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Automatic Adjustment Mechanisms in Pension Systems

The case for inflation adjustment in Spain 2022-2023

Members of the Experts Forum
of the Instituto BBVA de Pensiones

Creando Oportunidades

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Automatic Adjustment Mechanisms In Pension Systems – 1st quarter 2023

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1. Definition and objectives of Automatic Adjustment Mechanisms

In the search for the sustainability of public pension systems, both, gradual parametric reforms (changes in retirement age, contribution rates or revaluation adjustments) and systemic reforms (NDC schemes) have been the main strategies as high-income countries have responded to continuous longevity increases, below replacement level fertility, and the corresponding upward trend in old-age dependency ratios. All this has also happened in low productivity gains and economic growth, rapidly shifting labor markets, changing interest rates and regulatory reforms scenarios.

For national public pension schemes, a common denominator has been to introduce automatic adjustment mechanisms (AAMs) defined as "predefined rules that automatically change pension parameters or pension benefits based on the evolution of demographic, economic or financial indicators"[1]. Their main objective is to protect pensions from uncertainties in different contexts: demographic (longevity and life expectancy increases, old age dependency ratio evolution), economic (current and future inflation trends, wage growth, real GDP growth, productivity) and, more generally, financial situation of the system in the short, medium, and long term (funding balance).

Automatic means that parameters (retirement age, contribution rates, early retirement penalties, contribution period and so on) or benefits (initial benefit and benefits revaluation) are adjusted in accordance with a predefined rule. This rule can be designed to be systematically applied (for example, according to the evolution, yearly or otherwise, of the CPI) or can be used as a correction mechanism when the indicator of reference changes or crosses a critical threshold. This last approximation is usually associated to more sophisticated designs that look after an equilibrium in terms of sustainability and equity of the pension system.

Although the primary objective of this kind of mechanisms is cost-containment (sustainability), they also have other dimensions in the context of welfare restructuring. In this sense, these may seek to introduce economic and actuarial rationality for substantiating the prescribed changes in the pensions systems (recalibration and/or rationalization) looking for intragenerational fairness and intergenerational equity. They can offer the possibility to limit the political risks of regular negotiations between social partners to approve unpopular reforms that involve benefits cuts, reinforcing the credibility of the system, social trust, and the renewal of people's support for the implicit intergenerational contract in PAYG schemes. They also could help to elude blame for unpopular policies through compensation and obfuscation strategies (e.g., sequencing, long phasing-in periods, long indexation lags). They try to redistribute costs and benefits within and across generations, changing the nature of the pension promise to younger workers (risk sharing) and contribute to the paradigm shift in the responsibility for old-age income.

Automatic adjustment mechanisms come in a variety of forms that are extensively analyzed in the document *Pensions at a Glance 2021, Chapter 2* (OCDE, 2021). According to this source, about two-thirds of OECD countries employ at least one type of automatic adjustment for at least one of the (quasi-)mandatory components of their pension systems. In some cases, for example, they are linked to life expectancy developments at retirement ages

[1] OECD (2021), Pensions at a Glance 2021: OECD and G20 Indicators, Chapter 2, OECD Publishing, Paris, https://doi.org/10.1787/ca401ebd-en.

(e.g., Denmark, the Netherlands, Portugal, Finland, Cyprus, UK), to increases in the old-age dependency ratio (Germany); to declines in workforce (Japan), to inflation (Spain, Belgium, France), to decline in wages (Germany) or to the overall solvency of the scheme (Sweden, the Netherlands, Italy, Poland, Norway).

One thing that should be emphasized about AAMs is that their operation must be symmetric. That is, the response to any external change has to produce the desired effects however the direction of this change. If CPI (or life expectancy) increases, benefits (or the retirement age) must increase according to the established rule. But if CPI (or life expectancy) goes down, benefits (or the retirement age) must decrease equally, or one or other kind of unfairness will emerge.

