



An Roinn Coimirce Sóisialaí  
Department of Social Protection

# **Actuarial Review of Social Security Pension Schemes in Ireland as required by EU Regulation 549 / 2013**

**Mark Lee FSAI and Daniel Dowling**

**Department of Social Protection**

**17<sup>th</sup> December 2020**

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## DISCLAIMER

This actuarial review has been prepared for the purpose of addressing the scope as set out in Section 3 of this paper. It may not be suitable for use in any other context, for any other purpose or by any other party; we accept no responsibility for any such use. Any reliance placed on this material for another purpose, or by other parties is entirely at their own risk. This material should not be shared with any third party unless agreed in writing.

The material in this paper is based on administrative data from the Department of Social Protection (the 'Department') as at 31<sup>st</sup> December 2018. Whilst reasonable care has been taken to gauge the reliability of this data, we provide no guarantee as to the accuracy or completeness of this data, and we accept no responsibility and will not be liable for any errors or misrepresentations in the data made by any third party.

The actuarial work involved in the preparation of this material complies with the guidelines set out by the Society of Actuaries in Ireland in Actuarial Standards of Practice PA-2, General Actuarial Practice ('ASP PA-2'). For the purposes of ASP PA-2, the "user" of this material is the Department and the Central Statistics Office (the 'CSO').

# 1 Executive Summary

## 1.1 Background

- 1.1.1 Ireland has a single national universal social security scheme, the Social Insurance Fund (the 'SIF'). Whilst in insurable employment, including self-employment, workers make pay-related social insurance ('PRSI') contributions into the SIF and accrue social insurance benefits – principally pension benefits – that are payable from the SIF.
- 1.1.2 An actuarial review of the Accrued-to-Date liability (the 'ADL') in respect of current and former contributors to the Social Insurance Fund has been carried out by the Department of Social Protection (the 'Department').
- 1.1.3 The ADL represents the present value of all future social insurance (pension) payments arising from accrued benefits as at 31<sup>st</sup> December 2018. As such, it excludes the value of both cash inflows and future pension obligations arising from future PRSI contributions of both current and future workers.
- 1.1.4 This means that the ADL valuation is not by itself an appropriate indicator of fiscal sustainability; nor is it suitable for assessing impacts of the reforms that impact both current and future entitlements. It can be interpreted as the amount of resources which has to be set aside today in order to finance all pension rights which have been earned up to a given year.
- 1.1.5 The social security benefits below were in scope, though means-tested payments associated with these benefits were not included. Social assistance benefits that do not form part of the SIF are also out of scope.
  - State Pension (Contributory) ('SPC')
  - Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension ('WPC')
  - Invalidity Pension
- 1.1.6 The review was carried out on behalf of the Central Statistics Office (the 'CSO') who are required to compile a supplementary table, ESA Table 29, showing the accrued liabilities of all funded and unfunded pension schemes in Ireland as part of the National Accounts, under EU Regulation 549 / 2013.
- 1.1.7 The supplementary table on pension schemes facilitates international comparability of pension systems under the System of National Accounts (SNA, 2008) and European System of Accounts (ESA, 2010). The completed supplementary table is presented in Appendix 4.
- 1.1.8 The last actuarial review of the ADL was carried out at the same time as the actuarial review of the SIF at 31<sup>st</sup> December 2015. There is a legislative requirement for actuarial reviews of the SIF to be carried out every 5 years at a minimum. Reviews of the SIF cover the full range of benefits paid from the SIF and examine matters of sustainability and questions of policy.
- 1.1.9 Under EU regulation 549 / 2013, an updated ADL review is required at a minimum every 3 years. This is the first ADL review published on a standalone basis.

## 1.2 Methodology

- 1.2.1 The methodology used for the ADL valuation follows that set out in the Technical compilation guide for pension data in national accounts (2020 edition) <sup>1</sup>, hereafter referred to as the 'EU Technical Guide'.
- 1.2.2 The Accrued-to-Date liabilities represent the present value of pension benefits to be paid in the future on the basis of accrued rights. Accrued pension rights are those earned by current contributors and remaining pension entitlements of existing pensioners. No rights accrued after the current year — by present or by future contributors — are considered.
- 1.2.3 The Projected Benefit Obligation or ('PBO') method for valuing the liabilities was used. This is a typical approach and is also in line with the EU Technical Guide recommendation for social security pension schemes.
- 1.2.4 Under this approach future benefit payments for current and future beneficiaries are projected using a series of assumptions.
- 1.2.5 The actuarial model used by the Department was that supplied by KPMG as part of the last actuarial review of the SIF.
- 1.2.6 In projecting future benefit payments for current contributors, this model uses a series of model points, which represent the number of claimants and expected level of pension by gender for a given year of birth cohort.
- 1.2.7 These model points have been updated for this review using the social insurance records of current contributors up to 31<sup>st</sup> December 2018.
- 1.2.8 A net present value or capitalised summary of the projected future cashflows is then determined by discounting using an appropriate discount rate.
- 1.2.9 While the overall methodology is unchanged since the last valuation, two structural changes have been made to SIF pension benefits since the last review.
- 1.2.10 Firstly, invalidity pensions were extended to the self-employed in December 2017.
- 1.2.11 In addition, the government made significant changes to the State Pension (Contributory) whereby the rate of benefit payable to a pensioner is now the greater of that person's entitlement under the 'yearly average' ('YA') approach and their entitlement under a new 'interim Total Contributions Approach' ('TCA').
- 1.2.12 Prior to these changes the 'yearly average' approach only was used to determine the rate of benefit payable.
- 1.2.13 The calculations underlying the expected level of pension on retirement have been updated to reflect these changes.

## 1.3 Assumptions

- 1.3.1 There are several key assumptions underlying the projections of accrued benefit payments under the ADL.
- 1.3.2 The key assumptions used are those prescribed in the EU Technical Guide and are broadly the same as those underlying the European Commission's Ageing Report 2021, due to be published in the first half of 2021.

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<sup>1</sup> <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-20-008>

- 1.3.3 The assumptions have been updated since the last review of the ADL, whose effective date was 31<sup>st</sup> December 2015.
- 1.3.4 In particular, the discount rate has been reduced by 1 percentage point and population projections and expected life expectancy have been updated. The fall in discount rate reflects a decline in real interest rates to historically low levels, as reflected in market expectations of persistently low interest rates over future years.
- 1.3.5 A summary of the key assumptions adopted for determining the ADL calculation of social security pension obligations for EU reporting purposes is set out below with the previous assumptions at 31<sup>st</sup> December 2015 for comparison.

	31-Dec-15	31-Dec-18
Discount Rate	5% nominal/3% real	4% nominal/2% real
Price Inflation	2%	2%
Indexation (Wage growth & pensions in payment)	3.5% nominal/1.5% real (with short-term adjustments)	3.5% nominal/1.5% real (with short-term adjustments)
Mortality	2015 Eurostat population projections	2019 Eurostat population projections

*Table 1-1 Summary of key assumptions*

- 1.3.6 Paragraph 2.8 of Actuarial Standard of Practice PA-2, General Actuarial Practice ('ASP PA-2') requires the actuary to comment on the overall appropriateness of the methodology and assumptions where these are prescribed by another party. Overall, the assumptions and methodology are considered reasonable for the purposes of the EU Regulation 549 / 2013. Further detail is given in Section 7.4.

## 1.4 Data

- 1.4.1 Data extracts were taken from the operational systems of the Department of Social Protection to obtain listings, by age and gender, of
- pensions in payment at 31<sup>st</sup> December 2018 and
  - PRSI records up to 31<sup>st</sup> December 2018.
- 1.4.2 Pension recipient numbers were cross-checked against the Department's Annual Statistics report<sup>2</sup>, and records of PRSI paid were reconciled against the SIF accounts for 2018.
- 1.4.3 In order to project the accrued pensions of those under State Pension Age, the actuarial model uses a series of model points. These model points summarise the number of claimants and level of pension by gender and year of birth cohort and were updated as part of this review, using the extracted PRSI records.

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<sup>2</sup> [Statistical Information on Social Welfare Services report](#)

## 1.5 Results of the review

- 1.5.1 The value of the State's ADL in respect of social security pension schemes was estimated to be **€359.2 billion**, or 110.9% of GDP <sup>3</sup>, as at 31<sup>st</sup> December 2018.
- 1.5.2 This figure represents the central estimate of the present value of all expected future payments to current and former contributors of working age in respect of contributions to date, plus the liability for all future payments to current pensioners entitled to State Pension (Contributory), Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension and Invalidity pension.
- 1.5.3 The €359.2 billion compares to the figure of €231 billion at 31<sup>st</sup> December 2015. Thus, over the 3 years, the ADL has risen by €128 billion or 55%.
- 1.5.4 The primary reasons (in order of magnitude) for the 55% rise in the value are as follows (percentages represent the size of the increase as a proportion of the 2015 liability):
- The change in the key valuation assumptions (~€83 billion or 36%)
  - The additional accrual of benefits between 2015 and 2018 and the unwinding of the discount rate as the working population ages (~€32 billion or 14%)
  - The change in benefits since 2015 (~€10 billion or 4%)
- 1.5.5 The ADL represents the total of all future benefits to be paid to current pensioners and to social insurance contributors of working age in respect of their current record. This liability will be paid over the next 80 years. To put this in context, total expenditure for SIF pension benefits (including means-tested elements) was €7.4 billion in 2018.
- 1.5.6 Almost two-thirds of the increase arises as a result of a change in the underlying assumptions prescribed under the EU Technical Guide. As the discount rate assumption is set centrally by the Technical Guide, all other EU countries may be expected to show a similar increase in their ADL pension liabilities.
- 1.5.7 As with all long-term projections, these cashflow projections are subject to increasing uncertainty over time. The results (though not the ultimate cost of the benefits) are also heavily dependent on the assumptions used.

