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COMMISSION STAFF WORKING DOCUMENT

2024 Update of the 2016 Eurostat Study on the long-term budgetary implications of pension costs (SWD(2016) 268 final)

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Contents

1. Executive Summary

In 2016 a study on the long-term budgetary implications of pension costs (SWD(2016) 268 final) was released by Eurostat. The purpose of that study was to analyse the budgetary implications of the pension costs of staff in all EU institutions and agencies over the 50-year period 2015-2064 and assess the long-term effects of the relevant legal changes introduced by the 2013 EU Staff Regulation (SR) reform.

An update of the 2016 study was requested by the Working Party on the Staff Regulations in its meeting on 8 May 2023, and agreed by the Commission. Accordingly the present study responds to this request and constitutes an update of the one from 2016, looking at the major trends in staff pension expenditure over the fifty-year period 2024-2073. A projection of such length ensures consistency with the 2016 study and is aligned with normal actuarial practice[1]. This long-term study allows the assessment of the long-term effects of the relevant legal changes introduced by the 2013 EU Staff Regulation (SR) reform, whose impacts will continue to evolve over the fifty-year period.

The impact of the 2013 SR reform on the future Pension Scheme of European Officials (PSEO hereinafter) expenditure has been analysed by Eurostat by isolating the main parameters affected by the 2013 SR reform which have material effects on pension expenditure, namely:

a) the higher pensionable age,

b) the lower yearly pension accrual rates,

c) the creation of a new function group AST/SC corresponding to clerical and secretarial duties, and finally

d) the new career structure in function groups AST and AD.

All financial and demographic actuarial assumptions have been modelled adhering to the accepted actuarial practices. DG HR inputs have also been incorporated in the modelling process All the assumptions (modelling and values) have been validated by independent experts.

In terms of active staff, the present study assumes that the 2023 active population size will remain constant over the period 2024-2073.

[1] Actuarial practice in social security: joint technical publication of the International Labour Office (ILO) and the International Social Security Association (ISSA) (page 16).

In monetary terms, the forecast is made at constant 2023 prices to strengthen the comparability over the years, by isolating the variables that have a real influence on the pension expenditure, that is, the population structure and the long-term impact of the 2013 SR reform.

The analysis made, on the assumption that the active population will remain constant, leads to the following key estimations:

a) the number of beneficiaries of the scheme (old-age pensioners, invalids and survivors) is expected to pass from 30 495 in 2023 to about 42 532 in 2073 for a 39.5% increase, while
b) the yearly pension expenditure for the non active staff (at 2023 constant prices) will move from 2 418 million euro in 2023 to 1 951 million euros in 2073 for a 19.3% decrease.

The combination of the two findings above represents a clear demonstration of the effectiveness of the combined 2004 and 2013 reforms of the Staff Regulations.

The simulations performed also reveals that, without the 2013 SR reform, the expected additional pension expenditure at the last year of the projection period would have been substantially higher (+857 €m, i.e. 43.9%).

Moreover the new measures introduced by the 2013 SR reform are expected to lead to growing annual cost savings between 2024 and 2073: those savings will reach 857 million Euros in 2073.

Globally, the total cost savings over 50 years, at 2023 prices, are projected to be 31 483 million Euros.

When linking the 2016 and 2024 studies, which is possible only using the same salary grid i.e. the one at 1.7.2014 which was employed for the 2016 study, at “2014 prices”, the estimated total savings over the 2023 to 2073 period would be estimated in 25 260 million Euros.

Additionally, it is fundamental to highlight the circumstance that in case of inclusion of the pension expenditure related to staff currently active or under deferred status (non-active staff who have accrued at least ten years of pensionable service in the EU but have not yet reached the pensionable age), the estimated total savings over the 2023 to 2073 period would be 72 064 million euros at 2023 prices.

It also has to be outlined that the referred expected savings are additional to those produced by the 2004 reform of the SR, since the present study only focused on the impact of the four above mentioned key parameters amended by the 2013 SR reform.

Finally, it is important to hihlight that this study is not to be read as a prediction or a tool to forecast the exact amounts of pension expenditure in the short or medium term but as an assumption. It is a fact universally agreed by the actuarial literature[2] that it is highly unlikely that projections will exactly be realised. The actual values of the parameters may differ from those assumed for long-term projections, and there will be stochastic variations around those parameters. Long-term projections require long-term assumptions. Therefore, this study should not be interpreted as a prediction but rather as an assumption made for analytical purposes.

[2] See for instance *Subramaniam Iyer, "Actuarial mathematics of social security pensions", Quantitative Methods in Social Protection Series, International Labour Office (ILO) and International Social Security Association (ISSA), 1999.*

2. Introduction

The present study is an update of the 2016 Eurostat study on the long-term budgetary implications of pension costs - SWD(2016) 268 final and looks at the major trends in staff pension expenditure over the fifty-year period 2024-2073. An update of the 2016 study was requested by the Working Party on the Staff Regulations in its meeting on 8 May 2023 and agreed by the Commission. A projection of such length ensures consistency with the 2016 study and is aligned with normal actuarial practice[3]. The long-term study allows the assessment of the long-term effects of the relevant legal changes introduced by the 2013 EU Staff Regulation (SR) reform, whose impacts will continue to evolve over the fifty-year period.

The parameters and actuarial assumptions used in this study cover the whole period of the projection. Best actuarial practice highlights the following:

- long-term assumptions should not be influenced by a short-term period of experience variation[4];
- long-term assumptions are not suitable for predicting short-term future experience[5].

The study is not intended to be used as a tool to forecast the exact amounts of pension expenditure in the short or medium term.

Moreover, given the long-term projection period, the calculations are extremely sensitive to the assumptions of the model.

Each parameter and actuarial assumption has been set in compliance with the applicable legal basis (relevant parts of the SR), best actuarial practices and past observations: a summary of those is available in Section 4 of this study.

The impact of the 2013 SR reform on the future costs of the Pension Scheme of European Officials (PSEO hereinafter) has been analysed by Eurostat by identifying the main parameters of the pension scheme affected by the 2013 SR reform which have material effects on pension expenditure.

After identifying those parameters, Eurostat compared the trends in PSEO expenditure:

[3] Actuarial practice in social security: joint technical publication of the International Labour Office (ILO) and the International Social Security Association (ISSA) (page 16).
[4] Selecting and Documenting Other Pension Assumptions October 2009 Developed by the Pension Committee of the American Academy of Actuaries.
[5] UK Government Actuary's Department, Civil Service Pension Scheme (CSPS) Advice on assumptions.

- using the parameters applicable before the 2013 SR reform (*Test Version*, or in other words the *hypothetical* scenario where the 2013 SR reform did not occur);
- using the parameters applicable after the 2013 SR reform (*Current Version*, or in other words the *real* scenario where the 2013 SR reform is implemented).

The difference between the two sets of results (*Test Version* minus *Current Version*) represents the estimated savings brought by the examined parameters of the 2013 SR reform.

3. Main Concepts

3.1. The PSEO rests on a sound legal basis enshrined in the Staff Regulations

Pursuant to Article 83 of the Staff Regulations:

(a) The benefits paid under this pension scheme are to be charged to the budget of the Union;

(b) Member States are to jointly guarantee the payment of such benefits;

(c) Officials are to contribute one third of the cost of financing the pension scheme.

Article 83a and Annex XII of the Staff Regulations set out the actuarial rules for computing the contribution rate in order to guarantee the balance of the pension scheme.

