditure, the latter less related to the business cycle. Accordingly, whereas in the mid-2000s the Social Security contributory system recorded a surplus of more than 1% of GDP, by 2013 there was a deficit of 1.2% of GDP (see Chart 2).[5] Looking ahead, the demographic projections described will adversely affect the ratio of beneficiaries to contributors, exacerbating the pattern seen in recent years: in 2011 there were 2.6 persons aged 65 or over for every 10 persons between 15 and 64, up from 1.8 in 1981. As the baby boomers (those born between the late 1950s and the mid-1960s) start to retire in 2025, the ratio will rise further. The dependency ratio[6] stood at 50% in early 2014 and is expected to rise to 64% in 2031 and to 96% in 2051. It should be noted, however, that these long-term projections are by their very nature shrouded in considerable uncertainty and may be subject to revision.

This was the backdrop for the 2011 and 2013 pension reforms, which sought to adapt the pension system to the changes witnessed in Spain's demographics and in the economic climate. Law 27/2011 of 1 August 2011 on the update, adaptation and modernisation of

5 The contributory balance has been estimated using yearly Social Security budget outturns. On the revenue side it includes total contributions (actual plus imputed contributions), charges and other revenue, profits and dividends, disposal of real investments, capital transfers and contributions to top up minimums. On the expenditure side, it includes expenditure on contributory benefits and pensions (retirement and other benefits and pensions), personnel expenditure, current expenditure on goods and services, interest payments, real investments and capital transfers. This definition of revenue and expenditure approximates one of the factors that determines the new revaluation index.

6 Defined as the ratio of those aged under 15 and over 64 to the population aged 15-64.

SOCIAL SECURITY CONTRIBUTORY SYSTEM BALANCE CHART 2



SOURCES: Banco de España, Ministry of Employment and Social Security and the National Audit Office.

the Social Security System (in force since 2013) significantly altered eligibility for retirement, for example by phasing in a gradual increase in the statutory retirement age (from 65 to 67) and in the period used to calculate the regulatory base (from 15 to 25 years), along with the need to have contributed for at least 37 years in order to receive a full pension. For its part, Royal Decree-Law 5/2013 of 15 March 2013, on measures fostering the continuity of older employees' working lives and promoting active ageing, amended, inter alia, eligibility for both partial and early retirement, linking it to the increase in the statutory retirement age. The estimates available on the impact of the 2011 reform point to a saving of 30%-40% in expected pension expenditure in the long term without these reform measures,[7] even though, if the demographic projections described are confirmed, these measures alone would not ensure the sustainability of the pension system.

The reform process has recently intensified with the enactment of Law 23/2013, which establishes a new mechanism for calculating the annual revaluation of pensions (from 2014) and introduces the sustainability factor into the pension system (from 2019). The revaluation index sets the annual pension increase using a formula based on the system's budget constraints. The sustainability factor is defined as an automatic mechanism that links the initial amount of retirement pensions to life expectancy. Both parts of the reform are described in detail in the following section of this article.

These reform measures have been adopted against a background of reforms introduced in numerous other developed countries in recent years, involving the introduction into their pension systems of different kinds of automatic revaluation mechanisms triggered by different variables (see Table 1). In most countries that operate with a sustainability factor, higher life expectancy is the variable that triggers the automatic adjustment (in starting pensions, the retirement age or other parameters of the system). In this respect Italy, Latvia, Norway, Poland and Sweden, which have notional defined-contribution accounts systems, are all noteworthy. These systems operate on an actuarial basis: workers' contributions throughout their working life are accumulated in a fictitious (notional) account to which a rate of return is applied according to demographic and/or economic variables, and it is this which determines the value of their pension when they retire. In Sweden there is also an automatic revaluation mechanism if the present value of the liabilities of the system exceeds the asset value.

7 Specifically, in its 2012-2015 Stability Programme Update, the Spanish government envisaged an estimated saving of approximately 40% of the projected increase in pension expenditure in the period 2010 to 2050 before the reform. De la Fuente and Doménech (2013) estimate a saving in 2050 of 33% of the expected pension expenditure without the reform, Conde-Ruiz and González (2013) calculate a saving of 29% and the Banco de España (2011) estimates a saving of 43%.