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<sup>3</sup> Or 181.9% of modified GNI\*

## 2 Introduction and Background

### 2.1 Introduction

- 2.1.1 Ireland has a single national universal social security scheme, the Social Insurance Fund (the 'SIF'). Whilst in insurable employment, including self-employment, workers make pay-related social insurance ('PRSI') contributions into the SIF and accrue social insurance benefits – principally pension benefits – that are payable from the SIF.
- 2.1.2 The social security benefits payable from the SIF are financed on a pay-as-you-go ('PAYG') basis whereby current workers' contributions are financing the current beneficiaries' benefits.
- 2.1.3 Under EU regulation 549/2013 the CSO is required to compile a supplementary pensions table (ESA Table 29) alongside, and consistent with, the core National Accounts. This table includes estimates of the liabilities of all unfunded and funded pension schemes in Ireland, including the liability for SIF pensions.
- 2.1.4 Transmission of the table to Eurostat is mandatory every three years. A transmission in respect of valuation year 2018 is required by the end of December 2020.
- 2.1.5 The Department of Social Protection has conducted an actuarial review of the Accrued-to-Date Liability (the 'ADL') as at the 31<sup>st</sup> December 2018 in respect of current and former social insurance contributors.
- 2.1.6 The effective date of the previous actuarial review of social security pensions was 31<sup>st</sup> December 2015.
- 2.1.7 For the purposes of this review, the term 'social security pensions' refers to a range of different pension arrangements that are paid to those eligible for:
- State Pension (Contributory) ('SPC')
  - Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension ('WPC')
  - Invalidity Pension
- 2.1.8 The calculations in this review have been prepared based on methods and assumptions appropriate to the purposes set out above. Our interpretation of what is required to estimate the ADL for EU reporting purposes relies heavily on the EU Technical Guide. The guide contains details on the methodology and assumptions to be used for the purposes of the ADL calculation.
- 2.1.9 Appendix 2 contains a glossary explaining some of the technical terms used in the paper.
- 2.1.10 Appendix 3 contains a summary of the main provisions of social security pensions in Ireland.
- 2.1.11 Appendix 4 sets out the ESA Table 29 figures for submission to the CSO.



### 3 Scope of this Paper

- 3.1.1 This report has been prepared by Mark Lee, actuary, and Daniel Dowling, actuarial analyst, for the Department of Social Protection Investment Analysis Unit.
- 3.1.2 Users of the report who require further explanation in relation to any parts of the report which are not clear should contact the Department.
- 3.1.3 It has been peer reviewed by KPMG in Dublin. Appendix 1 contains a summary of KPMG's peer review of this paper.
- 3.1.4 The purpose of this actuarial review is to calculate the accrued-to-date liability for the pension obligations of the SIF, as required under EU Regulation 549 / 2013.
- 3.1.5 EU Regulation 549 / 2013 Requirements
  - The System of National Accounts (2008 SNA) and European System of Accounts (ESA 2010) allows for a better analysis and international comparability of the pensions systems within and between countries, by introducing a supplementary table on pensions schemes
  - Under EU 549 / 2013 regulation, the CSO are required to compile a table showing the liabilities of Irish pension schemes as part of our National Accounts. This table includes estimates of the liabilities of all unfunded and funded pension schemes including the liability for social security pension schemes. Transmission of the table to Eurostat is mandatory at three yearly intervals. The last such transmission was sent in 2017 in respect of valuation year 2015.
  - The table shows pension obligations of the various types of pension schemes using the ADL concept. These pension entitlements or obligations represent the present value of pensions to be paid in the future on the basis of accrued rights. Accrued pension rights are due to already paid contributions by current and former contributors and remaining pension entitlements of existing pensioners. No rights accrued after the valuation year, by present or by future workers, are considered.
  - The Department's interpretation of what is required to estimate the ADL for EU reporting purposes relies heavily on the EU Technical Guide.
- 3.1.6 The ADL provides an estimate of the cost of a hypothetical termination of a pension scheme without reneging on accrued entitlements.
- 3.1.7 The ADL valuation requires the actuary to make various assumptions which enable an estimation of the amount of the benefits which will become payable in the future. These assumptions are examined in more detail in later sections.
- 3.1.8 The supplementary table covers various types of pensions. The most significant category for the estimation of entitlements is pensions payable from retirement age. Generally, the largest amount of pension expenditure and entitlements is determined by this type of benefit. However, other contribution-based pension benefits are also in scope: in Ireland, this means Invalidity Pension (which is exclusively paid to people under State Pension Age ('SPA')), and the portion of Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension payable to people under State Pension Age.
- 3.1.9 Social assistance and means-tested pensions benefits are not in scope for the ADL valuation.

- 3.1.10 It is important to note that the accrued-to-date pensions entitlements valued in the ADL valuation are not designed to be an indicator of fiscal sustainability or suitable for assessing impacts of the reforms that impact both current and future entitlements, such as the interim Total Contributions Approach. They can be interpreted as the amount of resources which has to be set aside today in order to finance all pension rights which have been earned up to a given year.
- 3.1.11 To assess fiscal sustainability, it is preferable to compare (future) pension obligations with the cash inflows arising from the corresponding future pension-related assets. This is not in scope for the present review.

## 4 Recent developments in Social Security Pensions

### 4.1 Introduction

- 4.1.1 Below we review changes to social security pension benefit entitlements and rates of payment since the last valuation. Changes affecting means-tested SIF benefits (such as Qualified Adult allowances), non-pension SIF benefits (e.g. Paternity Benefit), and Christmas Bonus payments, are out of scope and are not discussed here. For further details on the benefit structures please see Appendix 3.

### 4.2 (Interim) Total Contributions Approach

- 4.2.1 State Pension (Contributory) is the primary social security pension benefit in Ireland, payable from SPA (currently 66 years old) to all employees and self-employed people who have made sufficient pay-related social insurance contributions over their working life.
- 4.2.2 Up to 2018, a person's State Pension (Contributory) entitlement on reaching State Pension Age was calculated using a 'yearly average' approach ('YA')<sup>4</sup>. Under the 'yearly average' approach, the total number of contributions paid or credited at pension age is divided by the number of years between entering insurable employment and the last full year before pension age is reached. Entitlement is then banded, with a yearly average of 48 contributions required for the maximum rate of pension. Reduced rates are payable for those with lower averages; however, these are not pro-rata and the reduction is moderated substantially. For example, someone with a yearly average of 20 contributions (38% of the maximum) receives a personal rate of 85% of the maximum. These percentages have been varied significantly over the years.
- 4.2.3 In 2018, to address anomalies from the YA calculation that adversely affected people with PRSI contribution gaps due to homemaking and caring periods, the Government put in place a significant change to State Pension (Contributory) entitlements, whereby the rate of benefit payable to a pensioner is now the greater of that person's entitlement under YA and their entitlement under the 'interim Total Contributions Approach' ('TCA').
- 4.2.4 The TCA is based on the totality of a person's paid and credited social insurance contributions history prior to State Pension Age, including a new 'Home Caring Credit' of up to 20 years for those who took time out of paid employment for caring roles. Under the TCA, a person who has accumulated 40 years of paid and credited social insurance contributions will qualify for the maximum rate of State Pension (Contributory), with proportionally lower rates payable to people with fewer contributions. This means that, unlike under the YA calculation, the period of time over which a person paid social insurance contributions is no longer a key factor in determining the rate of pension payable.

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<sup>4</sup> Separate arrangements apply for people who are in receipt of WPC or Invalidity pension on reaching SPA:

- a WPC claimant receives the higher of their ongoing WPC entitlement and their potential SPC entitlement (as calculated using the normal rules);
- an Invalidity Pension claimant transfers to SPC, at the maximum rate of payment.

- 4.2.5 The new 'greater of YA or TCA' entitlement is available to all people who reached State Pension Age on or after 1<sup>st</sup> September 2012. It will continue to be available to all new pension applicants until and unless new legislation is enacted to put in place a Total Contributions Approach only entitlement calculation for future retirees.
- 4.2.6 This change in entitlement was applied retrospectively from 30<sup>th</sup> March 2018. In cash terms, the first payments were made in early 2019, but the earlier date is the appropriate time of recording of the change under ESA 2010, as a clear obligation to pay was established on that date. Hence, the change in entitlements is in scope for this end-2018 valuation.
- 4.2.7 Over 40,000 pensioners assessed under the 2012 rate band changes were contacted commencing Autumn 2018 and invited to have their pensions reviewed. The resulting benefit changes, along with an estimate of the impact of the new 'greater of YA or TCA' approach on future retirees, are included in the end-2018 figures for ESA Table 29. Approximately 2,000 additional people are now in receipt of State Pension (Contributory) as a result of this exercise (as at 31<sup>st</sup> December 2018).

### 4.3 State Pension Age

- 4.3.1 The Government pledged in the 2020 Programme for Government to keep the State Pension Age at 66 pending the outcome within a year of the recommendations of the recently established Commission on Pensions. In the interim planned increases to age 67 in January 2021 and to age 68 in January 2028 have been repealed as part of the Social Welfare Bill 2020, which gives effect to the social welfare provisions announced in Budget 2021.
- 4.3.2 However, as this legislation was enacted almost 2 years after the 31<sup>st</sup> December 2018, this change is not reflected in the valuation. The EU Technical Guide indicates that only enacted pensions reforms should be reflected in the national accounts.
- 4.3.3 The Pension Commission is to report by June 2021. The Government will take action having regard to the recommendations of the Commission within six months.