The benefits paid under the scheme are laid down in Chapter 3 of Title V of the Staff Regulations, as well as in Annex VIII thereto.

3.2. The PSEO is a notional (virtual) fund with defined benefits, in which the contributions of staff serve to finance their future pensions

The PSEO functions as a notional fund with defined benefits[6]. Although there is no actual investment fund[7], it is considered that the amount which would have been collected by such a fund is invested in Member States governments' long-term bonds[8] and is reflected in the pension liability (*see point 2.4 below*). Member States jointly guarantee the payment of these benefits pursuant to Article 83 of the Staff Regulations and Article 4(3) of the Treaty on the European Union.

Being designed as a notional fund, the contributions of EU staff to PSEO serve to finance their future pensions. In fact, the pension contribution covers the cost of the pension rights acquired in a given year and is not in any way linked to the pension expenditure of that year.

[6] A defined benefit plan is a pension plan that defines an amount of pension benefit that an employee will receive on retirement, usually dependent on one or more factors such as age, years of service and remuneration.

[7] The European Coal and Steel Community (ECSC) had a pension fund, but it was dismantled and replaced by the notional fund upon the merger of the institutions of the Communities. The notional fund was put in place for the European Economic Community with the adoption of the Staff Regulations in 1962.

[8] Based on the observed average annual interest rates on the long-term public debt of the Member States as provided for in Article 10 of Annex XII to the Staff Regulations.

The case law of the EU courts[9] has established the notional fund character of PSEO despite the finding that PSEO also displays some features of a solidarity scheme[10].

The PSEO is therefore different from most of the schemes which exist in the Member States for public officials. In such schemes, the pension contribution rate or pension benefits are adjusted in order to maintain a yearly balance between the collected contribution and the pension expenditure. In this type of scheme, if the balance cannot be achieved, the budget finances the difference through taxes.

The PSEO notional fund is assessed periodically, both annually and on a five-year basis, as if a real fund existed, which represents a further guarantee for its long-term sustainability.

3.3. The PSEO is designed to be in actuarial balance by default through the rate of contribution to the scheme and the pensionable age

The balance of the PSEO is ensured annually through the variation of the rate of contribution to the scheme and, where relevant, of the pensionable age.

The PSEO follows an actuarial balance principle according to which the annual contribution paid by staff has to cover one third of the rights accrued in the same year[11]. The acquired rights of EU civil servants during a given year correspond to the future pensions that the staff will receive after retirement, as well as to the entitlement (under certain conditions) to an invalidity allowance, a survivor's pension, or an orphan's pension. To make this computation[12] possible, the series of future payments for the pension benefits to the European civil servants are evaluated at their present value using an interest (discount) rate. The computation is thus an actuarial valuation.

The pension contribution rate is the mechanism that maintains the scheme in actuarial balance on an annual basis. If the actuarial assessment of the various parameters set out in the Staff Regulations shows that a pension contribution rate different from the rate in force should be applied to fully cover the pension rights acquired during a given year, then the pension

[9] See e.g. Case F-105/05 – Wils vs Parliament, point 85 and Case T-439/09 *Purvis vs Parliament*, point 45.
[10] See Case T-135/05 - Campoli vs Commission, point 134.
[11] Article 83(2) of the Staff Regulations.
[12] In technical terms, the method used in the computation of the pension contribution rate is that prescribed by international accounting standard IPSAS 39 and referred to as 'projected unit credit'. The sum of the actuarial values of rights acquired by active members of staff, referred to in actuarial practice as 'service cost', is compared to the annual total of their basic salaries in order to calculate the contribution rate.

contribution rate is updated through an automatic procedure. Consequently, when staff members pay the updated pension contribution rate, they acquire pension rights for a given year and are protected by the principle of acquired rights.

In addition, the 2013 reform of the Staff Regulations introduced pensionable age as the second element balancing the system. In particular, the Staff Regulations mandated the Commission to carry out an assessment of the pensionable age every five years, taking into account the changes in pensionable age for civil servants in the Member States and the changes in life expectancy of EU staff[13]. In that respect, the Commission has submitted its report to the European Parliament and the Council in 2021[14].

3.4. The PSEO liability is jointly guaranteed by the Member States

3.4.1. PSEO's liability is not funded

While staff contribute from their salaries one third of the expected cost[15] of pension benefit that they will receive on retirement, the PSEO scheme is not funded. Pursuant to Article 83 of the Staff Regulations, the benefits paid under PSEO are to be charged to the EU budget and the Member States must jointly guarantee payment of such benefits according to the scale laid down for financing such expenditure.

3.4.2. Calculation of the liability

Eurostat calculates annually the liability recognised in the EU budget, which is called the 'Defined Benefit Obligation' (DBO). The projected unit credit method[16] is used. The liability recognised in the balance sheet is the present value of the defined benefit obligation at the balance sheet date. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of government bonds that are denominated in the currency in which the benefits will be paid, and that have terms to maturity approximating to the terms of the related pension liability[17].

[13] Article 77, paragraphs 6 and 7 of the SR.

[14] Report from the Commission to the European Parliament and the Council pursuant to Article 77 of the Staff Regulations of Officials (COM/2021/94 final.

[15] The expected cost is determined under a set of specific rules and assumptions defined in the Staff Regulations.

[16] The valuation is carried out according to the IPSAS 39 methodology. This accounting standard requires the employer to determine the actuarial commitment on an ongoing basis, considering both the promised benefits during the active lifetime of employees, and foreseeable increases in salaries.

[17] The DBO of the PSEO at 31 December 2023 was valued at around EUR 95 billion. The DBO is calculated according to international accounting standards (IPSAS 39) and is strongly influenced by the inherent

3.4.3. The historical accumulation of the PSEO liability

Under the notional fund approach, staff contributions are not set aside in an actual pension fund but are instead credited to the EU budget at the time they are collected and spent according to the decisions of the budgetary authority i.e. they are not assigned to any particular policy field. After the entry into force of the PSEO, it was decided that the employer's part of the PSEO contribution was not to be collected: instead, the EU institutions undertook to pay future pension benefits (to be charged to the Union budget) when staff retire.

From a budgetary perspective, the PSEO has produced net revenue in the past, due to the fact that the PSEO is not yet mature, or, in other words, there are more active staff paying contributions for future pension rights than pensioners or disabled staff drawing benefits. The PSEO revenue consists of the pension contributions paid by the staff and the employer's contribution (the latter not being paid into a fund but only reflected in the pension liability). In this way, the EU budget is effectively borrowing money from the members of the scheme in return for a guarantee to pay future benefits.

The balance of the amounts borrowed and the amounts repaid is reflected in the pension liability.

3.4.4. The two recent substantial SR reforms aimed to keep the PSEO in line with the key requirements for a sustainable pension scheme

The EU pension scheme has gone through two substantial reforms in less than ten years, in 2004 and 2013. Both reforms had an impact on various parameters of the pension scheme, such as pension entitlements, which were reduced, and the pensionable age, which was increased.

The 2013 reform increased the pensionable age, introduced a lower yearly pension rights accrual rate, created a new category of staff with lower entry-level salaries, and established slower career paths (the main elements intended to provide savings in pension expenditure).

The savings on pension expenditure arising from the 2013 reform of PSEO is the subject of the current study.

