KPMG

Actuarial Review of

The Social Insurance Fund

31 December 2015

28 September 2017

Department of Employment Affairs

and Social Protection

Actuarial Review of the Social Insurance Fund 2015

Undertaken by KPMG on behalf of the

Department of Employment Affairs and

Social Protection

28 September 2017

Note from Consultants

To: The Minister for Social Protection
The Department of Employment Affairs and Social Protection
Áras Mhic Dhiarmada
Store Street
Dublin 1

28 September 2017

Subject: 2015 Actuarial Review of the Social Insurance Fund ("SIF")

We have pleasure in enclosing our report setting out our findings on the Actuarial Review of the Social Insurance Fund 2015.

The consultancy team would like to acknowledge the invaluable assistance given by the members of the Steering Committee and Rowena Pecchenino, Professor and Head of the Department of Economics, Finance & Accounting at NUI Maynooth.

We also wish to acknowledge the insight provided by officials from the Department of Finance with respect to the macroeconomic and demographic assumptions used and the actuary in the Department of Public Expenditure and Reform for strong actuarial insight. Finally, we would like to thank the Central Statistics Office ("CSO") for their contribution on the presentation of the Accrued to Date Liability (required for the first time under EU reporting requirements) and associated analysis.

Yours sincerely,

Brian Morrissey, FSAI

Joanne Roche, FSAI

NOTICE ABOUT THIS REPORT

Our report is for the benefit and information of the addressees only. The scope of work for this report is included as Appendix 9 as set out in the RFT. To the fullest extent permitted by law we will not accept responsibility or liability to any other party (including the addressees' legal and other professional advisers), whether obtained under the Freedom of Information Act or otherwise in respect of our work on this report.

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1 Executive Summary

1.1 Background

The Social Welfare (Consolidation) Act, 2005 makes provision for the carrying out of actuarial reviews of the Social Insurance Fund at five yearly intervals.

Following a competitive tender process, KPMG has been appointed by the Department of Employment Affairs and Social Protection to carry out this fourth actuarial review ("Review") of the Social Insurance Fund ("Fund" or "SIF") with an effective date of 31 December 2015 in order to meet this legislative requirement and with a view to informing both short to medium term and long term policy development in relation to the social insurance system generally. This Review builds on the findings of the 2000, 2005 and 2010 Reviews in relation to social insurance based benefits and pensions.

The scope of the Review is set out in Chapter 2 and the original scope from the Request for Tender ("RFT") issued by the Department of Employment Affairs and Social Protection ("the Department") is included in Appendix 9.

The Review covers a 55 year period from 2016-2071 whereas the 2010 Review had covered the 55 year period 2011 - 2066.

The main social insurance benefits paid by the Fund relate to retirement, illness, incapacity, unemployment, maternity and bereavement. It is funded by PRSI contributions from employees, employers and the self-employed, with a subvention from the Exchequer where there is a gap between income and expenditure. A description of how the Fund works is set out in Appendix 1 and readers are advised to familiarise themselves with this content in order to better inform their understanding of this report.

We have developed a financial projection model which underpins the analysis presented in this report. The model will be delivered to the Department by no later than Quarter 4 2017 as requested in the RFT.

Before commenting on the results, it is important to emphasise that long-term projections are, by their nature, unlikely to be borne out in practice. We would encourage readers to focus on the trends which emerge over the period and on the relativities between projected incomes and expenditures under the base case and the various scenarios, rather than on the absolute results for individual years. Our reliances and limitations are included in Appendix 11.

1.2 Key Conclusions

The key conclusions we have drawn from the Review are set out here. The key conclusions of our Review are broadly consistent with the findings of the 2005 and 2010 Reviews albeit the medium term outlook is much healthier. Note where we quote monetary figures these are in 2017 real price terms:

- One of the key results from this Review is the net present value of future projected shortfalls which is €335 billion based on a real discount rate assumption of 1.5% per annum.
- Where a real discount rate of 2% per annum was chosen as per the 2010 Review, the €335 billion would reduce to €280 billion. (€324 billion was the assessed value at the 2010 Review based on 2010 data and the macro-economic and demographic outlook at that point.)
- The Fund currently has a modest surplus of income over expenditure in cash terms (2016 surplus of €0.4 billion on expenditure of €8.8 billion and receipts of €9.2 billion).
- The surplus is projected to increase in 2017 before reducing in the period 2018 to 2019 and returning to a small shortfall in 2020. The annual shortfalls are projected to increase from 2021 onwards as the ageing of the population starts to impact. See Figure 1.1.

- Our projections indicate that in the absence of further action to tackle the shortfall, the excess of expenditure over income of the Fund will increase significantly over the medium to long term. The modest 2020 projected shortfall of €0.2 billion is expected to increase to €3.3 billion by 2030 and to €22.2 billion by 2071. Expressed as a percentage of GDP, the shortfall is projected to increase from 0.1% of GDP in 2020 to 0.9% in 2030 and, 3.1% in 2055 before gradually reducing to 2.9% of GDP by 2071.
- In the longer term, sizeable Exchequer subvention will be required to meet ongoing expenditure requirements in the absence of reductions in expenditure levels or increases in PRSI income. As can be seen from Figure 1.1, it is projected that Exchequer subventions will need to increase in 2017 real price terms (from nil currently) to €1.7 billion by 2025, €5.6 billion by 2035 and €11.4 billion by 2045.

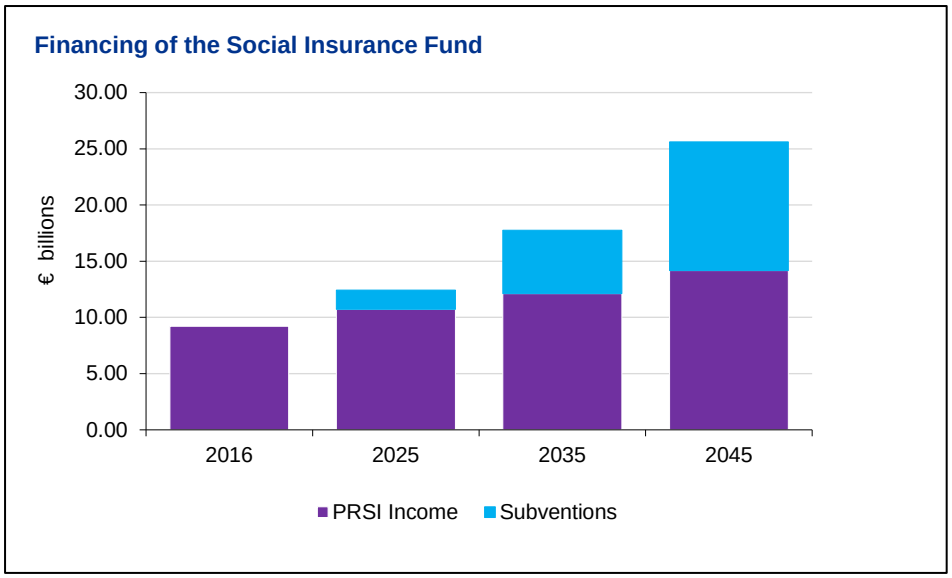

Figure 1.1: Projection of Fund Financing (PRSI Income / Exchequer subvention) over the projection period

- The increasing shortfalls in the Fund over the medium to long term are projected to continue, notwithstanding the variety of measures taken since the 2010 Review. The inter-review period saw significant PRSI base broadening measures coupled with a range of refinements to social insurance schemes. Other changes to pension eligibility arrangements (including increases in the State Pension Age to 66 in 2014 and the different rate bands applying for SPC qualifiers since 2012) were anticipated and allowed for at the 2010 Review.
- As identified at the 2010 Review, in the medium to long term pension related expenditure is projected to continue to be the predominant component of the Fund expenditure rising from 70% in 2016 to circa 80% in 2071.
- As observed at previous reviews the significant increase in pension-related expenditure is attributable to Ireland's rapidly altering population structure and in particular the large rise in those over State Pension Age ("SPA"), which is 66 currently and due to rise to 68 in 2028.
- The population over SPA is projected to increase from 12% of the total population in 2015 to 17% in 2035 to 23% in 2055.
- Simultaneously, the pensioner support ratio is projected to decline from 4.9 workers for every individual over age 66 to 2.9 workers in 2035 and to 2.0 workers by 2055. This position is alleviated somewhat by the increase in the SPA to 67 and 68 in 2021 and 2028 such that the support ratio improves from 2.9 workers over age 66 to 3.4 for every individual over age 68 in 2035 and from to

2.0 workers over age 66 in 2055 to 2.3 workers over age 68. It is worth bearing in mind that it is the *effective* retirement age (which tends to be lower than the SPA) which drives the requirements for benefits and funding.

- Our base case scenario assumes that benefits generally increase in line with average earnings. Re-rating benefits in line with CPI rather than in line with earnings dramatically impacts the Fund finances and alleviates the projected shortfalls. However, re-rating benefits in line with CPI over a prolonged period results in pension rates of payment significantly behind the current pension level of 33% of Average Earnings.
- Social insurance benefits offer excellent value for money for those on the lower part of the income distribution or shorter contribution histories, and the self-employed. For those at the higher end of the income distribution, the Fund is redistributive and such contributors generally get back less than they pay in. The value for money achieved by women versus men is less clear cut. Women are projected to live longer than men (albeit the life expectancy gap is narrowing with time) and therefore taking the example of a man and woman with equivalent contribution histories who would qualify for the same level of SPC, a woman will fare better from the SIF. However men have a higher propensity to claim other benefits from the SIF including Invalidity, Jobseeker's and Illness Benefit. Where these benefits are taken into account in addition to SPC, men tend to fare better overall than their female counterparts.
- The projected shortfall at 2066 of €21.2 billion, (the end of the previous projection period), is now much reduced as compared with that projected at the 2010 Review at which point if was €25.7 billion. In terms of contributions the figures at outset of the period are higher, primarily due to the PRSI base broadening measures introduced since the 2010 Review, offset by the lower overall size of the projected workforce in later years. Pension expenditure which dominates overall expenditure particularly in the later years is lower at the end of the projection period. This is because of a combination of lower initial expenditure as compared with what was expected at the 2010 Review (primarily due to rate increases being lower than expected over the period), heavier mortality assumptions at this Review which affect all of the existing stock of beneficiaries, and lower overall projected SPC entries due to a combination of (i) the reduced size of the projected population (ii) modelling which more accurately captures the actual propensity of individuals in the various retiring datasets to qualify and hence claim SPC.

There is some uncertainty on numbers potentially accessing SPC beyond 2030 as these individuals are only part way through their careers. This assumption is stressed in Chapter 9.

1.3 Overview of the Base Case

Table 1.1 summarises the shortfall / (surplus) of projected income to expenditure (expressed as a % of projected GDP) under our base case scenario.

All monetary figures are in 2017 price terms (i.e. net of Consumer Price Index inflation after 2017), except for the 2015 figures which are known and 2016 figures which are provisional outturn actual cash amounts. The net present value of these shortfalls over the 55 year projection period is €335 billion[1] based on a real discount rate of 1.5% per annum.

[1] €335 billion corresponds to a real discount rate of 1.5% per annum. The result is highly sensitive to the discount rate chosen. Where a 2% per annum real discount rate is chosen (which is like for like with that chosen at the 2010 Review) the shortfall would reduce to €280 billion. The corresponding net present value at the 2010 Review on a 2% real discount rate was €324 billion

	Income and Expenditure Projections (€ billions)			
Year	**Receipts**	**Expenditure**	**Surplus / (Shortfall)**	**(Shortfall) as a % of GDP**
2015	8.5	8.6	(0.1)	0.0%
2016	9.2	8.8	0.4	0.2%
2017	9.6	9.1	0.5	0.2%
2018	9.8	9.5	0.2	0.1%
2019	9.9	9.9	0.0	0.0%
2020	10.0	10.3	(0.2)	(0.1%)
2021	10.2	10.8	(0.6)	(0.2%)
2022	10.3	10.9	(0.6)	(0.2%)
2023	10.4	11.4	(1.0)	(0.3%)
2024	10.6	11.9	(1.3)	(0.4%)
2025	10.7	12.4	(1.7)	(0.5%)
2026	10.8	12.9	(2.1)	(0.6%)
2027	11.0	13.6	(2.7)	(0.8%)
2028	11.1	13.9	(2.8)	(0.8%)
2029	11.2	14.1	(2.9)	(0.8%)
2030	11.3	14.6	(3.3)	(0.9%)
2035	12.1	17.8	(5.6)	(1.4%)
2045	14.2	25.6	(11.4)	(2.4%)
2055	16.9	34.2	(17.3)	(3.1%)
2071	22.5	44.7	(22.2)	(2.9%)

Table 1.1: Projected income, expenditure (€ billions) and deficit as a % of GDP for each future year up to 2030 and spot years

Further analysis of base case results is provided in Chapter 7.

1.4 Base Case Assumptions used

The selected base case assumptions reflect discussions with the Steering Committee (see Appendix 8), with key input from Department of Finance representatives.

We have used the 2016 estimated outturn figures and 2017- 2021 short term projections set out by the Department of Finance in the Stability Programme Update of April 2017.

To ensure consistency across Irish and EU long term modelling outputs the assumptions underpinning the long term projections (2022+) were based on projections run by the European Commission ("the Commission") and sent to Member States to form the basis of the 2018 Ageing Report. We discussed the basis underpinning these and note these are long run projections which do not, for example, take account of the possible negative effects of Brexit on the Irish growth trajectory. We discuss Brexit in more detail in Chapter 5 and stress the assumptions through a variety of scenarios run, as commented on in Chapter 9.

The base case assumptions are therefore generally consistent with the assumptions used by the Department of Finance for current projection purposes save for an adjustment to the mortality assumptions.

We have taken the mortality improvement factors used by the CSO in their most recent population projections[2] as opposed to those underpinning the 2015-based population projections produced by Eurostat. These Irish specific mortality improvement rates reflect the views of the expert group assembled by the CSO to perform Irish Population and Labour Force projections.

Other assumptions reflect macroeconomic and other demographic (e.g. labour force) assumptions provided by the Department of Finance – those used for the Stability Programme Update in the short term, followed by those produced by the Commission and intended to feed into the 2018 Ageing Report for the medium and longer term.

The population data at outset has been overlaid[3] with the Census 2016 results. In contrast the 2015 population projections for Ireland produced by Eurostat were based on the age distribution from Census 2011 at which point the country's age distribution was significantly different.

Table 1.2 outlines the key macroeconomic assumptions used in the base case projections.

	Assumption (%)				
Year	Real GDP Growth	Price Inflation	Real Earnings Growth	Unemployment rate[4]	Employment Growth
2016	5.2	1.0	1.9	7.9	2.9
2017	4.3	1.6	1.4	6.4	2.7
2018	3.7	2.0	1.1	5.8	2.4
2019	3.1	2.1	1.0	5.5	1.9
2020	2.7	2.1	1.1	5.5	1.5
2021	2.5	2.1	1.0	5.5	1.4
2022-2025	2.2	2.0	1.8	5.7	0.4
2026-2030	1.7	2.0	1.2	6.2	0.4
2031-2035	1.8	2.0	1.4	6.2	0.5
2036-2040	1.7	2.0	1.5	6.2	0.2
2041-2045	1.5	2.0	1.5	6.2	-0.1
2046-2050	1.5	2.0	1.5	6.2	-0.1
2051-2055	1.6	2.0	1.5	6.2	0.1
2056-2060	1.9	2.0	1.5	6.2	0.4
2061-2065	2.1	2.0	1.5	6.2	0.6
2066-2071	2.0	2.0	1.5	6.2	0.5

*The figures from 2022 onwards are grouped in 5 year bands (typically) and are averages
Table 1.2: Key base case macroeconomic assumptions

We have applied the Commission's rates (e.g. labour force, participations rates etc.) on an age by age basis to a revised Irish population with Census 2016 overlay. The age by age rates used in our model coincide with the Commission's rates on individual age basis but when expressed on a grouped age basis reflecting a different underlying age profile of our revised 2015 population are are very marginally different to the Commission's rates quoted above.

Table 1.3 outlines a selection of statistics from the base case population projections used at various spot years into the future.

[2] Population and Labour Force Projections 2016 – 2046, dated April 2013
[3] By "overlaid" we mean that the 31 December 2015 based population projections produced by Eurostat (disaggregated by age and gende) were replaced with the population totals and age and gender splits included in Census 2016.
[4] The unemployment rate and employment growth figures relate to age groups 15-74 for consistency with the headline figures included in the SPU. The unemployment rate refers to the percentage of the labour force (rather than population).

	2015	2025	2035	2045	2055	2065	2071
Fertility rate	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Life expectancy at 66 - males	17.6	19.5	21.0	22.1	23.1	24.0	24.6
Life expectancy at 66 - females	20.1	21.7	22.9	23.9	24.7	25.6	26.0
Net migration (thousands)	-0.6	6.9	9.1	13.6	12.8	11.5	10.7
Population (millions)	4.7	5.2	5.4	5.7	6.0	6.1	6.2

Table 1.3: Key base case demographic assumptions

We have considered a variety of alternative demographic and macro-economic scenarios including alternative real earnings growth rates in Chapter 9.

1.5 Main drivers of changed outlook for the Fund since 2010 Actuarial Review

1.5.1 Changed start point (2011 - 2015)

The start point of the Fund's position in 2015 is very different to that projected in 2010. The projected shortfall in 2015 from the 2010 Review was €2.0 billion when in reality the shortfall was €0.1 billion. This is a result of 2 main factors; the PRSI base-broadening measures on the income side and action on the expenditure side (no rate increases 2010 – 2015) coupled with some curtailments on some of the short-term schemes.

PRSI Base broadening measures

The start point for PRSI income at this 2015 Review is significantly greater than had been anticipated at the 2010 Review (€8.8 billion in 2015 income versus €7.7 billion projected from the 2010 Review).

The main reason for the differences (just under €800 million) on the PRSI side reflects the various PRSI base broadening measures carried out since the 2010 Review which made a strong contribution to the restoration of the Fund's finances.

One of the more significant budgetary measures with respect to the PRSI base was the 2013 Measure which abolished the weekly PRSI-free allowance of €127 for people paying at Class A, H and E.

Expenditure

Both pension and non-pension related expenditure is lower in 2015 as compared with that anticipated at the time of the 2010 review. This is primarily driven by the absence of rate increases in that 5 year period[5] as compared with expectations.

1.5.2 Revised Actuarial projections (2016 – 2065)

As identified at previous Reviews, the main driver of the increase in overall projected expenditure is pension-related expenditure, which is itself attributable, to a large extent, to the projected ageing of the population over the next 55 years. Other significant contributing factors are increased labour force participation and the consequent increase in the numbers meeting the qualification conditions for SPC, and at the higher pension rates.

[5] There was a subsequent catch up on rate increases in 2016 and 2017 when for example the SPC increased from €230.30 to €233.30 in 2016 and further to €238.30 in 2017.

Table 1.4 illustrates that those over SPA are projected to increase from 12% of the total population in 2015 (when SPA = 66) to 23% (when SPA = 68) by 2055.