### 4.4 Invalidity Pension

- 4.4.1 Invalidity Pension is a pension payment for people who cannot work because of a long-term illness or disability. It is not means-tested and is based solely on the PRSI contributions of the applicant.
- 4.4.2 From December 2017, the Invalidity Pension scheme was extended to self-employed workers. Those paying PRSI at Class S now have the option of applying for Invalidity Pension on a similar basis to those who are employees. The measure now gives the self-employed access to the safety-net of State income supports if they have a serious illness or injury that prevents them from working. To qualify for an Invalidity Pension, a self-employed person or employee must have:
- 260 PRSI paid contributions (Class A, E, H or S) since they started paying social insurance and
  - 48 PRSI paid or credited contributions (Class A, E, H or S) in the last complete contribution year or the second last contribution year before the date of their claim

## **4.5 Pension Rates of Payment**

- 4.5.1 Budget 2016: The weekly rate of all pension payments (for those aged 66 and over) was increased by €3 per week.
- 4.5.2 The weekly rates of pension payments (including recipients under age 66) were increased in 2017, 2018 and 2019 by €5 per week (with proportional increase for those on reduced rates).
- 4.5.3 No changes were made to weekly rates of pension payments (disregarding means-tested benefits) in 2020 and 2021.
- 4.5.4 At 31<sup>st</sup> December 2018, the rate of pension for those over age 66 was €243.30. Pension rates for those under age 66 (Invalidity pension and Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension) were €203.50.
- 4.5.5 Note, in projecting rates of pension at retirement for those retiring after the valuation date we have taken account of the known changes in rates of payment in 2019-2021.

## **4.6 Treatment of benefit changes in ESA Table 29**

- 4.6.1 Changes in pensions entitlements due to changes in scheme structure are highlighted in row 7 of ESA Table 29 (see Supplementary Table in Appendix 4).

## 5 Data used in this review

### 5.1 Data overview

- 5.1.1 The data used in this review belongs to 4 broad categories
- Demographic data
  - Financial data
  - Macro-economic data
  - Scheme data
- 5.1.2 In some instances, the EU Technical Guide recommends the use of certain data where possible.
- 5.1.3 This aids consistency when comparing pension liabilities across different EU states.
- 5.1.4 In particular, the guide recommends a number of projection assumptions common to those underlying the EU Commission's 2021 Ageing Report, to be published in 2021.

### 5.2 Demographic, Financial and Macro-Economic data

- 5.2.1 In accordance with the guidance in the EU Technical Guide, the demographic data underlying the valuation projections were taken from latest Eurostat population projections for Ireland (EUROPOP 2019/proj\_19n)<sup>5</sup>.
- 5.2.2 The new population projections begin on 1 January 2019 and are split by age and gender for each year in the future. The previous set of Eurostat projections had a base year of 2015.
- 5.2.3 Eurostat also publishes the mortality/survival rates underlying these projections and these were used to project the evolution of the opening population into the future (following the Closed Group approach, see Section 6).
- 5.2.4 It should be noted that the Eurostat mortality rates do also include allowances for mortality improvements in the future. For example, the life expectancy for a 66-year old is expected to be circa 2.5 years longer at 2050 than at 2019.
- 5.2.5 The above population projections form the basis for the 2021 Ageing Report, due to be published in 2021.
- 5.2.6 Data for labour force projections were taken from the latest labour force projections from the European Commission (also underlying the 2021 Ageing Report).
- 5.2.7 Macroeconomic projection assumptions from the Department of Finance and the European Commission were used.
- 5.2.8 The EU Technical Guide recommends that "In order to reflect heterogeneous growth paths across the EU, the wage growth assumptions of the Ageing Working Group — reflecting labour productivity growth — should if possible be used for the estimation of pension entitlements."
- 5.2.9 Financial data was taken from the Social Insurance Fund accounts, in particular for the history of PRSI contributions and the benefits payments by scheme.

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<sup>5</sup> [https://ec.europa.eu/eurostat/data/database?node\\_code=proj](https://ec.europa.eu/eurostat/data/database?node_code=proj)

- 5.2.10 Summary data for each of the benefits under review were taken from the Department's Annual Statistics report<sup>6</sup>.
- 5.2.11 The Annual Statistics report gives a history of expenditure and numbers of beneficiaries with breakdowns by age and gender. Breakdowns are given by scheme and cover social insurance and social assistance benefits. Details of (maximum) rates payable for the various benefits are also set out here.

### 5.3 Scheme recipient data

- 5.3.1 The scheme data was sourced directly from the Department's operational computer systems.
- 5.3.2 Data extracts were taken on 31<sup>st</sup> October 2020, for data current at 31<sup>st</sup> December 2018.
- 5.3.3 Data was validated against published sources. Further details are given below.
- 5.3.4 For each individual in receipt of pension, the following data was extracted for those entitled to a payment on the 31<sup>st</sup> December 2018: a person identifier, age, gender, and the weekly amount payable.
- 5.3.5 This data was not affected by the timing of payments and generally only gave 1 week's amount, per person, as at the 31<sup>st</sup> December 2018.
- 5.3.6 The entitlements were broken down by category. These were used to remove means-tested elements as these are out-of-scope for the ADL valuation.
- 5.3.7 The amounts were then expressed as a proportion of the maximum rate payable. This could exceed 100% in the event that allowances such as the Living Alone or Island Allowance were paid in addition to the base pension. However, means-tested allowances in respect of Qualified Adults and Qualified Children were not included.
- 5.3.8 As the social insurance benefits in question are flat-rate pensions, with the percentage of the maximum rate determined when a claim is made, the proportion of the maximum rate is broadly stable.
- 5.3.9 Recipient numbers were reconciled against the Department's Annual Statistics reports and we were satisfied the recipient data was reasonable.
- 5.3.10 As discussed previously in Section 4, an exercise commenced in late 2018 to contact circa 40,000 people who retired on State Pension (Contributory) after 2012 to determine whether they would receive a higher pension under the new TCA calculation.
- 5.3.11 To quantify the changes to State Pension (Contributory) recipient numbers and levels of pension arising from this exercise a separate data extract was taken of pensions in payment prior to the exercise. This extract was then used to establish the lower pension calculated under the YA only approach. It was also used to identify the circa 2,000 people who did not qualify for State Pension (Contributory) under the YA only approach but were granted a pension under the 'greater of YA and TCA'.
- 5.3.12 The projected benefits payable in 2019 were also cross-checked against the SIF accounts. Certain adjustments were needed for the reconciliation, such as adding back additional means-tested allowances and the Christmas bonus.

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<sup>6</sup> [Statistical Information on Social Welfare Services report](#)

- 5.3.13 A 1.1% uplift was applied to the State Pension (Contributory) pension data above to cater for an accounting re-classification of non-contributory pension payments to State Pension (Contributory).
- 5.3.14 Inter-valuation movement data was not readily available. While this did not directly affect the valuation of future liabilities it restricted the level of movement analysis between valuations.
- 5.3.15 A summary of the State Pension (Contributory) recipient data used is given in the table below. Note that numbers are higher than the Department's Annual Statistics report due to the higher numbers qualifying for State Pension (Contributory) under the 'greater of YA and TCA'. Average pension figures displayed include non-means tested allowances and a loading to allow for accounting re-classification of non-contributory pensions to State Pension (Contributory).

Age Band	Women		Men		Total	
	Number	Average Pension	Number	Average Pension	Number	Average Pension
66 – 70	60,105	89%	87,564	92%	147,669	91%
71 – 75	43,450	86%	73,584	91%	117,034	89%
76 - 80	24,547	81%	48,279	89%	72,826	86%
81 – 85	16,362	76%	31,294	85%	47,656	82%
86 - 90	7,363	77%	11,888	81%	19,251	80%
90 +	4,305	81%	4,699	83%	9,004	82%
<b>Total</b>	<b>156,132</b>	<b>85%</b>	<b>257,308</b>	<b>89%</b>	<b>413,440</b>	<b>88%</b>

*Table 5-1 Summary of State Pension (Contributory) recipient data. Average pension percentages represent proportion of maximum rate.*

## 5.4 Scheme contributor data

- 5.4.1 In projecting future benefit payments for current contributors, the actuarial model uses a series of model points, which represent the number of claimants and expected level of pension by gender for a given year of birth cohort.
- 5.4.2 These model points have been updated for this review using the social insurance records of current contributors.
- 5.4.3 An operational system data extract was taken on 31<sup>st</sup> October 2020 of the social insurance records up to the 31<sup>st</sup> December 2018 for those under State Pension Age.
- 5.4.4 The social insurance record included a person identifier, year of birth, gender, the year of entry into insurable employment and for each year the PRSI contributions by class or credited contributions.
- 5.4.5 The total PRSI paid was also recorded and this was used to cross-check the data against the 2018 SIF accounts.
- 5.4.6 Spot-checks were also carried out to validate that the data extracted was consistent with that obtained from the operational system user interface.



- 5.4.7 Caps were applied to ensure that the combined PRSI contributions and credited contributions could not exceed the number of weeks in the year (typically 52).
- 5.4.8 The cumulative history to the end of 2018 was then summarised for input into the actuarial model.
- 5.4.9 In order to project the level of pensions for current contributors under the TCA, an estimate of the level of caring periods is required.
- 5.4.10 Home caring disregards for periods of caring after 1994 were available under the YA benefit calculation but there is little data in relation to the caring periods for people's full working lives.
- 5.4.11 Typically, the majority of applications for the recognition of caring periods are made on retirement, and little data exists prior to this point. In addition, home caring periods are only recorded in the Department's operational computer systems where they are materially beneficial to the applicant's claim. This means that, where the existing social insurance record results in the maximum rate of pension under the YA calculation, additional caring periods which might be relevant for the TCA calculation are not generally recorded.
- 5.4.12 An in-depth exercise analysing the gaps in people's employment histories and estimating the potential home caring periods is included in pages 49 and 50 of the Actuarial Review of The Social Insurance Fund 31 December 2015 (the '2015 Actuarial Review')<sup>7</sup>.
- 5.4.13 We have relied on the results of this analysis as a basis for the allowances for home caring periods and home-making disregards (post 1994) used in the model.
- 5.4.14 Average home-caring periods of 9/3.4 years were granted to women/men respectively. These figures assume 90%/50% take-up for women/men and estimates for women/men of 10 years/6.8 years for the average gaps in social insurance records.
- 5.4.15 These estimates were cross-checked against the 1953 cohort of retirees and our view is that they lie within a reasonable range.
- 5.4.16 For home-making disregards in relation to caring periods after 1994, we phased the anticipated take-up of these periods from circa 2/1 years for women/men in the 1953 cohort up to the values set out in 5.4.14 for those in the 1975 cohort and thereafter.
- 5.4.17 Under the TCA, recognition of caring periods has increased the numbers of State Pension (Contributory) recipients, particularly for women. The increased level of benefits under the 'greater of YA and TCA' means fewer are better off on the means-tested non-contributory pension. The model parameters were calibrated to the new levels of female claimants.
- 5.4.18 State Pension (Contributory) new entrant data extracts by year of birth cohort and gender need to be put in place to facilitate monitoring of the claimant levels.
- 5.4.19 The estimates for caring periods should also be reviewed as more data becomes available.