2. Automatic Life Expectancy Adjustment Mechanisms

A recent and expanding trend in most pension reforms has been to automatically link pension benefits to population period life expectancy developments observed at retirement age. The link has been established and reinforced in multiple ways: (i) linking entry pensions to sustainability factors or life expectancy coefficients (Finland, Portugal, Spain -as defined in the 2013 pension reform, now abandoned), to old age dependency ratios (Germany, Japan), or to life annuity coefficients (Sweden, Italy, Poland, Latvia, Norway); (ii) linking normal and early retirement ages to life expectancy markers (e.g., Denmark, the Netherlands, Portugal, UK, Slovakia, Italy, Finland, Greece); (iii) linking the qualifying conditions to life expectancy, e.g., indexing the eligibility requirements to the contribution length (e.g., France, Italy); (iv) conditioning the annual pension indexation (the Netherlands, Luxembourg); (v) conditioning the pension penalties (bonuses) for early (late) retirement to the contribution length (e.g., Portugal); (vi) introducing insurance and non-insurance risk-sharing life annuity products with partial or no guarantees (e.g., the Netherlands, the United States); (vii) determining the accumulation of pension entitlements (the Netherlands); (viii) phasing in national Financial Defined Contribution (FDC) plans (e.g., Chile).

The way countries have been linking retirement age policy strategies to life expectancy developments is thus very diverse. Many have implemented ad-hoc fixed schedules (sixteen OECD countries have passed legislation that will increase the standard retirement age). Others have preferred automatic indexation, often implicitly targeting a constant expected period in retirement (e.g., the Netherlands) or a constant balance (ratio) between time spent in work (contributing) and in retirement (e.g., UK). Others have recently set a target age for retirement (e.g., Sweden) to inform about retirement timing decisions. Some countries have opted not to have a "standard" retirement age, defining instead an age window at which pension benefits may first be drawn. Finally, some (e.g., USA) linked the eligibility age for pensions to the eligibility age for other benefits such as public health care. What the alternative retirement age policies have in common is that they are typically insufficiently aligned with the pension scheme's ultimate goals, with adequacy, long-term financial sustainability and intergenerational actuarial fairness and neutrality being the main criteria adopted. Without an automatic link between life expectancy and retirement age, the decision to postpone retirement to uphold pension adequacy would continue to rely on worker's retirement timing decisions. Since many tend to retire as early as possible or fail to accurately estimate their future longevity and financial needs, counting on individuals' own decisions to delay retirement is likely to fail.

The introduction of sustainability factors and/or life annuity coefficients in DB schemes was one of the first policy responses of public pension schemes to the long-term solvency challenges posed by population aging. Defined Contribution (FDC or NDC) schemes incorporate a mechanism that automatically adjusts the initial benefit level to changes in life expectancy at the time of annuitizing the accumulated (financial or notional) wealth.

Since life annuities are priced taking into account forecasted mortality rates, the higher the survival prospects of the population, the lower the value of the pension annuity. This automatically allocates the risk of increasing life expectancy to pensioners. The introduction of sustainability factors into PAYG DB schemes is a way of incorporating this DC risk sharing and automatic stabilizer feature. In addition, this policy contributes to establishing a pseudo-actuarial structure tightening the link between contributions and benefits in aggregate terms, strengthening the incentives for prolonging working lives, and enhancing active labor force participation. This is also important for rational retirement timing decisions and formal labor market participation. Linking pensions to longevity is seen as leading to the restructuring and modernization of the social contract while

retaining the old age social insurance nature of the scheme that pools individual longevity risk among birth cohorts and across generations.

For a given retirement age, sustainability factors reduce lifetime pension benefits (pension wealth) to counterbalance the extra costs of longer retirement periods that follow from increased life expectancy prospects. This is often justified as providing for intergenerational fairness, although normally in a very approximate way. From the point of view of pension adequacy, sustainability factors gradually reduce the relationship between benefits and pre-retirement labor market earnings—the replacement rate—which is often perceived as a measure of the generosity of social protection systems, raising old age poverty concerns among pensioners in the most disadvantaged groups. To mitigate the effect of sustainability factors on pension adequacy, in some countries (e.g., Portugal) this correction has been combined with flexible retirement age approaches, offering workers the possibility to: (i) retire at the same age as previous generations, but with a reduced pension, or (ii) extend the working life for as long as necessary to offset pension cuts.