Age Group	2015	2025	2035	2045	2055	2065	2071
0 - 19	1,307	1,395	1,325	1,321	1,408	1,427	1,423
20 - (SPA-1)	2,847	3,016	3,191	3,224	3,195	3,312	3,417
SPA +	586	746	929	1,193	1,402	1,436	1,416
Total	4,740	5,157	5,445	5,738	6,005	6,175	6,256
0 - 19	28%	27%	24%	23%	23%	23%	23%
20 - (SPA-1)	60%	58%	59%	56%	53%	54%	55%
SPA +	12%	14%	17%	21%	23%	23%	23%
Pensioner Support Ratio	**4.9**	**4.0**	**3.4**	**2.7**	**2.3**	**2.3**	**2.4**
Total Support Ratio	1.5	1.4	1.4	1.3	1.1	1.2	1.2

Table 1.4: Population Structure 2015 to 2071 (000s); base case assumptions

The pensioner support ratio is projected to decline from 4.9 workers for every individual over pension age to 2.3 workers over the period of the projections.

In spite of increases to SPA in 2021 and 2028, the decline in the projected support ratio is projected to be rapid and severe reducing to 2.7 workers by 2045.

The key driver of the ageing of the population is the number of individuals who are rapidly approaching SPA or indeed the effective retirement age (the “bulge” in the population of those aged circa 30 – 45 currently – see Figure 6.1) and increases to life expectancy. Compounding this are fertility rates which are lower than they tended to be historically and which are projected to remain below the natural “replacement” rate of 2.1 throughout the period.

At this Review there is a reduction as compared with the 2010 Review in terms of the mortality improvement assumption (lower at this Review), the absolute numbers of inward migrants and the associated age distribution which have had a strong bearing in terms of the absolute size of the population particularly in the later years of the projection period.

Overall, the population projections at this 2015 Review are lower in absolute terms than at the 2010 Review.

1.5.3 Changes in the expenditure associated with non-pension benefits

While demographic factors are a significant contributing factor to the longer-term increase in expenditure notably pension-related expenditure, there has been some reduction in recent years in the level of expenditure associated with short term schemes.

Projected 2015 non-pension benefits from the 2010 review were €3.5 billion (2016 real price terms) compared to the actual €2.7 billion that materialised in that year.

The expenditure on non-pension benefits such as Jobseeker’s Benefit naturally reduced due to the reduction in unemployment rates as compared with those expected at the 2010 Review. Further there were some curtailments to benefits over the period since the 2010 Review due to the introduction of measures including:

- the 2013 Measure which reduced the duration of Jobseeker’s Benefit by up to 3 months;
- the 2014 Measure which reduced the weekly rate of Invalidity Pension payable to 65 year olds from €230.30 per week to €193.50 per week from January 2014.

However Invalidity Pension expenditure (which is affected by the ageing of the population as the highest propensity to claim is in the age bracket 55+) is projected to increase more than anticipated at the previous Review. This is in part explained by the extension of the benefit to the self-employed.

Table 1.5 below shows the projected expenditure split by pension and other benefits.

	Total Receipts	Pension Expenditure	Other Expenditure	Total Expenditure
2016	9.2	6.1	2.7	8.8
2035	12.1	12.9	4.9	17.8
2071	22.5	35.7	9.0	44.7

Table 1.5: Projected pension and non-pension related expenditure (€ billions) – 2015 Review

The above results indicate that as a result of rapid increases in pension related expenditure as the population structure changes:

- pension expenditure as a proportion of total Fund expenditure is projected to rise from approximately 69% in 2016 to circa 80% in 2071;
- non-pension benefits as a proportion of total Fund expenditure are projected to reduce from approximately 31% in 2016 to circa 20% in 2071.

1.6 Treatment in this review of post 2015 Legislative / Budgetary changes impacting the Fund

The effective date of the Review is 31 December 2015; however we have taken account of the budgetary and legislative changes impacting benefit and contribution levels at the date of finalising the Review. This includes, for example, the 2017 Budget Measure which allowed for an extension of Invalidity Pension to the self-employed from 1 December 2017.

In contrast with the 2010 Review (where a combination of enacted and anticipated change was reflected), the Steering Committee recommended that our base case for the 2015 Review allow for *enacted* change only. In a departure from the 2010 Review, the proposed change to the SPC rules as set out in the National Pensions Framework are not factored into our base case projection scenario as these have not been enacted. The changes involved an alternative to the current “Yearly Average” design to be replaced by a “total contributions approach” for new recipients of SPC from 2020 onwards.

Further commentary on the impact of a variety of alternative “National Pension Framework” or “Total Contributions Approach” variant scenarios is included in Chapter 12. The impact of the use of the Yearly Average approach throughout is relatively modest with a 2% difference in SPC expenditure resulting in 2071 as compared with the 2010 approach of applying the YA rules to 2019 and TCA rules from 2020.

1.7 Alternative scenarios examined in this Review

We have carried out a number of scenario tests in addition to the base case to quantify the responsiveness of the results to changes in the key underlying macroeconomic and demographic assumptions.

We note that the projections are particularly sensitive to the following factors:

- the approach used to index benefit payments (i.e. a change from increases in line with average earnings[6] to increases in line with Consumer Price Index);
- changes in future rate of improvement in mortality rates and associated life expectancies (in the absence a commensurate change in the SPA);
- the future population both in terms of absolute numbers and age profile which is impacted by increasing life expectancy, fertility rates and migration flows;
- real earnings growth - higher productivity increases negatively impact the magnitude of the shortfall (in 2017 real price terms) due to the assumed continuation of the link of the SPC with real earnings growth. Notwithstanding, because of the relationship of real earnings / productivity increases with GDP the shortfall when expressed as a % of a (higher) GDP is largely unchanged.
- any short term shock resulting in a contraction from a now larger PRSI base occurring in the absence of a material fall in SIF expenditure (increasingly pension-related and "sticky") would result in a requirement for a series of sizeable Exchequer subventions in a downturned economy.
- the judgement around the total contributions paid over a working lifetime (and hence the level of SPC for which individuals will qualify) for those retiring beyond 2030 makes a sizeable impact on the shortfall at the later years of the projection period.

The Brexit scenario examined for the Review arises from the application of the adverse World Trade Organisation ("WTO") scenario described in the ESRI and Department of Finance Working Paper no. 548 published in 2016. It assumes that the impact on the Irish growth trajectory is a relatively smooth reduction in output and associated productivity increases over the long term. Under such a policy scenario notwithstanding that PRSI receipts are projected to gradually reduce post Brexit, the overall long term "gap" between income and expenditure is expected to be lower than otherwise. This arises because pensions and other benefits are anticipated to continue to increase in line with average earnings increases which are expected to be reduced in the post Brexit scenario as compared with the base case.

If instead Ireland experienced an acute short- term economic shock as a result of Brexit leading to a severe reduction in PRSI receipts, then the impact of Brexit on the Finances of the SIF would clearly be different to that suggested by the application of the above "smooth growth reduction" scenario in isolation.

The alternative scenarios including the above outlined Brexit and shock scenario are examined in Chapter 9 (alternative macroeconomic and demographic assumptions) and Chapter 12 (Varying Policy Options).

1.8 Equalised Contribution Rates

Equalised contribution rates are the multiple of current contribution rates which would be required to balance the Fund's income and expenditure. We have developed equalised contribution requirements, with and without Exchequer subvention, over, 5, 10, 20 year periods and the full projection period.

Table 1.6 sets out the results in the form of multiples of the current contribution rates. This table shows that, over the 10 years commencing in 2018[7], contribution requirements are circa 102% of benefit outgo. In other words, current contribution rates would need to be on average 2% higher over the next 10

[6] The most recent documented "statement" on pension indexation was in the National Pensions Framework in 2010 which referred to sustaining the value of the State Pension at 35% of average weekly earnings. The 2015 Ageing Report referred to SPC being indexed "at a rate reviewed annually in the Budget".
[7] Given that we are now in 2017, 2018 is the first year of our modelled projections and the earliest date any envisaged budgetary or policy changes could practically be implemented.

years if income and expenditure were to be balanced. However, as the periods are extended beyond 10 years, the contribution shortfall increases significantly.

Equalised Contribution rates over range of periods			
Starting	**No Subvention**	**Subvention of 25%**	**Subvention of 33%**
	Equalised Contributions for 5 year period		
2018	102%	77%	69%
	Equalised Contributions for 10-year period		
2018	110%	82%	73%
2028	139%	104%	93%
2038	173%	130%	116%
2048	197%	148%	132%
2058	202%	151%	135%
	Equalised Contributions for 20-year period		
2018	125%	94%	84%
2038	186%	140%	125%
2058*	201%	151%	134%
	Equalised Contributions for whole projection period		
2018	174%	131%	117%

Table 1.6: Equalised Contribution Rates
*13 year (as opposed to 20 year) year period beginning 2058 and ending in 2071.

The figures show that in the absence of increases in contribution rates (or corresponding reductions in expenditure) sizeable Exchequer subventions will be required to balance income and outgo.

By way of explanation, the 148% highlighted in the above table (base case) indicates that for the 10 year period from 2048 to 2058, even allowing for an annual Exchequer subvention of 25% of expenditure, projected contribution income would need to be 48% higher than the projected amount at that point in order to keep the Fund in balance.

Figure 1.2 shows how the "equalised" or break-even contribution rates (in the absence of Exchequer subventions) over annualised periods[8] compare with, the effective Class A rate of earnings. Table 7.2 contains further detail.

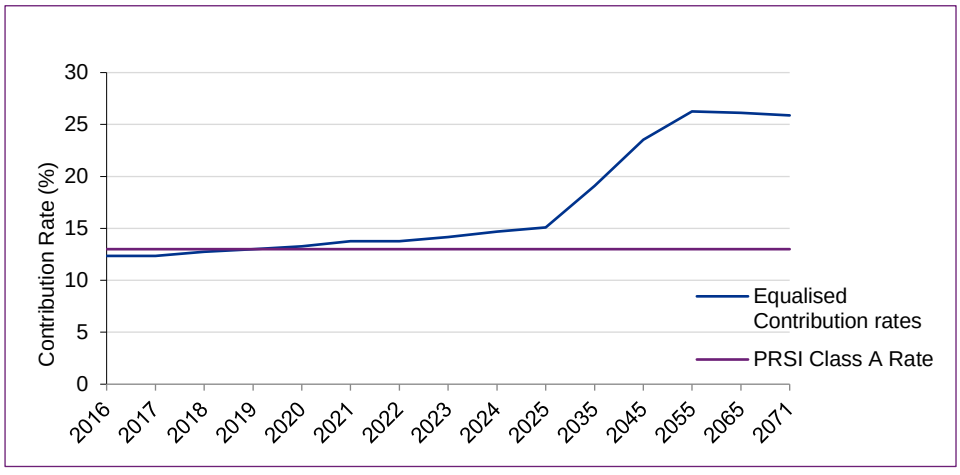

Figure 1.2: Equalised or "break even" annualised Class A contribution rates (in the absence of Exchequer subventions) over a variety of projection periods as compared with PRSI Class A rate of circa 13% (combined employer and employee) of earnings

[8] See Table 7.3 for further detail

1.9 Discounted value of future shortfalls in the Fund

Table 1.7 shows the discounted value at year end 2015 of the projected shortfalls of the Fund. This is defined as the present value of the Fund shortfalls (i.e. difference between income and expenditure) over a number of time periods. We have used a central real discount rate of 1.5% per annum giving rise to a net present value of future shortfalls of €335 billion.

The results are very sensitive to the real discount rate chosen. A range of alternative plausible discount rates can give rise to a very different valuation on the present value of the shortfalls.

If, for example, a real discount rate of 2% per annum was chosen as per the 2010 Review, the €335 billion would reduce to €280 billion. (€324 billion was the assessed value at the 2010 Review based on 2010 data and the macro-economic and demographic outlook at that point.)

Net present value of projected future shortfalls				
Period	**"Real" discount rate assumptions (p.a.)**			
	1%	**1.50%**	**2%**	**3%**
5 years to 2020	1.0	1.0	1.0	1.0
10 years to 2025	-3.8	-3.6	-3.5	-3.1
20 years to 2035	-35.6	-33.0	-30.7	-26.5
30 years to 2045	-104.0	-93.4	-83.9	-68.1
Full period to 2071	**-404.2**	**-335.4**	**-279.6**	**-196.9**

Table 1.7: Net Present Value of projected future shortfalls (€ billions) as at 31 December 2015 under a range of alternative "real" discount rate assumptions

It is important to realise that the discounted value of future shortfalls is a hypothetical figure reflecting the "pay as you go" nature of the system. It is, however, a useful measure (expressed in 2017 real price terms) of the magnitude of the shortfalls expected to build up in the Fund, all else being equal. €335 billion equates to 1.2 times 2016 levels of GDP[9].

We would point out that most of the "debt" arising relates to projected expenditure shortfalls in the latter part of the projection period. This reflects the higher anticipated expenditure particularly on pension-related benefits due to the ageing of the population over time. The discount rate is therefore a crucial assumption used to discount back these projected cash-flows / shortfalls in the future to a summarised net present value number for inclusion in Table 1.7.

The present value of future shortfalls is an important and relevant figure arising from the 2015 Review in terms of any attempt to ascertain the sustainability of the SIF.

As we later point out in Chapter 10, it is only possible to draw conclusions about the sustainability of a social security scheme by comparing pension and indeed other social security obligations with the respective assets (in the case of the Irish system the present value of future PRSI receipts). The resulting residual amount of obligations and assets represents the sustainability or fiscal gap.

1.10 Value for money indicators

We examined a range of value for money measures to assess the extent to which individuals receive value for money from the Fund in respect of their own and their employer's contributions.

In this review we have developed value for money indicators which compare the present value of all future PRSI contributions by / on behalf of an individual to the present value of the principal future benefits that the individual is expected to accure from the Fund. The benefits included in the assessment

[9] GDP in 2016 was €275.510 billion per the CSO's National Income and Expenditure Annual Results in constant price terms

are the SPC, Invalidity Pension, Illness Benefit and Jobseeker's Benefit which together account for 71% of SIF expenditure in 2015. This represents a departure from the methodology at the 2010 Review where only the SPC was included in the value for money analysis. The rationale was that all with the entitlement will generally claim SPC whereas other benefits are only accessed in the event of the relevant contingent event arising for the individual (e.g. Illness, unemployment etc).

For SPC, a value for money analysis of the increased means-tested payment available for a "qualified adult" dependant of the main recipient has also been included at this Review in addition to the analysis of the main recipient payment . The "qualified adult" payment is essentially an increase to the main life payment due in respect of a dependant (usually a spouse, civil partner, or cohabitant). The increase for qualified adults is in line with the rate of qualified adults we observed from the male and female new SPC qualifiers in 2015 and was applied to male contributors only given the negligible number of female recipients with qualified adults.

Beyond the SPC, Invalidity, Illness, and Jobseeker's Benefits there are also many other benefits that may be accessed over the course of an individual's working life, depending on PRSI Class, with the full range available to Class A. These additional benefits have not been explicitly taken into account in this value for money analysis.

We have calculated the annualised rates at which contributions would need to be paid to fully pay for the expected value of future SPC benefits. We performed this calculation on a range of earnings and pension rates for individuals entering the PRSI system at age 25 (on a given set of assumptions about the future – described in Chapter 11). This is shown in Tables 1.8 and 1.9 where the "Required PRSI Rate" contribution can be directly compared with the "effective" annual rate of PRSI applying to Class A and Class S contributors. (The "effective" rate of PRSI is calculated as the PRSI rate (combined employee and employer in the case of Class A) which would be payable on all assessable income.

The "required" contribution in the table is the percentage of salary required to be paid annually on an individual's full income and compares directly with the "effective PRSI rate".

The only difference between Tables 1.8 and 1.9 relates to the level of benefits (and associated cost) assumed to be accessed. Table 1.8 allows for the SPC to be accessed only whereas Table 1.9 allows for the cost of the SPC and Invalidity, Illness and Jobseeker's benefits to be accessed.

Weekly Pension	Minimum Wage			NAE			NAE x 2			NAE x 3		
	Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate	
		Class A	Class S		Class A	Class S		Class A	Class S		Class A	Class S
€238.30	**30.8%**	8.2%	3.7%	**15.5%**	13.0%	3.7%	**7.8%**	13.0%	3.7%	**5.2%**	13.0%	3.7%
€233.60	**30.2%**	6.8%	3.1%	**15.2%**	10.8%	3.1%	**7.6%**	10.8%	3.1%	**5.1%**	10.8%	3.1%
€214.20	**27.7%**	5.1%	2.3%	**13.9%**	8.1%	2.3%	**7.0%**	8.1%	2.3%	**4.6%**	8.1%	2.3%
€202.80	**26.2%**	3.4%	1.5%	**12.2%**	5.4%	1.5%	**6.1%**	5.4%	1.5%	**4.1%**	5.4%	1.5%
€155.20	**20.1%**	2.6%	1.2%	**9.4%**	4.1%	1.2%	**4.7%**	4.1%	1.2%	**3.1%**	4.1%	1.2%
€95.20	**12.3%**	1.7%	0.8%	**5.7%**	2.7%	0.8%	**2.9%**	2.7%	0.8%	**1.9%**	2.7%	0.8%

Table 1.8: Contribution rate as % of salary required to fully pay for SPC benefits only. The table compares these contribution rates with the effective actual annual contribution rates payable.

Weekly Pension	Minimum Wage			NAE			NAE x 2			NAE x 3		
	Required PRSI Rate	Effective Annual Rate Class A	Effective Annual Rate Class S	Required PRSI Rate	Effective Annual Rate Class A	Effective Annual Rate Class S	Required PRSI Rate	Effective Annual Rate Class A	Effective Annual Rate Class S	Required PRSI Rate	Effective Annual Rate Class A	Effective Annual Rate Class S
€238.30	**36.6%**	8.2%	3.7%	**18.4%**	13.0%	3.7%	**9.2%**	13.0%	3.7%	**6.1%**	13.0%	3.7%
€233.60	**35.4%**	6.8%	3.1%	**17.8%**	10.8%	3.1%	**8.9%**	10.8%	3.1%	**5.9%**	10.8%	3.1%
€214.20	**31.7%**	5.1%	2.3%	**16.0%**	8.1%	2.3%	**8.0%**	8.1%	2.3%	**5.3%**	8.1%	2.3%
€202.80	**29.1%**	3.4%	1.5%	**13.7%**	5.4%	1.5%	**6.9%**	5.4%	1.5%	**4.6%**	5.4%	1.5%
€155.20	**22.1%**	2.6%	1.2%	**10.4%**	4.1%	1.2%	**5.2%**	4.1%	1.2%	**3.5%**	4.1%	1.2%
€95.20	**13.6%**	1.7%	0.8%	**6.4%**	2.7%	0.8%	**3.2%**	2.7%	0.8%	**2.1%**	2.7%	0.8%

Table 1.9: Contribution rate as % salary required to replicate the SPC payments, Invalidity, Illness and Jobseeker's Benefits. The table compares these contribution rates with the effective actual annual contribution rates payable.