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<sup>7</sup> <https://assets.gov.ie/37220/99a896910d574b7daa0b65fbb00900e5.pdf>

## 6 Methodology for ADL valuation

- 6.1.1 The methodology used for the calculation of the ADL follows that prescribed in the EU Technical Guide.
- 6.1.2 To maintain consistency across pension schemes it is recommended to apply the Projected Benefit Obligation or ('PBO') approach for the estimation of pension obligations of defined benefit schemes for government employees and of social security pension schemes.
- 6.1.3 Benefits are to be uprated in line with wage growth (where appropriate) and pensions indexed in accordance with indexation rules.
- 6.1.4 Accrued-to-date liabilities are the present value of pension benefits to be paid in the future on the basis of accrued rights. Accrued pension rights are those earned by current contributors and remaining pension entitlements of existing pensioners. No rights accrued after the current year — by present or by future contributors — are considered.
- 6.1.5 The ADL is also known as the 'closed group valuation' approach.
- 6.1.6 For the estimation of pension liabilities, the EU Technical Guide notes that it is important to distinguish between pension entitlements accrued by current retirees, and pension entitlements accrued by current contributors. The former group has its working and contribution period behind it and is therefore already entitled to full pension benefits. For the estimation of ADL liabilities, it is important to take into account that current contributors have not yet accrued all of their future (expected) full pension benefits upon retirement.
- 6.1.7 Current pensioners or retirees are entitled to pension benefits on the basis of past accrued pension rights. As outlined above, this group is entitled to full pension benefits. In other words, the benefits they receive in the base year are fully accrued. It is important to note that current pensioners are entitled to pension benefits not just for one year but, in fact, to all future pension payments, usually until they die.
- 6.1.8 The estimation of pension entitlements for current contributors closely follows the approach for current retirees. There are two additional considerations when calculating the accrued pension rights of this group:
- They are not yet entitled to the full pension they would receive after a full contribution career
  - An estimate must be made of the pension payable at retirement
- 6.1.9 The accrued proportion of the full pension under the PBO approach is calculated as follows:
- $$\text{Accrued pension} = \text{approximated future full pension} \times T / N$$
- where
- T = Contribution periods of the participant up to and including the base year, and
- N = total expected contribution periods of the participant until retirement.
- 6.1.10 The projection of future contribution periods starts after the year for which the latest data on past contributions is available i.e. from 2019 onwards.
- 6.1.11 For this projection, it is stated in the EU Technical Guide that is appropriate to base the calculation on a constant contribution profile over time.

- 6.1.12 The pension benefit at the future point of retirement has been directly estimated for sample cohorts for whom detailed samples were examined and then projected over the remaining retirement phase.
- 6.1.13 The remaining retirement phase extends to 2100 after which point the closed group liabilities are anticipated to be fully extinguished.
- 6.1.14 The liabilities valued cover social-insurance type pension benefits:
- State Pension (Contributory)
  - Widow's, Widower's or Surviving Civil Partner's Pension (Contributory)
  - Invalidity Pension
- 6.1.15 In Ireland, individuals who are on Invalidity Pension are calculated within the ADL measure and those who were previously on Invalidity Pension are captured once they reach State Pension Age (currently 66 years old) as they automatically transfer to State Pension (Contributory) at that stage.
- 6.1.16 The calculations underlying the expected level of pension on retirement have been updated to reflect the changes to the structure of SIF pension benefits since the last review outlined in Section 4: the extension of Invalidity Pension to the self-employed and the introduction of the 'greater of YA or TCA' State Pension (Contributory) entitlement calculation. See also Appendix 3 for more information on the benefit calculations.
- 6.1.17 In order to calculate the increase in liabilities arising from the extension of Invalidity Pension to class S contributors, we have relied on costings prepared during the last actuarial review. Table 12.20 on page 142 of the 2015 Actuarial Review sets out these additional costs. These have been used to derive a loading to the present value excluding class S.
- 6.1.18 Schemes based on social assistance-type benefits (such as State Pension (Non-Contributory)), means-tested benefits and private savings benefits are not included. The EU Technical Guide indicates social assistance benefits should be excluded where feasible.
- 6.1.19 The additional age-related payment (currently payable as and from reaching age 80), the Living Alone Allowance and the Island Allowance have been included in the liabilities as these are not means-tested.
- 6.1.20 Both Qualified Adult/Child and Fuel Allowances, which are means-tested are excluded from the liabilities.
- 6.1.21 The Christmas bonus is also excluded.
- 6.1.22 Only enacted pension reforms as at the valuation date are recorded in the supplementary table. They affect the estimates of pension entitlements in the year in which the reform is enacted and subsequently.
- For clarity, State Pension Age is assumed to increase to age 67 in 2021 and age 68 in 2028
- 6.1.23 Projected benefit outflows were capitalised by discounting the projected cash-flows at a suitable discount rate. A wide range of other assumptions were used in the calculation of the ADL estimate, as discussed in the following section.

## 7 Assumptions

### 7.1 Overview of Assumptions

- 7.1.1 The assumptions used for the calculation of the ADL follows those prescribed in the EU Technical Guide.
- 7.1.2 These assumptions coincide with those produced by the Commission for the purposes of the Ageing Report 2021.
- 7.1.3 The assumptions should be considered in totality and any one element should not be considered in isolation.

A summary of all assumptions adopted for the ADL calculation for the previous and current review of social security pension obligations for EU reporting purposes is set out at Table 7-1:

	31-Dec-15	31-Dec-18
Discount Rate	5% nominal/3% real	4% nominal/2% real
Price Inflation	2%	2%
Indexation (Wage growth & pensions in payment)	3.5% nominal/1.5% real (with short-term adjustments)	3.5% nominal/1.5% real (with short-term adjustments)
Mortality	2015 Eurostat population projections	2019 Eurostat population projections

Table 7-1 Key assumptions underlying ADL valuation

### 7.2 Financial Assumptions

#### 7.2.1 Discount Rate

For government-managed pension schemes, it is generally agreed that central government debt securities provide a suitable basis for the discount rate. Furthermore, the choice of the discount rate is ideally based on the following criteria:

- In order to obtain a suitable proxy for a risk-free interest rate, it is advisable to base it not on central government debt securities of one single country but on a basket of e.g. European central government debt securities
- The maturity of these debt securities should be similar to that of pension entitlements, i.e. at least 10 years, but preferably longer.
- In order to guarantee comparability across countries, the same discount rate should be applied to all EU countries and all government-managed pension schemes (including social security pension schemes) at whatever level of government.
- A stable discount rate should be applied to avoid the noise resulting from frequent changes.

**Discount rate:** In line with the above criteria, it is recommended by Eurostat to set the discount rate at 2% per annum in real terms and 4% per annum in nominal terms

The EU Technical Guide provides the following commentary on its recommendation to change the real discount rate to 2% per annum:

*“The long-term interest rate assumptions that underpinned the Ageing Report (AR) 2018 long term projections until 2070 contain elements dating back to 2006. The conventional assumptions on long-term interest rate that have underpinned the AWG work over the past 15 years reflect historical averages in some countries. However, the macroeconomic environment has substantially changed over the past decades, as acknowledged by a vast literature. Risk-free nominal interest rates in advanced economies have been trending downward, for several decades. Real rates declined in parallel, although to a slightly lesser extent. Persistently low inflation and sluggish economic growth suggest a secular decline of the real equilibrium rate to historically low levels, as reflected in market expectations of persistently low interest rates in the years to come. This global phenomenon is well documented in the literature, being attributed to both “structural factors” having triggered an excess of real savings over investment (ageing and low productivity trends, sluggish invention and innovation, low investment profitability, income growth in emerging economies, rising income or wealth inequality, deleveraging), but also to some more circumstantial or policy-related drivers, such as the scarcity of safe assets coupled with increased demand during global uncertainty, especially in the euro area after the sovereign debt crisis.”*

## 7.2.2 Inflation Rate

**Inflation rate:** An inflation rate of 2% per annum should be applied. This is in line with the European Central Bank’s inflation rate target

## 7.2.3 Wage growth

It is assumed that, over the long term, wages follow labour productivity growth per capita in the economy. In order to reflect heterogeneous growth paths across the EU, it is recommended in the EU Technical Guide that the wage growth assumptions produced by the Ageing Working Group for use in the 2021 Ageing Report – reflecting productivity growth per capita – should be used if possible.

The labour productivity per hour growth rate for Ireland was taken from the projections run by the European Commission and sent to Member States to form the basis of the 2021 Ageing Report

Average wage increases / labour productivity group per hour (growth rate %)						
	2019*	2030	2040	2050	2060	2070
Real	2.10%	1.11%	1.54%	1.54%	1.54%	1.54%
Nominal	2.10%	3.11%	3.54%	3.54%	3.54%	3.54%

\*actual pension indexation used for 2019

- 7.2.4 Where indexation of pensions is known (up to Budget 2021) actual rates of pensions indexation have been used.

### 7.3 Demographic Assumptions

- 7.3.1 It is recommended for Member States to use the Eurostat's latest available population projections framework with respect to the demographic assumptions of mortality, fertility and migration.