The impact of longevity increases on the pension financial solvency and through it economic and social sustainability should at least partially be offset by linking pension benefits to life expectancy, noting that in some cases (e.g., increasing retirement ages) this protects both adequacy and financial sustainability. However, a supplementary correction is likely to be needed in countries with aged and declining populations to adjust for changes in the size and composition of the contributing population. Similarly, introducing a balancing mechanism ensuring financial balance over time is recommended. For instance, Sweden and Finland have the most far-reaching automatic stabilizer mechanisms. Sweden combines the automatic adjustment of benefits to life expectancy through the annuity factor with a balancing mechanism ensuring solvency and a target retirement age to inform labor market exit decisions. Finland adjusts both benefits levels (through a sustainability factor) and retirement ages to life expectancy, supplemented by a balancing mechanism adjusting contribution rates if needed.

Although designed to maintain financial solvency, balancing mechanisms also impact on intergenerational fairness and equity. Linking pensions to life expectancy increases the uncertainty about retirement income and the length of life after retirement, which are critical parameters in retirement (consumption, saving, labor market) planning, with possible effects on subjective well-being.

The way pensions have been linked to longevity markers is not however exempt from several conceptual and policy design flaws. Although the precise outline of pension reforms differs among countries, they typically share one common feature: in almost all cases and countries, unisex life expectancy measures computed from period and not cohort life tables have been used to automatically link ex-ante longevity improvements and pension benefits. Abstracting from the well-known sex gradient in life expectancy, in a scenario of continuous decline in age-specific mortality rates, the use of period life expectancy results in a systematic underestimation of the remaining lifetime at retirement, incorrectly signaling solvency prospects and, as a result, delaying or watering-down pension reforms. This generates unintended and potentially sizable implicit subsidies from future to current generations, establishes an unfair actuarial link between contributions and pension entitlements, distorts labor supply decisions and leads to macroeconomic inefficiency. In this way, underestimated life expectancy counteracts the objectives of recent reform approaches targeting a strengthening of contributory principles and actuarial fairness on a lifetime basis.

Besides, for pension policy, the issue of the correct estimation of the future life expectancy is also amplified when ex-ante differences in mortality are observed, the longevity improvements are not homogenous across socioeconomic groups, there is high lifespan inequality at retirement and subjective mortality beliefs differ

significantly from objective longevity measures, translating into implicit intragenerational tax/subsidy effects and ineffective financial planning. Moreover, life expectancy adjustments tend to be inconsistent with intergenerational fairness and neutrality principles, exacerbating redistributive effects. In addition, in many countries, life expectancy trends are not followed by parallel movements in healthy life expectancy (HLE) and disability-free life expectancy (DFLE), challenging the executability of pension reforms targeting longer working lives and questioning again its redistributive effects. Finally, policy design features such as provisions capping the maximum increase in retirement age per period (e.g., The Netherlands) or long indexation lags reduce the effectiveness of automatic stabilizers. The impact of COVID-19 on pensions is estimated to be limited while ageing pressure might come back to the forefront.

In most countries, life expectancy adjustment mechanisms are fully automatic, while in some they are semi-automatic as each adjustment requires political approval to be activated. The Canadian case is described as having an automatic backstop mechanism: when the pension plan is estimated to be financially unsustainable, the political process is triggered, and the back-up adjustment will be automatically activated if there is no political agreement on an alternative solution.

3. The Spanish Automatic Inflation Adjustment Mechanism for pensions and the international overview

According to Law 21/2021, all Spanish Social Security nominal benefits will be revalued yearly with Consumer Price Index (CPI) so that they keep pace with overall price increase.

This will be done automatically in January (in any year t) by the average monthly YoY CPI change from November (t-2) to November (t-1). Moreover, when the said criterium yields a number below 0, the nominal value of benefits will not be changed, as stated literally in Law 21/2021. This violates one of the properties of a proper AAM: symmetry, for when inflation is negative the real value of a nominal magnitude increases (*vid infra*).