The findings of this Review with respect to value for money for individual contributors are broadly consistent with the previous Review albeit our assessment of value for money across the genders has been refined:

- Those on lower incomes fare considerably better than those on higher incomes.
- Those with qualified adults achieve better value for money than those without.
- Those with short contribution histories have the potential to fare better than those with full contribution histories under the current rules.
- For a male and female both becoming entitled to the same level of SPC for a given contribution history, the Fund provides better value to females (all else equal) due to longer female life expectancy and hence their likelihood to receive an SPC pension for longer duration.
- Factoring in the additional value in respect of contributions paid by males, manifested largely through additional IQA payments (made directly to their wives/partners), means that the value for money is broadly equivalent across the genders as far as SPC entitlements are concerned. (Negligible qualified adult payments are made on female pension payments.)
- The value for money assessment is highly dependent on which benefits are assumed to be accessed from the Fund. When for example other benefits are considered in addition to the SPC such as Invalidity Pension, Illness, and Jobseeker's Benefits, males in fact achieve better value for money than their female counterparts due to males' higher propensity to claim these benefits.
- The self-employed achieve very good value for money compared with the employed – when the comparison reflects that both employer and employee contributions are payable in respect of an employed person.
- If Jobseeker's and Illness Benefits are extended to the self-employed they will enjoy even more favourable value for money.
- For those at the higher end of the income distribution, the Fund is redistributive and these employees generally get back less than they pay in.

1.11 Policy options examined

1.11.1 Pension policy options examined – focus on Total Contributions Approach (TCA) from 2020

A wide range of policy options are examined in Chapter 12 as part of the Review. The policy options examined mainly centred around pension options from 2020 given that a proposed change to the calculation of pension entitlements had been set out in the National Pensions Framework to reflect a "total contributions approach" ("TCA") for new SPC recipients from that date.

Our analysis shows that overall expenditure on SPC reflecting the TCA changes proposed in the National Pensions Framework[10] is only marginally different to that under the current ”yearly average” rules. This reflects the fact that:

- the weighted average pension under the TCA rules is not very different to the current yearly average rules. (In 2020 the weighted average pension is 93% under current rules and is anticipated to reduce to 89% under TCA) rules);
- the 2020 changes only impact new entries to the SPC and not the existing recipients (in respect of whom the majority of the expenditure arises).

We also examined a range of alternative TCA scenarios. None of these have a material impact in the early years following introduction in 2020. It takes a number of years for changes in expenditure of any note to emerge for SPC.

For example in Table 1.10, where new entries in 2020 would comprise €208 million[11] of expenditure in that year under existing rules, this would reduce to €199 million under the proposed TCA rules and increase to €211 million where the rules change such that the greater of current rules and TCA rules apply.

The corresponding expenditure figures for new entries in 2030 are shown in the rightmost column. The expenditure figures are higher in 2030 reflecting the fact that more individuals are expected to qualify for SPC in 2030 compared with 2020 due to the ageing of the population and records are improving through time meaning that these individuals typically qualify for higher pension rates.

Expenditure New Recipients SPC - YA and 2020 Variants (€ millions)		
Retiring in spot year	**2020**	**2030**
Current rules ("YA")	208	323
2020 Variants ("TCA")		
30ths	199	320
31sts	197	317
32nds	195	315
33rds	192	312
34ths	190	309
35ths	188	306
40ths	177	292
Greater of YA and 30ths	211	330
Greater of YA and 35ths	209	327

Table 1.10: Expenditure (€ millions) for new recipients to SPC – 2020 and 2030 under a variety of different “TCA” rules

Detailed analysis set out in Chapter 12 and Appendix 7 describes a variety of alternative TCA approaches and assesses the impacts on individual contributors. In the absence of a “guarantee” that individuals would get a rate of SPC at least equal to that available under the existing “Yearly average” rules, any changes to the calculation method would see some people positively impacted by the rule change but also a significant number of people negatively impacted.

[10] The central TCA scenario assumes that individuals accrue 1/30th for each year of contributions to a maximum of 30 / 30ths allowing for the inclusion of credits of no more than 10 years.

[11] Note €208 million expenditure in 2020 assumes new entries are uniformly distributed throughout the year, meaning the expenditure attributable to new entries in the year is roughly half of what would be expected for a full year’s expenditure.

1.11.2 Costings of extending benefits for the self-employed

The second main policy area examined was around the costing of the extension of various benefits to the self-employed.

A summary of the costings performed is shown in Tables 1.11 and 1.12. This reflects additional projected expenditure where Invalidity, Illness, Jobseeker's, Carer's Benefits are extended to the self-employed. Note that the starting point for these costings is the position outlined in section 1.10, which shows that the self-employed already achieve very good value for money compared with the employed (when the comparison reflects that both employer and employee contributions are payable in respect of an employed person).

The costings for Invalidity Pension reflect the extension to Class S from 1 December 2017 as per the Budget 2017 Measure. Costings for other benefits (Jobseeker's, Illness, and Carer's Benefit) are assumed to be implemented effective 1 January 2018.

More detail as to the costs which are projected to build up in each of the schemes including the "lag effects" before the schemes reach full maturity is provided in Chapter 12. The Invalidity scheme in particular takes almost 10 years to reach full maturity and this reflects the fact that it is a long term scheme than a short term scheme such as Jobseeker's. The individuals with the highest propensity to claim Invalidity Pensions are those aged 55+.The main assumption underlying our costings is that the incidence rates / likelihood of take up of each benefit type is the same as the incidence rates of those currently entitled to receive the benefits. There is inherent uncertainty in this assumption with respect to Jobseeker's Benefit in particular as the propensity of the self-employed to claim Jobseeker's Benefit may be different to the propensity of those in Class A. Incidence rates will only become known if and when the scheme becomes available to Class S.

Year	Projected costs of extending Invalidity, Illness, Jobseeker's, Carer's Benefit				
	Invalidity	Illness	Jobseeker's	Carer's	Total
2015 (act)	0	0	0	0	0
2016	0	0	0	0	0
2017	3	0	0	0	3
2018	30	40	45	2	118
2019	59	54	58	3	173
2020	87	72	60	4	223
2021	125	88	63	5	281
2022	152	94	67	5	317
2023	176	99	71	5	351
2024	198	104	75	6	382
2025	218	108	81	6	413
2035	429	172	103	10	714
2040	496	198	112	12	817
2045	551	222	123	14	910
2050	537	223	125	15	899
2055	563	237	134	16	950
2060	601	256	144	17	1,018
2065	665	282	158	19	1,124
2071	800	331	185	21	1,337

Table 1.11: Additional projected expenditure (€ millions) on various benefit types where extended to Class S

It can be seen from Table 1.11 that to extend Invalidity Pension to Class S for example starts out at quite modest levels of cost - €30 million in 2018 but increase steeply such that by 2025 the cost is expected to be €218 million and €429 million in 2035. The estimate of extending Jobseeker's Benefit is €45 million in 2018 increasing to €103 million by 2035.

We estimate that where Invalidity, Illness, Jobseeker's, and Carer's Benefits are extended to Class S (Invalidity from December 2017 and Illness, Jobseeker's, and Carer's from January 2018), PRSI paid by Class S would need to increase substantially over the projection period in order to ensure that the benefits are delivered in a revenue neutral manner. The change in the Class S PRSI rate is as follows:

Starting	No Subvention	Subvention of 25% Benefits	Subvention of 33% Benefits	No Subvention	Subvention of 25% Benefits	Subvention of 33% Benefits
% Increase in Contributions for 5-year period				Actual rate of Class S PRSI for 5-year period		
2018	41%	32%	28%	5.6%	5.3%	5.1%
% Increase in Contributions for 10-year period				Actual rate of Class S PRSI for 10-year period		
2018	56%	43%	38%	6.2%	5.7%	5.5%
2028	95%	72%	64%	7.8%	6.9%	6.6%
2038	108%	81%	73%	8.3%	7.2%	6.9%
2048	100%	75%	67%	8.0%	7.0%	6.7%
2058	96%	72%	64%	7.8%	6.9%	6.6%
% Increase in Contributions for 20-year period				Actual rate of Class S PRSI for 20-year period		
2018	78%	59%	53%	7.1%	6.4%	6.1%
2038	103%	78%	70%	8.1%	7.1%	6.8%
2058*	97%	73%	65%	7.9%	6.9%	6.6%
% Increase in Contributions for whole projection period				Actual rate of Class S PRSI for whole 55-year period		
2018	94%	71%	64%	7.8%	6.8%	6.6%

Table 1.12: Percentage increase in the amount of PRSI contribution and actual rate of PRSI required where various benefit types are extended to Class S under a scenario of no subventions from Exchequer, 25% subvention, a 33% subvention.

*13 year period 2058 to 2071

What Table 1.12 shows is that PRSI paid by self-employed people would need to increase by 78% from 2018 (e.g. from 4% of earnings to just under 7%) where the cost of extending Invalidity, Illness, Jobseekers, and Carer's Benefits over a 20 year period is considered. Where costs over the whole projection period are factored in, rates would need to almost double.

As noted above these additional contributions relate only to the incremental cost of the specific benefits mentioned above. We saw in Table 1.8 that the typical / annual cost for the accrual of SPC is of the order of 10% - 15% of earnings (depending on average earnings, date commencing PRSI etc.). In total, where notional contributions for the accrual of SPC and the above incremental benefits are payable, the total rate of contribution to ensure revenue neutrality would be of the order of 20% per annum.

It can be seen from Table 1.13 which disaggregates the increased PRSI across the various benefit types that the increased equalised contribution rates are primarily attributable to the cost of extending to Invalidity, with the other benefits less material. For example, the table shows that when considering the increased equalised contributions for the 20 year period beginning in 2018 PRSI by Class S would need to increase by 78% in the absence of Exchequer subventions. Of the 78%, 44% relates to the cost of Invalidity Pension, with a further 20% related to the cost of extending for Illness Benefit and 14% for Jobseeker's.

Starting	Invalidity	Illness	Jobseeker's	Total	Invalidity	Illness	Jobseeker's	All 3 Benefits
% Increase in contributions required for 5-year period					Actual rate of Class S PRSI for 5-year period			
2018	17%	13%	11%	41%	4.7%	4.5%	4.4%	5.6%
% Increase in Contributions for 10-year period					Actual rate of Class S PRSI for 10-year period			
2018	28%	16%	12%	56%	5.1%	4.6%	4.5%	6.2%
2028	57%	24%	14%	95%	6.2%	5.0%	4.6%	7.8%
2038	66%	27%	15%	108%	6.6%	5.1%	4.6%	8.3%
2048	60%	25%	14%	100%	6.4%	5.0%	4.6%	8.0%
2058	58%	24%	14%	96%	6.2%	5.0%	4.6%	7.8%
% Increase in Contributions for 20-year period					Actual rate of Class S PRSI for 20-year period			
2018	44%	20%	14%	78%	5.7%	4.8%	4.6%	7.1%
2038	63%	26%	14%	103%	6.5%	5.0%	4.6%	8.1%
2058*	58%	25%	14%	97%	6.3%	5.0%	4.6%	7.9%
% Increase in Contributions required for whole period					Actual rate of Class S PRSI for whole 55-year period			
2018	56%	24%	14%	94%	6.2%	5.0%	4.6%	7.8%

Table 1.13: Percentage increase in the amount of PRSI contribution and actual rate of PRSI required from Class S where various benefit types extended to Class S under a scenario of no subventions from the Exchequer

*13 year period 2058 to 2071

1.12 Sustainability of SIF Expenditure

The outlook at this Review is more positive than at the 2010 Review with an overall assessed net present value of shortfalls over the 55 year projection period of the review of €335 billion[12].The opening position of the SIF (a modest surplus of €0.4 billion in 2016) is healthier following a number of years of economic growth and the impact of a variety of Government measures taken since the recession which commenced in 2008. The short to medium term outlook is positive with the SIF projected to remain in modest surplus to 2019. Only thereafter do shortfalls begin to emerge with a modest shortfall of €0.2 billion in 2020 increasing to circa €1.7 billion by 2025 and ratcheting up significantly thereafter.

Given the turnaround in the finances of the SIF since the 2010 Review, and the much improved short term and medium term outlook, a reader might understandably question the extent to which the longer term projections are an accurate reflection or "best estimate" of the shortfall expected to emerge. In other words, to what extent is the ageing of the population inevitable? To what extent is the pension expenditure associated with that ageing population likely to materialise? What elements of the shortfall / debt are subject to more uncertainty such that experience may turn out differently to what has been assumed?

Given the work we have performed and the insights obtained over the course of completing both this Review and the 2010 Review, we provide some comments on each of these questions in turn in an attempt to further the debate on the question of sustainability.

1.12.1 Is the ageing of the population inevitable?

The Irish population similar to many other Western World Nations is projected to age substantially over the coming decades. This change is projected to start impacting in the not too distant future given the population "bulge" of individuals currently aged 30-45 such that by 2035 the pensioner support ratio is projected to reduce from 4.9 workers today to 2.9 workers at that stage.

[12] €335 billion corresponds to a real discount rate of 1.5% per annum. The result is highly sensitive to the discount rate chosen. Where a 2% per annum real discount rate is chosen (which is like for like with that chosen at the 2010 Review) the shortfall would reduce to €280 billion. The corresponding net present value at the 2010 Review on a 2% real discount rate was €324 billion

Given that Irish fertility rates have been below "replacement levels" since the 1990s, and projected to remain below 2 into the long term future the remaining "levers" within policymakers' control to reverse the ageing trend are to:

- increase the working lifetime by, for example, extending the age at which individuals stop working through increasing the SPA or other measures to increase the "effective" retirement age;
- encourage greater labour force participation particularly amongst currently under-represented groups;
- encourage a greater inflow of workers.

The impact by 2035 of increasing the SPA from 66 to 68 is seen by observing the difference in the projected pensioner support ratio before and after the change e.g. an increase from 2.9 to 3.4 workers for every individual over SPA. This level of observed improvement assumes that *effective* retirement ages increase commensurately.

In terms of policies to encourage a greater flow of workers to the economy, it is worth noting the scale of the effort which would be required. 1.4 million is the additional number of workers needed (in the context of the then projected working age population of 3.2 million) by 2035 to ensure that the pensioner support ratio remains the same as current levels of 4.9 workers for every pensioner. By 2055, 3.6 million additional workers would be needed in order to maintain the pensioner support ratio at current levels.

1.12.2 What does this mean for the pension expenditure associated with the SIF?

At any given point in time pension expenditure comprises of cash-flows from the recently retired population or "new entries" and cash-flows from the existing retired population reflecting expenditure built up from retirees over a circa 20 year period.

Any changes to pension rules typically happen gradually and apply to new entries in the future only (of necessity to give individuals advance notice of any proposed change). Rule changes are therefore typically slow to materially impact on projected pension-related expenditure. This effect can be seen from the variety of alternative TCA options examined as part of policy options analysis in Chapter 12.

Given the nature of the expenditure profile, once an individual has retired and becomes part of the existing stock of retirees, one of the main remaining policy options therefore becomes the rate at which the pension is indexed in payment.

The compounding effect of a given pension indexation policy becomes very material over a prolonged period as can be seen from the figures produced at Table 12.1.

Our base case projections assume that a policy of maintaining increases in pensions in line with average earnings will be maintained. Whilst a policy of increasing pensions below the rate of increase in average earnings over a sustained period results in much reduced shortfalls, the flipside of pursuing such a policy is that the real purchasing power of the pension becomes eroded for those in receipt. Overall for this reason, social insurance pension expenditure is "debt like" in nature.

We note as also that pension expenditure is just one element of expenditure which will be impacted by an ageing population. At the same time, healthcare expenditure (outside the SIF) is projected to continue to rise (this trend is already being observed in Ireland and being attributed to the ageing effect), as will other long term care costs including Nursing Home Care.

Any assessment of the adequacy of individual retirement income (Chapter 12 contains some commentary) will need to ensure that any future shift of healthcare costs to the individual is considered fully.

1.12.3 What elements of the expenditure / debt and overall shortfall are subject to more uncertainty?

There are some elements of the shortfall projections which are subject to uncertainty and this uncertainty becomes more pronounced when attempting to project cash-flows into the long term future. The main elements of uncertainty relate to:

- The uncertainty around the rate of future improvements in mortality;
- The assumption about the extent to which PRSI contribution records will likely continue to improve into the future;

We have stress tested both of these assumptions and the results are outlined in Chapter 9. A lower life expectancy assumption could result in a reduction in annual shortfall at the end of the projection period from €22.2 billion to €16 billion (with an impact of broadly similar magnitude in opposite direction for a plausible higher life expectancy assumption).

An alternative scenario for the judgement around the extent which contribution records may continue to improve[13] in the future results in a revised annual shortfall of €20 billion compared with €22.2 billion in the base case.

[13] Reflecting improved records for those retiring up to 2030 as observed from the datasets but reflecting no improvement thereafter (there is insufficient data in terms of contribution histories for the later retiring cohorts). Under base case we assume a level of continued improvement to 2040

2 Introduction and Scope

This chapter includes:

- Legislative background and scope of the Review
- Contents of the Review
- Explanation of the projected figures in this Report

2.1 Background to this Review

The Social Welfare Consolidation Act, 2005 makes provision for the carrying out of actuarial reviews of the Social Insurance Fund at five yearly intervals.

The first Actuarial Review of the Social Insurance Fund ("Fund") was completed in 2002 (with an effective date of 2000), a second review was completed in 2007 (with an effective date of 2005) and the third and most recent review was completed in 2012 (with an effective date of 2010), the "2010 Review".

Following a public tender process, the Department of Employment Affairs and Social Protection requested KPMG to prepare the fourth actuarial review ("2015 Review") of the Fund to fulfil the legislative requirement to carry out such a review every five years. It is anticipated that this report will provide information to the Department of Employment Affairs and Social Protection to assist short, medium, and long term policy development in relation to the social insurance system generally.

The 2015 Review builds on the findings of the 2000, 2005 and 2010 Reviews and takes comprehensive account[14] of all legislated changes expected to impact on the Fund over the course of the projection period (i.e. the 55 year period from 2016 to 2071).

Whereas the base case of the 2010 Review took account of both legislated for and announced/ anticipated reforms (the main ones being the 2020 planned changes to state pensions described in the National Pensions Framework), by contrast the 2015 Review base case takes account of legislated reforms only. This approach was taken for consistency with the new EU reporting requirements of Social Security benefits. A variety of different policy scenarios including 2020 reforms using a range of different possible parameters are examined in Chapter 12.

A report is required to be made to the Minister for Social Protection on completion of each Review, and a copy of the report under this section is to be laid before each house of the Oireachtas within 6 months of the completion of the Review.

2.2 Challenges facing the Social Insurance Fund currently

The challenges facing the Fund and in particular the pension related expenditures are mirrored by many social security programs internationally. Many social security programs face financial challenges in planning for the future due, among other things, to the effects of changing demographic structures over time. The age structure of the Irish population (similar to many countries in the EU) is projected to dramatically change in the coming decades due to the dynamics of fertility, life expectancy, and migration rates. Political decisions are being planned, considered and/or made in order to meet these challenges. In many cases, the main concern is future long-term costs.

[14] Based on available information up to date of finalisation of this report.