In April 2020, Eurostat published population projections based on 2019 data. Data available include:

- Projected population on 1<sup>st</sup> January by age and sex, and by single year time interval for several decades ahead of the base-year (2019);
- Assumptions on future age-specific fertility rates; sex-specific and age-specific mortality rates and international net migration levels.

- 7.3.2 Mortality rates from the Eurostat data have been used, including allowances for future improvements in mortality.

- 7.3.3 Life expectancies from age 66 (State Pension Age) are shown below for illustration purposes:

Life expectancy at age 66 from underlying Eurostat mortality rates						
	2019	2030	2040	2050	2060	2070
Female	21.3	22.1	23.1	24.0	24.8	25.6
Male	18.9	19.6	20.5	21.3	22.2	22.9

- 7.3.4 Disability / invalidity prevalence rates

In order to estimate entitlements to Invalidity Pension, assumptions need to be made regarding the probability of becoming disabled in the future. This probability is reflected in the 'prevalence rate', which is defined in this context as the total number of persons on invalidity pensions for a given age / gender divided by the total population at that age / gender. As recommended in the EU technical guide, constant prevalence rates have been used for the estimation of pension entitlements given the uncertainty around future disability prevalence rates.

### 7.4 Overall Appropriateness of Assumptions

- 7.4.1 ASP PA-2 (paragraph 2.8) requires commentary on the overall appropriateness of the methodology and assumptions where these are prescribed by another party. Overall, the assumptions and methodology are considered to be reasonable. Some additional commentary is given in relation to two of the material financial assumptions below.

- 7.4.2 The inflation rate assumption of 2% per annum is consistent with the ECB price stability objective to maintain inflation rates below, but close to, 2% over the medium term. Furthermore, the market-implied Euro inflation rate at 31<sup>st</sup> December 2018 (as derived from Euro-swap implied inflation curves at a 25-year term) was 1.78% with a tolerance of +/- 0.25%. A range of 1.5% - 2.0% could be considered appropriate for the purpose of the ADL calculation.

- 7.4.3 A discount rate in the range 2.9% to 4.4% could be considered appropriate for the purpose of the ADL calculation reflecting the approach described below. The discount rate is a material assumption and a sensitivity test has been prepared below for this assumption.

- 7.4.4 The value of liabilities at a future date will depend on the prevailing yields on long dated bonds at the effective date of that valuation. In accordance with related professional guidance issued by the Society of Actuaries in Ireland, Actuarial Standard of Practice Pen-4, it may be appropriate for an actuary to assume that different yields will apply in future, provided that the alternative rate(s) can be justified either by examination of the relevant yield curves or by reference to historic norms.
- 7.4.5 For the purposes of deriving a potential range of suitable discount rates, it was assumed at one end of the range that no yield reversion will take place over time and that expected long term yields on Eurozone Government AAA bonds (25 year term) remain at 0.9% p.a. At the other end of the range a yield reversion of 0.8% was allowed for such that the overall yield on bonds would be 1.7%.
- 7.4.6 The discount rate is a critical assumption for funding purposes and in the case of a pre-funded pension scheme is heavily interlinked with investment strategy. The baseline is a 100% bond / Liability Driven Investment strategy (the 'least risk' portfolio) which gives a discount rate in the range of 0.9% p.a. – 1.7% p.a.
- 7.4.7 Trustees in funded schemes are often amenable to holding a sizeable proportion of return seeking / growth assets particularly for schemes with long maturity and strong employer covenants. The reasons cited for holding return seeking / growth assets include the long-term nature of the promise and confidence in the employer covenant. Many actuaries use a dual discount rate model which reflects a pre-retirement discount rate that reflects initial investment strategy (with a significant allocation to return-seeking assets) and a lower post retirement discount rate reflecting anticipated increase in risk reducing / matching assets as schemes mature / contributors retire.
- 7.4.8 In keeping with the above, an equity risk premium (ERP) in the range of 3.0% p.a. - 4.0% p.a. could be considered reasonable.
- 7.4.9 Using a long term investment strategy of 67% equities and 33% long dated euro area government bonds assuming no yield reversion coupled with a 3% ERP, an assumed investment return of 3.9% p.a. on equities and 0.9% p.a. on bonds would be derived, resulting in a long term discount rate of 2.9% p.a.
- 7.4.10 Alternatively, assuming 0.8% yield reversion with a 4% ERP, an assumed investment return of 5.7% p.a. on equities and 1.7% p.a. on bonds would result in a long-term discount rate of 4.4% p.a.
- 7.4.11 Therefore, plausible discount rates in the range 2.9% - 4.4% would be calculated based on economic conditions prevailing at balance sheet date.

## 8 Accrued to Date Liability Valuation Results

### 8.1 Summary

- 8.1.1 The value of the ADL in respect of social security pension schemes has been calculated to be **€359.2 billion**, or 110.9% of GDP<sup>8</sup>, as at the 31<sup>st</sup> December 2018.
- 8.1.2 This figure represents the central estimate of the present value of all expected future payments to current and former contributors of working age in respect of contributions to date, plus the liability for all future payments to current pensioners entitled to State Pension (Contributory), Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension and Invalidity pension.

### 8.2 Movement since 2015 valuation

- 8.2.1 The €359 billion compares to the figure of €231 billion at the 31<sup>st</sup> December 2015. Thus, over the 3 years, the ADL has risen by 55%.
- 8.2.2 The primary reasons (in order of magnitude) for the 55% rise in the value are as follows (percentages represent the size of the increase as a proportion of the 2015 liability):
- The change in the key valuation assumptions (~€83 billion or 36%)
  - The additional accrual of benefits between 2015 and 2018 and the unwinding of the discount rate as the working population ages, less benefits discharged (~€32 billion or 14%)
  - The change in benefits since 2015 (~€10 billion or 4%)
- 8.2.3 The ADL represents the total of all future benefits to be paid to current pensioners and to social insurance contributors of working age in respect of their current record. This liability will be paid over the next 80 years; to put this in context, the total expenditure for the schemes in question (including means-tested elements) was €7.4 billion in 2018.

### 8.3 Commentary on nature of results

- 8.3.1 The cashflow projections are subject to increasing uncertainty over time. The results (though not the ultimate cost of the benefits) are also heavily dependent on the assumptions used.
- 8.3.2 In Section 9 below we illustrate the sensitivity of the results to stresses on key assumptions to give an understanding of the areas where subjectivity and judgement are used for long-run projections of this nature.
- 8.3.3 The ADL valuation is not by itself an appropriate indicator of fiscal sustainability; nor is it suitable for assessing impacts of the reforms that impact both current and future entitlements. It can be interpreted as the amount of resources which has to be set aside today in order to finance all pension rights which have been earned up to a given year.

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<sup>8</sup> Or 181.9% of modified GNI\*



- 8.3.4 To assess fiscal sustainability, it is preferable to compare (future) pension obligations with the cash inflows arising from the corresponding future pension-related assets. This is not in scope for the purposes of satisfying EU Regulation 549 / 2013.

## 9 Sensitivity Analysis

### 9.1 Introduction

- 9.1.1 A number of critical assumptions were made in respect of the calculations presented in this paper and these are outlined in Section 7. Any variation in these assumptions can have a significant impact on the valuation results. Certain parameters were stressed as part of a sensitivity analysis to allow an understanding of the main areas of inherent subjectivity and judgement in the calculations as a result of the uncertainty surrounding the assumptions underpinning long-run projections.
- 9.1.2 The sensitivities of accrued-to-date liabilities are shown with the intention of illustrating a range of reasonable outcomes that have been determined at the present valuation. They are not intended to illustrate a possible range of variation in assumptions that might be considered at future valuations and in light of future experiences.
- 9.1.3 Sensitivity analysis was carried out in relation to specified changes in the discount rate, mortality rates, pension indexation and State Pension Age. Each sensitivity test was performed in isolation, meaning all other parameters were assumed to remain unchanged.

### 9.2 Discount Rate Sensitivity

- 9.2.1 Table 9-1 illustrates the impact on the valuation of the ADL results of a +/- 1 percentage point change in the baseline discount rate of 4% nominal.

Discount Rate	Base (-1%pp)	Base	Base (+1%pp)
	€ billion	€ billion	€ billion
Accrued Liability	463.1	359.2	285.6

Table 9-1 Discount Rate Sensitivity

### 9.3 Mortality Sensitivity

- 9.3.1 Table 9-2 illustrates the impact on the valuation of the ADL results by testing its sensitivity to the mortality rates underlying Eurostat's lower mortality scenario. Under this scenario, life expectancies are circa 0.3/0.9 years higher at 2030/2050 respectively. Higher life expectancies result in higher liabilities as pensions are paid for longer.

Mortality projections	Lower mortality	Baseline mortality
	€ billion	€ billion
Accrued Liability	373.4	359.2

Table 9-2 Mortality Sensitivity

## 9.4 Pension Indexation

- 9.4.1 Table 9-3 illustrates the impact on the valuation of the ADL results by testing the impact of using pensions increases linked to inflation, not wages. For this scenario we have maintained known pension increases (up to 2021) and only applied the change to assumed increases from 2022 onwards.

Indexation	Inflation-linked increases	Baseline assumption
	€ billion	€ billion
Accrued Liability	268.1	359.2

*Table 9-3 Pension Indexation Sensitivity*

## 9.5 State Pension Age

- 9.5.1 Table 9-4 illustrates the impact on the valuation of the ADL results by testing its sensitivity to keeping the State Pension Age fixed at age 66. The baseline ADL figure assumes State Pension Age will increase to 67 in 2021 and 68 in 2028.

State Pension Age 66	SPA 66	Baseline assumption
	€ billion	€ billion
Accrued Liability	392.9	359.2

*Table 9-4 State Pension Age remains at 66*

It is important to note that this is an accrued liability view and does not represent the full cost of keeping the SPA at 66. The intention of this scenario is to illustrate the sensitivity of the ADL to changes in SPA.