The 2021 CPI-based AAM for pensions benefits just discussed replaces the former "Índice de Revalorización de las Pensiones" (or Benefits Revaluation Index, Spanish acronym IRP) introduced by Law 23/2013. The IRP was an unnecessarily complex algebraic formula with a floor of 0.25% and a ceiling of "CPI change + 0.5pp. The fact is that the IRP was applied during 2014-2017, at the floor rate of 0.25%, suspended from 2018 till 2021 (when discretionary, close to CPI inflation, adjustments were used) and replaced by the new AIAM strictly based on CPI inflation in 2022. In the period 2014-2017, CPI inflation was negative in the three first years adding an overall 0.9% increase in the purchasing power of benefits on top of the corresponding 0.75% during those three years.

The Spanish debate on inflation adjustment mechanisms during the last decade, thus, has been rather useless. Decades ago, it was decided to use CPI inflation as a criterion for benefits adjustment, even fixing it in laws. On several occasions all governments decided to change this criterion to favor less onerous adjustments and that was used politically by the opposition. The IRP was introduced in the midst of a severe debt crisis during the twin recessions between 2008 and 2013. When inflation resumed in 2017 the government gave up using it amidst mounting political and social unrest.

Paradoxically enough, given that the IRP was designed to contain pension expenditures, during the period 2014-2017, real expenditure actually increased as inflation was negative. Having used a fully symmetric inflation based AIAM would have produced better aggregate results.

Many advanced and not so advanced countries apply today AAM for (price/wage) inflation adjustment of pension benefits. That's a standard but, naturally, many varieties are used. In general, it is intended that benefits keep pace with the "cost of living" however it is measured (that is another, rather tricky issue). But some countries do not think twice when it comes to also keeping their national budgets balanced. In the table below it can be seen that CPI inflation is rather dominant but that some mixed criteria also apply, often a convex combination of prices and wages growth or directly below prices growth.

Table 1. Benefits revaluation in 22 countries of the European Union.

País	Criterios de revalorización anual de las pensiones (ca. 2020)	Comentarios
Germany	W	
Austria	P	> P for lower benefits
Belgium	P	
Czech Republic	0.5*P + 0.5*W	
Denmark	W	
Slovak Republic	P	
Slovenia	0.4*P + 0.6*W	
Spain	P	Only if CPI change > 0
Estonia	0,2*P + 0,8*WB	
Finland	0,8*P + 0,2*W	
France	P	
Greece	< P	No revaluation in 2009-2020
Netherlands	P	Depending on Funding Ratio
Hungary	P	
Ireland	W	Discretionary
Italy	P	< P for higher benefits
Latvia	0,7*WB	Lower for higher benefits
Lithuania	WB	
Luxemburg	W	Subject to budgetary ceilings
Poland	0.8*P + 0.2*W	
Portugal	Between P - 0.75% and 1.2*GDP growth	
Sweden[2]	W – 1,6%	See Section 5 below

Legend: P: CPI Change, W: Wage Change, WB: Wage Bill Change (aggregate)
Source: IAE 2022 (Spanish Institute of Actuaries, 2022, Table 3.1)

Indexing pension benefits with inflation is a very effective way to help retirees' households to face cost of living increases but may be very costly for the whole system when inflation is high and financial resources are not increasing correspondingly. Social contributions are closely linked to wages and when inflation is of the "imported inflation" kind wages tend not to fully adapt to overall price increase. This creates a financial gap for Social Security that may widen considerably as expenditure grows above receipts. Particularly as inflation adjustments at any particular year are compounded through time.

Almost everywhere Social Security pension benefits are computed at retirement as loose annuities that do not fully respect actuarial and financial principles, especially those required by inflation indexed annuities. This means that any cost due to inflation adjustment must fall on current and future workers' shoulders with no financial provisions made to accommodate for the extra cost of inflation. This is also the case of Spain.

[2] See Section 5 below for a detailed account of the Swedish case.