With regard to the Irish Fund, PRSI income has increased significantly from a base of €6.7 billion at the 2010 Review to €8.5 billion in 2015, and the costs associated with short term benefits such as Jobseeker's Benefit and Illness Benefits have reduced. The financing pressures are related predominantly to the pension and other age-related expenditure items which represent an ever-increasing share of overall expenditure. Long term benefits comprised 63% of overall SIF expenditure in 2010 and have risen to 79% in 2015.

2.3 Scope of our Work

The full scope of our work was set out in the Request for Tender ("RFT") document issued by the Department of Employment Affairs and Social Protection in November 2016. Our Review addresses each of the requirements therein.

The principal output of the Review relates to projections of income and expenditure of the Fund over the short, medium, and long term (up to 2071). The projections were carried out using a principal set or "base case" set of assumptions about the future, in addition to a wide range of alternative assumptions.

All calculations in the base case reflect reforms which have been legislated for. Anticipated reforms such as changes to pensions from 2020 reflecting altered qualification conditions as described in the National Pensions Framework are reflected in policy scenarios. Other policy scenarios examined included an extension of various benefits to the self-employed.

A key component of the exercise involved the calculation and impact of:

- "breakeven contribution rates" (multiples of current PRSI contributions required to balance income and expenditure);
- varying subvention (transfers from the Exchequer) amounts;
- combination of multiples of current PRSI contributions and Exchequer subvention amounts.

As part of our review of alternatives for the future progression of Fund expenditure, we assessed the costs associated with up-rating of benefit rates and limits in line with a number of different indexation measures (including real earnings and price inflation).

In addition to the core income and expenditure projections, the report examines a range of "value for money" indicators for a number of different contributors to the Fund.

2.4 Guide to our report

A guide to the remainder of our report is set out in the Table 2.1 below.

Section	Title	Description
Chapter 3	**Recent developments in relation to the Fund**	■ Outlines effected and proposed changes to the income and benefits paid by the Fund and the timeframe for the introduction of these changes.
Chapter 4	**Data used in the Review**	■ Main categories and sources of data used in the Review.
Chapter 5	**Methodology and Assumptions**	■ Introduction to the methodology and assumptions employed in our assessment of the projected income and expenditure of the Fund; ■ How individual contribution and expenditure items were modelled as part of this Review.

Chapter 6	**Population and Labour Force Projections**	■ Population Projections – information received and analysis ■ Assumptions underlying the population projections ■ Labour Force Projections – information received and analysis ■ Changes to the population projections since 2010 Review ■ Range of matters relating to the ageing of the population
Chapter 7	**Base Case Results**	■ Projections of the level of income and expenditure up to 2071. We highlight the shortfall that arises in nominal terms and as a percentage of GDP; ■ Break-even contribution rates needed to meet the total expenditure for a range of future time periods; ■ Comparison over the projection period of overall expenditure of the long and short term benefits; ■ Discounted value of the sum of the future projected shortfalls of the Fund.
Chapter 8	**Comparison with 2010 Review**	■ Sets out the principal differences between this and the 2010 Review in the areas of assumptions, data, and enacted changes to benefit entitlements.
Chapter 9	**Sensitivity of projections to assumptions**	■ Projections on variant demographic assumptions; ■ Projections on variant economic assumptions; ■ Projections on variant labour market assumptions; ■ Brexit scenario and short term shock
Chapter 10	**Accrued to date pension liabilities**	■ Introduction to the concept; ■ Background and Scope - EU reporting requirement; ■ ADL Results 31 December 2014 and 31 December 2015; ■ Sustainability measures; ■ Reconciliation between the Accrued to date Liability (“ADL”) and the Open-system liabilities (“OSL”) calculated as part of the base case of the Actuarial Review; ■ Methodology and assumptions overview.
Chapter 11	**Value for money projection**	■ VFM differences by age, gender, early / late entrant, income band; ■ VFM impact of going from YA[15] to TCA[16]; ■ VFM impact of extending benefits to Class S; ■ Case studies / VFM impact on a variety of contributors.
Chapter 12	**Policy Impacts**	**Policy Options for benefit indexation** ■ In line with Consumer prices (CPI); ■ In line with real earnings growth index (as PRSI); ■ Index calculated to retain 35%–40% of Average Earnings at retirement. **2020 Policy Change** ■ SPC Expenditure under YA (current rules) and TC (Framework) approach; ■ SPNC Expenditure under YA (current rules) and TC (Framework) approach for SPC; ■ SPC + SPNC Expenditure under an ascending scaling system for SPC;

[15] Yearly averaging approach: reflects the current approach of calculating state pension contributory entitlement using an averaging approach
[16] Total contributions approach: reflects the proposed 2020 approach of calculating SPC entitlement using a total contributions approach

		■ Analysis of a variety of TCA options 2020 – 2030; ■ Expenditure neutral TCA which will optimise banding / pro rata system; ■ Costing where can choose greater of YA or TCA for initial 5 year period; ■ Deferment Scheme - cost analysis. **Class S (self-employed) costings / options** ■ Extension of Invalidity Pension to Class S; ■ Extension of Jobseekers Benefit to Class S; ■ Extension of Illness Benefit to Class S; ■ Extension of all (Invalidity, Jobseekers, Illness) to Class S.
Appendix 1	**How the Social Welfare Fund works**	■ Benefits and contributions to the Fund
Appendix 2	**Summary of detailed data provided (including accounts)**	■ Accounts of the Fund (2011 - 2016)
Appendix 3	**Summary of Key Data Provided and Checks Performed**	■ 10 year trends in level of benefit payments since 2006 including overview of the macroeconomic and budgetary changes that impacted these trends
Appendix 4	**Accrued to date Liability ("ADL") methodology and assumptions**	■ Detail on methodology used for the ADL; ■ Detail on assumptions used for the ADL
Appendix 5	**Detailed projections on base case assumptions**	■ Detailed individual expenditure and income projections under the base scenario; ■ Detailed long and short benefit projections under each of our scenario runs from Chapter 9.
Appendix 6	**Choice of discount rate assumption to be used for "core" Actuarial Review**	■ Choice of discount rate – "core" actuarial review
Appendix 7	**2020 Total Contributions Approach scenarios examined**	■ Costings and cost benefit analysis of a variety of alternative 2020 scenarios examined
Appendix 8	**Steering Committee**	■ Membership of Steering committee
Appendix 9	**Scope**	■ Detailed scope as set out in the RFT and extensions
Appendix 10	**Glossary**	■ Glossary of Terms used
Appendix 11	**Reliance and Limitations**	■ Reliance and Limitations

Table 2.1: Guide to the report

Notes in relation to this Review

It should be noted that the projections are based on a wide range of assumptions about the future which are unlikely to be borne out in reality. We would encourage readers to focus on the trends which emerge over the projection period of the Review and on the relativities between various items of income and expenditure rather than on the results for individual years.

In practice, actual experience is likely to differ from best estimates due to factors such as changes in the economic environment, demographics, regulation, economic, operational and other factors. It must therefore be recognised that actual results will differ, perhaps materially, from those inherent in the values given.

The assumptions are described in Chapters 5 and 6. Sensitivities to the key assumptions are set out in Chapter 9 and Appendix 5. Policy scenarios are considered in Chapter 12.

All figures are in 2017 price terms (i.e. net of Consumer Price Index inflation after 2017), except for the 2016 figures which are provisional outturn actual cash amounts.

This report complies with ILO / ISSA Guidelines[17] on actuarial work for social security (2016 edition).

The work has been peer reviewed under the Institute and Faculty of Actuaries' APS X2 standard.

This report should be read in its entirety, as individual sections, if read in isolation, may be misleading.

Our reliances and limitations are set out in Appendix 11.

[17] ILO is the International Labour Organisation; ISSA is the International Social Security Association

3 Recent developments in relation to the Fund

This chapter includes:

- Background to the Irish Social Welfare System and the Irish Social Insurance Fund
- Recent changes to Fund expenditure, contributions and payment rates (2011 - 2017)
- Recent reforms and Government commitments to pension changes

3.1 Background to the Irish Social Welfare system

Ireland's social welfare system is:

- contingency based;
- delivered predominantly through statutory schemes supplemented by some administrative schemes;
- funded very broadly 60:40 through general taxation and contributions to the SIF.

In general, to qualify for a primary weekly social welfare payment a person must experience a defined contingency, such as old age or a disability and satisfy either a social insurance contribution requirement (for a PRSI based payment) or a means test (for payments funded through general taxation).

There is both an insurance-based and a means-tested payment in respect of many contingencies, including job seeking, widowhood, old age etc. Perhaps the more notable exception to this model is the Child Benefit scheme, which is virtually universal and Supplementary Welfare Allowance (SWA), which is a means tested general guarantee of minimum income not linked to any specific contingency.

In addition, the Household Benefits Package is available to all persons aged 70 and over, regardless of social welfare status or the composition of the household, as well as to recipients of pensions aged 66 to 70 and disability payments subject to certain household composition criteria.

The social insurance (PRSI) system, which is the subject of this review, is mandatory and insures nearly all workers and the self-employed for a range of contingencies which vary depending on the Class of PRSI paid.

Most employees 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 Employment Affairs and Social Protection, subject to meeting the qualifying criteria.

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 (when the combined employee and employer contribution rates are considered together). Consequently, they are entitled to a restricted range of social insurance payments. Social Welfare expenditure totalled €20.0 billion in 2015, comprising €8.6 billion in Social Insurance expenditure. By way of background, of the remaining €11.4 billion Social *Welfare* expenditure (unrelated to the SIF), the two biggest components were Jobseeker's Allowance of €2.7 billion and Child Benefit of €2.0 billion.

3.2 Background to the Irish Social Insurance Fund

The Fund is a pay-as-you-go (PAYG) social insurance scheme that is financed by contributions from employees, employers, the self-employed and by a contribution or "subvention" from the Exchequer when the cost of the benefits exceeds the contribution income.

PRSI contributions are paid into the Fund. This Fund helps to finance the wide range of contributory social insurance benefits, pensions and other payments. The primary long term benefit from the Fund is the SPC, which is payable at age 66 to those who retire from insurable employment and who satisfy the social insurance contribution conditions.

Legally the Exchequer is the residual financier of the Fund and Exchequer subventions were the norm for over 40 years – for example in 1967 the Exchequer subvention was 38% of Fund expenditure. However, no Exchequer contribution was required between 1997 and 2009 as the Fund was in surplus on foot of contributions from employers and workers in those years. In 2008, the current operating balance of the SIF moved into deficit and deficit accelerated rapidly in 2009 (€2.5 billion) and 2010 (€2.75 billion) as the recession took hold. This meant that the accumulated surplus built up over 11 years was exhausted in less than 3 years. In the years 2010-2013 inclusive sizeable Exchequer subventions were made (averaging €1.7 billion over the period or just under 20% of expenditure). The subvention fell significantly in 2014 and 2015. As and from 2016 the SIF has returned to surplus.

In 2014, the last year for which complete information is available, the vast majority (74%) of PRSI contributors pay at Class A, with another 12% in Class S (i.e. the self-employed). At a glance, Table 3.1 provides details of the benefit entitlements available to each of the PRSI classes.

	PRSI Classes								
Benefits / Pensions	**A**	**B**	**C**	**D**	**E**	**H**	**J**	**P**	**S**
Adoptive Benefit	√				√	√			√
Carer's Benefit	√	√	√	√	√	√			
Guardian's Payment (Contributory)	√	√	√	√	√	√			√
Health and Safety Benefit	√				√	√			
Illness Benefit	√				√	√		*	
Invalidity Pension	√				√	√			√*
Jobseeker's Benefit	√					√		*	
Maternity Benefit	√				√	√			√
Occupational Injuries Benefit	√	*		√			√		
Paternity Benefit	√				√	√			√
Partial Capacity Benefit***									
State Pension (Contributory)	√				√	√			√
Treatment Benefit	√				√	√		√	√
Widow's, Widower's or Surviving Civil Partner's (Contributory)	√	√	√	√	√	√			√

* Limited Benefit
**** From December 2017**
*******Doesn't require a PRSI class as such. Partial capacity benefit can be awarded if claimant is on Illness Benefit or Invalidity Pension for 6 months

Table 3.1: PRSI Class and (potential) entitlement to benefit (subject to meeting qualifying conditions)

Details of recent changes to PRSI contributions payable and to benefits are provided in Sections 3.3 - 3.6.

3.3 Changes to PRSI contributions (& other income) 2011 to date

2011

Significant PRSI changes were announced in Budget 2011:

- The annual earnings ceiling for the payment of employee PRSI was abolished;
- The rate of PRSI payable by the self-employed was increased from 3% to 4%;
- Office holders became liable for PRSI at 4% on all income, where their income is over €5,200 per annum;
- The Health Contribution was abolished;
- The threshold for a liability to a Class S contribution by the self-employed increased from €3,174 to €5,000 per annum;
- The rate of employee PRSI payable by certain civil and public servants (Classes B, C and D) was set at 4% where earnings exceed €75,036 per annum (the former employee annual ceiling). These Classes pay 0.9% on weekly income over €26;
- From 2 July 2011 employer's PRSI on those earning less than €356 a week or equivalent was halved from 8.5% to 4.25%. This change was introduced on a time limited basis for 2½ years and reverted to 8.5% on 1 January 2014;
- Relief on employee PRSI in respect of payments by employees to their own pensions and PRSAs was abolished;
- Employer PRSI became payable on half of the employee payment to the pension or PRSA;
- Share-based remuneration became subject to employee PRSI only at the rate of 4%.

2012

- Full abolition of relief on employer PRSI for pension contributions made by employees;
- Phased increase in the minimum number of paid PRSI contributions required to be eligible to become a voluntary contributor from 260 up to 6 April 2013 to 520 from 6 April 2015.

2013

- The weekly PRSI-free allowance of €127 for people paying at Class A, H and E and of €26 for modified rate contributors was abolished;
- The minimum flat rate for self-employed contributors was increased from €253 to €500;
- The flat rate payment of voluntary contributors made by former self-employed contributors was increased from €253 to €500;
- For those with an annual self-employed income in excess of €5,000 but who have no net liability to tax, the flat rate payment was increased from €157 to €310;
- Modified rate contributors were exempt from PRSI in respect of self-employed earned income (from a profession or trade) and any other unearned income. This exemption was abolished and all such income became liable to PRSI at the rate of 4%. Employees with no additional earned self-employed income but who do have unearned income only were not affected by this measure in 2013;
- Maternity Benefit was taxed in full from 1 July 2013.

2014

- The 4.25% employer PRSI rate applied to employees with weekly earnings of less than €356 reverted to the original 8.5% rate from 1 January 2014;
- From 1 January 2014 PRSI at 4% became chargeable on the additional unearned income of employees or occupational pensioners under pension age where the unearned income is their only additional source of income and it is taxable under the Revenue Commissioners' self-assessed system and the individual is a "chargeable person" for income tax purposes.

2015

- No changes (to PRSI rates / payments, thresholds or income base).

2016

- The Class A threshold for charging the 10.75% rate of Employer PRSI increased from €356 to €376;
- Introduction of a new tapered PRSI credit of €12 per week for Class A and H employees earning between €352 and €424 per week (to reduce the weekly amount of PRSI charged).

2017

- No changes (to PRSI rates / payments, thresholds or income base).

A summary of 2017 PRSI rates payable is provided in Table 3.2 below[18].

PRSI Rates 2017	Employer	Employee
Class A - most employed persons		
Less than €352 per week	8.50%	Nil
Between €352 and €376 per week	8.50%	4%
More than €376 per week	10.75%	4%
Class S - Certain directors not insurable under Class A	Nil	4%
Class S – Self-employed persons / investment income	Nil	4%

Table 3.2: 2017 PRSI rates
Note: Between earnings of €352 to €424 a reduced PRSI charge is payable.

[18] Not all of the income generated from the above PRSI rates is payable to the Social Insurance Fund. 0.7% of the 10.75% PRSI rate for classes A and H is payable to the National Training Fund. For Class A contributions between €352 and €424 a scaling PRSI credit also reduces PRSI income.

3.4 Changes affecting wide range of social insurance schemes (and other benefits part financed through PRSI) from 2011 to date

Over the period since the last Review, a broad range of changes to social insurance benefits have been introduced across a range of schemes. These changes can be divided into two phases.

The initial phase covers the period 2011 to 2014 and saw the continuation of a number of measures which had commenced in 2009 designed to reduce expenditure from the Fund in order to ensure its financial sustainability into the future. Measures in the period included a further 3 month reduction to the period for which Jobseekers Benefit is payable and a reduction in the rate of Invalidity Pension.

The period 2015 to 2017 saw the improvement in a number of schemes and the introduction of new schemes and the restoration of previous benefits e.g. paternity benefit was introduced in 2016 and the Christmas Bonus was partially restored in Budget 2015 for long term welfare recipients.

The main measures introduced in and since Budget 2011 are now outlined. It should be noted that some of the changes outlined below also impacted on schemes (which are not paid from the Fund), e.g. the Household Benefits package and Fuel Allowance.

2011 measures

Weekly Rates of Payment

A reduction of €8 per week in most weekly payments to people aged under 66 was introduced, with proportionate reductions for qualified adults and those on reduced rates of payment.

Treatment Benefits

Most elements of the Treatment Benefit scheme were discontinued.

Household Benefits Package

There were efficiency savings in the energy and communications elements of the Household Benefits Package.

2012 measures

Increase for a Qualified Child

Where a person claiming Invalidity Pension, Carer's Benefit, State Pension (Contributory or Transition) or Incapacity Supplement had a spouse or partner with income of over €400 a week, payment of the half-rate increase in respect of a qualified child was discontinued.

Jobseeker's Benefit

Where a Jobseeker's Benefit recipient was working for part of a week, the payment entitlement became based on a 5 day week rather than a 6 day week.

Sunday working was taken into account when calculating the amount of Jobseeker's Benefit to be paid, from 2013.

Disablement Benefit

New applicants for Disablement Benefit had to have a disability classified at > 15% to qualify for the payment.

Statutory Redundancy

The employer rebate of statutory Redundancy payments was reduced from 60% to 15%.

Fuel Allowance

The Fuel Allowance season was reduced from 32 to 26 weeks. This impacted on both social insurance and social assistance scheme recipients.

Treatment Benefit

The frequency of the grant for hearing aids decreased from two years to four years. Also, the maximum grant available for one hearing aid was reduced from €760 to €500 and for two, from €1,520 to €1,000.

State Pension (Contributory)

A lower pension was payable to new applicants of State Pension (Contributory) (from Sept 2012) who had a yearly average of less than 48 PRSI contributions.

Late Claims

Late claims for certain contributory pensions could be backdated for more than 12 months provided the relevant qualifying conditions were fulfilled. This backdating period was reduced to a maximum of six months.

Widow(er)'s and Surviving Civil Partner's Contributory Pension

The total number of paid PRSI contributions needed to qualify for Widow(er)'s Contributory Pension and Surviving Civil Partner's Contributory Pension increased from 156 to 260 contributions.