## 10 Conclusions

- 10.1.1 The results of the review show a substantial increase in the ADL since 2015.
- 10.1.2 Almost two-thirds of the increase arises as a result of a change in the underlying assumptions prescribed under the EU Technical Guide. As this discount rate assumption is set centrally by the Technical Guide, all other EU countries may be expected to show a similar increase in their ADL pension liabilities.
- 10.1.3 The fall in discount rate (and the associated rise in liabilities) reflects a decline of real interest rates to historically low levels, as reflected in market expectations of persistently low interest rates in the years to come.
- 10.1.4 This review has not considered the sustainability of social security pensions.
- 10.1.5 The figures are not suitable for assessing impacts of reforms that impact both current and future entitlements, such as the interim Total Contributions Approach.
- 10.1.6 An updated review of social security pension schemes is required to be completed not later than three years after this review, under EU regulation.

# 11 Appendix 1 – Summary of Peer Review Findings



The agreed scope of our actuarial peer review of the work performed by Mark Lee, ('the Actuary'), Investment Analysis unit, Department of Social Protection ('DSP') and his Report relating to the actuarial review of Social Security Pension Schemes in Ireland as required by EU Regulation 549 / 2013 at an effective date of 31<sup>st</sup> December 2018 is set out in an engagement letter on 23<sup>rd</sup> November 2020. The review comprised a 2-stage peer review process:

**Stage 1:** Review of methodology and assumptions, including approach to addressing data gaps, particularly with respect to home-making periods to be used as part of the review;

**Stage 2:** Review of the calculations for the Accrued to Date Liability ('ADL') effective 31<sup>st</sup> December 2018 and the Report. This review included a review of the movements from the position at 31<sup>st</sup> December 2015; and the movements from a 'rolled forward' opening position at 31<sup>st</sup> December 2017. I understand that as required by Eurostat the latter one-year movement in the ADL position between 31<sup>st</sup> December 2017 and 31<sup>st</sup> December 2018 is reflected in the Table 29 return submitted, with the assumptions used for the 31<sup>st</sup> December 2017 position the same as the 31<sup>st</sup> December 2018 snapshot.

The peer review exercise was undertaken by Joanne Roche FSAI, KPMG.

The **Stage 1 review** undertaken in November and early December 2020 comprised the following activities:

- Discussions with the Actuary on approach to data, methodologies, and assumptions reflecting the Technical compilation guide for pension data in national accounts (2020 edition), hereafter referred to as the 'EU Technical Guide'.
- A review of the proposed approach to the rollforward to 31 December 2017 and the approach to updating for revised data (including allowances for data gaps in the homemaking records), as described in the report;

The **Stage 2 review** over a 2 - 3 week period in December reflected:

A review of the calculations which included:

- Independent checking of the closing ADL calculations effective 31<sup>st</sup> December 2018 and the movements since 31<sup>st</sup> December 2015.
- Independent checking of the 'rolled forward' opening ADL calculations effective 31<sup>st</sup> December 2017
- Review of two drafts of the report and the final report;
- Discussions with the Actuary in relation to a number of aspects of the review including the reasonableness of the results.

On the basis of the approach set out above, the peer reviewer has concluded that in her opinion:

- The report of 17th December 2020 is comprehensive and provides sufficient detail to allow an informed reader
  - readily review and understand the results emerging;
  - understand the work performed to generate these results including methodologies and assumptions employed, key data inputs used, the main judgments made.
- The main financial and demographic assumptions / data used in performing the review are set out in the EU Technical Guide. The actuary does comment on the overall appropriateness of the assumptions in section 7 and describes alternative plausible approaches to setting the discount rate which he identifies as a key judgement. Another area of uncertainty is around the future state pension age and this is described in section 4.3 of the report. The areas of judgement or uncertainty are illustrated as part of the sensitivities shown in section 9. The sensitivities disclosed (discount rate, life expectancies, pension indexation, state pension age) are sufficiently broad to capture the main

areas of inherent subjectivity and judgement in the calculations.

- The methodology that has been used is appropriate. Specifically, the review is based on a commonly accepted actuarial methodology known as the 'Projected Benefit Obligation' method as is prescribed in the EU Technical Guide;
- No issues arose from independent checking of the calculations. We noted that the modelling was performed to a very high standard reflecting granular modelling of the benefits and thorough consideration of data quality issues arising with reasonable adjustments made to allow for gaps.

Comments made by us relating to the technical content of the draft report was reflected in the final report of 17<sup>th</sup> December 2020.

## **Suggestions for future assessment of the ADL**

### **Data – Availability and Quality**

At 5.4 of the report the actuary identifies two actions with respect to data gathering and data quality which I agree with and re-emphasise:

- SPC new entrant data extracts by year of birth cohort and gender need to be put in place to facilitate monitoring of the claimant levels.
- The estimates for the home caring periods should be reviewed as more data becomes available. Note the estimates rely on work performed as part of the actuarial review of the Social Insurance Fund 2015. The estimates for caring periods are more important under the interim TCA approach (which allows for credits for caring periods over a full working lifetime and not just 'disregards' in respect of periods post 1994 as was the case with the yearly average approach.)

At 5.3 of the report the actuary comments that inter-valuation movement data was not readily available. While this did not directly affect the valuation of future liabilities it restricted the level of movement analysis between valuations.

The availability of this data for future valuations would be helpful in identifying impacts of policy changes on recipients and in performing 'experience' analysis to understand the key drivers of the magnitude of the changed obligation which may in part help inform future policymaking.

### **Reliances and Limitations**

We have performed some reasonableness checks on the data received but otherwise have assumed that the factual material and information provided to us, both in written and verbal form, provides an accurate representation of the facts.

The values in the Report are based on 2018 estimates of the cost of providing pension benefits reflecting guidance in the EU technical guide, and the in-force benefit structures reflecting legislation prevailing in 2018 with true up for benefit amounts / known rates of payment in the years 2019 - 2021.

The results are influenced by the underlying assumptions as indicated by the sensitivities shown in Section 9 of the Report. In practice, the actual costs will not be known with certainty until the last beneficiary in the social insurance system forming part of this review has died. Actual costs emerging are likely to differ from estimates due to factors such as changes in demographics / life expectancies and economic factors such as the rate at which pensions will actually be indexed into the future. It must therefore be recognised that actual results will differ from those inherent in the values given.

Our peer review opinion should be read in its entirety and in conjunction with the Report, as individual sections, if read in isolation, may be misleading.

This peer review letter is delivered subject to the agreed written terms of KPMG's engagement. Any party who chooses to rely on our letter (or any part of it) will do so at its own risk. To the fullest extent permitted by law, KPMG will accept no responsibility or liability in respect of our letter to any other party.

Judgements as to the conclusions drawn in this letter and Report should be made only after studying both the letter and the Report in their entirety. We assume that users of this letter and Report will seek explanation and / or amplification of any parts which are not clear.

## 12 Appendix 2 – Glossary

- 12.1.1 **Accrued to date liability ('ADL')** The ADL valuation is also known as a 'Closed Group Valuation' as there is no allowance for future service benefits to be accrued in respect of current PRSI contributors or new entrants to the workforce.
- Accrued pension rights refer to pension rights already earned by current contributors and remaining pension entitlements of those currently in receipt of pension. No rights accrued after the current year —by present or by future workers —are considered.
- 12.1.2 **Ageing Working Group ('AWG')** Working group of the European Commission dealing in matters of ageing populations and sustainability
- 12.1.3 **Actuarial assumptions** The set of assumptions made by the actuary as to rates of investment return, inflation, increase in earnings, mortality, etc. which form the basis of an actuarial valuation or other actuarial calculation.
- 12.1.4 **Actuarial value** Actuarial value is a mathematical calculation, often of the financial condition of a pension plan. It includes the computation of the present monetary value of benefits payable to present members, and the present monetary value of future employer and employee contributions, factoring in mortality among active and retired members and also the rates of disability, retirement, withdrawal from service, salary and interest. It is the value of cash, investments, and other property belonging to a pension plan, as used by the actuary for the purpose of an actuarial valuation. The actuarial value of assets may represent an average value over time, and normally differs from the amount reported in the financial statements, which is a measurement as of the date of the statement of net assets.
- 12.1.5 **Central Statistics Office ('CSO')** National Office for collection of economic and social information
- 12.1.6 **Consumer Price Index ('CPI')** An index that can be used to measure levels of inflation
- 12.1.7 **ESA** European System of Accounts
- 12.1.8 **Eurostat** The statistical office of the European Union
- 12.1.9 **Insurable employment** Employment for which PRSI contributions to the Social Insurance Fund are required
- 12.1.10 **Interim Total Contributions Approach ('TCA')** An alternative method of calculation State Pension (Contributory) introduced in 2018, where the rate is determined by the total number of contributions. Currently operating alongside the YA approach, the greater of the two being awarded.
- 12.1.11 **Liabilities** The obligations of a scheme to pay amounts of money either immediately or in the future. Liabilities whose payment is dependent on unpredictable future events (such as the death of a member) are called "contingent liabilities".
- 12.1.12 **Pay-as-you-go ('PAYG')** A system of meeting costs as they arise rather than when they are incurred
- 12.1.13 **Pay Related Social Insurance ('PRSI')** Workers earning an income (and their employers) pay contributions to the Social Insurance Fund. In return, they are covered for certain benefits, such as the State Pension (Contributory)

- 12.1.14 **Qualified adult ('IQA')** An increase for a Qualified Adult (IQA) is payable in respect of a person who is wholly or mainly maintained by the claimant and is either a spouse/Civil Partner/Cohabitant or a person over 16 years of age who is caring for a qualified child of the claimant.
- 12.1.15 **Social Insurance Fund ('SIF')** The fund from which Social Insurance benefits are paid and into which PRSI contributions are made.
- 12.1.16 **State Pension (Contributory) ('SPC')** Basic State Pension in Ireland determined with respect to social insurance contribution record
- 12.1.17 **State Pension Age ('SPA')** The age at which State Pension (Contributory) becomes payable
- 12.1.18 **Widow's, Widower's or Surviving Civil Partners' benefit ('WPC') Pension** for surviving spouses of late workers or pensioners
- 12.1.19 **Yearly Average ('YA')** A method for calculating a person's State Pension (Contributory) entitlement on retirement. The rate is based on the average contributions since entry into insurable employment.