Section 4 below provides some current estimates of the financial cost of adjusting 2023 Social Security pension benefit with average 2022 inflation, that has turned out to be 8.45%. With around 10 million pensioners (insurance and assistance schemes and civil servants' scheme) receiving almost 11 million monthly payments (14 payments per year) the cost of inflation adjustment will be close to 19 billion euros only in 2023 and many more times that amount in Present Value terms as current revaluation gets compounded every next year.

The current, supply induced inflation, before and after the Russian invasion of Ukraine, is exceptional and clearly different from conventional demand inflation that in Europe has been reasonably tackled by ECB policies since 2000. But it is not so different from inflation experienced during the oil crises some five decades ago. Then a persistent inflation process ignited and could only be stopped by hard monetary policies that brought recession and unemployment (the "Volcker Recession"). This time, there are not many reasons to fear spiraling wages and prices as Central Banks everywhere have reacted rapidly and rather strongly, and raw energy and food inputs are landing towards more normal levels and/or inflation rates.

4. The former Spanish Inflation and Longevity Automatic Adjustment Mechanisms and the current CPI based Automatic Adjustment Mechanism: Impact and the sustainability issue

In 2013 Spain introduced two automatic adjustment mechanisms in the pension system. The first was the Pension Revaluation Index (IRP) which, in the absence of additional resources, revalued pensions annually based on the difference between the growth rate of social contributions and that of expenditures, due to the increase in the number of pensioners and the effect of replacing old pensions with new (and more expensive) ones (the so-called substitution effect). The mechanism included a gradual correction if the system presented a structural deficit and used the centered average of the growth rates for 11 years, which made it necessary to anticipate and forecast the main determinants of the pension system six years ahead. If the system was in equilibrium and the sum of the growth in the number of pensions and the substitution effect coincided with the real growth in contributions, pensions could be revalued with the GDP deflator, in line with price growth.

The second mechanism was the Sustainability Factor (FS), which adjusted the initial pension to the increase in life expectancy so that the discounted present value of pensions remained constant for the same retirement age. To the extent that new pensions enter the system with an actuarial deficit, the FS did not reduce it but at least prevented it from continuing to rise as life expectancy increased.

According to the projections of the European Commission's Ageing Report 2021, these two mechanisms made it possible to avoid an increase in pension expenditure over GDP of at least 3.6 percentage points in 2050 (2.7 pp due to the IRP and 0.9 pp thanks to the FS). The projections of savings estimated by the application of the IRP show that the increase in contribution revenues will foreseeably be insufficient over the next three decades to compensate for the increase in the number of pensions and the replacement effect. Furthermore, the latest INE population projections 2022-2072 show that this problem will not be transitory since the increase in the dependency rate of the population over 65 or 67 years of age will not be reversed after 2050, but will remain relatively stable thereafter.

Law 21/2021 repealed both mechanisms, which were replaced by (1) the revaluation of pensions according to the average annual inflation rate of the monthly CPI, transferring the contributory deficit of the pension system to the State, and (2) by the so-called Intergenerational Equity Mechanism (MEI), which only increases Social Security contributions by 6 tenths of a percentage point for a decade and postpones to the end of the decade the evaluation of the measures necessary to correct the imbalance generated by the derogation of the Sustainability Factor, with the projections existing at that time.

The application of Law 21/2021 in 2023 implies that social contributions will rise by 6 tenths due to the entry into force of the MEI and that pensions will be revalued by 8.5%, according to the average CPI inflation between the months of November 2021 and 2022. Had the IRP been maintained, the minimum pension could have increased by 8.5%, but the rest of the pensions would only have increased by 0.25%, unless permanent resources had been contributed to the system (for example, through a surcharge on personal income tax) to transparently finance the contributory deficit.

Forecasts indicate that the deficit of the contributory pension system will increase to over an additional 2.4% of GDP in 2023 (see García, 2022), approximately 60% of the expected deficit of the Spanish general government. According to the General Government Budget report, in addition to a deficit forecast for non-financial operations of around € 7 billion for next year, Social Security will need transfers from the State of almost € 39 billion, which represents slightly more than 25% of the € 152 billion receipts expected in social contributions.