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volatility of the real discount/interest rate which corresponds to a market value at 31 December of each year. For instance, a good part of the increase of the liability between 2022 and 2023 (from EUR 84 billion to EUR 95 billion) is due to the decrease of the real discount rate from 1.1% on 31 December 2022 to 0.8% on 31 December 2023. All other parameters remaining equal, if the interest rate was to increase up to 1.1% on 31.12.2024, the liability would go down to its value at 31 December 2022.

4. Key parameters of the pension scheme affected by the 2013 SR reform

The Eurostat study assesses the effect of the 2013 SR reform on four key parameters of the pension scheme, which have the biggest impact on pension expenditure.

The approach taken was to estimate the extra pension costs which would have been incurred by 2073 if the provisions of the 2013 Staff Regulations on these four parameters had not been introduced.

It should be noted that only the four parameters of the pension scheme specifically mentioned here were taken into account in the study.

Those four parameters are:

- **the pensionable age**: the normal pensionable age is 66 years for staff recruited as of 1 January 2014, with transitional measures for staff recruited before that date (Article 52 of the SR and Article 22 of Annex XIII thereto),
- **the accrual rate** of 1.8% per year for staff recruited since 1 January 2014, 1.9% for staff recruited between 1 May 2004 and 31 December 2013 and 2.0% for staff recruited before 1 May 2004 (Article 77(2) of the SR and Article 21 of Annex XIII thereto),
- **the new function group AST/SC** corresponding to clerical and secretarial duties (Articles 5, 65(4) and 66 of the SR),
- **the new career structure in function groups AST and AD:** access to the higher grades of AD13 and AD14 is made possible only via a selection procedure for officials not assigned to the types of post 'head of unit or equivalent', or 'adviser or equivalent'; similarly, access to grades AST 10 and AST 11 (senior assistant) is now available for the best performing assistants who pass a selection procedure and carry a high degree of responsibility (Article 45(1) of the SR and Annex I thereto).

The interdependence of these parameters means that analysing their impact *ceteris paribus* may lead to biased results. Nevertheless, despite their potential statistical uncertainty, single impacts are presented in Section 5.4 in a synthesis of the simulations.

To establish its individual impact, two scenarios were drawn up for each parameter:

- *Test* S*cenario* is a fictional situation where population and expenditure are forecasted assuming that the 2013 SR reform had not entered into force;

- *Current Scenario* is the real situation where population and expenditure are forecasted following the 2013 SR Reform.

5. Actuarial Assumptions

Actuarial assumptions have a fundamental influence on long-term projections. The actuarial assumptions of this study have benefited from DG HR inputs and are consistent with accepted actuarial practices. All the assumptions (modelling and values) have been validated by independent experts.

5.1. Literature

Actuarial literature[18] universally agrees on the fact that it is highly unlikely that projections will be exactly realised: experience will diverge from the projected values.

The actual values of the parameters may differ from those assumed, and there will be stochastic variations around those parameters.

Long-term projections require long-term assumptions. Unfortunately, the long-term average rates are unpredictable, so **this study is not to be read as a prediction but as an assumption:** the **hypothetical nature of a long-term pension cost analysis** must be emphasised.

As reported in the Journal of Actuarial Practice: *'The purpose of a pension forecast is to test the future cost impact of some expected or proposed changes. The emphasis is on the future trend of the cost. Forecast results should be shown as estimates. Each individual item (e.g. liabilities, benefit payments, assets, etc.) may differ greatly from that produced by a subsequent valuation. It is not necessary, and it is often misleading, to provide detailed results for each forecast year.'*[19]

'Uncertainty in projections can result from a variety of sources ..., time also increases uncertainty: Projections over longer periods are less certain than short-term projections because of the compounding effects of inaccuracies in assumptions over time'[20].

[18] See for instance *Subramaniam Iyer, 'Actuarial mathematics of social security pensions', Quantitative Methods in Social Protection Series, International Labour Office (ILO) and International Social Security Association (ISSA), 1999.*

[19] Sze M., '*The process of pension forecasting',* Journal of Actuarial Practice vol.1, No 1, 1993.

[20] Understanding Population Projections: Assumptions Behind the Numbers, Toshiko Kaneda and Jason Bremner.

The opportunity to use actuarial methods when performing social security pension scheme projections has been outlined by Crescentini and Spandonaro[21] among others.

In particular, the *component method* suggests that the actuary should break down the covered population into components and then simulate the evolution of each component over time. The extent of the breakdown depends on the availability of the data for the valuation and on the computing capacity at the disposal of the actuary. The minimum breakdown required is by:

- category of covered person (active staff, pensioners, disabled staff, widows/widowers and orphans),
- sex,
- age.

Additional breakdown is justified only if it is expected to lead to a commensurate increase in the precision of the projections.

The methodology must be tailored to the level of complexity of the assumptions. Depending on the assumptions, the methodology can be simplified: assumptions should be kept as simple as possible, unless there are reasonable grounds to do otherwise.

5.2. Demographic assumptions

5.2.1. Population

The population at the beginning of the projection exercise is composed by the PSEO members at 31 December 2023.

Active staff include officials, temporary agents, contract agents and parliamentary assistants.

Non-active staff include old-age pensioners, deferred pensioners[22], beneficiaries of an invalidity pension, beneficiaries of an invalidity allowance, widows/widowers and orphans.

The total PSEO population was split into 3 073 homogeneous classes named '*population aggregate for projection purpose (PaP)*', based on the criteria below:

- administrative status,
- applicable Staff Regulations depending on the date of recruitment,

[21] Crescentini Laura, Spandonaro Federico, 1992, 'Methodological developments in forecasting techniques'.
[22] Non-active staff who have accrued at least ten years of pensionable service in the EU but have not yet reached pensionable age.

- contract type,
- contract length,
- function group,
- age.

The approach known as '*open group'* is used, under which new members (hereinafter *new entrants*) are allowed to enter the PSEO population throughout the projection exercise.

It is widely accepted actuarial practice to put in place some simplifications when carrying out similar exercises.

The present study, consistent with previous studies, is agnostic about any future EU enlargements or withdrawals mainly due to the uncertainty of future events. Moreover, since 2010 (date of release of the first study), only one EU enlargement and one EU withdrawal have occurred.

Such a stable framework provides a realistic base and makes it possible to outline the impact of the current population structure on future pension expenditure.

The 2013 reform of the Staff Regulations established the new function group of secretaries and clerks (AST-SC).

In the light of these observations, the size of the active population is kept stable for the whole projection. In line with the methodological approach already implemented for the 2016 study, the size of the active staff sub-categories (officials, temporary agents, contract agents and parliamentary assistants) is also kept stable all along the projection: consequently, the staff member replacing a temporary agent at the end of their contract[23] still belongs to the category of temporary agents (analogous treatment is reserved for contract agents and parliamentary assistants).

5.2.2. Population transitions

The first step of the projection technique consists in estimating the number of individuals in each of the population sub-groups at discrete time-points (year 0 to 50), starting from the given initial values (time t=0 on 31.12.2023).

Death, disability, retirement, and turnover are events which involve a *negative* demographic impact. Those events determine a *population transition* which involves a transfer from one population class to another.

[23] A duration of six years is assumed for the length of the cumulated contracts of temporary agents, contract agents and parliamentary assistants.

For each of the 50 years under analysis, it is necessary to generate new entrants which will keep the active population stable.

New entrants are added according to the formula below:

$$number\ of\ new\ entrants\ at\ T_n = number\ of\ actives\ disappeared\ between\ T_{n-1}\ and\ T_n$$

5.2.3. Active staff

The present study assumes that the 2023 active population size will remain constant over the period 2023-2073.