## 13 Appendix 3 – Main Benefit Provisions

### 13.1 Social security pension benefits

13.1.1 For the purposes of this report, the term ‘social security pensions’ refers to social insurance pensions benefits payable from the national Social Insurance Fund. The key schemes under consideration in this valuation are as follows:

- State Pension (Contributory)
- Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension
- Invalidity Pension

These schemes provide partial replacement income for qualifying retirees and those suffering from long-term illness or disability, as well as for their widowed spouses. Further detail is given below.

13.1.2 The State Pension (Contributory) is paid to people from State Pension Age (currently 66 years old) to those who satisfy the social insurance contribution conditions. It is not means-tested. An individual can have other income and still get a State Pension (Contributory). This pension is taxable, but a person is unlikely to pay tax if it is their only income. There are a number of pro-rata pensions available to people who paid different types of social insurance contributions or who did not pay contributions because of various reasons. For example, those with mixed insurance records (i.e. people who worked for some time in the public and private sector) may be entitled to a pro-rata pension. Pensioners who worked for some years abroad and whose pensions are governed by EU regulations or bilateral agreements may also be paid a pro-rata pension.

13.1.3 Invalidity Pension is a weekly payment to insured people who cannot work because of a long-term illness or disability. On reaching State Pension Age, recipients are transferred to State Pension (Contributory). Invalidity Pension is taxable.

13.1.4 Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension is a weekly payment to the husband, wife or civil partner of a deceased person. Either the recipient or their deceased spouse or civil partner must satisfy PRSI contribution conditions. The pension is payable regardless of other income. To qualify an individual must be a widow, widower or surviving civil partner and they must not be cohabiting with another person. If a person is divorced (or part of a civil partnership that has been dissolved) and would have been entitled to a Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension had they remained married (or in a civil partnership), they may retain their entitlement to the Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension.

13.1.5 The main benefit is paid weekly and the rates depend on the pension a claimant is in receipt of (as well as some restrictive constraints i.e. must reside in the State to avail of Free Travel pass). There are added benefits that are not means-tested:

- Partial increase in weekly amount when age 80 is reached
- Living alone allowance
- Living on a specified island allowance

## 13.2 Eligibility

- 13.2.1 With very few exceptions: all employees whether full-time or part-time earning €38 or more per week and self-employed workers with an income of €5,000 a year or more who are aged 16 or over and under pensionable age, are liable for pay-related social insurance (PRSI) contributions.
- 13.2.2 The employers of the above employees are liable for PRSI contributions on the reckonable earnings of the employee (including notional pay).
- 13.2.3 Social insurance contributions are divided into different categories, known as classes with sub-classes in some instances. In general, PRSI contribution classes are decided by the nature of a person's employment. PRSI contribution classes also determine the range of social insurance benefits available to contributors. Most employees in Ireland pay Class A PRSI. This class of contribution confers an entitlement to the full range of social insurance payments that are available from the Department of Social Protection.
- 13.2.4 The other classes of social insurance are Classes B, C, D, E, H, J, S, K, M, and P. Those insured in one of these classes pay insurance at a lower rate than Class A contributors. Consequently, they are not entitled to the full range of social insurance payments. The social insurance classes in Ireland whose benefits include the pension schemes being valued are described below. The table below from the Department's Annual Statistics report shows the benefits available to each class.

PRSI Class	A	B	C	D	E	H	J	K	M	P	S	Voluntary Contributors
State Pension (Contributory)	X				X	X					X	X
Widows', Widowers' and Surviving Civil Partners' Contributory Pension	X	X	X	X	X	X					X	X
Adoptive Benefit	X				X	X					X	
Health and Safety Benefit	X				X	X						
Jobseeker's Benefit	X					X				X <sup>[1]</sup>		
Maternity Benefit	X				X	X					X	
Paternity Benefit	X				X	X					X	
Treatment Benefit	X					X					X	
Carer's Benefit	X	X	X	X	X	X						
Illness Benefit	X				X	X				X <sup>[1]</sup>		
Invalidity Pension	X				X	X					X	
Occupational Injuries Benefit	X	X <sup>[1]</sup>		X			X		X <sup>[1]</sup>	X		
Guardian's Payment (Contributory)	X	X	X	X	X	X					X	X
Death Grant	X				X	X						X
ALL BENEFITS	X											

[1] in limited circumstances

- 13.2.5 Class A applies to people in industrial, commercial and service type employment who are employed under a contract of service with a reckonable pay of €38 or more per week from employment. It also includes civil and public servants recruited from 6 April 1995. Most employees in Ireland pay PRSI Class A.
- 13.2.6 Class B Permanent and pensionable Civil Servants, Registered Doctors and Dentists employed in the Civil Service and Gardaí, recruited prior to 6 April 1995. Benefits include Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension only
- 13.2.7 Class C Commissioned Army Officers and Members of the Army Nursing Service, recruited prior to 6 April 1995. Benefits include Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension only
- 13.2.8 Class D Permanent and pensionable employees in the public service other than those mentioned in Classes B and C, recruited prior to 6 April 1995. Benefits include Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension only

- 13.2.9 Class E Ministers of religion employed by the Church of Ireland Representative Body.
- 13.2.10 Class H Non-Commissioned Officers and enlisted personnel of the Defence Forces.
- 13.2.11 Class S Self-employed people such as farmers, certain company directors, people in business on their own account and certain people with income from investments, rents and maintenance.
- 13.2.12 At the time a claim is made, eligibility for benefits is assessed using a social insurance contribution requirement, as well as various scheme-specific qualifying criteria. Examples include
- The class/classes of social insurance paid
  - The age of entry into insurable employment
  - The accumulated number of PRSI contributions made prior to the relevant claim of benefit date
  - The number of PRSI contributions made in the year/s coming up to the relevant claim of benefit date
  - the Yearly Average assessed number of PRSI contributions

For example, a State Pension (Contributory) applicant must be age 66, to have started paying social insurance contributions before age 56 and to have paid a minimum of 520 (10 years') contributions.

Further details on eligibility conditions can be obtained at the links below:

[State Pension \(Contributory\)](#)

[Widow's, Widower's or Surviving Civil Partner's \(Contributory\) Pension](#)

[Invalidity Pension](#)

### **13.3 Added accrual**

- 13.3.1 A person under the age of 66 who ceases to be covered by compulsory PRSI may opt to become a Voluntary Contributor, provided certain conditions are satisfied. A person under similar considerations may be eligible to be covered by credited contributions.
- 13.3.2 Voluntary Contributions are designed to facilitate employees or self-employed persons who are no longer subject to compulsory PRSI, to pay contributions directly to the Department on a voluntary basis, in order to protect their future pension entitlements. They cannot be used to satisfy the social insurance requirements of an Invalidity Pension.
- 13.3.3 Credited contributions (credits) are social insurance contributions designed to protect the social insurance entitlement record of insured workers who are not in a position to make PRSI contributions. Credits are awarded in circumstances such as unemployment or illness, and their purpose is to help protect the social insurance entitlements of insured persons during periods when they may not be in a position to pay contributions. In order to qualify for credits, a person must first have entered insurable employment - he or she must have paid at least one PRSI at Class A, B, C, D, E, H or P. Credits may enable insured workers to qualify for various social insurance benefits. They are not available to class S (only) contributors.

- 13.3.4 Other forms of contribution cover provided for breaks in PRSI contributions, where eligible, are referred to as Home Caring Periods or Homemaker's Scheme. A homemaker/carer is a person who has taken time out of the workforce to provide home care, and did not, as a result, have a paid or credited contribution or reckonable voluntary contribution on their social insurance record.
- 13.3.5 The Homemaker's Scheme provides those years spent working in the home while caring on a full-time basis for a child up to 12 years of age or an incapacitated person age 12 or over will be disregarded in calculating a person's Yearly Average number of contributions. The scheme came into effect on 6 April 1994 and applies to both men and women, from that date onwards and not before. However, a person may get credits for the tax year he or she becomes a homemaker and the tax year he or she stops being a homemaker if the period spent as a homemaker is not a complete year.
- 13.3.6 Home Caring Periods are part of a measure announced by the Government in 2018 under the interim Total Contributions Approach. Those who have spent time out of the workforce for caring duties can apply for a Home Caring Period up to a maximum of 20 years, including periods prior to 1994.

## 13.4 Benefit rate structure

- 13.4.1 The level of benefits awarded on application for a benefit is broadly determined by paid and credited contributions.
- 13.4.2 For the State Pension (Contributory), on application at SPA, applicants satisfying the qualifying conditions are awarded some proportion of the maximum rate of State Pension (Contributory), currently €248.30 per week (and €243.40 per week at 31<sup>st</sup> December 2018).
- 13.4.3 Prior to 2018, a person's pension entitlement on reaching SPA was calculated using a 'yearly average' approach. Under the 'yearly average' approach, the total number of contributions paid/credited at pension age is divided by the number of years between entering insurable employment and the last full year before pension age is reached. Entire calendar years with absence of contributions due to homemaking (after 1994) can be disregarded in the calculation of state pension rates, up to a maximum of 20 years. Entitlement is then banded with a yearly average of 48 required for a full rate pension. (Separate arrangements apply for those who reach pension age while on a Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension or Invalidity pension.) There are a number of pro-rata pensions, which were introduced because of the exclusion of some people from the social insurance system at particular times. Table 13-1 below shows the relationship between the yearly average number of contributions and pro-rata pensions for applicants after 1 September 2012:

Yearly average rate band	Percentage of Maximum
48 or more	100 %
40 – 47	98 %
30 – 39	90 %
20 – 29	85 %
15 – 19	65 %
10 – 14	40 %

*Table 13-1 Post 2012 'yearly average' State Pension (Contributory) rate bands*

- 13.4.4 Since 2018, the rate of benefit payable to a pensioner is now the greater of that person's entitlement under the 'yearly average' and their entitlement under a new 'interim Total Contributions Approach'. Under the TCA, a person who has accumulated 40 years of paid and credited social insurance contributions will qualify for the maximum rate of State Pension (Contributory), with proportionally lower rates payable to people with fewer contributions. A new Home Caring Period of up to 20 years (including periods prior to 1994) can be applied for under the TCA. The TCA calculation is based on the totality of a person's paid and credited social insurance contributions history prior to State Pension Age, including the new Home Caring Period. Credited contributions are capped at 520 (10 years) and the aggregate of Home Caring Periods and credited contributions cannot exceed 1040 (20 years).