AUTOMATIC ADJUSTMENT MECHANISMS IN VARIOUS COUNTRIES

TABLE 1

Country	Sustainability factor	Who is affected?	Determinant variable	Variable adjusted	Revaluation depends on:
Germany	X	All pensioners	Wages, contributions and dependency ratio	Starting pension and revaluation	Wages, contributions and dependency ratio
Denmark	X	New pensioners	Life expectancy	Year of retirement	Wages
Spain	X	All pensioners	Life expectancy, revenue and expenditure of system, number of pensions and substitution effect	Starting pension and revaluation	Revenue and expenditure of system, number of pensions and substitution effect
Finland	X	New pensioners	Life expectancy	Starting pension	Prices and wages
France	X	New pensioners	Life expectancy	Starting pension and years needed to generate pension	Prices
Greece	X	New pensioners	Life expectancy	Year of retirement	GDP and prices
Netherlands	X	New pensioners	Life expectancy	Year of retirement	Wages
Hungary	X	Pensioners in the system	GDP, prices and wages	Revaluation	GDP, prices and wages
Italy	X	New pensioners (notional accounts)	Nominal GDP, life expectancy	Starting pension and year of retirement	Prices
Japan	X	All pensioners	Life expectancy and dependency ratio	Starting pension and revaluation	Prices, life expectancy and dependency ratio
Latvia	X	New pensioners (notional accounts)	Life expectancy	Starting pension	Prices
Norway	X	New pensioners (notional accounts)	Life expectancy	Starting pension	Wages
Poland	X	New pensioners (notional accounts)	Life expectancy	Starting pension	Prices and wages
Portugal	X	New pensioners	Life expectancy	Starting pension	GDP and prices
Czech Republic	X	New pensioners	Year of birth	Year of retirement	Prices and wages
Sweden	X	All pensioners (notional accounts)	Wages, GDP, contributions, liabilities and life expectancy	Starting pension and revaluation	Wages, GDP, contributions, liabilities and life expectancy

SOURCES: Report of the Committee of Experts on the sustainability factor of the public pension system, Report analysing the legislative impact of the draft bill regulating the sustainability factor and the revaluation index of the Social Security System, and the 2012 Ageing Report.

The 2013 reform

As indicated above, the December 2013 pension system reform was two-pronged: it established a new revaluation formula, replacing the former system which linked annual pension increases to the rate of change of the CPI; and it linked starting pensions to life expectancy (the sustainability factor). Both these changes are described in detail below.

REVALUATION INDEX

The new revaluation index determines the annual increase in contributory pensions, including the minimum pension, replacing from this year the arrangement in place up to 2013 and which linked pension increases to the CPI.[8]

8 Article 7 of Law 23/2013 establishes that pensions will increase in accordance with the revaluation index published in the corresponding State Budget Law. Nevertheless, Law 22/2013 of 23 December 2013, the State Budget Law for 2014, contains no mention of the revaluation index to be used to set the increase in pensions (established as 0.25%). Accordingly, the new revaluation index, with the publication of the factors to be used in its calculation, in accordance with Additional Provision One of Law 23/2013, will first apply for all effects and purposes in 2015.

The revaluation index is obtained from the budget constraints on the pension system, that is, from equating revenue to expenditure in year t+1,[9] by decomposing expenditure into three components (revaluation, number of pensions and the substitution effect) and setting moving averages to smooth the factors over the business cycle (see Box 1 for a detailed description of how the index is calculated).

Two practical considerations are called for regarding the implementation of the new revaluation index. First, the law establishes that the revaluation cannot result in a pension increase which is lower than 0.25% or higher than inflation+0.5 pp.

Second, as the components of the formula are in the form of averages centred on t+1, in order to calculate the revaluation index, future revenue and expenditure must be projected, up to the period t+6.[10] The law establishes that the macroeconomic framework needed to make these forecasts will be provided by the Ministry of Economic Affairs and Competitiveness. In turn, the Independent Authority for Fiscal Responsibility will deliver its opinion on the values calculated by the Ministry of Employment and Social Security for determination of the revaluation index and the sustainability factor in each year.

SUSTAINABILITY FACTOR

The second element of the reform, the sustainability factor, which will be applicable from 2019, consists in linking starting pensions to life expectancy. If life expectancy rises over time, the sustainability factor will mean that starting pensions will decline. For the 5-year period 2019-23 it will be calculated as follows:

$$FS_t = FS_{t-1}\left[\frac{e_{67}^{2012}}{e_{67}^{2017}}\right]^{\frac{1}{5}}$$

where FS_t is the sustainability factor in year t, FS_{2018} equals 1, and e^x_{67} is the life expectancy of a 67-year-old in year x.