5.2.4. Life tables

The separate life tables for men and women employed in the present study are those used for the calculation of the 2023 pension liability and pension contribution rate: the 2023 EU life tables (EULT 2023) were produced by Eurostat, reviewed by independent external actuaries[24] and adopted by the EU national delegates of the Article 83 Working Group at its 27 June 2023 meeting.

The 2023 EULT are prospective (dynamic) life tables, different for male and female members.

Concerning staff with disabilities, the 2023 EULT brought three years forward are applied, in accordance with common actuarial practices (it is assumed that a member with a disability has a lower life expectancy than a non-disabled person of the same age).

The EU Staff Regulations set out a five-year update of the life tables[25]: the most recent update took place in 2023.

No specific rules related to the life tables were directly affected by the 2013 SR reform, thus no savings are expected to be directly originating from this item.

5.2.5. Invalidity tables

The 2023 Invalidity Table, which contains the probabilities of becoming disabled depending on age, has been employed for the present study.

The EU Staff Regulations set out a five-year update of the invalidity tables[26]: the most recent update took place in 2023.

[24] Prudential Actuaries Ltd.
[25] Art. 9.2 of Annex XII of the SR.

The calculations differentiate between the beneficiaries of an invalidity pension as provided by the Staff Regulations before 1 May 2004 and the beneficiaries of an invalidity allowance as created by the 2004 SR reform with less favourable conditions, especially with respect to the calculation of their financial entitlements as compared to the former disability pension.

No specific rules related to the invalidity tables were directly affected by the 2013 SR reform, thus no savings are expected to be directly originating from this item.

5.2.6. Deferral tables

Staff who have contributed to the PSEO for at least ten years are entitled to a pension deferred to the moment of reaching the pensionable age.

Deferral tables contain the probabilities (deferral rates) for an active member of staff to become a deferred pensioner and are expected to quantify the phenomenon of active staff transitioning to the deferred pensioners category.

As no specific rules related to the deferral rates were directly affected by the 2013 SR reform, no savings are expected to be directly originating from this item.

5.2.7. Retirement ages

The various retirement ages (early, normal and maximum) are directly set by the legislator in the SR provisions.

The 2013 SR reform raised the normal retirement age from 63 to 66.

The individual retirement age depends on individual status: for example, the date of recruitment affects retirement behaviour. Depending on the date of recruitment, a different yearly pension accrual rate (either 1.8% or 1.9% or 2%) will be applied, requiring a different number of service years to reach the 70% ceiling for the retirement pension (38.9, 36.8 or 35 years respectively).

It is evident that, aside legal provisions, individual choices will affect the actual behaviour of the staff concerned once they have reached the minimum pensionable age.

The estimated additional expenditure without the 2013 SR reform is obtained taking into account the changes to the pensionable ages.

[26] Art. 9.1 of Annex XII of the SR.

5.2.8. Widow/widower rates

The surviving spouse of an active staff member, pensioner, deferred pensioner or disabled staff member, is entitled to a survivor pension under certain conditions laid down in Annex VIII of the SR.

The widow/widower rate is the probability, by age, of a pension rights holder dying and being succeeded by a widow/widower.

No specific rules related to the widow/widower rates were directly affected by the 2013 SR reform, thus no savings are to be expected directly originating from this item.

5.2.9. Orphan rates

The death of a PSEO member may involve paying an orphan's pension to surviving children.

The orphan rate is the probability, by age, of a pension rights holder dying and being succeeded by children.

No specific rules related to the orphan rates were directly affected by the 2013 SR reform, thus no savings are expected to be directly originating from this item.

5.2.10. Recruitment policy

The active population is kept stable all along the projection period.

In addition, following the introduction of the new function group of AST-SC, during the first 22 years of the projection exercise, secretaries and clerks will gradually replace assistants with equivalent duties until reaching the same number of members.

The estimated additional expenditure without the 2013 SR reform is obtained considering the gradual replacement above.

5.2.11. Turnover rate

Actuarial theory distinguishes between involuntary turnover (due to expiry of a contract, for instance) and voluntary turnover (due to resignation, for instance).

PSEO turnover is also strictly dependent on the function group (contract agents have higher turnover rates than officials by default). Consequently, average turnover rates per function group have been used. In particular:

- the turnover rates of officials are assumed to be nihil as past observations have revealed immaterial withdrawal rates and as officials' contracts are permanent.

- the turnover rates of other staff (temporary agents, contract agents and parliamentary assistants) reflect the capped duration of their contracts (or succession of those) and the observed patterns over time.

No specific rules related to the turnover rates were directly affected by the 2013 SR reform, thus no savings are to be expected directly originating from this item.

5.2.12. Age of new entrants

The age of newcomers reflects past observations and any expected relevant HR policy.

5.3. Economic assumptions

5.3.1. General salary growth (GSG)

Salaries are updated yearly under Article 65 of the SR.

Annex XI to the SR details the method of calculations of those annual updates.

A thirty-year (1994 to 2023) geometric moving average of the annual net salary increases applied has been used.

It should be borne in mind that between 2011 and 2014, the applied annual salary updates were different from the calculated ones (*salary freeze*).

The estimated additional expenditure without the 2013 SR reform is obtained taking into account the difference between:

- thirty-year moving average of calculated GSG (without *salary fr*eeze),
- thirty-year moving average of applied GSG (with *salary freeze*).

5.3.2. Individual salary progression

The individual salary progression (ISP) depends on step advancements and promotions.

While step advancements generally occur after a fixed period of two years (Article 44(1) of the SR), promotions occur only after a variable number of years in the same grade and are based on comparative merits (Article 45 to the SR and Annex I thereto).

Eleven categories of staff have been identified (three for officials, three for temporary agents, four for contract agents, and one for parliamentary assistants) and average ISP rates by grade have been calculated.

The estimated additional expenditure without the 2013 SR reform is obtained by incorporating:

- amendments to the average career rates from provisions of Table B.1 of Annex I to the Staff Regulations (for administrators and assistants);
- introduction of specific slower average career rates from provisions of Table 2 of Annex I to the Staff Regulations (for secretaries and clerks);
- slower average career rates proposed by DG HR to reflect the actual career perspectives;
- career limitations imposed on AD 12, AD 13, AST 9 and AST 10 staff[27].

The estimated additional expenditure without the 2013 SR reform is obtained taking into account the above-mentioned changes affecting individual salary progression.

5.3.3. Basic salaries at recruitment

The basic salaries at recruitment are clearly set by the legislator[28].

Those basic salaries are used for the projection.

The estimated additional expenditure without the 2013 SR reform is obtained as the difference between:

- using the official basic salary grid;
- adjusting the official salary grid by incorporation of the hypothetical salary adjustments described in Part 4.3.1 above;
- applying the AST basic salaries to the AST-SC members as if the AST-SC function group had not been established by the 2013 SR reform and AST staff were recruited to perform clerical and secretarial duties.

5.3.4. Pension accrual rate

The yearly pension accrual rates are linked to the date of entry into service (see Part 4).

The estimated additional expenditure without the 2013 SR reform is obtained as the difference between:

- using the three yearly pension accrual rates (1.8%, 1.9% and 2.0%);

[27] Articles 30 & 31 in Annex XIII of the SR.
[28] Article 66 of the SR.