This example considers a someone with 40 years' worth of insurable employment from date of entry up to retirement age. This contributor had on average 35 paid and 7 credited PRSI contributions, with 2 years of Homemaking 'disregard' periods and 4 years' worth of Home Caring Periods.

The average contributions under 'yearly average' is 44, which falls under the 98% rate band for the State Pension (Contributory).

YA method:

$$\frac{(35 + 7) \times 40}{40 - 2} = \frac{1680}{38} = 44.21$$

TCA method:

$$\frac{((35 \times 40) + \text{minimum}(520, 7 \times 40) + \text{minimum}(1040, 4 \times 52))}{2080} =$$

$$\frac{1400 + 280 + 208}{2080} = \mathbf{90.76\%}$$

- 13.4.5 For Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension the rate of payment is assessed based on the deceased's or surviving partner's social insurance record (but not the combination of the two). If the yearly average is 48 or more or the short yearly average exceeds 39, the maximum rate is granted. Otherwise reduced rates (effective 2020) are granted as shown in Table 13-2:

Yearly average rate band	Aged under 66	Aged over 66
48 or more	€208.50	€248.30
36 – 47	€205.40	€243.40
24 – 35	€202.90	€237.70

*Table 13-2: Widow's, Widower's or Surviving Civil Partner's (Contributory) Pension*

- 13.4.6 The rate of the Invalidity pension is currently €208.50 (and €203.50 per week at 31<sup>st</sup> December 2018). If the beneficiary remains in receipt of the Invalidity pension when reaching State Pension Age, their benefit will be transferred to the maximum rate under the State Pension (Contributory).

## 13.5 Indexation of benefits

13.5.1 Ireland is currently atypical compared to other EU countries in its approach to applying discretionary increases through political decisions in the annual budgetary process. This may change in the future: the Roadmap for Pensions Reform 2018-2023 recommends that Ireland should

- Set a formal benchmark of 34% of average earnings for State Pension (Contributory) payments by the end of 2018 and;
- Institute a process whereby future changes in pension rates of payment are explicitly linked to changes in the consumer price index and average wages by the end of 2018.

However, these plans have not been enacted into law, so that the system of discretionary increases through political decisions continues to apply and is assumed to continue throughout this report; albeit the indexation of the state pension over the long term is assumed to keep pace with earnings growth and therefore remain a constant percentage of national average earnings throughout.

## 14 Appendix 4 – ADL Supplementary Table

See below the Supplementary ESA Table 29 – Column H – completed as at 31<sup>st</sup> December 2018.

Supplementary Table 29 – Column H					
Column number		Discount rates	3%	4%	5%
		<b>Figures in €billion</b>	<b>Opening balance sheet</b>		
	1	<b>Pension entitlements</b>	409.3	326.7	264.5
		Changes in pension entitlements due to transactions			
(2.1+... 2.4) – 2.5	2	Increase in pension entitlements due to social contributions	20.4	21.2	21.3
	2.1	Employer actual social contributions	6.5	6.5	6.5
	2.2	Employer imputed social contributions	N/A	N/A	N/A
	2.3	Household actual social contributions	1.8	1.8	1.8
	2.4	Household social contribution supplements	12.3	13.1	13.2
	2.5	Less: Pension scheme service charges	0.2	0.2	0.2
	3	Other (actuarial) change of pension entitlements in social security pension schemes	12.7	-0.1	-6.2
	4	Reduction in pension entitlements due to payment of pension benefits	7.4	7.4	7.4
2 + 3 - 4	5	Changes in pension entitlements due to social contributions and pension benefits	25.7	13.7	7.7
	6	Transfers of pension entitlements between schemes	N/A	N/A	N/A
	7	Change in entitlements due to negotiated changes in scheme structure	16.4	12.9	10.5
	8	Changes in entitlements due to revaluations	-	-	-
	9	Changes in entitlements due to other changes in volume	11.7	5.9	2.9
		<b>Closing balance sheet</b>			
1 + Σ (5 to 9)	10	Pension entitlements (incl. contingent pension entitlements)	463.1	359.2	285.6



## Notes

An explanation of rows and columns of the supplementary table follows:

The rows in the supplementary table contain a reconciliation between the opening value of pension obligations (entitlement) at the beginning of a period (31<sup>st</sup> December 2017) and the closing value at the end of a period (31<sup>st</sup> December 2018).

**Row 1** illustrates the opening stock of pension obligations (entitlements), which is identical with the previous year's closing stock (had it been calculated). In this case it equals to the 31<sup>st</sup> December 2017 position reflecting the ADL calculation in respect of social security pension schemes. The opening ADL of €326.7bn is calculated on the same set of assumptions as applying to the closing ADL of €359.2bn and described in this report.

**Row 2** shows the changes to pension entitlements due to contributions. This is formula based and is equal to: Row 2.1 up to and including 2.4 less 2.5.

**Row 2.1** Employer (and self-employed) social insurance contributions are displayed here. A notional adjustment has been made to remove contributions in relation to benefits not included in the ADL such as unemployment benefits.

**Row 2.2** Not applicable for social insurance benefits

**Row 2.3** Employee social insurance contributions are displayed here. A notional adjustment has been made to remove contributions in relation to benefits not included in the ADL such as unemployment benefits.

**Row 2.4** This is equivalent to the unwinding of the discount rate, meaning that its value is equal to the discount rate times the pension entitlements at the beginning of the accounting period. In this case it is  $4\% \times €326.7\text{bn} = €13.1\text{bn}$

**Row 2.5** This represents the fixed portion of contributions set aside for covering the pension scheme service charges.

**Row 3** This row reflects a residual / balancing figure which includes "experience effects" found in social security pension schemes in which the observed outcome of pension modelling assumptions (real wage growth rate, discount rate, etc.) differs from the levels assumed in the previous estimation.

**Row 4** comprises of the pension benefits that are paid during the period.

**Row 5** shows the changes to pension entitlements due to contributions and benefits. Formula based, equal to Row 2 + Row 3 – Row 4.

**Row 6** Transferring pension entitlements: Nil

**Row 7** Pension reforms occurring between opening and closing dates: This row includes the extension of invalidity pension to the self-employed and the introduction of the interim Total Contributions Approach guarantee for State Pension (Contributory)

**Row 8** Revaluations are due to changes to the key model assumptions in the actuarial calculations and are covered in **row 8**. These assumptions are the discount rate, the wage growth rate and, if used in the model, the inflation rate. Eurostat have indicated the opening balance should reflect changes in the key model assumptions – hence this line is Nil

**Row 9** When the demographic assumption used in the actuarial calculations are changed, they are recorded as other changes to the volume of assets (**Row 9**). Any changes to assumptions which are not revaluations. This includes presumptions on future retirement behaviour. Besides changes to the underlying assumption, the general framework of the actuarial model applied may also change from one year to the next to improve the accuracy of the results. A model change extending the projection period has been entered here.

**Row 10** illustrates the closing stock of pension obligations (entitlements), which is identical with the opening stock for the following year. In this case it equals to the 31<sup>st</sup> December 2018 position reflecting the ADL calculation in respect of social security pension obligations is €359.2bn.



The alternative view below walks from the previously published opening balance as at 31<sup>st</sup> December 2015 to the 31<sup>st</sup> December 2018 close. Assumption and model changes are presented in rows 8-9 in this view. Opening balance sheets and item 2.4 are calculated using discount rates of 4%/5%/6%.

Alternative View of Supplementary Table 29 – Column H					
Column number	Discount rates start year		4%	5%	6%
	Discount rates end year		3%	4%	5%
		<b>Figures in €billion</b>	<b>Opening balance sheet</b>		
	1	<b>Pension entitlements</b>	288.4	231.0	187.4
		Changes in pension entitlements due to transactions			
(2.1+... 2.4) – 2.5	2	Increase in pension entitlements due to social contributions	58.3	58.7	58.1
	2.1	Employer actual social contributions	18.0	18.0	18.0
	2.2	Employer imputed social contributions	N/A	N/A	N/A
	2.3	Household actual social contributions	4.9	4.9	4.9
	2.4	Household social contribution supplements	36.0	36.4	35.8
	2.5	Less: Pension scheme service charges	0.6	0.6	0.6
	3	Other (actuarial) change of pension entitlements in social security pension schemes	6.3	-2.9	-7.3
	4	Reduction in pension entitlements due to payment of pension benefits	21.2	21.2	21.2
2 + 3 - 4	5	Changes in pension entitlements due to social contributions and pension benefits	43.4	34.6	29.6
	6	Transfers of pension entitlements between schemes	N/A	N/A	N/A
	7	Change in entitlements due to negotiated changes in scheme structure	12.7	10.3	8.5
	8	Changes in entitlements due to revaluations	94.1	67.9	49.9
	9	Changes in entitlements due to other changes in volume	24.5	15.4	10.2
		<b>Closing balance sheet</b>			
1 + Σ (5 to 9)	10	Pension entitlements (incl. contingent pension entitlements)	463.1	359.2	285.6