Concurrent Payments

Previously, a person who was in receipt of a Widow(er)'s Pension, Surviving Civil Partner's Pension or One Family Parent Payment could also be entitled to a half rate Jobseeker's Benefit, Illness Benefit or Incapacity Supplement. These half rate payments ceased for new applicants.

2013 measures

Household Benefits Package

The value of the Telephone Allowance element of the Household Benefit Package was reduced to €9.50 per month.

The Electricity / Gas Allowance was reduced to €35 per month.

Jobseeker's Benefit

The duration of Jobseeker's Benefit was reduced from 12 months to 9 months for recipients with 260 or more contributions paid.

The duration of Jobseeker's Benefit was reduced from 9 months to 6 months for recipients with less than 260 contributions paid.

These measures came into effect on April 3 2013. Claimants getting Jobseeker's Benefit for 6 months or more (or 3 months in the case of those with less than 260 contributions paid) on April 3 of that year were not affected.

Redundancy Payments Scheme

The employer rebate element (15%) of the statutory redundancy scheme was discontinued.

2014 measures

Bereavement Grant

The €850 Bereavement Grant was abolished in respect of deaths on or after 1 January 2014.

Invalidity Pension

In line with the abolition of the State Pension (Transition) from January 2014, the higher weekly rate for Invalidity Pension recipients aged 65 years (which was the same rate as the maximum weekly rate of the State Pension (Contributory)) was discontinued, and the rate payable for new 65 year old recipients became the general weekly rate for Invalidity Pension.

People who were getting Invalidity Pension (existing and new recipients) continued to be automatically transferred to State Pension (Contributory) at age 66 years at the maximum weekly rate of payment.

The weekly rate payable to all new qualified adults of Invalidity Pensioners was standardized at the rate for those under the age of 66.

Maternity and Adoptive Benefit

The minimum and maximum rates of Maternity and Adoptive Benefit were standardised for new applicants. This resulted in an increase of up to €12.20 for those receiving less than the new rate of payment and a reduction of up to €32 per week for all other claimants. The change applied to new claimants only.

Illness Benefit

From January 2014, a person was not entitled to Illness Benefit or Injury Benefit for the first 6 days of any claim, up from 3 days.

Household Benefits Package, Fuel Allowance and Free Travel

The Telephone Allowance was discontinued for existing and new recipients from January 2014.

2015 measures

Living Alone Allowance

The Living Alone Allowance, payable to pensioners and people with disabilities living alone, was increased by €1.30, from €7.70 to €9.00 per week. This increase applied to the relevant social insurance and social assistance schemes.

Christmas Bonus

The Christmas Bonus was abolished in 2009 and partially reinstated in December 2014 with a 25% payment to all long-term social welfare recipients at a cost of c. €65 million. This measure benefited both social insurance and social assistance scheme recipients.

2016 measures

Weekly rates of payment

There was a €3 increase in the weekly personal rates of payment made to social welfare recipients aged 66 years and over, with proportionate increases for qualified adults and those on reduced rates of payment.

Fuel Allowance

The Fuel Allowance increased by €2.50 per week, increasing the payment to €22.50 per week from January 2016. This benefited the relevant social insurance and social assistance scheme recipients.

Paternity Benefit

Paternity Benefit was introduced for children born after 1 September 2016. Qualifying contribution classes are A, E, H, and S. The benefit is paid at the same rate as Maternity Benefit and lasts for two weeks. Half-rate benefit is payable if in receipt of the following payments:

- One-Parent Family Payment;
- Widower's and Surviving Civil Partner's (Contributory) Pension;
- Widower's and Surviving Civil Partner's (Non-Contributory) Pension;
- Death Benefit by way of Widow's/Widower's/Surviving Civil Partner's or Dependent Parents' Pension (under the Occupational Injuries Scheme).

Christmas Bonus

€197 million was paid to long-term welfare recipients in December 2015, of which €99m was paid to social insurance scheme recipients.

A 75% Christmas Bonus was paid in December 2015 to recipients of long-term Social Welfare payments (e.g. State Pension (Contributory), Widow(er)'s Contributory Pension, Invalidity Pension, Deserted Wife's Benefit). The minimum payment was €20 and overall 1.23 million people benefited, of which 569,250 were recipients of social insurance schemes.

Free Travel

€3 million in additional funding to allow for new routes, higher passenger numbers and increases in fares.

2017 measures

Weekly rates of payment

There was a €5 increase in the weekly personal rates of payment made to social welfare recipients with proportionate increases for qualified adults and those on reduced rates of payment.

Social insurance benefits for the self-employed

Invalidity Pension will be extended to Class S Contributors from December 2017.

The Treatment Benefit scheme was extended to Class S Contributors from March 2017.

The range of Treatment Benefits (for employees and self-employed) will be extended from October 2017 to provide further dental and optical benefits.

Christmas Bonus

€221 million paid to long term welfare recipients in December 2016, of which €116 million was paid to social insurance scheme recipients.

An 85% Christmas Bonus was paid in December 2016 to recipients of long-term Social Welfare payments (e.g. State Pension (Contributory), Widow(er)'s Contributory Pension, Invalidity Pension, Deserted Wife's Benefit) (minimum payment of €20).

3.5 Changes in rates of payment (2011 to date)

The weekly personal and qualified adult rates of payment made to people aged 66 or over were maintained at 2009 levels until 2016 at which point they increased by €3 per week (from €230.30 per week to €233.30 for the full rate of state pension contributory, for example). They were further increased by €5 per week in 2017. (The maximum weekly rate of state pension contributory, for example has increased to €238.30).

However, the weekly rates applicable to persons of working age e.g. Jobseekers Benefit was reduced in both 2010 and 2011 and remained at that level until 2017. The reduction for most schemes was of the value of approximately €16.30 per week in total. From 2017 there was a €5 increase in all maximum weekly benefits and allowances including Maternity / Paternity, Illness Benefit, Invalidity Pension, Jobseeker's Benefit, with proportionate increases for people in receipt of reduced rate payments and for qualified adults.

Payment of the December Bonus for those in receipt of long term social insurance benefits was partially reinstated at 25% in December 2014, increased to 75% in December 2015 and paid at 85% in December 2016.

3.6 Programme for Government Commitments relevant to the Fund

The Main Commitments in The Programme for Government are:

- "We will seek to introduce a PRSI scheme for the self-employed and provide a supportive tax regime for entrepreneurs and the self-employed".
- "We will reply on the annual recommendations of the Low Pay Commission on the level of adjustment each year. Working with the Oireachtas, we will cut Employers' PRSI for low income workers to mitigate the cost of minimum wage increases, in order to protect jobs."
- "We will also extend the Dental Treatment Benefit under the Social Insurance Fund to reimburse the cost of some routine dental treatments. For medical cardholders, we will introduce a preventive dental health package also."
- "We will increase the State Pension and the Living Alone Allowance above the rate of inflation."
- "We support an increase in the Disability Benefit and Allowance, Carer's Benefit and Allowance, and Blind Person's Pension."
- "We will increase paid parental leave in the first year of birth (currently maternity leave is 26 weeks, plus 2 weeks paternity leave to be introduced from September)."

It should be noted that the Programme for Government commitments do not specify, for instance, the amount of any proposed increase e.g. in weekly rates of payment or when such increases would apply.

4 Data used in the Review

This chapter:

- Sets out the main categories and sources of data used in the Review

4.1 Categorisation of the data

The data provided to us for the purposes of performing the Review can be categorised broadly as follows:

- Information on contributions and benefits from the Department of Employment Affairs and Social Protection's operational computer systems, in particular the central records system.
- Financial data from:
  - The Social Insurance Fund Accounts 2011-2015;
  - Summary data provided in the "Statistical Information on Social Welfare Services 2015" ("the Statistics Report") and equivalent historic reports for 2011-2015;
  - 2017 Revised Estimates for the Department of Employment Affairs and Social Protection and the provisional financial outturn for 2016 supplied by the Department.
- Macroeconomic and demographic data from:
  - Population projections based on the 2015 based population projections provided by Eurostat
  - Details of the CSO's population projections[19] from their most recent report, the mortality improvement assumptions from which were used in the population projections;
  - Census 2016 results[20] which were overlaid on the population projections;
  - Short term macroeconomic and demographic assumptions (2016 to 2021) from the Department of Finance[21];
  - Long term macroeconomic and demographic data from the European Commission which are to feed into the 2018 Ageing Report (unpublished at date of signing of this report).

[19] CSO's Population and Labour Force Projections 2016 – 2046 dated April 2013
[20] In overlaying 2016 Census results we replaced the opening 31 December 2015 population data used by Eurostat in their 2015 based population projections with the April 2016 data by age and gender as revealed in Census 2016 in order to give a trued up picture of actual population totals and the breakdown by age and gender
[21] Assumptions included in the Stability Programme Update April 2017

4.2 Utilisation of the data

The data is used in three main areas:

- As the starting point of the projections. The data, comprising population data, benefit expenditure information and PRSI Contribution information is summarised further in Sections 4.3 to 4.5.
- To assist in the choice of appropriate assumptions (although allowance is also made for expected future trends which may not yet be reflected in statistics). Assumptions are discussed further in Chapter 5.
- As a validation of the projection methodology; projection results (where a 2015 base is used) are compared with actual data for 2016 and estimates for 2017 to ensure the projections are robust.

We summarise below the data which are the starting point for the projections.

4.3 Benefit data

The Department provided details of short term and long term benefit expenditure during 2015 and 2016 as well as official estimates for 2017.

In addition to expenditure, for all the significant benefits we received the total number of recipients, claimants and beneficiaries split by age, gender and scheme component type and rate band (where appropriate) for 2015 and similarly for "new entries" to the various schemes. Details on total benefit payments for 2015 were accessed from the Statistics Report.

We received a report of new entries to SPC in 2015 showing entitlement by age / gender / yearly average contributions paid / rate band.

For all the significant benefits we received details of recipients at each age and gender and appropriate rate band in 2015 and a 3 or 5 year history.

We also received benefit recipient data disaggregated by associated earning bands for the main benefit types (SPC, WPC, Invalidity, Jobseeker's, Illness Benefit). In addition:

- For Jobseeker's Benefit we received data by duration;
- For Illness Benefit we received the total population of those in receipt of Illness Benefit, coupled with data on the subset of the illness population in receipt of benefit for greater than 2 year duration[22].

4.4 Population and Labour Force data

4.4.1 Population data

Data for the population projections was taken from the 2015 based population projections produced by Eurostat.These are the population projections intended to form the basis of the 2018 Ageing Report. Two key adjustments were made to these Eurostat produced population projections (i) the opening 31 December 2015 position was trued up for the Census 2016 results and (ii) the mortality rates after 2015 were adjusted to allow for mortality improvement rates used by the CSO in their most recent population projection study. These two adjustments are described further below.

[22] Since 2009 new recipients of Illness Benefit are paid for a maximum of 2 years. Up to then, recipients were entitled to Illness Benefit for as long as they were unfit to work. We needed to isolate the current cohort in receipt of Illness Benefit for less than 2 year's duration only when performing costings for extending the benefit in its current form to Class S.

Step 1 involved assembling the following demographic data provided as part of the projections produced by Eurostat for each individual year from 2015 and split by age and gender:

- Population projections;
- Migration numbers;
- Fertility rates;
- Mortality rates and resulting life expectancies.

It was important to replicate the projections produced by Eurostat from one period to the next i.e.

$$Population\ at\ year\ t = Population\ at\ year\ (t-1) + Births\ in\ year\ t - Deaths\ in\ year\ t \pm Net\ Migration\ at\ year\ t$$

in order to allow us make the above described adjustments to the projections and to allow individual items (e.g. net migration) to be analysed and stress tested in our alternative scenarios.

Step 2 involved overlaying Census 2016 population data disaggregated by age and gender on the population projections. In other words we replaced the opening 31 December 2015 population numbers split by age and gender produced by Eurostat with the revised population numbers revealed in Census 2016.

Step 3 and the final adjustment to the mortality and hence population projections was to alter the year by year mortality rates included in the projections. The opening 2015 age by age mortality rates provided were retained but mortality rates from 2016 onward were altered to allow for the level of mortality improvement rates used by the CSO in their most recent population and labour force projections[23].

4.4.2 Labour Force Data

Data for the labour force projections was also taken from the 2015 labour force projections[24] produced by the European Commission.

The following demographic data split by age and gender was provided at individual years:

- Labour force volumes;
- Labour force participation rates;
- Employment and Unemployment rates;

Labour force data in the short term period to 2021 inclusive was provided by the Department of Finance and coincided with those used as part of their Stability Programme Update of April 2017.

Further detail is provided in Chapter 6.

[23] CSO Population and Labour Force Projections 2016 – 2046 published April 2013
[24] The end of the projection period for the labour force projections was 2070. In order to project to the end of the projection period for the core actuarial review (i.e. 2071) we assumed that the rates in force in 2070 would remain constant in 2071. The population projections on the other hand were available out to 2080 and therefore no assumption or extrapolation was required.

4.5 Contribution Data

Contribution data was provided by the Department of Employment Affairs and Social Protection. This data came in two formats:

- Total PRSI contributions paid, total earnings and weeks of insurable employment in 2014 and 2015. The data were split by age, income range, gender, insurance class. This data was used as the starting point to project the PRSI contribution base into the future.
- A breakdown of the PRSI database by "primary" class in 2014 and 2015 into order to allow us identify the cost of extending benefits to class S. In each case an age, gender split was provided.
- Contribution history of datasets of contributors to the PRSI system reaching SPA in each year:
    - Datasets for retirees in each year 2016-2025: Yearly samples by age, gender, PRSI class, and earnings of contributors projected to reach SPA in the relevant year.
    - 2030 - 2070 retiring samples: Samples by age, gender, PRSI class, and earnings of those projected to reach SPA in the relevant year. Samples were provided at 5 yearly spot intervals 2030, 2035 etc.

All the datasets of those reaching SPA within a given year included a full PRSI history (contributions and credits) for each individual enabling us to quantify yearly average ("YA") contributions in respect of each thereby ascertaining the expected pension these individuals would quality for and subsequently claim on reaching SPA.

4.6 Verification of the data

KPMG performed a variety of checks on the data for consistency with other sources as described in Appendix 3. However, KPMG does not accept responsibility for any inaccuracies in the data supplied.

The integrity of the Review is dependent on the data on which it is based. Having performed a variety of checks on the data we have no reason to doubt the accuracy of the data provided albeit we did note gaps in data in some areas, for example, in relation to State Pension (Non-Contributory) which we relayed to the Department.

As requested at 4.4.5 of the RFT we provided an assessment of the quality of the data used for the Review cognisant of the guidelines provided by the International Social Security Association / International Labour Organization (ISSA / ILO) for Actuarial Work for Social Security. We have separately provided the Department with our comments from this assessment.

5 Methodology and Assumptions

In this chapter, we set out:

- Introduction to the methodology and assumptions employed in our assessment of the projected income and expenditure of the Fund
- Description of how individual contribution and expenditure items were modelled

5.1 Methodology

The starting point for our projections was the 2016 and 2017 estimates of income and expenditure based on the data contained in "Further Revised Estimates for Public Services" provided from the Department of Employment Affairs and Social Protection. From 2018 onwards our approach to projecting future income and expenditure was as follows:

- Macroeconomic and demographic assumptions were analysed and agreed with the Steering Committee (including input from the Department of Finance) to form the basis of our projections for the population, labour force and macroeconomic variables affecting the Fund (e.g. real earnings growth).
- We gathered the relevant data on the Fund and analysed and cross-checked this data with various sources of information for consistency. (Details of the variety of checks performed on the data are included in Appendix 3).
- We developed a detailed projection model to project the future population structure as well as the future expenditure on benefits (both long term and short term) and contributions to the Fund.
- For each benefit category we separately modelled the expected number of recipients (taking account of our modelled population structure) and associated benefit expenditure.
- We aggregated the results of each benefit by category and compared with projected PRSI contributions in each future year to provide an overall picture of the costs of servicing these benefits over the period of the projection.

Chapter 6 gives more detail on our population and labour force projection methodology.

5.2 Assumptions

5.2.1 Introduction

A significant number of assumptions were required to project the future development of the Fund over a 55 year period.

The selected base case assumptions reflect discussions with the Steering Committee, the Department of Finance and Rowena Pecchenino, Professor of Economics and Head of the Department of Economics, Finance & Accounting at NUI Maynooth (and part of the KPMG team).

The base case macroeconomic assumptions are consistent with the assumptions used by the Department of Finance for current projection purposes and public policy.

For the base case, the macroeconomic assumptions for the short term (up to 2021) projections are those set out in the Stability Programme Update of April 2017.

Thereafter, the demographic assumptions and macroeconomic assumptions from 2022 onwards are those produced by the European Commission for Ireland and intended to be used in the 2018 Ageing Report[25]. Further detail on all demographic assumptions is set out in Chapter 6.

We have considered the reasonableness of the assumptions as a whole and consider the base case assumptions to be reasonable for the purposes of the Review reflecting that the core purpose of these assumptions which is to ensure consistency with other projections in the public domain[26].

5.2.2 Assumptions required

The main categories of assumptions used in the Review are as follows:

- Demographic and labour force assumptions
- Macroeconomic assumptions
- Assumptions about the rules and rates prevailing (e.g. ceilings and thresholds for PRSI purposes)
- Scheme specific assumptions e.g. the numbers qualifying for SPC and at varying rate bands for each future year, which in turn requires an assumption about the typical PRSI contribution record at retirement (i.e. a total number of paid and "credited" contributions historically and into the future).

The following sections deal with each of these in turn.

5.2.3 Demographic and Labour Force Assumptions

For completeness, we comment briefly here on the population and labour force assumptions used in our model. Full details are provided in Chapter 6.

Demographic assumptions

The population projections use the 2015 based population projections produced by Eurostat with an overlay of the 2016 Census data. The profile of the population projection over time is therefore otherwise unchanged from those produced by Eurostat incorporating the same assumptions for fertility and net migration numbers (by age and gender) reflecting the assumptions utilised by Eurostat on the 2016 Census baseline. In terms of mortality rates (by age and gender), whilst consistent with Eurostat in the outset year, mortality improvement rates into the future are projected in line with the CSO Population and Labour Force Projections 2016 - 2046.

These population projections allow for a more Irish specific view of the rate of future mortality improvements into the long term – an area of significant judgement – and materially impacting the projections.

Labour force assumptions

Assumptions and projections run by the Commission and sent to Member states forming the basis of the 2018 Ageing Report were used for the long term labour force and macroeconomic assumptions.

In order to project the size of the labour force we made assumptions about the level of labour force participation by gender and age, based on the participation rates to be contained in the 2018 Ageing

[25] The 2018 Ageing Report: Economic and budgetary projections for the 28 EU Member States (2016 - 2070) which is due to be published in September 2017.
[26] The base case for the purpose of this Review reflects the 2015 based population and associated mortality rates (at outset) produced by Eurostat which are typically used in the public domain for other purposes. The base case also reflects stronger mortality improvement rates into the future consistent with the CSO's most recent population projections.

Report. The participation rates were then applied to the projected population numbers in order to project the labour force.

5.2.4 Macroeconomic Assumptions

We have used the 2016 estimated outturn figures and 2017-2021 short term projections set out by the Department of Finance in the Stability Programme Update of April 2017.