- using only two pension accrual rates (1.9% and 2.0%), thus assuming that no 1.8% yearly accrual rate has ever been introduced (to simulate the non-occurring of the 2013 SR reform).

5.3.5. Inflation rate

The forecast is made at constant 2023 prices to strengthen the comparability over the years, by identifying the variables that have a real influence on pension expenditure, that is, the population structure and the long-term impact of the 2013 SR reform.

6. Results

6.1. *Key findings*

The two recent (2004 and 2013) reforms of the Staff Regulations amended several legal provisions related to the pension expenditure.

Some amendments were meant to directly reduce the cost of pensions, such as the further reduction of the yearly pension accrual rate from 1.9% to 1.8%, and the further increase of the pensionable age from 63 to 66.

Other changes to the Staff Regulations, while not directly related to pension costs, have an impact on the overall cost of pensions by limiting the final salaries on which pension benefits are calculated. These include the creation of the AST/SC function group, lower entry-level salaries, slower or capped careers paths, and the suspension of the application of the salary method.

On the assumption that the active population will remain constant, the number of beneficiaries of the scheme (old-age pensioners, disabled staff and survivors) will pass from 30 495 in 2023 to about 42 532 in 2073, with an increase of 39.5% (see Table 2).

However, at the same time, the yearly pension expenditure for the non-active staff (at 2023 constant prices) will be EUR 2 418 million in 2023 and fall to EUR 1 951 million in 2073, thus decreasing by 19.3% (see Table 8).

This long-term decrease of the pension expenditure, analysed together with the 39.5% increase in the real number of beneficiaries estimated over the same period, is a clear demonstration of the effectiveness of the combined 2004 and 2013 reforms of the Staff Regulations.

The simulation performed also reveals that, without the 2013 SR reform, the expected additional pension expenditure in the last year of the projection period would have been substantially higher (+ EUR 857 million i.e. 43.9%, see Table 10).

As mentioned above, the new measures introduced by the 2013 SR reform are expected to lead to growing annual cost savings between 2024 and 2073: those savings will reach EUR 857 million in 2073.

The total cost savings over 50 years, at 2023 prices, are projected to be EUR 31 483 million.

It should be noted that the referred expected savings are additional to those produced by the 2004 reform of the SR, since the present study only focused on the impact of the four above-mentioned key parameters (see Chapter 3 of the present report) amended by the 2013 SR reform.

6.2. Evolution of the population

6.2.1. Projection of the active population

The active population is assumed to remain constant at 67 395 persons throughout the 2023-2073 timeframe (Table 1).

Table 1: Active Population

Category	2023 Headcount	2073 Headcount
Official AD	20,562	20,562
Official AST	11,191	6,351
Official SC	1,174	6,014
TA AD	10,407	10,407
TA AST	4,314	2,448
TA SC	919	2,785
CA FG I	2,060	2,060
CA FG II	2,808	2,808
CA FG III	4,087	4,087
CA FG IV	7,832	7,832
PA	2,041	2,041
Total	**67,395**	**67,395**

6.2.2. Projection of the non-active population

The size of the non-active population (pensioners, disabled staff, widows/widowers and orphans) over the 2023-2073 period is expected to increase from 30 495 to 42 532 (+39% equivalent to a 3.7% linear yearly increase).

The non-active population is expected to increase until year 2048, whereas in the second half of the projection period, from year 2049 onwards, its size is expected to decrease.

Table 2: Projection of the non-active PSEO population (pensioners, disabled staff, widows/widowers and orphans)

Year	Retirees, Invalids, Survivors	Yearly Change	Year	Retirees, Invalids, Survivors	Yearly Change	Year	Retirees, Invalids, Survivors	Yearly Change
2023	30,495	0.0%	2040	42,419	2.0%	2057	44,193	-0.6%
2024	31,617	3.7%	2041	43,228	1.9%	2058	43,985	-0.5%
2025	31,986	1.2%	2042	44,091	2.0%	2059	43,791	-0.4%
2026	32,528	1.7%	2043	44,882	1.8%	2060	43,622	-0.4%
2027	33,168	2.0%	2044	45,552	1.5%	2061	43,485	-0.3%
2028	33,947	2.3%	2045	45,964	0.9%	2062	43,362	-0.3%
2029	34,653	2.1%	2046	46,193	0.5%	2063	43,255	-0.2%
2030	35,440	2.3%	2047	46,257	0.1%	2064	43,163	-0.2%
2031	36,212	2.2%	2048	46,268	0.0%	2065	43,085	-0.2%
2032	37,025	2.2%	2049	46,129	-0.3%	2066	43,010	-0.2%
2033	37,751	2.0%	2050	45,938	-0.4%	2067	42,935	-0.2%
2034	38,445	1.8%	2051	45,725	-0.5%	2068	42,857	-0.2%
2035	39,156	1.8%	2052	45,439	-0.6%	2069	42,793	-0.1%
2036	39,800	1.6%	2053	45,189	-0.6%	2070	42,716	-0.2%
2037	40,348	1.4%	2054	44,945	-0.5%	2071	42,661	-0.1%
2038	40,893	1.4%	2055	44,690	-0.6%	2072	42,580	-0.2%
2039	41,602	1.7%	2056	44,439	-0.6%	2073	42,532	-0.1%

6.3. Pension expenditure

The estimation of the pension expenditure over the fifty-year period covers pension-related expenditure under Chapters 2, 3 and 4 of Annex VIII to the SR (retirement pension and severance grants, transfers-out, invalidity pensions/allowances, survivors' pensions).

Figures provided in the tables below show the major trends that are expected over the period 2023-2073.

Tables 3 to 8 give projected expenditure broken down as follows:

- Table 3: Retirement pensions expenditure
- Table 4: Invalidity pensions and allowances expenditure

- Table 5: Survivor pensions expenditure
- Table 6: Retirement, invalidity, survivors' pensions expenditure
- Table 7: Transfers-out and severance grants expenditure
- Table 8: Total pensions expenditure.

6.3.1. Pension expenditure for old-age pensioners

The pension expenditure for old-age pensioners is equal to EUR 1 911 million at year zero of the projection (2023) and is estimated to be EUR 1 446 million (at 2023 prices) in the last year of the projection (2073). The forecasting model estimates a maximum value of EUR 2 809 million for retirement pension expenditure in year 2044: from 2045 onwards this category of pension expenditure is expected to decrease and reach its minimum of EUR 1 446 million in the last year of projection (2073).