5. The use of automatic stabilizers in NDC systems: Sweden

Overview of Sweden's pension system:

In 1999, Sweden introduced a completely new universal public pension system covering all citizens and all residents working in Sweden. The system consists of (1) a mandatory earnings-related non-financial defined contribution (NDC) "pay-as-you go" scheme with individual accounts (contribution rate 16%); (2) topped by a mandatory earnings-related individual financial defined contribution (FDC) scheme (contribution rate 2.5%); and (3) with a guaranteed minimum pension which is "means tested" vis á vis the sum of a retiree's NDC and FDC benefits.

Contributions are paid on earnings from employment up to a ceiling at about 1.5 times the average wage, which is indexed with the rate of growth of aggregate average earnings. The earliest at which a benefit in the public scheme can be claimed is 63 from 2023 and employees have the right to remain with their employers until the age of 69 from 2023.

The interaction of occupational supplements to the public NDC and FDC schemes

With the introduction of the new public pension schemes in 1999-2000, Sweden's four major quasi mandatory union-based occupational *supplementary pension schemes* (which cover about 90% of the labor force) were also converted to FDC. These are financed by an additional 4.5% contribution rate on earnings below the ceiling on contributions into the public NDC and FDC schemes and a full contribution rate based on earnings above the ceiling. Together the mandatory public and quasi-mandatory occupational pension schemes are financed by a total contribution rate of 23%.

The AP reserve fund(s)

An important component of the overall Swedish public pension landscape is "the" public AP-funds introduced in the 1960s. The specific aim from the beginning was to build up a buffer reserve to contribute to the financing of the baby-boom cohorts born in 1943-1968 when these disproportionately large birth cohorts would begin to retire from 2010 and into the mid-2030's. The AP-funds are in a sense the Swedish pension system's "bank" as they also execute financial transactions, including investing the NDC scheme's assets (about 200 billion USD in December 2021, equal to 31.5% of Swedish GDP for that year). It is also noteworthy that due to skilled "conservative" management, the value of the (internationally invested) AP-funds declined by only about 12% with the fall of international stock markets in 2022, which can be compared with the Swedish financial fund market fall in asset values of close to 30%.

One way of summarizing the process underlying the creation and growth of the AP funds is that the demographic "boomers" born in the period 1943-1968 have indirectly more or less covered their own "excess cost" as they

enter into retirement through their partial funding of the national AP pension fund(s) during their years of active participation in the labor force. Notably, the Swedish Pension Agency's projections for future revenues and expenditures now suggest that the greatest "risk" going forward in time is that the reserve funds may become too large.

The calculation of the NDC benefit

The individual's NDC benefit is determined at retirement by (a) dividing the amount on the individual's account by the average projected life expectancy of the retiree's birth cohort[3] and (b) a frontloaded "advance payment" of a return of 1.6% factored at the outset into the calculation of the yearly annuity payment. The figure 1.6% is an estimate of the future real rate of growth of the yearly aggregate earnings of workers. The choice of 1.6% is a conservative estimate of the "real economic return" of future productivity growth.

The definition of earnings

Sweden's definition of earnings in the context of the public pension system is based on a broad definition of what constitutes earnings – in addition to earnings received from an employer or self-employment. The broad definition of earnings underlying the pensions also encompasses social insurance benefits received that compensate days of parental leave from work to take care of sick children, periods devoted to studies, periods in military conscription, financial compensation for work injury, periods with unemployment insurance and periods covered by disability compensation. Contributions on these forms of "earnings" are also paid into the AP-fund(s) from the government budget and noted on individual accounts. Indexación de las pensiones y el "Índice de Ingresos" (pensionables)[4]