The assumptions underpinning the long term projections (2022 +) were based on projections run by the Commission and sent to Member states to form the basis of the 2018 Ageing Report.

Table 5.1 summaries the main macroeconomic assumptions used in the base case:

	Assumption (%)				
Year	Real GDP Growth	Price Inflation	Real Earnings Growth	Unemployment Rate[27]	Employment Growth
2016	5.2	1.0	1.9	7.9	2.9
2017	4.3	1.6	1.4	6.4	2.7
2018	3.7	2.0	1.1	5.8	2.4
2019	3.1	2.1	1.0	5.5	1.9
2020	2.7	2.1	1.1	5.5	1.5
2021	2.5	2.1	1.0	5.5	1.4
2022-2025	2.2	2.0	1.8	5.7	0.4
2026-2030	1.7	2.0	1.2	6.2	0.4
2031-2035	1.8	2.0	1.4	6.2	0.5
2036-2040	1.7	2.0	1.5	6.2	0.2
2041-2045	1.5	2.0	1.5	6.2	-0.1
2046-2050	1.5	2.0	1.5	6.2	-0.1
2051-2055	1.6	2.0	1.5	6.2	0.1
2056-2060	1.9	2.0	1.5	6.2	0.4
2061-2065	2.1	2.0	1.5	6.2	0.6
2066-2071	2.0	2.0	1.5	6.2	0.5

*The figures from 2022 onwards are grouped in 5 year bands (typically) and are averages

Table 5.1: Projected future real GDP, price inflation, real earnings growth, unemployment rate, employment growth

We have applied the Commission's rates (e.g. labour force, participations rates etc.) on an age by age (rather than grouped age) basis to a revised population with Census 2016 overlay. As a result the rates applied in our model when expressed on a grouped age basis (as a % of the revised population structure reflecting the overlay) are very marginally different to the Commission's rates quoted here.

As can be seen there is a significant step change[28] in the assumptions before and after 2022. This is the point at which the short and medium term assumptions in the Stability Programme Update ("SPU") are replaced by the longer term projections of the Commission intended to form the basis of the 2018 Ageing Report.

The SPU projections do take account of the potential impact of Brexit on Ireland whereas the longer term assumptions (from 2022 onwards) selected by the European Commission for the purposes of the 2018 Ageing Report do not make explicit allowance in their model.

The Commission's projections are based on a long run model. Certain sensitivity tests and scenarios are used in addition to the baseline scenario such as higher / lower migration, high / low Total Factor Productivity growth etc., but there has been no explicit analysis performed in terms of Brexit impacts.

[27] The unemployment rate and employment growth figures relates to age groups 15-74 for consistency with the headline figures included in the SPU. The unemployment rate refers to the percentage of the labour force (rather than population).
[28] The step change is notable for projected real earnings growth, employment growth and to a lesser extent real GDP growth.

The labour productivity assumption (which coincides with real earnings growth assumption adopted by the Commission) from 2022 is materially higher (1.8% per annum average 2022 to 2025 as compared with 1.0% per annum in 2021). The higher real earnings growth adopted by the Commission post 2022, for example, feeds into a higher GDP growth rate than otherwise.

Impact of Brexit

The ESRI and the Department of Finance summarise their view on the impact of Brexit in their Working paper produced in 2016[29:] as follows:

"We find that the level of Irish output is permanently below what it otherwise would have been in the absence of BREXIT."

The Department of Finance comment that naturally the extent of the impact of Brexit will depend on the final terms of the UK's exit and its relationship with the EU.

The ESRI's simulation results from their Working Paper no. 548 suggest that the potential long term impact of Brexit on Ireland is "severe".

As set out in the SPU, the forecasts for 2019 and beyond (up to an including 2021) take into account, as far as possible, the estimated impact of this shock to the economy. It must be recognised, however, that a multitude of factors such as the post-exit nature of the trading arrangements between the UK and the EU has yet to be settled and so medium-term forecasts are subject to considerable uncertainty.

Adverse WTO Scenario

As part of their analysis, the ESRI and Department of Finance considered a number of scenarios ranging from an EEA type model to an adverse World Trade Organisation ("WTO") scenario. The simulation results indicate that under the EEA scenario, the level of Irish output will be around 2.3 per cent below what it otherwise would have been ten years after Brexit, while the impacts are 2.7 per cent and 3.8 per cent in the FTA and WTO scenarios respectively. This equates to a reduction in the average GDP growth rate of 0.4 per cent per annum every year, under the WTO scenario.

The WTO scenario is effectively what could be regarded as a "Hard Brexit" scenario whereby the UK and EU do not conclude a bilateral trade agreement and instead the UK exercises its rights under the Most Favoured Nation ("MFN") clause of the WTO.

Brexit Scenario / "Economic Shock"

In Chapter 9 we examine the scenario of a sustained negative impact on Ireland of Brexit in the longer term. Additionally we comment on the potential impact of a sharp negative shock (not necessarily Brexit induced) on the finances of the SIF such as that observed in the last economic recession which commenced in 2008.

5.3 Receipts Projections

For the projection of PRSI contribution income, the actual 2015 PRSI database was used in respect of Class A contributions and 2014 PRSI database was reflected in the projections for the Class S. (In general, self-assessed tax returns for a given year are due on the 31st of October of the following year, and processing of these returns is not fully completed by Revenue until several months later. This meant that self-assessed 2015 data was not fully available at the time of conducting the principal data analysis

[29] ESRI and Department of Finance Working paper no 548 *"Modelling the Medium to Long Term Potential Macroeconomic impact of Brexit on Ireland"* produced in November 2016.

for this Review). In addition, the Department provided us with the 2016 and 2017 estimates of PRSI receipts. The following steps were performed in order to project future PRSI income:

- A split of PRSI contribution income by class and gender, age and earnings band was provided.
- New contributors in the future are assumed to join either PRSI Class A (employed) or Class S (self-employed). From the 2.6 million records in the 2014 PRSI database we note the numbers in these two classes account for 75% (1.8 million) and 9% (>250,000) of the total PRSI contributors.
- We have assumed that for any given age and gender the proportion in Class A and Class S will remain constant. Therefore the proportion of the labour force in PRSI Class S (relative to Class A) will increase slightly in future years as the population ages.
- PRSI Classes B, C, and D (public servants employed prior to April 1995) were grouped together and as there are no new entrants joining this category are expected to decline in number gradually until 2037 (the youngest joining in 1995 were assumed to be 18 reaching retirement age[30] of 60 by 2037). [New hires in the public sector since 1995 are PRSI Class A contributors.]
- A number of financially immaterial social insurance classes were grouped with PRSI Class A contributors for simplicity.
- In projecting future contributions, average earnings within each band, contribution ceilings and thresholds were increased annually at the assumed earnings growth rate.
- The current PRSI contribution rates were assumed to remain constant.

5.4 Benefit Projections

5.4.1 Introduction

For each of the main benefit types the benefit amount and number of claimants were projected separately – there is detailed commentary below for each benefit category. Benefits are projected to increase in line with assumed real earnings growth from a base reflecting the rates in force in 2017. However, we have also looked at alternative indexation options for all benefits in Chapter 11.

Our modelling reflects all legislated for policy changes affecting expenditure.

In terms of changes in 2021 (increase in SPA to 67) and 2028 (increase in SPA to 68), we modelled additional projected recipients expected to access other benefits of the Fund in the absence of SPC . The other benefit categories which are projected to see an increase in recipient numbers are Jobseeker's and Illness Benefit as well as Invalidity Pension. Having examined incidence rates at older ages for these benefit types, and failing to observe any distinct observable trends (save for Invalidity Pension which showed a clear increase in incidence rates with age), we assumed that additional numbers accessing these benefits would be as follows:

- We allowed for additional expected numbers of 66 and 67 year olds from 2021 and 2028 onwards respectively, by examining the incidence rates of 65 year old recipients of Jobseekers Illness and Invalidity Benefits as a proportion of the relevant populations and assuming the same rates would apply to those at ages 66 – 67 who previously would have otherwise expected to receive SPC. When reading the remainder of this Chapter a reader may find it helpful to bear in mind the materiality of each of the expenditure items discussed in turn.

- Figure 5.1 illustrates the proportion of total 2015 expenditure represented by each major expenditure category.
- Figures in Appendix 5 illustrate the expected progression of expenditure trends through time. Pension related expenditure is expected to increase from 70% in 2016, to circa 82% / 83% in 2071.

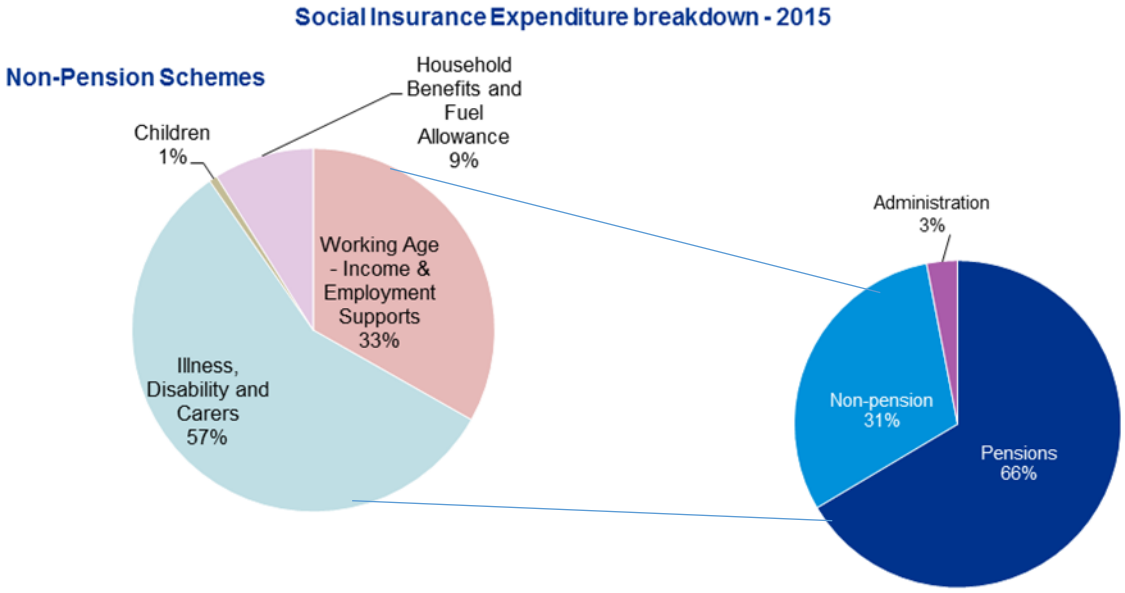

Figure 5.1: Expenditure by type, Statistical Information on Social Welfare Services 2015[31]

5.4.2 Pension Benefits (circa 66%[32] of the 2015 Fund expenditure)

5.4.2.1 State Pension (Contributory) *(circa 52%[33] of the 2015 Fund expenditure)*

Existing 2015 pensioners and expected future new beneficiaries were modelled separately.

Existing Recipients

The Department of Employment Affairs and Social Protection provided us with the number of recipients of SPC payments during 2015 (across the entire SPC scheme and in respect of new entries). This was split by age and gender and rate band. We were also provided with the number of participants and the associated total expenditure for each rate band at the end of 2015 which allowed us to calculate the overall weighted average annual pension payment for 2015.

The number of future claimants at each age for each year was projected based on the number of claimants at the end of the previous year and allowing for the probability of survival.

Combining the number of claimants and the projected future average annual benefit amounts, allowed us to project the total expenditure for existing pensioners for each future year.

[31] Note the %s shown in the leftmost pie chart are the proportions of the non-pension related schemes i.e. Working Age Income and Employment Supports is circa 33% of non-pension expenditure or circa 10% of overall expenditure.
[32] We quote 69% of expenditure as being pension-related at outset elsewhere in this report. This reflects pension-related expenditure itself (66%) plus the pension related share in respect of administration costs in addition.
[33] €4.475 billion of €8.616 billion total expenditure in 2015

New Pensioners

In order to project the cost of future new claimants, we estimated (i) the numbers qualifying for SPC in each future retiring year and (ii) the proportion of new claimants falling into each pension band in each future year split by gender. For example, the proportion of new male and female pensioners in 2017 who will be in receipt of 100% pension, 98% pension etc.

Numbers qualifying / claiming SPC

To estimate the numbers claiming SPC, we examined our retiring samples at each future year (e.g. for the 2020 retiring year we examined all those with date of birth 1954 in the PRSI database who were due to retire in 2020, aged 66). We then checked to ascertain how many individuals in this sample would have qualified for SPC (at any level) – in the main this involved checking for the numbers with at least 520 "paid" contributions. An adjustment was also made for those who qualify but instead claim from schemes,such as Widow (er's) Contributory Pension, making them ineligible for an SPC payment.

Retiring Year	2016	2019	2020	2030	2040
Population Male (age = SPA)	21,557	22,328	23,053	25,841	31,990
Males Claimants	17,613	17,789	18,203	22,596	29,664
Claimants (% of male population)	**82%**	**80%**	**79%**	**87%**	**93%**
Population Female (age = SPA)	21,990	23,987	24,176	28,633	34,504
Female Claimants	11,666	11,965	12,904	16,951	24,906
Claimants (% of female population)	**53%**	**50%**	**53%**	**59%**	**72%**
Population Total	43,547	46,315	47,228	54,474	66,494
Claimants	29,279	29,753	31,107	39,547	54,571
Overall Claimants as a % Population	**67%**	**64%**	**66%**	**73%**	**82%**

Table 5.2: Projected SPC claimants as a % of the population at various spot years in the future

Numbers qualifying at varying rate bands

To estimate the numbers in receipt of SPC at varying rate bands we used the full contribution history provided by the Department of Employment Affairs and Social Protection for each future retirement year to estimate the projected total pension entitlements for each retiring cohort. An assumption was needed about contribution careers (the level of contributions and credits which individuals would likely make between the Review date and State Pension Age) and here we assumed that individuals would continue to contribute/receive credits in line with average rate of contributions they had made over their career to date. This allowed the calculation of a projection of the total contributions and yearly average contributions in respect of each member which then allowed us to calculate the corresponding rate of SPC entitlement.

The pension entitlement of each sample member for a given retiring year was then used to estimate the weighted average pension entitlement for the entire retiring sample for each (spot) year split by gender. We calculated rates of pension for each retiring individual for each of the first 10 years of the projection period (2016-2025) and thereafter at 5 year spot years interpolating between years.

For each future year, we looked at the new claimants reaching pensionable age in that year. In the first year of pension payment, the cost of benefits is the number of projected qualifiers[34] at pensionable age in that year multiplied by the weighted average pension payment (as calculated above).

[34] Numbers of "Qualifiers" for SPC for each retiring sample are examined by checking individual data against the qualification criteria – i.e. a check to ascertain the numbers with at least 520 "paid" contributions and who commenced contributions prior to reaching age 56.

The number of these claimants in receipt of this benefit in future years is run down based on the probability of survival. The average pension payments are increased in line with real wage inflation to give the total expenditure for each future year.

There is a separate projection for each set of claimants reaching pensionable age in each future year between 2016 and 2071.

Homemaking data and associated assumptions made

Background to the Homemaker's Scheme

Under the Homemaker's Scheme subject to specified eligibility criteria, any years that an individual spent as a homemaker (since 6 April 1994) are ignored or "disregarded" when working out the yearly average contributions for SPC.

A homemaking year is a year in which an individual is out of the workforce for the full tax year. Up to a maximum of 20 homemaking years can be disregarded for SPC purposes.

Homemaker's credits can be awarded for part of a year at the start of the homemaking period, from the date an individual becomes a homemaker up to the end of the tax year. Likewise, homemaker's credits can also be awarded for part of a year when the homemaking period ends, from the start of the tax year up to the date an individual stops homemaking.

Approach to assumptions made

With the upcoming proposed 2020 National Pensions Framework changes, there was a heightened focus at this Review on homemakers' data. The approach to the calculation of pension where homemakers' periods are "disregarded" under the yearly average contribution approach will need to change on transitioning to a Total Contributions Approach (TCA). Under the TCA credits rather than the current "disregards" as described above are expected to be reflected in the formula when calculating total contributions/credits to be awarded for SPC purposes.

We set out hereunder our approach to estimating homemaking gap periods and likely "take-up" by males and females. "Take-up" refers to the propensity for individuals to actually make a claim in respect of homemaking periods having registered where applicable for the Homemakers scheme.

The following table shows the PRSI contribution history record "gaps" between the ages of 21 – 50 for both males and females in the 2016 and the 2030 retiring datasets. It shows that typical female gaps at ages 21 - 50 amounts to circa 10 years for those who retired in 2016 and the corresponding gaps at these ages for men is circa 4 years. For those retiring in 2030 the gap reduces marginally for women to 9 years and increases for men to 6.8 years.[35]

PRSI record average gaps (years) for ages 21 - 50		
Retiring Sample	**Male**	**Female**
2016 (i.e. DOB 1950)	4.1	10.0
2030 (i.e. DOB 1962)	6.8	9.0

Table 5.3: Gaps in records at ages which may indicate homemaking periods

Where only post 1994 gaps in contribution histories are examined (given the fact that the current Homemaker's scheme gives a "disregard" in the calculation of the yearly average beginning from this period only), the relevant gaps are much reduced particularly with respect to the 2016 retiring sample.

[35] Disregards: From 6 April 1994, any contribution year spent as a homemaker may be disregarded in the calculation of the yearly average up to a maximum of 20 years. The fact that you do not have any contributions in those years will not affect your entitlement to a pension.

This reflects the fact that the vast majority of these individuals would have already completed most of their homemaking by 1994.

PRSI record average gaps (years) for ages 21 - 50 - Post 1994 only		
Retiring Sample	**Male**	**Female**
2016 (i.e. DOB 1950)	0.7	1.3
2030 (i.e. DOB 1962)	5.0	6.3

Table 5.4: Gaps in records at ages which may indicate homemaking periods post 1994

For our base case we assumed that homemaking disregards only apply to periods post 1994 reflecting the terms of the Homemakers scheme, with assumed 90% take-up for women, 50% take-up for men. This translates to 1 year for women retiring in 2016 (being 1.3 years x 90%) increasing to 6.0 years (6.3 years x 90%) for those retiring in 2030. For men the equivalent post 1994 gap which is assumed to be "taken-up" and used as a disregard in the calculation of SPC is 0.5 years for men (0.7 years x 50%)[36] retiring in 2016 increasing to 2.5 years (5.0 years x 50%) by 2030.

In Appendix 7 where a number of variant 2020 scenarios are examined in detail we look at two homemaking scenarios – the "base case" described above and an alternative homemaking scenario whereby the Homemakers scheme is hypothetically extended to include periods pre 1994.

Independent qualified adult ("IQA") allowance

We have refined our methodology for the independent qualified adult allowance ("IQA") associated with the SPC at this Review as compared with the 2010 Review to reflect declining proportions expected to qualify for this benefit in the future. This reflects the expectation that as increasing numbers of individuals qualify for SPC in their own right given improving records fewer will have a need for the means-tested IQA. The rate of assumed decline in the IQA allowance is equal to the inverse of the improvement seen in the proportion of the females qualifying for SPC.