Table 3: Projection of the pension expenditure for the old-age pensioners (EUR million)

Year of projection	Retirement expenditure	Yearly Change	Year of projection	Retirement expenditure	Yearly Change	Year of projection	Retirement expenditure	Yearly Change
2023	1,911	0.00%	2040	2,695	1.28%	2057	2,108	-3.05%
2024	2,000	4.69%	2041	2,730	1.27%	2058	2,044	-3.00%
2025	2,023	1.14%	2042	2,763	1.21%	2059	1,984	-2.94%
2026	2,059	1.79%	2043	2,789	0.96%	2060	1,927	-2.90%
2027	2,124	3.15%	2044	2,809	0.72%	2061	1,873	-2.82%
2028	2,187	2.96%	2045	2,805	-0.16%	2062	1,822	-2.72%
2029	2,247	2.73%	2046	2,783	-0.79%	2063	1,773	-2.65%
2030	2,316	3.10%	2047	2,746	-1.33%	2064	1,728	-2.53%
2031	2,380	2.75%	2048	2,701	-1.64%	2065	1,686	-2.44%
2032	2,442	2.58%	2049	2,643	-2.13%	2066	1,647	-2.34%
2033	2,487	1.86%	2050	2,581	-2.37%	2067	1,610	-2.24%
2034	2,525	1.52%	2051	2,516	-2.53%	2068	1,576	-2.13%
2035	2,561	1.42%	2052	2,445	-2.79%	2069	1,544	-1.99%
2036	2,590	1.16%	2053	2,377	-2.80%	2070	1,517	-1.75%
2037	2,614	0.92%	2054	2,308	-2.91%	2071	1,491	-1.74%
2038	2,633	0.71%	2055	2,241	-2.88%	2072	1,467	-1.62%
2039	2,661	1.08%	2056	2,174	-3.01%	2073	1,446	-1.44%

6.3.2. Expenditure for the beneficiaries of an invalidity pension or allowance

The expenditure for invalidity allowances and pensions is equal to EUR 211 million at year zero of the projection (2023) and is estimated to be EUR 68 million (at 2023 prices) in the last year of the projection (2073). The forecasting model estimates a maximum value of EUR 211 million for the expenditure for invalidity pensions/allowances in 2023: from 2024 onwards, this category of expenditure is expected to decrease and reach its minimum of EUR 68 million in the last years of projection (2071 to 2073). The decrease also depends on the circumstance that the subset of beneficiaries of an invalidity pension represents a 'closed' group due to the 2004 SR reform, which amended the provisions on the invalidity pension.

Table 4: Projection of the expenditure for invalidity pensions/allowances (€ million)

Year of projection	Invalidity expenditure	Yearly Change	Year of projection	Invalidity expenditure	Yearly Change	Year of projection	Invalidity expenditure	Yearly Change
2023	211	0.00%	2040	118	-6.27%	2057	71	0.41%
2024	209	-0.55%	2041	110	-6.52%	2058	71	0.62%
2025	207	-0.98%	2042	102	-7.11%	2059	72	0.31%
2026	205	-1.13%	2043	95	-7.44%	2060	72	0.01%
2027	200	-2.40%	2044	87	-8.07%	2061	72	-0.03%
2028	196	-2.19%	2045	82	-6.22%	2062	71	-0.31%
2029	190	-3.18%	2046	78	-4.50%	2063	71	-0.27%
2030	182	-3.99%	2047	75	-4.05%	2064	71	-0.44%
2031	175	-3.84%	2048	72	-3.11%	2065	71	-0.50%
2032	168	-3.91%	2049	71	-1.41%	2066	70	-0.59%
2033	162	-3.61%	2050	70	-1.37%	2067	70	-0.51%
2034	157	-3.22%	2051	70	-0.56%	2068	69	-0.55%
2035	152	-3.22%	2052	70	-0.31%	2069	69	-0.65%
2036	146	-3.54%	2053	70	-0.01%	2070	69	-0.55%
2037	140	-4.47%	2054	70	0.09%	2071	68	-0.41%
2038	134	-4.53%	2055	70	0.49%	2072	68	-0.36%
2039	126	-5.85%	2056	71	0.67%	2073	68	-0.68%

6.3.3. Pensions expenditure for widows/widowers and orphans.

The expenditure for widows/widowers' and orphans` pensions is equal to EUR 243 million at year zero of the projection (2023) and is estimated to be EUR 398 million (at 2023 prices) in the last year of the projection (2073). The forecasting model estimates that this category of expenditure is expected to increase all along the projection period and reach its maximum of 398 million in the last year of projection (2073).

Table 5: Projection of the expenditure for the pensions to widows/widowers and orphans (€ million)

Year of projection	Widows/widowers & Orphans` expenditure	Yearly Change	Year of projection	Widows/widowers & Orphans` expenditure	Yearly Change	Year of projection	Widows/widowers & Orphans` expenditure	Yearly Change
2023	243	0.00%	2040	284	1.41%	2057	357	1.12%
2024	245	0.97%	2041	288	1.37%	2058	361	1.06%
2025	246	0.56%	2042	291	1.36%	2059	364	1.00%
2026	248	0.70%	2043	296	1.48%	2060	368	0.96%
2027	250	0.75%	2044	300	1.39%	2061	371	0.92%
2028	252	0.92%	2045	304	1.50%	2062	374	0.84%
2029	254	0.58%	2046	309	1.48%	2063	377	0.81%
2030	256	0.67%	2047	314	1.49%	2064	380	0.74%
2031	257	0.55%	2048	318	1.47%	2065	383	0.68%
2032	259	0.69%	2049	323	1.43%	2066	385	0.66%
2033	261	0.84%	2050	327	1.43%	2067	387	0.57%
2034	263	0.97%	2051	332	1.37%	2068	390	0.56%
2035	266	1.16%	2052	336	1.32%	2069	392	0.50%
2036	269	1.09%	2053	341	1.30%	2070	393	0.45%
2037	272	1.15%	2054	345	1.25%	2071	395	0.42%
2038	276	1.40%	2055	349	1.20%	2072	396	0.36%
2039	280	1.24%	2056	353	1.16%	2073	398	0.36%

6.3.4. Retirement, invalidity, survivors' pension expenditure

The expenditure for the pensions for the not-active population (old-age pensioners, beneficiaries of an invalidity allowance/pension, widows/widowers and orphans) is equal to EUR 2 364 million in year zero of the projection (2023) and is estimated to be EUR 1 911 million (at 2023 prices) in the last year of the projection (2073). The forecasting model estimates a maximum value of EUR 3 196 million in year 2044: from 2045 onwards this category of expenditure is expected to decrease and reach its minimum of EUR 1 911 million in the last year of projection (2073).

Table 6: Projection of the expenditure for the pensions for the not-active population (old-age pensioners, beneficiaries of an invalidity allowance/pension, widows/widowers and orphans) (€ million)

Year	Retirees+ Invalids+ Survivors` Exoenditure	Yearly Change	Year	Retirees+ Invalids+ Survivors` Exoenditure	Yearly Change	Year	Retirees+ Invalids+ Survivors` Exoenditure	Yearly Change
2023	2,364	0.0%	2040	3,097	1.0%	2057	2,536	-2.4%
2024	2,455	3.8%	2041	3,127	1.0%	2058	2,477	-2.3%
2025	2,477	0.9%	2042	3,156	0.9%	2059	2,420	-2.3%
2026	2,513	1.4%	2043	3,180	0.7%	2060	2,366	-2.2%
2027	2,574	2.5%	2044	3,196	0.5%	2061	2,315	-2.2%
2028	2,635	2.4%	2045	3,191	-0.2%	2062	2,267	-2.1%
2029	2,690	2.1%	2046	3,170	-0.7%	2063	2,222	-2.0%
2030	2,754	2.4%	2047	3,134	-1.1%	2064	2,180	-1.9%
2031	2,812	2.1%	2048	3,092	-1.4%	2065	2,140	-1.8%
2032	2,868	2.0%	2049	3,038	-1.7%	2066	2,102	-1.7%
2033	2,910	1.5%	2050	2,979	-1.9%	2067	2,067	-1.7%
2034	2,945	1.2%	2051	2,917	-2.1%	2068	2,035	-1.6%
2035	2,979	1.2%	2052	2,851	-2.3%	2069	2,005	-1.5%
2036	3,006	0.9%	2053	2,787	-2.2%	2070	1,979	-1.3%
2037	3,027	0.7%	2054	2,722	-2.3%	2071	1,954	-1.3%
2038	3,043	0.5%	2055	2,661	-2.3%	2072	1,931	-1.2%
2039	3,067	0.8%	2056	2,598	-2.4%	2073	1,911	-1.0%

6.3.5. Transfers-out and severance grants expenditure

The expenditure related to the transfers-out and severance grants is equal to EUR 54 million at year zero of the projection (2023) and is estimated to be EUR 40 million (at 2023 prices) in the last year the projection (2073). The forecasting model estimates a maximum value of EUR 54 million in 2023: all along the projection period this category of expenditure is expected to decrease and reach its minimum of EUR 40 million in the last year of projection (2073).