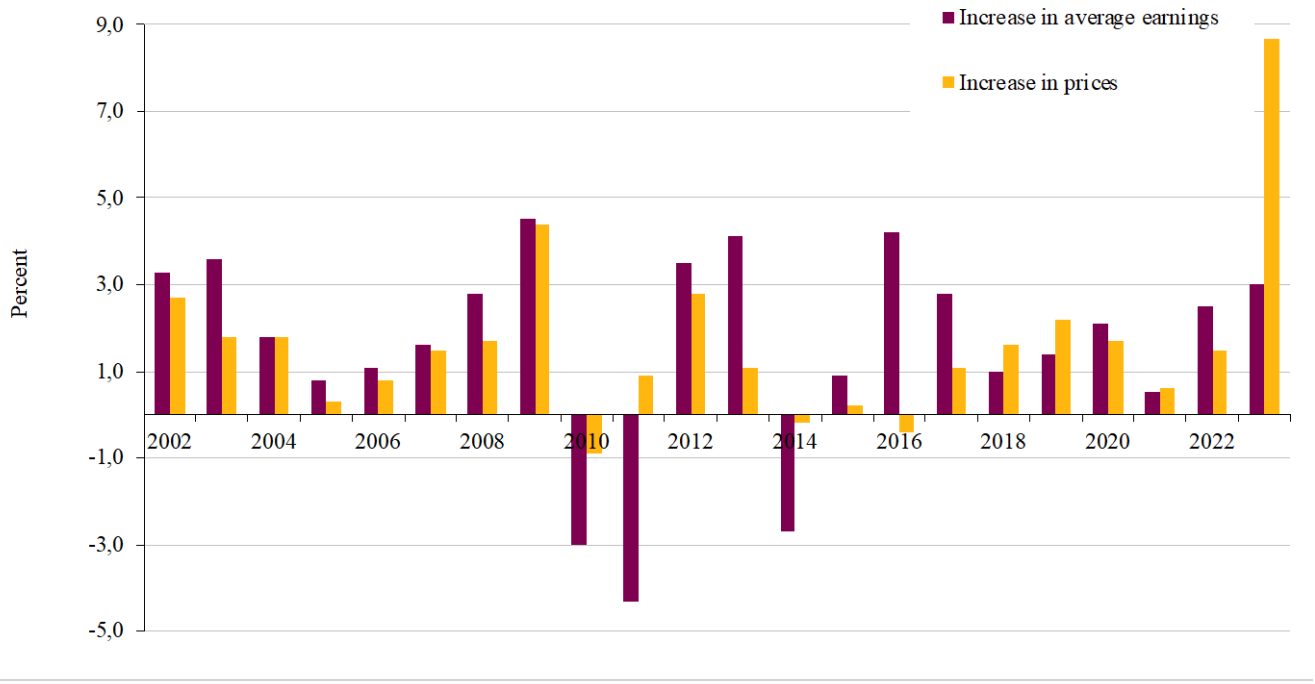
Indexation of NDC accounts and benefits – the *"income index"*[5]

After the pension benefit has been granted NDC benefits are indexed on a yearly basis with the change in the aggregate "income index" minus the value of 1.6% factored into the initial calculation of the benefit. Importantly since it is based on nominal values, the income index also encompasses the rate of inflation.

[3]After the introduction of new legislation, the minimum pension age is scheduled to be regularly adjusted from 2026 in accordance with projected life expectancy.

[5]Palmer (2013) and Palmer and Zhao de Gosson de Varennes (2020) explains in greater detail this and other options in the construction of defined contribution (NDC and FDC) annuities.

Figure 1. Components of the indexation of Swedish Pensions



The above Diagram compares the year-on-year change in the earnings index the rate of inflation. On average the earnings index increased by about 0.4 percent more than the rate of inflation – but in recessionary periods of 2010, 2011 and 2014 we also observe that nominal earnings decreased and by more than the decrease in inflation.

The Swedish NDC balancing mechanism

The Swedish NDC scheme is also equipped with a "balance index" that replaces normal indexation when the ratio of the value of assets (contributions paid in by employees and employers on their behalf plus the value of the AP-funds capital) to the value of liabilities (monetary value of pension rights of all participants based on account values) falls below 1.000. When this occurs, the balancing mechanism takes over the role of the indexation of the accounts of contributors and benefits of pensioners until a financial balance of at least 1.000 is once again achieved. The balancing mechanism was also invoked during the recent recessionary period noted above. Importantly, the balancing mechanism including the mathematical details is written into the legislation. This means that government intervention should never become necessary to restore the financial sustainability of the public NDC pension scheme – creating complete autonomy for the system.