5.4.2.2 Widow(er)'s and Surviving Civil Partner's (Contributory) Pension *(circa 17% of the 2015 Fund expenditure)*

Widow(er)'s and Surviving Civil Partner's Contributory Pension was the second largest individual benefit payment in 2015 accounting for 17% of the total expenditure in the Fund in 2015.

We were provided with the number of recipients of this benefit split by age and gender for 2015 and the preceding 3 years. This was used to calculate distribution rates of those in receipt of Widow(er)'s Benefit at each age, i.e. the number of people receiving the benefit at each age and gender, divided by the total population level for that gender in 2015. These distribution rates were assumed to be constant for each future year, and were applied to projected population levels giving the number of claimants in each year by age and gender.

An estimate of the number of recipients at each rate group for 2015 was also provided. This was given for personal rate claimants and qualified children. From this we derived the weighted average personal benefit amount.

For each future year, we combined the future claimant numbers with the average personal rate for each age and gender to calculate the total projected expenditure.

[36] Rounded up from 0.35 years to 0.5 years given the uncertainty around this data

5.4.2.3 Other (Bereavement Grant and Death Benefit) *(negligible portion of overall expenditure)*

These benefits made up less than 1% of the overall expenditure of the Social Insurance Fund for 2010.

For each future year, the benefit is increased year on year in line with changes in the overall population and allows for increases in line with real earnings growth.

5.4.3 Working Age - Employment Supports

Detailed analysis was performed given the number of changes in the working age income support expenditure of the Fund in recent years primarily driven by the reduced number of Jobseeker's as compared with the previous Review.

5.4.3.1 Jobseeker's Benefit *(4% of the total expenditure of the Fund in 2015)*

To calculate the expenditure for each year we modelled the number of claimants and the amount of this benefit over the projection period.

We were provided with the number of recipients of this benefit split by age and gender and also duration for 2015 and the preceding 3 years. This was used to calculate distribution rates of those in receipt of Jobseeker's Benefit at each age, i.e. the number of people receiving the benefit at each age and gender, divided by the total unemployment numbers for that age and gender in 2015. These distribution rates assumed a constant proportion of the future projected unemployment rates giving the number of claimants in each year by age and gender.

For each future year, we combined the future claimant numbers with the average personal benefit for each age and gender to calculate the total projected expenditure.

We allowed for additional expected numbers of 66 and 67 year olds from 2021 and 2028 onwards respectively, by examining the incidence rates of 65 year olds who accessed Jobseekers since January 2014 and allowed for these additional incidence rates in 2021 and 2028 when the SPA increases.

5.4.3.2 Deserted Wife's Benefit *(1% of the total expenditure of the Fund in 2015)*

This benefit is no longer available to new claimants, so it is expected that the total costs for this benefit will decline over time. The number of future claimants at each age for each year was projected based on the number of claimants at the end of the previous year and allowing for the probability of survival.

5.4.3.3 Maternity Benefit *(3% of the total expenditure of the Fund in 2015)*

Future recipients were projected by reference to the expected number of births to female labour force participants based on 2015 incidence rates. The average benefit payable was estimated from the 2015 data.

5.4.3.4 Redundancy and Insolvency *(<1% of the total expenditure of the Fund in 2015)*

The statutory redundancy employer rebate was abolished where the redundancy occurs after 1 January 2013 so this benefit now accounts for a negligible portion of overall Expenditure.

5.4.3.5 Other (Treatment Benefits, Health and Safety Benefit and Adoptive Benefit) *(negligible portion of overall Fund expenditure)*

Treatment Benefits, Health and Safety Benefit and Adoptive Benefit make up less than 1% of the overall expenditure in the Fund for 2015. We allowed for the 2017 Budget measures in respect of Treatment Benefits noting that the financial impact is fully reflected in 2018 and thereafter. We subsequently increased these benefit amounts each year in line with population growth allowing for any increase in real earnings growth.

5.4.3.6 Partial Capacity Benefit

This is increased each year in line with population changes and allows for any increase in line with real earnings growth.

5.4.4 Illness, Disability and Carers

5.4.4.1 Illness Benefit *(7% of the total expenditure of the Fund in 2015)*

We were provided with projected Illness Benefit amounts by Department of Employment Affairs and Social Protection from 2011-2015 and were given statistics on the number of claimants who were in receipt of the benefit for more than 2 years. For those in receipt of Illness Benefit for longer than 2 years we assumed that this was a closed population, declining over time. We therefore projected the number of recipients allowing for the probability of survival of this group of claimants.

For the individuals with claims of less than 2 years duration we were provided with the number of recipients of this benefit split by age and gender for 2015. This was used to calculate distribution rates (as a proportion of the labour force as opposed to general population, reflecting the qualification requirements) of those in receipt of Illness Benefit at each age, i.e. the number of people receiving the benefit at each age and gender, divided by the total labour force for that gender in 2015. These distribution rates were assumed to be constant for each future year, and were applied to projected labour force levels giving the number of claimants in each year by age and gender.

We allowed for small numbers of additional expected 66 and 67 year olds from 2021 and 2028 onwards respectively, by examining the incidence rates of 64 year old recipients as a proportion of the labour force and assuming the same rates would apply to those impacted by the pension reforms.

5.4.4.2 Invalidity Pension *(8% of the total expenditure of the Fund in 2015)*

The number of recipients of Invalidity Pension was projected to increase each year in line with labour force population changes (given the qualification conditions). We also allowed for the following expected new recipients:

- Those aged 66 and 67 year olds from 2021 and 2028 onwards respectively, by examining the trend in increasing incidence rates between the ages 60 - 64 year old recipients as a proportion of the labour force and assuming the trend continues for those aged 66 – 67.

We also separately considered the remaining illness beneficiaries with greater than 2 year duration i.e. those that had been on Illness Benefit pre 2009. On balance we decided not to include them as additional entries to Invalidity Benefit in future years as we expect that most of them will transition into SPC, other retirement benefits and would have already transferred to Invalidity Pension where this was a viable alternative.

5.4.4.3 Other (Injury Benefit, Carer's Benefit, Medical Care and Disablement Benefit) *(negligible portion of overall expenditure)*

The number of beneficiaries is projected to increase each year in line with population changes and the benefit amount is expected to increase in line with real earnings growth.

5.4.5 Children

Children (child related payment) *(negligible portion of overall expenditure)*

Recipients of child-related payments are assumed to increase in line with projected future birth rates and expenditure is uprated for increases in real earnings growth.

5.4.6 Supplementary Payments Agencies and Miscellaneous Services

Household Benefits Package and Fuel Allowance *(3% of the expenditure of the Fund in 2015)*

The Household Benefits package is a secondary benefit available with a range of social insurance and social assistance schemes. It is funded by the Fund only in respect of insurance based schemes[37]. It is available to all aged 70 or over without a means test and with no household composition rules (one package per household provided for the registered user of utilities). Applicants must be permanently residing in the State.

People aged 66-70 who are in receipt of qualifying payments such as SPC, Widow(er)'s and Surviving Civil Partner's Contributory Pension, equivalent recognised foreign pensions or who satisfy a means test and who live alone or only with certain excepted people may also qualify.

Widow(er)'s and Surviving Civil Partners aged from 60 to 65 whose late spouses / partners had been in receipt of the Household Benefits package and who live alone or only with certain excepted people may retain that entitlement.

People aged under 66 who are in receipt of qualifying payments (such as Invalidity Pension) and who live alone or only with certain excepted people may also qualify.

Fuel Allowance

The Fuel Allowance is a secondary benefit available with a range of social insurance and social assistance schemes. It is funded by the SIF only in respect of insurance based schemes[38]. It is a means tested weekly payment of €20 available for people on long term schemes such as SPC, Widows Pension (Contributory), Guardian's Payment (Contributory) and Invalidity Pension. It is paid for 26 weeks from October to March each year.

We projected that recipient numbers of both Household Benefits and Fuel Allowance would increase year on year in line with the change in the population aged 66 or over and that the amounts payable would increase each year in line with real earnings growth.

5.4.7 Administration Costs

Administration Costs *(3% of the total expenditure of the Fund in 2015)*

As administration cost are a relatively small proportion of the total expenditure we have assumed as a practical expedient that they will increase in line with real earnings growth.

[37] Household Benefits are also available for people in receipt of certain assistance payments including State Pension (Non-Contributory), Widows Pension (Non-Contributory), Carer's Allowance, Blind Person's Pension, Disability Allowance and One Parent Family Payment (if aged 66-70).
[38] Fuel Allowance is also available for people in receipt of certain assistance payments including Disability Allowance, One Parent Family Payment, Blind Person's Pension, Guardian's Payment (non-contributory), long term Jobseeker's Allowance, Supplementary Welfare Allowance and some Employment schemes.

5.4.8 State Pension (Non-Contributory)

State Pension (Non-Contributory) *(Expenditure arises (in the main) outside the SIF)*

For this 2015 Review we were requested to model State Pension Non Contributory ("SPNC") expenditure under the base case and the TCA approach outlined in the National Pensions Framework. SPNC is not SIF-related expenditure *per se* but the SIF pays out sums to the general Exchequer in respect of individuals who would otherwise have had an underlying entitlement to SPC.

By way of background, PRSI contributors can become entitled to the SPNC where they pass the means-test and either (i) are not entitled to SPC at all based on their PRSI record (e.g. do not have a 520 minimum paid contributions) or (ii) would be entitled to SPC but at a lower rate band than the SPNC.

SPNC Recipients

As with other expenditure types, future SPNC recipients reflect (i) those already in receipt of SPNC – the "existing stock" and (ii) those projected to newly qualify for SPNC in each year of the 55 year period.

For existing SPNC recipients we projected forward by allowing for the probability of survival from one year to the next.

With regard to new entries, we ascertained the number of new SPNC entries in 2016 who would otherwise have qualified for SPC (or not). We were therefore able to establish future male and female SPNC qualifiers from two distinct cohorts (i) the proportions of non SPC qualifiers who would qualify for SPNC and (ii) the proportions of those who would qualify for SPC but instead qualify for SPNC (due to their satisfying the means-test and qualifying for SPNC at a higher rate band than their underlying SPC entitlement).

We therefore modelled two distinct cohorts projected to qualify for SPNC as follows:

- 39.2% of SPC non qualifiers (males) and 25.2% of SPC non-qualifiers (females) in each future year. This is the same under both YA and TCA approaches;
- Under the YA approach: 3.5% of males who would have qualified for SPC and 4.7% of females. Under the TCA approach[39]: 5.25% of males and 7% of females who would have qualified for SPC [These are the projected numbers of individuals who are assumed to get a higher pension under SPNC rules than the prevailing SPC rules and hence qualify under the SPNC route.]

As can be seen from the above, the numbers of future SPNC qualifiers changes through time predominantly in line with movements in non-SPC qualifiers which is on a downward trend – see Table 5.2 for further detail.

SPNC Expenditure

To calculate SPNC expenditure we multiplied the projected number of SPNC recipients in each future year by the weighted average rate of SPNC payment which we have assumed remains constant through time[40] albeit increases in line with real earnings growth.

[39] Under the TCA approach more are projected to qualify for SPNC due to lower average SPCs and more individuals distributed at the lower rate bands (e.g. the 33% -40% level whereas the minimum under the YA approach is 40%)
[40] A constant weighted average SPNC rate means that we are implicitly assuming the interaction of individuals' means with SPNC at the various rate bands in the future will remain the same as 2016 in the absence of data or studies indicating anything to the contrary.

6 Population and Labour Force Projections

This chapter:

- describes population projections - information received and analysis
- outlines the assumptions underlying the population projections
- describes the labour force information received and analysis
- provides commentary on the changes to population projections at the 2010 Review
- provides commentary on a range of matters associated with the ageing of the population

6.1 Population Projections

6.1.1 Information received

The initial assumptions we used in developing population projections were provided by the Department of Finance. The principal assumptions provided for the base case reflect the 2015 based population projections produced by Eurostat to be used in the production of "The 2018 Ageing Report"; a Report to be prepared by the European Commission (DG ECFIN) and the Economic Policy Committee (EPC). The 2015 based population projections have been overlaid with the results of the Census 2016 on the "usually resident" basis for the 2016 base year (in fact we used these projections for the year end 2015 year). Our population projections reflect the 2015 based population projections as described above but with allowance for Irish specific mortality improvement rates in line with the CSO's most recent study[41].

6.1.2 Analysis of the Population Projections

Based on these assumptions, we present in Table 6.1 some summary details of the projected population and its structure out to 2071. Looking first at the overall population it can be seen that under the base case the population is forecast to rise from 4.74 million in 2015 to 6.26 million in 2071, an increase of 32% over 2015 levels.

Age Group	2015	2025	2035	2045	2055	2065	2071
0 - 19	1,307	1,395	1,325	1,321	1,408	1,427	1,423
20 - 65	2,847	2,965	3,069	3,071	3,070	3,198	3,294
66 +	586	797	1,052	1,346	1,527	1,550	1,539
Total	4,740	5,157	5,446	5,738	6,005	6,175	6,256
0 - 19	28%	27%	24%	23%	23%	23%	23%
20 - 65	60%	57%	56%	54%	51%	52%	53%
66 +	12%	15%	19%	23%	25%	25%	25%
Pensioner Support Ratio	**4.9**	**3.7**	**2.9**	**2.3**	**2.0**	**2.1**	**2.1**
Total Support Ratio	1.5	1.4	1.3	1.2	1.0	1.1	1.1

Table 6.1: Population Structure 2015 to 2071 (000s); base case assumptions. Note the population structure presented as "2015" in the above table in fact represents the April 2016 population structure estimated upon 2016 Census results.

[41] CSO Population and Labour Force Projections 2016 – 2046 published April 2013

As can be seen from Table 6.1, when examining the breakdown across age groups we chose the "adult group" as those aged 20 – 65 while those over pension age are assumed to be aged 66+. Later in this section we examine the impact of the increases in SPA in terms of observed improvements in the support ratio.

$$Pensioner\ Support\ ratio = \frac{Number\ of\ people\ of\ working\ age}{Number\ of\ people\ over\ pension\ age}$$

6.1.3 Changing population structure

Due to the expected dynamics of life expectancy, fertility, and migration rates (each discussed in turn below), the age-structure of the population is projected to dramatically change in the coming decades. In other words, not only is the population projected to be much larger than it is now, it is also expected to be much older.

Based on the above measure of "working age", the proportion of the population aged 66 and over is projected to rise from 12% in 2015 to 23% by 2045 and 25% by 2055, remaining broadly flat thereafter. In other words in 2015 there are circa 4.9 workers for every individual over age 66 and this reduces to circa 2.3 workers for every individual over age 66 by 2045, further declining to 2.0 workers by 2055. At the same time the proportion relating to the group in the middle of the age pyramid becomes smaller due to below natural replacement fertility rates.

The pensioner support ratio is a key measure of the ability of the Fund to meet its obligations in the future as contributions by and on behalf of the working population plus general taxation are necessary to finance the benefits paid to the retired population in the absence of any material level of prior funding.

The total support ratio i.e. the ratio of the number of people of working age to the number of children plus those over pension age is expected to decline from 1.5 at outset to 1.0 by 2055.

$$Total\ Support\ ratio = \frac{Number\ of\ people\ of\ working\ age}{Number\ of\ children + Number\ of\ people\ over\ pension\ age}$$

When considering the financial prospects for the Fund it is necessary to take into account the proportion of the working age population who are expected to be contributors and the proportion of the elderly who will be in receipt of pensions including allowance for those pensions paid to people overseas. Therefore the ratio of pensioners to contributors for the Fund will not equal the pensioner support ratio shown in Tables 6.1 and 6.2 but is expected to follow a similar trend.

Figure 6.1 gives a more detailed breakdown of the 2016 population by gender and age category. A population "bulge" at the age groups 30-45 can be clearly seen and explains the dramatic reduction in the projected pensioner support ratio between now and 2045, thereafter expected to decline more gradually.

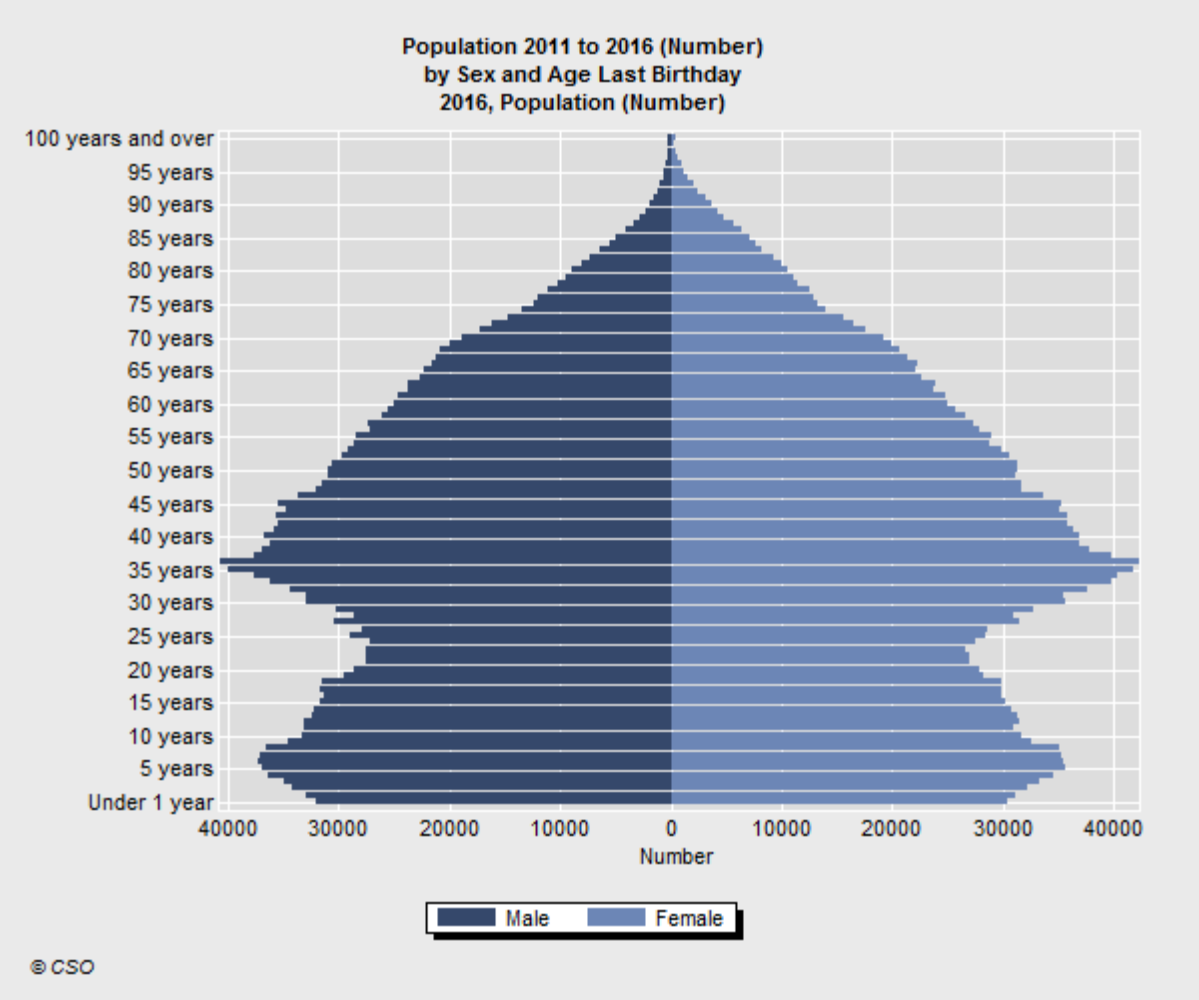

Figure 6.1: Detailed breakdown of the 2016 population by gender and age category

6.1.4 Support ratios and dependency ratios – Findings of Census 2016

The trend in increasing age and total dependency[42] ratios is consistent with the initial findings of the CSO in Census 2016, which indicates that Ireland is currently undergoing a change in its population composition and is facing into the challenge of an ageing population.