Table 7: Projection of transfers-out and severance grants (€ million)

Year of projection	TrOut+SevGr Expenditure	Yearly Change	Year of projection	TrOut+SevGr Expenditure	Yearly Change	Year of projection	TrOut+SevGr Expenditure	Yearly Change
2023	54	0.00%	2040	42	-1.20%	2057	39	-0.39%
2024	51	-6.07%	2041	41	-1.44%	2058	40	0.28%
2025	51	0.40%	2042	41	-0.67%	2059	40	0.12%
2026	51	-0.51%	2043	40	-1.99%	2060	40	0.10%
2027	50	-1.58%	2044	40	-0.01%	2061	40	-0.09%
2028	48	-2.80%	2045	40	-1.08%	2062	40	-0.13%
2029	48	-0.87%	2046	40	-0.47%	2063	40	0.16%
2030	47	-2.34%	2047	40	-0.08%	2064	40	-0.11%
2031	47	-0.89%	2048	39	-0.32%	2065	40	0.34%
2032	46	-1.93%	2049	40	0.28%	2066	39	-0.78%
2033	45	-0.73%	2050	39	-0.20%	2067	40	0.81%
2034	45	-1.16%	2051	39	-0.15%	2068	39	-0.73%
2035	44	-1.57%	2052	40	0.36%	2069	40	0.27%
2036	44	-0.99%	2053	39	-0.37%	2070	39	-0.22%
2037	43	-0.49%	2054	40	0.48%	2071	40	0.03%
2038	43	-2.04%	2055	39	-0.22%	2072	40	0.20%
2039	42	-0.31%	2056	40	0.46%	2073	40	-0.18%

6.3.6. Total expenditure for the non-active population and for transfers-out and severance grants

The expenditure related to the pension expenditure for the non-active members (retirement pensions, invalidity allowances/pensions, survivors` pensions, transfers-out and severance grants) is equal to EUR 2 418 million in year zero of the projection (2023) and is estimated to be EUR 1 951 million (at 2023 prices) in the last year of the projection (2073), decreasing by 19.3%. The forecasting model estimates a maximum value of EUR 3 237 million in 2044: from 2045 onwards this category of expenditure is expected to decrease and reach its minimum of EUR 1 951 million in the last year of projection (2073).

Table 8: Projection of the expenditure for the pensions to the non-active population (old-age pensioners, beneficiaries of an invalidity allowance/pension, widows/widowers and orphans) and for transfers-out and severance grants (€ million)

Year	Retirees, Invalids, Survivors` & Transfers-Out Expenditure	Yearly Change	Year	Retirees, Invalids, Survivors` & Transfers-Out Expenditure	Yearly Change	Year	Retirees, Invalids, Survivors` & Transfers-Out Expenditure	Yearly Change
2023	2,418	0.0%	2040	3,139	1.0%	2057	2,575	-2.4%
2024	2,506	3.6%	2041	3,169	0.9%	2058	2,516	-2.3%
2025	2,528	0.9%	2042	3,197	0.9%	2059	2,460	-2.2%
2026	2,563	1.4%	2043	3,220	0.7%	2060	2,406	-2.2%
2027	2,624	2.4%	2044	3,237	0.5%	2061	2,355	-2.1%
2028	2,684	2.3%	2045	3,231	-0.2%	2062	2,307	-2.0%
2029	2,738	2.0%	2046	3,209	-0.7%	2063	2,262	-2.0%
2030	2,801	2.3%	2047	3,174	-1.1%	2064	2,219	-1.9%
2031	2,859	2.1%	2048	3,131	-1.3%	2065	2,179	-1.8%
2032	2,914	1.9%	2049	3,077	-1.7%	2066	2,142	-1.7%
2033	2,955	1.4%	2050	3,018	-1.9%	2067	2,107	-1.6%
2034	2,990	1.2%	2051	2,957	-2.0%	2068	2,074	-1.6%
2035	3,023	1.1%	2052	2,891	-2.2%	2069	2,044	-1.4%
2036	3,050	0.9%	2053	2,827	-2.2%	2070	2,019	-1.3%
2037	3,070	0.7%	2054	2,762	-2.3%	2071	1,994	-1.2%
2038	3,085	0.5%	2055	2,700	-2.2%	2072	1,971	-1.1%
2039	3,109	0.8%	2056	2,637	-2.3%	2073	1,951	-1.0%

6.4. Impact of the 2013 reform – synthesis of the simulations

Sensitivity analysis is highly recommended[29] to assess the impact of each parameter intervening in the related calculations.

Table 9 shows the extra pension costs which would be incurred by 2073 in the hypothetical scenario in which no 2013 SR reform is implemented.

The model estimates that the total pension expenditure in 2073, without the 2013 reform, would be EUR 856.8 million higher (+43.9%). This amount is split into several components each linked to a particular parameter.

Table 9 provides the related information.

Table 9: Impact at year 2073 of the 2013 SR reform on the pension expenditure of the non-active population

Sensitivity Analysis		
Parameter	**Value (€m)**	**Impact (€m)**
Expenditure Current Scenario year 50	1,950.5	
Basic Salary at recruitment	166.8	8.6%
Recruitment Policy	206.5	10.6%
General Salary Growth	114.7	5.9%
Individual Salary Progression	116.3	6.0%
Retirement Age	180.3	9.2%
Pension Accrual Rate	59.3	3.0%
Initial Population	12.8	0.7%
Expenditure Test Scenario year 50	2,807.3	
Additional Expenditure without the 2013 SR reform	**856.8**	**43.9%**

When analysing the effect of the single parameters involving savings, it is necessary to observe that some of the effects are correlated; for example, changes in the accrual rate are correlated with changes in the pensionable age.

It should be emphasised that the estimations are meaningful only at the most aggregated level, the parameters described above being statistically interrelated.

[29] McGillivray (1996) and Picard (1996).

6.5. Impact of the 2013 SR reform: yearly savings

Table 10 and Graphs 1 and 2 provide a view of the expected savings from the 2013 SR reform.