6. Main conclusions and recommendations

The above sections contain a large number of interesting considerations above the wide range of rules that almost automatically would allow a modern Social Security pensions scheme to adapt to changing demographic and economic conditions. Some of these rules, also known as Automatic Adjustment Mechanisms (or AAM) have been successfully implemented in OEC and other countries and their and their results are now widely available and shared among experts and the general public everywhere.

In order to extract the basic lines and implications of the analysis performed in this document, the following table contains a sum up of the main conclusions and corresponding policy recommendations that can be obtained.

Conclusions	Recommendations
In the last few decades most OECD countries have established different automatic rules to adjust their public pension system to changing demographic and economic conditions, either structural (Life Expectancy) or temporary (CPI changes). Automatic Adjustment Mechanisms (or AAMs), as they are technically known, tend also to be symmetric and based on moving averages to smooth their impacts.	Governments should be concerned with a symmetric operation of AAM. Asymmetry makes them less effective and efficient. That is the case when CPI inflation is negative.
AAM have been historically justified on grounds of sustainability of public pension systems as the increase in Life Expectancy (LE) made retirement periods larger and larger. These use different approaches combining interventions through retirement age, direct adjustment of monthly payments at causation and/or using indices based on LE dynamics.	Besides advances in designing and implementing LE based AAMs, countries should switch to proper computation of LE using "cohort" instead of "period" methods. These methods underestimate LE. Healthy Life Expectancy and the fact that less favored workers live shorter lives should be considered.
Spain has recently switched to a straight CPI based AAM for benefits revaluation. Previously, a formula that severely limited price adjustment was used. This formula, because of negative CPI growth during 2014-2017, actually increased real benefits thus financially destabilizing the system's balance. Most OECD countries use AAM based on prices, wages, or a combination of these to adjust benefits.	The current CPI based AAM law expressly forbids applying this rule when CPI inflation is negative. This should be reversed. As wages are being adjusted well below current inflation, benefits adjustment for 2023 could also be limited to below current inflation.

Conclusions	Recommendations
The repealing of 2013's Sustainability Factor (FS, Spanish acronym for *Factor de Sostenibilidad*) and Benefits Revaluation Index (IRP, for *Índice de Revalorización de las Pensiones*) is a missed opportunity to stabilize Social Security balance in the longer term. The new CPI based AAM will work towards unsustainability and the so-called Mechanism for Intergenerational Equity (MEI, in its Spanish acronym) will not provide much needed resources. At least, an expenditure increase in 3.6 percentage points over GDP could have been avoided had the IRP and FS been kept. It has been estimated that de contributory Social Security deficit will increase in 2023 by 2.4 GDP percentage points.	All Social Security reform measures adopted so far, with the exception of the MEI, will increase expenditure. New measures for 2023 and beyond should decisively aim at increasing resources and/or reverse deficit increase by combining Defined Contributions benefits formulae with Life Expectancy based Retirement Age AAMs.
Sweden is the best well-known case of swift and beneficial to all transition towards sustainability of a PAYGO Social Security scheme. The core of this transformation lies in the change to a Non-financial (or Notional) Defined Contribution formula for benefits calculation, or NDC scheme. This required a detailed technical design and intense political consensus building, besides social consultations during the late 90s last century and early years of the present century. Once the standard established, many countries, including Italy, Ireland, and Greece. As for "cost of living" indexation of benefits, these are initially set as indexed annuities so that inflationary scenarios are provided for, and yearly revaluation granted at a given rate. Revaluation is completed ex-post when wages increase differently than expected.	Sweden's case provides a clear example of how to adapt through ex-ante rules (rather than through discretionary ex-post measures) to future developments. In this way, resources to pay for necessary cost of living updates or baby-boomers retirement are planned and arranged all through the labor and expected length of life of retirees. It is advisable that this kind of arrangements are also adopted in countries like Spain, where Social Security is already suffering from structural lack of financial resources.