For example, in 2019 the sustainability factor will be equal to the ratio of the life expectancy of a 67-year-old in 2012 to the life expectancy of a 67-year-old in 2017 (raised to a fraction of 1/5). Thus, if life expectancy rises between 2012 and 2017, the starting pension would decrease as a result of the application of the sustainability factor. In 2020 the sustainability factor will be that corresponding to 2019 multiplied by the same ratio. This ratio will be revised every five years, so that in 2024 it will be equivalent to the ratio of the life expectancy of a 67-year-old in 2017 to the life expectancy of a 67-year-old in 2022, and so on.

As life expectancy tends to rise over time, application of the sustainability factor will mean that future retirees will have lower starting pensions than current retirees with the same employment record. The system provides for intergenerational fairness, because although future retirees will have lower starting pensions, they will receive their pensions for a longer period (as their life expectancy will be higher). Accordingly, the total amount received as pension over their lifetime would be similar from one generation to the next.

9 See Annex 3 of the report of the Committee of Experts of 7 June 2013 on the sustainability factor of the public pension system.

10 It is also important to note that some of the variables needed to calculate the revaluation index depend on the revaluation index itself. For example, in order to calculate the revaluation index in 2014, an expenditure forecast for the period 2014-19 is needed, but this expenditure will depend, in turn, on the pension revaluation index applied in that period. Accordingly, the revaluation index in any specific year will depend on the future pattern of that index in subsequent years, being obtained recursively. However there is no provision in the law for how this calculation will be made.

The new pension revaluation index, which replaces the linking of pensions to the CPI from 2014, is as follows:

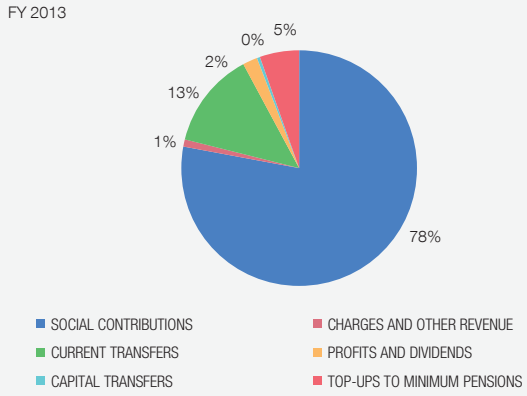
$$IR_{t+1} = \bar{g}_{I,\,t+1} - \bar{g}_{p,\,t+1} - \bar{g}_{s,\,t+1} + \alpha\left[\frac{I^{*}_{t+1} - G^{*}_{t+1}}{G^{*}_{t+1}}\right]$$

where IR_{t+1} is the revaluation index, i.e. the amount by which pensions grow between years t and t+1. The variables that come into play in the calculation, from left to right, are: the rate of change of the system's revenue, the rate of change of the number of pensions, the substitution effect and a component that adjusts for the difference between the system's revenue and expenditure. These components are not included in the formula in the current year, but via 11-year averages centred on t+1. That is to say, the rate of change of revenue, for example, which is calculated for the revaluation in 2014, will be the average of this rate between years 2009 and 2019. From 2009 to 2013 the rate is taken as a figure, while from 2014 to 2019 projections for the rates are incorporated. The same occurs with the remaining components. This allows for smoothing of the year-to-year rates of revaluation and mitigates the effects of the business cycle. A more detailed description of each of the formula components is given below.

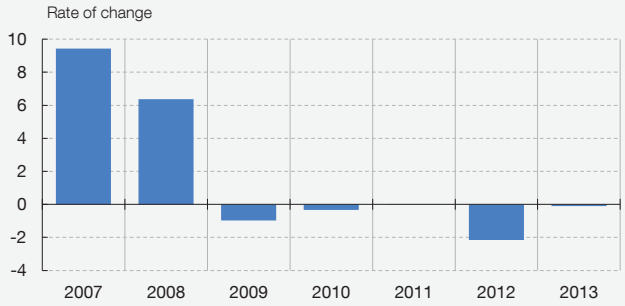
Social Security System revenue

The first component, $\bar{g}_{I,t+1}$, is the arithmetic moving average centred on t+1 of 11 values of the rate of change of the Social Security System's revenue. The non-financial transactions relating to revenue headings 1 to 7 of the Social Security Budget, principally social contributions (see Panel 1), are considered revenue. Excluded from revenue are non-periodic items and State