Table 10: Projected annual cost savings at 2023 prices

Year	Savings (€m)	Savings (%)	Year	Savings (€m)	Savings (%)	Year of projection	Savings (€m)	Savings (%)
2023	171	0.0%	2040	596	2.2%	2057	674	3.8%
2024	456	167.0%	2041	604	1.3%	2058	697	3.4%
2025	501	9.7%	2042	590	-2.4%	2059	719	3.1%
2026	528	5.4%	2043	566	-4.0%	2060	739	2.8%
2027	539	2.1%	2044	534	-5.7%	2061	756	2.4%
2028	546	1.3%	2045	519	-2.8%	2062	772	2.1%
2029	554	1.5%	2046	504	-2.9%	2063	786	1.8%
2030	539	-2.7%	2047	496	-1.5%	2064	797	1.5%
2031	523	-3.0%	2048	496	-0.1%	2065	808	1.3%
2032	508	-2.8%	2049	503	1.5%	2066	818	1.3%
2033	502	-1.3%	2050	517	2.7%	2067	827	1.1%
2034	498	-0.6%	2051	532	3.0%	2068	835	1.0%
2035	494	-0.8%	2052	555	4.2%	2069	842	0.8%
2036	506	2.4%	2053	577	4.0%	2070	846	0.5%
2037	530	4.7%	2054	600	4.0%	2071	851	0.6%
2038	561	5.8%	2055	626	4.3%	2072	855	0.5%
2039	584	4.1%	2056	649	3.8%	2073	857	0.2%

The savings in the expenditure for the pensions of the non-active PSEO members (old-age pensioners, beneficiaries of an invalidity allowance/pension, widows/widowers and orphans), increase all along the projection period and reach their maximum of EUR 857 million in year 2073 (last year of the projection)[30].

The estimated total savings over the observed period of 50 years (2024 to 2073), due to the 2013 reform of the SR, are estimated at EUR 31.5 billion (EUR 31 483 million) at 2023 prices.

To be able to link the 2016 and 2024 studies, it is necessary to use the same salary grid i.e. the one at 1 July 2014 (the grid employed in the context of the 2016 study, where the starting

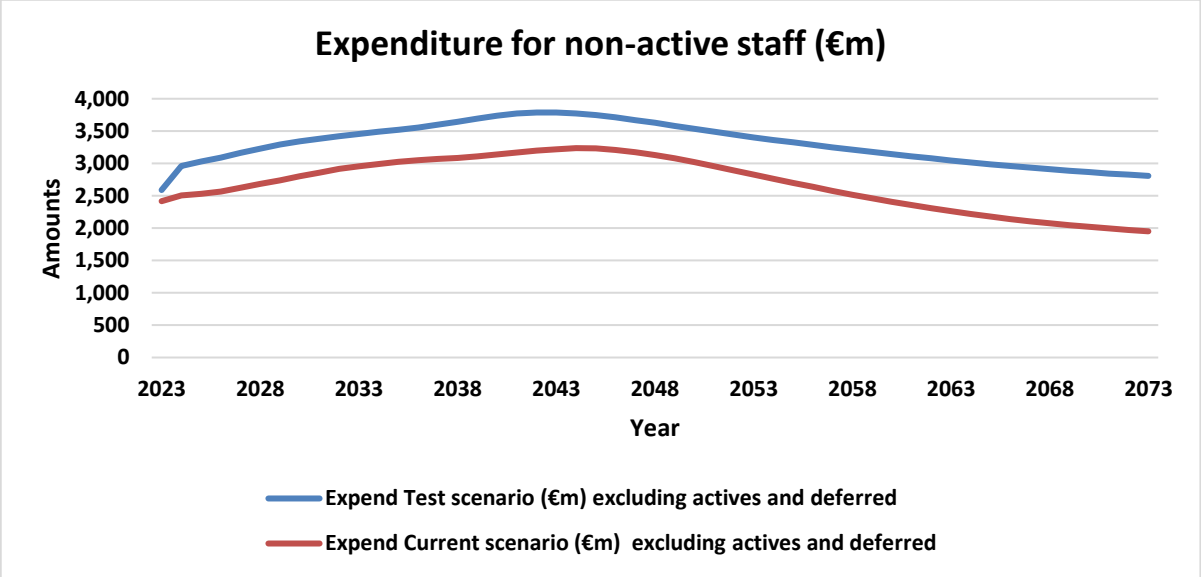
[30] Under the 'test scenario,' where the 2013 SR reform had not taken place, many more staff members would have retired in 2024 because the retirement age would have been lower compared to the situation where the SR reform took place. This leads to significantly higher pension costs. In contrast, under the current scenario (with the SR reform in place), fewer people retire in 2024 due to the higher retirement age, resulting in much lower pension costs. Because of this, there is a big increase in savings from 2023 to 2024. In particular, the observed big increase in savings from 2023 to 2024 is due to the combined effects of:

- the proportion of staff members close to the 'normal' retirement ages;
- (ii) the different assumed 'normal' retirement ages, respectively for the 'current' (64 to 66 years) and 'test' (61 to 63 years) scenarios, and
- (iii) the larger basis of active staff who will become pensioners during the projection period as the 5% reduction in establishment plan posts did not materialise in the test scenario.

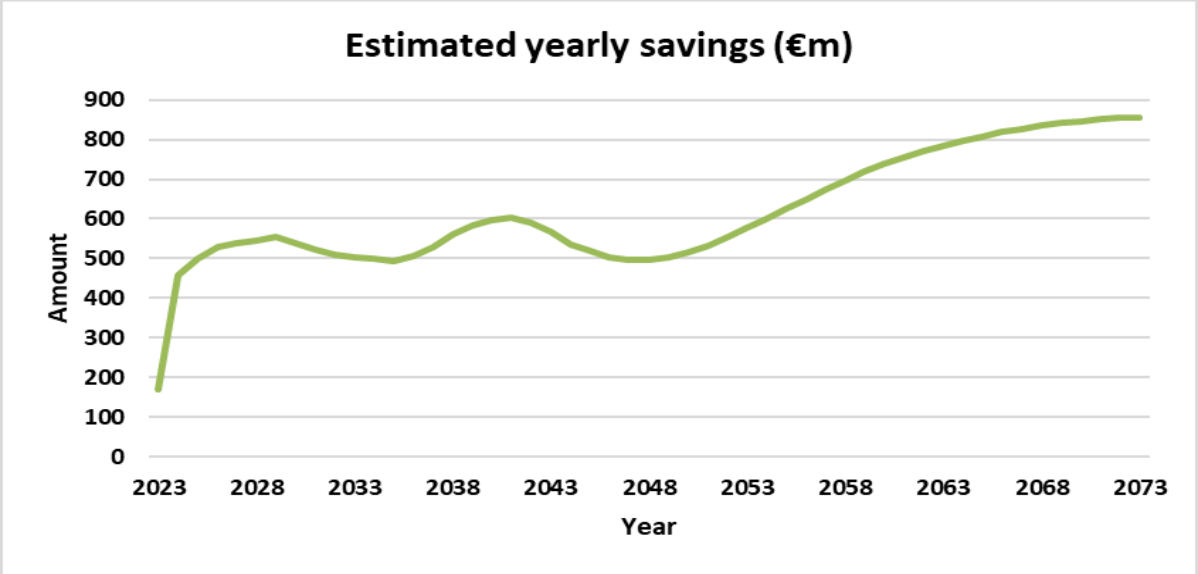
population was the one at end 2014). At 2014 prices, the estimated total savings over the 2023 to 2073 period would be EUR 25.3 billion (EUR 25 260 million).

It is also important to notice that if pension expenditure for currently active staff and staff under deferred status is included, the estimated total savings over the 2023 to 2073 period would be 72.1 billion euro (EUR 72 064 million) at 2023 prices.

Graph 1: Estimated expenditure for pensioners, disabled staff, widows/widowers and orphans (at 2023 prices)



Graph 2: Estimated savings in the expenditure for non-active staff (at 2023 prices)



7. Review of Eurostat calculations

Consistently with the approach for the 2016 Eurostat study on pension expenditure savings derived from the 2004 SR reform, the methodology, assumptions, and computations performed by Eurostat have been reviewed and validated by external actuarial experts.