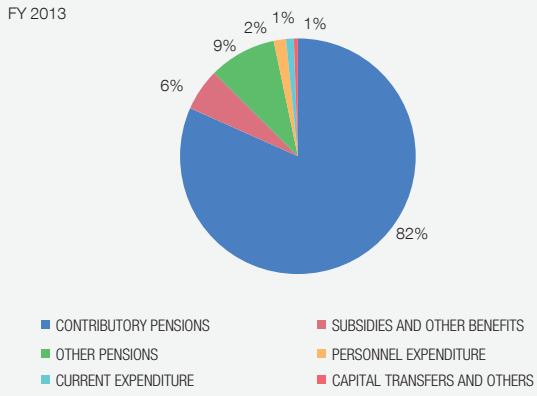
1 DISTRIBUTION OF SOCIAL SECURITY SYSTEM REVENUE



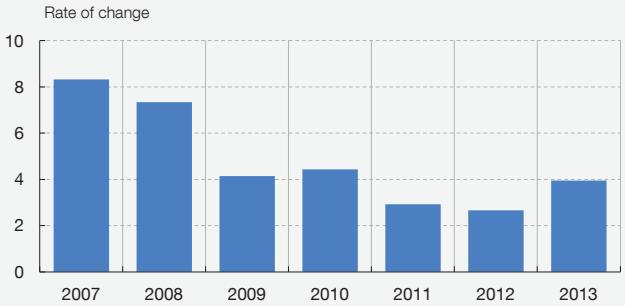
2 SOCIAL SECURITY SYSTEM REVENUE



3 DISTRIBUTION OF SOCIAL SECURITY SYSTEM EXPENDITURE



4 SOCIAL SECURITY SYSTEM EXPENDITURE



SOURCES: Banco de España, Ministry of Employment and Social Security and the National Audit Office.

transfers for the financing of non-insurance benefits, except top-ups to minimum pensions. In the 2009-13 period, Social Security revenue posted a rate of change of -0.7% on average. This is in contrast to the average expansion of 7.9% recorded in the two years spanning 2007 and 2008 (see Panel 2).

Number of contributory pensions

The second component of the formula, $\bar{g}_{p,t+1}$, is the arithmetic moving average centred on t+1 of 11 values of the rate of change of the number of contributory pensions. In May 2014, there were 9.2 million contributory pensions, with this variable having experienced average growth of 1.6% in the 2009-13 period. This growth is expected to quicken from the third decade of this century, as the baby boomers retire. In calculating this component with a negative sign, the formula lessens the revaluation insofar as there are demographic pressures in the form of a higher number of pensions.

Substitution effect

The third component of the formula, $\bar{g}_{s,t+1}$, is an arithmetic moving average of the so-called substitution effect. This is defined as the increase in the average pension in a year in the absence of any revaluation that year. That is to say, the increase in the average pension that comes about owing to the fact that the pensions of new pensioners are usually higher than the pensions of pensioners who abandon the system. In this way, the substitution effect depends on the number and amount of pensions of new pensioners relative to the number and amount of the pensions of pensioners exiting the system. It is estimated that the substitution effect would currently stand at around 1.0%.[1] This component has a negative sign, meaning that the revaluation diminishes owing to the upward pressure on expenditure due to the amount and number of new pensions.

Adjustment of the system's imbalances

The final component of the formula, $\alpha\left(\frac{I^*_{t+1} - G^*_{t+1}}{G^*_{t+1}}\right)$, makes adjustments for the imbalance that may arise between Social Security revenue, I, and expenditure, G. The asterisk denotes that these are geometric means centred on t+1 of 11 values of these components. When the difference between revenue and expenditure is positive, this component increases the revaluation, while if it is negative, it reduces it. The imbalance between revenue and expenditure is multiplied by parameter α, which measures the speed at which the imbalances are corrected. At first, a value of α equal to 0.25 will be used. That is to say, in each year, 25% of the imbalance between revenue and expenditure is corrected. As regards expenditure, this encompasses the non-financial operations relating to expenditure headings 1 to 7 in the Social Security budget, chiefly contributory pensions (see Panel 3). Excluded from expenditure are non-periodic items, benefits for the discontinuation of activity of self-employed workers and non-insurance benefits, except top-ups to minimum pensions.[2]

1 This figure of 1% has been obtained as follows: of the 9,155,000 pensioners at the end of 2013, it is estimated, drawing on Social Security data, that 541,000 correspond to new pensions and, therefore, 395,000 to exits (given that at end-2012 there were 9,008,000 pensions). Likewise drawing on Social Security data, it is estimated that the average amount in 2013 of new pensions is 28% higher than the average amount in 2012. Accordingly, assuming that the new pensions are paid over seven months and that the pensions exiting the system are over five months, the average pension in 2013, in the absence of any revaluation, is 1.0% higher than the average pension in 2012.

2 Setting aside the geometric mean can give some indication of the scale of this last component. In 2013, according to the Social Security budget outturn, the system's revenue totalled approximately €120.8 billion, while expenditure was €132 billion (giving rise to a deficit of 1.2% of GDP). Thus, with a parameter α equal to 0.25, the last factor of the formula would subtract 2.3% from the revaluation. That, however, without taking into account the geometric mean centred on t+1, which smoothes the amount of this factor to a large extent, since it is unlikely that the deficit observed in 2013 will persist throughout the business cycle.

Based on the report analysing the legislative impact of the corresponding draft bill, applying the sustainability factor would mean that, comparing retirees who have accumulated the same pension rights, in 2025 they would receive starting pensions approximately 3% lower than they would have received had they retired now. And this pattern would be projected into subsequent years, in accordance with current mortality forecasts.[11]

11 It must be noted, however, that the calculations will be based on the final mortality tables for each year; specifically, on the mortality tables of the Social Security System's retirees, drawn up by the Social Security System.

Effects on public pension expenditure

Both the new pension revaluation index and the sustainability factor are a significant step forward on the path to achieving the financial sustainability of the Social Security System, as they link the revaluation of pensions to the factors that determine the financial equilibrium of the system, and the amount of starting pensions to higher life expectancy. The system is thus equipped with automatic adjustment mechanisms to absorb economic and demographic risks arising, for example, from the increase in the number of pensions associated with population ageing. Moreover, part of the cost associated with demographic pressures is passed on to current generations, reflecting the need to link contributory pensions to the resources available at each point in time.

The existence of floors and ceilings in the new revaluation index ensures that future pensions will not fall in nominal terms. However, by removing the link between pension revaluation and inflation, the new legislative framework does not guarantee that pensions will always maintain their purchasing power; hence, according to how inflation moves, they could decline in value in real terms.

Regarding the impact of the reform, the latest 2014-17 Stability Programme Update presented by the Spanish government in April estimates a saving of 3.4 percentage points of GDP in pension expenditure in 2050 in comparison with a no-reform scenario, so that throughout the projection horizon this expenditure would remain at a similar level to that seen in the base year. Two recent papers [see Díaz-Giménez and Díaz-Saavedra (2014) and Sánchez (2014)] also offer the results of different simulations of the effects of the reform based on overlapping generations general equilibrium models calibrated for the case of Spain. They specifically include simulation of the pension expenditure pattern arising from the legislative changes.[12] The results coincide in pointing out that, although the 2011 reform did enhance the financial sustainability of the system, it alone was not sufficient to guarantee its equilibrium in the long term.[13] Nevertheless, the introduction of the sustainability factor and of the new revaluation index would seem to have largely reversed this situation, so substantial progress appears to have been made towards achieving the long-term financial balance of the system, tackling the effect that gradual population ageing will have on the public pension system. The adjustment mechanism works mainly through the average pension.[14]

The reform marks a far-reaching structural change in the pension system, as it links future benefits to the system's capacity to generate revenue, thus significantly mitigating the risk of unsustainability that adverse macroeconomic and demographic scenarios could trigger. However, the new system may heighten uncertainty over future pensions; accordingly, it should be implemented as transparently as possible, so that people have all the necessary information on their future pension and are able to take optimal decisions on saving while still working in order to be prepared for their retirement. The reform establishes several

12 The main advantage of using general equilibrium models is that they permit the inclusion of the endogenous reactions of agents to changes in the economic situation, such as, for example, a change in the pension system. This means that numerous economic variables can be simulated, such as households' decisions on leisure, work and retirement, labour market developments, financial decisions, the pension reserve fund, minimum pensions, etc. Other alternatives that may be used to project pension expenditure in the long term are accounting projections, based on a series of hypotheses as to the future performance of certain variables and the projection of pension expenditure through accounting identities and micro-simulation models, which permit more in-depth analysis of the distribution effects of the reforms [see the discussion in Jimeno *et al* (2008)].

13 For example, both papers estimate that the pension system would have a deficit of around 8% of GDP in 2050.

14 The Sánchez model (2014) also underlines the fact that the simulation results are conditional upon the assumed macroeconomic and demographic scenario, since as a result of the pension floors, more adverse future economic scenarios – while less likely – could trigger imbalances in the system.

mechanisms designed to achieve this transparency. The life expectancy figures will be published, informing pensioners of the effect the sustainability factor will have on how their pensions are calculated. The components used to calculate the revaluation index will also be published annually. In turn, it would be advisable to devise mechanisms encouraging retirement saving, to top up pay-as-you-go public pensions in the future.

9.7.2014.

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