[42] Dependency ratios are the opposite of support ratios. The "old age dependency ratio" or "pensioner dependency ratio" measures those aged 66 and over as a proportion of the working age population. Similarly the "total dependency ratio" measures the total of children plus those over pension age as a proportion of the working age population.

A chart of the progression of the support ratio can be seen in Figure 6.2.

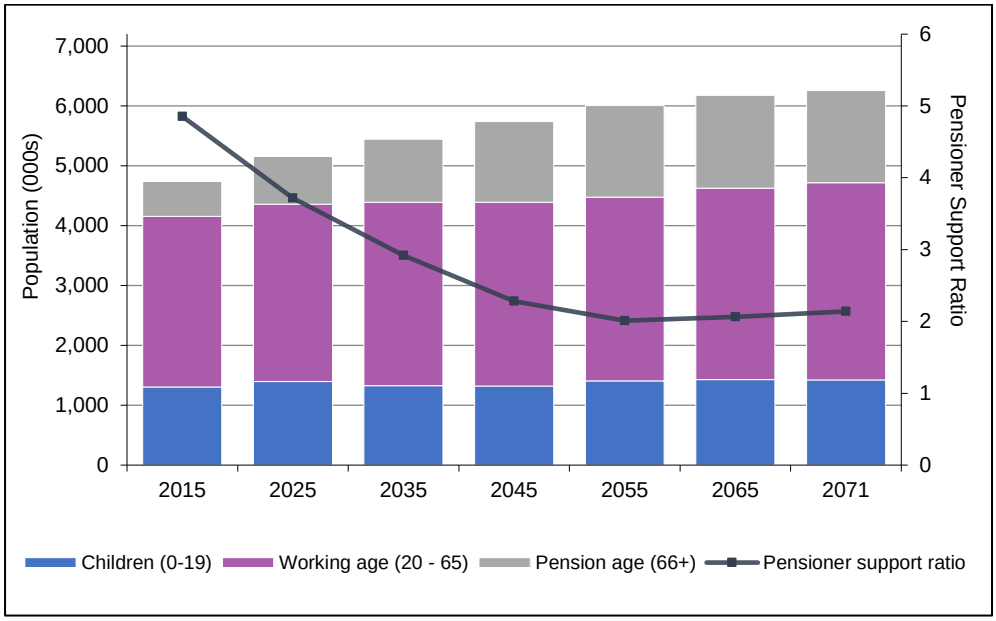

Figure 6.2: Projected age structure of the population and pensioner support ratio (2015-2071)

6.1.5 Pensioner Support ratio measure and impact of pension reforms

The impact of the reforms in terms of the increase in the State Pension Age is shown in Table 6.2 below. In 2035, for example, those of "working age" are the 20 – 67 age cohort, whereas those over State Pension Age are those aged 68+.

Age Group	2015	2025	2035	2045	2055	2065	2071
0 - 19	1,307	1,395	1,325	1,321	1,408	1,427	1,423
20 - (SPA-1)	2,847	3,016	3,191	3,224	3,195	3,312	3,417
SPA +	586	746	929	1,193	1,402	1,436	1,416
Total	4,740	5,157	5,445	5,738	6,005	6,175	6,256
0 - 19	28%	27%	24%	23%	23%	23%	23%
20 - (SPA-1)	60%	58%	59%	56%	53%	54%	55%
SPA +	12%	14%	17%	21%	23%	23%	23%
Pensioner Support Ratio	**4.9**	**4.0**	**3.4**	**2.7**	**2.3**	**2.3**	**2.4**
Total Support Ratio	1.5	1.4	1.4	1.3	1.1	1.2	1.2

Table 6.2: Population Structure 2015 to 2071 (000s). "SPA" refers to State Pension Age

The pensioner support ratio commences at 4.9 in 2015 but reduces more gradually to 3.4 by 2035 and to 2.3 by 2055. In contrast the support ratio taking no account of reforms is projected to decline much more steeply to 2.9 by 2035 and to 2.0 by 2055 as can be seen from Table 6.1.

Support ratios are a rather crude measure as variations occur over time due to the number of young people in third level education and people over SPA continuing to work.

The 2015 Ageing Report included 2015 Irish statistics on *effective* retirement rates – the age at which people actually stop working - of 64.9 years for males and 64.8 years for females.

Therefore the figures in Table 6.1 may continue to provide a more meaningful measure of the pensioner support ratio based on past trends of the relationship between effective retirement ages and SPAs.

6.2 Mortality Rates and associated Life Expectancy Assumptions

Current and future mortality rates are the key determinant of how long people will draw pension benefits from the Fund (pensions being the most material element of Fund expenditure and increasingly so with time). With advances in medical science and improved social and environmental conditions, mortality rates have, for a number of years, declined more rapidly than historic norms albeit the rate of improvement has slowed down in both Ireland and the UK in recent years. Accordingly, people are now living longer than ever before with associated implications for the Fund.

We firstly examined the mortality rates and associated life expectancies underlying the 2015 based population projections produced by Eurostat. Life expectancies at age 66 using these assumptions in 2015 and at 10 year intervals thereafter are shown in Table 6.3.

	2015	2025	2035	2045	2055	2065	2071
Male	17.6	18.6	19.6	20.5	21.4	22.2	22.7
Female	20.1	21.3	22.4	23.4	24.3	25.2	25.8

Table 6.3: Life expectancy at age 66 - 2015 to 2071; 2015 based population projections produced by Eurostat

As the mortality projections incorporate an allowance for future mortality improvements, the average life expectancy is projected to increase over the period in question. A circa 10% increase in assumed life expectancies is assumed in the first 20 years of the projection period and similarly thereafter.

Given that the CSO regularly produce Irish-specific population projections, we also examined this data source and ultimately utilised this in the production of our base case population projection by taking the opening 2015 mortality rates as per Eurostat above and adjusting the future projected mortality rates in line with the CSO's most recent population projections.

From our analysis of the resulting life expectancies we see that projected life expectancies are higher throughout for both males and females using the CSO mortality improvements. For example, in 2046 (the end point of the CSO projections) 66 year old males are projected to live over 22 years whereas Eurostat assume males of equivalent age will live over 20.5 years only.

	2015	2025	2035	2045	2055	2065	2071
Male	17.6	19.5	21	22.1	23.1	24	24.6
Female	20.1	21.7	22.9	23.9	24.7	25.6	26.0

Table 6.4: Life expectancy at age 66 - 2015 to 2071; base case assumptions (reflects CSO mortality improvements on Eurostat baseline mortality rates)

Given the importance of this variable to the Fund's finances and the degree of uncertainty associated with it, (particularly the long term rate of improvement in future mortality and whether past trends can be expected to continue – see Section 6.7), we employ a number of stress tests in Chapter 9.

6.3 Fertility Rate assumptions

Eurostat in their 2015 based population projection also produces assumptions of the future fertility rates of the population. The base case projections assume that the total fertility rate will increase marginally and gradually from 1.92 in 2016 to 1.97 by 2071.

2015	2025	2035	2045	2055	2065	2071
1.92	1.96	1.96	1.96	1.96	1.96	1.97

Table 6.5: Fertility rates 2015 to 2071

The age specific fertility rates for each projection year are applied to the projected female population to estimate the projected births. These births are then divided into males and females in the ratio 51.5: 48.5. The appropriate survivorship ratios are then applied to male and female births before these are added in to yield the total projected population.

As can be seen from Table 6.5 fertility rates are expected to remain below the natural "replacement rate" of 2.1 throughout the period.

6.4 Migration

Migration patterns in Ireland at the time of reporting have changed significantly since the previous Review. Future migration is difficult to predict with any degree of certainty. For that reason one of our variant assumptions examines a zero net migration scenario. Our central migration assumptions have been taken from the 2015 based population projections and spot rates are outlined in Table 6.6.

The small net outward migration in 2015 is projected to shift to a 6,900 per annum net inward by 2025, thereafter increasing again to 13,600 by 2045 and gradually reducing to 10,700 by 2071.

2015	2025	2035	2045	2055	2065	2071
-0.58	6.89	9.13	13.57	12.85	11.50	10.705

Table 6.6: Migration numbers (000s) 2015 to 2071

The distribution of migrants across the age spectrum at various points in the future is set out in Table 6.7. Although overall the net inward migration numbers are projected to increase significantly over the period, there are sizeable differences across the age groups with major inflows projected for children under 14 and adults (25-34 years old). On the other hand sizeable outflows are assumed in the age group young adult cohort (aged 15-24 years).

Age group	2015		2025		2035		2045		2055		2060	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
0-14	2,951	3,574	3,353	4,056	3,389	4,131	3,578	4,425	3,448	4,210	3,345	4,094
15-24	-5,391	-7,323	-4,065	-5,704	-3,245	-4,697	-2,220	-3,378	-1,631	-2,800	-1,394	-2,523
25-34	2,401	2,754	3,779	3,990	3,978	4,163	4,553	4,779	4,223	4,246	3,951	3,966
35-44	-312	10	167	342	244	410	465	610	363	495	269	432
45-54	341	624	416	688	369	649	376	667	274	550	211	490
55-64	-252	154	-199	192	-201	165	-176	169	-203	98	-224	62
65+	-24	-84	-9	-118	-28	-201	-21	-260	-51	-373	-70	-430
Total	**-286**	**-291**	**3,442**	**3,446**	**4,506**	**4,620**	**6,555**	**7,012**	**6,423**	**6,426**	**6,088**	**6,091**

Table 6.7: Migration distribution 2015 to 2060

6.5 Reconciliation with population projections carried out for 2010 Review

At this review under the base case, the population is projected to rise to 6.2 by 2066, whereas at the 2010 Review, the population was projected to rise to just over 7 million by 2066. Despite the significant differences in the absolute size of the projected population, the proportion assumed to be aged 68+ (i.e. over SPA) remains broadly unchanged between reviews at 22% / 23%.

The main reasons for the differences in the size of the projected population by 2066 are:

- the incorporation of the Census 2016 overlay which reduced projected numbers in 2066 by **0.04 million;**
- the assumed absolute numbers of inward migrants is materially lower (and over a prolonged period) than at the 2010 Review – a reduction of **0.49 million**;
- life expectancies are shorter at the 2015 Review as compared with the 2010 Review particularly for males. For example life expectancy from age 65 by 2060 had been anticipated to be 25.8 years for males, 27.0 years for females. At this Review the different base line mortality rates and different rate of projected future mortality improvements results in comparable projected life expectancies for a 65 year old in 2060 of 24.5 years for males and 26.1 years for females. Overall this reduced projected numbers in 2066 by **0.10 million**;
- the assumed fertility rate has fallen (1.92 in 2015 as compared with 2.06 projected at 2010 Review) and the projections are that assumed future fertility rates are slightly lower than those assumed at 2010 – a reduction of **0.15 million**;
- the assumed distribution of the migrants and fertility rates across the age cohorts differs as compared with the 2010 Review resulting in a further reduction of **0.17 million.**

6.5.1 Life expectancy

Life expectancy differences between Reviews arose from differences in baseline mortality rates (particularly for males) and differences to future mortality improvement rates. Of the two effects the difference in baseline mortality rates which reflects not just the 2015 base year but carries forward into each future year of the projection period is the more material effect. A selection of mortality rates or "qxs" at various spot ages expected to prevail in 2015 at the 2010 and 2015 Reviews is shown in Table 6.8. As can be seen there are quite material differences arising particularly for males and at older ages.

Mortality rates (Qxs) in 2015 - Base case projections versus 2010 Review				
	Expected at 2010 Review		Actual at 2015 Review	
Age	Male	Female	Male	Female
30	0.06%	0.03%	0.09%	0.03%
40	0.09%	0.06%	0.11%	0.06%
50	0.22%	0.17%	0.26%	0.17%
60	0.58%	0.41%	0.68%	0.44%
70	1.60%	1.08%	1.82%	1.21%
80	4.88%	3.55%	5.57%	3.80%
90	12.56%	11.25%	19.20%	15.00%

Table 6.8: Mortality rates at various spot ages (males and females) – 2010 and 2015 Review

A walk showing the attribution of the difference between the population projections by 2066 at the 2010 and 2015 Reviews is shown at Figure 8.6.

6.6 Labour Force

6.6.1 Information received and extrapolated

Information on labour force participation rates and employed, unemployed numbers was received from the Department of Finance. In the short term to 2021, the assumptions are in line with those used for the purposes of the SPU. For the longer term assumptions from 2022 onward, the assumptions were produced by the European Commission for Ireland and are intended to be used in the production of the upcoming "2018 Ageing Report".

The projection of the labour force involves multiplying labour force participation rates (by age and gender) at each future year by the projected population. Similar to the population projections, age and gender-specific labour force participation rates for each year to 2071 were adopted based on the assumptions anticipated to be used in the 2018 Ageing Report.

Population as a whole	2015	2025	2035	2045	2055	2060
Young (15-24)	38.0%	38.8%	41.1%	42.2%	41.0%	41.0%
Prime age (25-54)	81.2%	81.3%	81.2%	81.4%	81.3%	81.2%
Older (55-65)	57.9%	61.5%	64.5%	62.8%	63.1%	63.7%
Total Participation rate						
20 - 65	74.9%	75.5%	75.4%	75.3%	75.9%	76.0%
15 - 65	69.3%	69.2%	69.3%	69.8%	70.1%	69.9%

Table 6.9: Labour force participation rates – Population as a whole

Males	2015	2025	2035	2045	2055	2060
Young (15-24)	39.9%	40.6%	42.8%	44.0%	42.7%	42.7%
Prime age (25-54)	89.6%	87.6%	86.7%	86.8%	86.7%	86.6%
Older (55-65)	69.2%	68.7%	68.5%	65.9%	65.9%	66.3%
Total Participation rate						
20 - 65	83.3%	81.6%	80.3%	80.1%	80.6%	80.5%
15 - 65	73.6%	74.5%	73.6%	74.1%	74.3%	74.0%

Table 6.10: Labour force participation rates – Males

Females	2015	2025	2035	2045	2055	2060
Young (15-24)	35.9%	36.8%	39.3%	40.3%	39.2%	39.2%
Prime age (25-54)	73.2%	75.2%	75.6%	75.7%	75.7%	75.6%
Older (55-65)	46.8%	54.6%	60.8%	60.0%	60.4%	61.0%
Total Participation rate						
20 - 65	66.7%	69.5%	70.5%	70.5%	71.1%	71.3%
15 - 65	62.0%	63.9%	73.6%	65.4%	65.7%	65.6%

Table 6.11: Labour force participation rates – Females

We have applied the Commission's rates (e.g. labour force, participations rates etc.) on an age by age (rather than grouped age) basis to a revised population with Census 2016 overlay. Also a result the rates applied in our model when expressed on a grouped age basis (as a % of the revised population structure reflecting the overlay) are very marginally different to the Commission's rates quoted here.

6.6.2 Analysis of Labour force Participation rates

We note the following in relation to our analysis of labour force participation rates:

- Using recent trends in labour market behaviour the total participation rate (for the age group 20 to 65) is projected to increase by 1.1 percentage point (from 74.9% in 2015 to 76.10% in 2060), reflecting the fact that increase in female rates outweighs the projected reduction in male participation rates over the period.
- A large increase in participation rates is projected for female workers aged 55 to 65 from 47% to 61% compared to males of the same age for whom participation rate are projected to gradually fall from 69% to 66%, leading to a substantial narrowing of the gender gap in terms of participation rates of workers in the 55 to 65 year old group up to 2060.
- The participation rates of prime-age male workers (aged 25 to 54), at around 90% at outset declining to 87% at the end of the projection period remain the highest of all groups throughout the projection period.
- Overall total participation rates are mainly driven by changes in the participation rate of prime-age workers (25 to 54), as this group accounts for about 74% of the total labour force (albeit declining to 68% by the end of the projection period).

We set out in the Table 6.12 the projected labour force numbers for the projection period.

Age Group	2015	2025	2035	2045	2055	2060
	000s	000s	000s	000s	000s	000s
15-24	218	247	281	270	265	281
25-34	541	485	534	588	559	549
35-44	612	563	497	550	605	601
45-54	492	600	551	488	540	580
55-64	304	384	487	441	394	396
65-74	58	91	128	163	139	132
Total	**2,225**	**2,370**	**2,477**	**2,500**	**2,502**	**2,539**

Table 6.12: Labour Force numbers (in 000s) from 2015 to 2060 at each age group

In summary the total labour supply is projected to increase by 14% from 2.2 million in 2015 to circa 2.5 million in 2060.

Whilst the proportions of prime age workers participating in the labour force is broadly unchanged from 2010, there has been a shift in the age structure of the labour force at the younger and older cohorts. The participation of those under 24 in the labour force has reduced from 42% to 38%, whereas the participating rates at later ages continues to increase. At this 2015 Review it can be seen that 58% of those aged 55 to 65 are participating in the labour force whereas at the 2010 Review the figure for the 55 to 64 year old cohort was 56%.

6.6.3 Assumptions on Unemployment and adjustment to unemployment rates

As per the projections produced by the European Commission for the purposes of the 2018 Ageing Report, the unemployed population is calculated by applying the unemployment rates (by age band and gender) to the projected labour force.

	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
UE rate	9.4%	5.5%	6.1%	6.3%	6.2%	6.2%	6.1%	6.2%	6.2%	6.2%

Table 6.13: Unemployment Rate assumptions (aged 15 – 74, in percentages) proposed by European Commission for use in the 2018 Ageing Report

As referred to in Chapter 5 there is a step up between the short-term projections carried out for the purposes of the SPU to 2021 and those carried out by the Commission for the purposes of the 2018 Ageing Report. Ireland's unemployment rate is expected to fall to 5.5% by 2020 and then climb to 6.3% by 2030. From that year onwards the rate is projected to remain stable at approximately that long term level.

Gender-specific unemployment rates by age group are summarised below. It can be seen that at outset and throughout the projection period male unemployment rates are higher (typically 40% higher) and this is true at all ages.

Age Group (males)	2015	2020	2025	2030	2035	2040	2045	2050	2060
15 - 19	31.5%	16.0%	18.1%	18.4%	18.3%	18.4%	18.6%	18.6%	18.5%
20 - 24	21.2%	12.5%	14.0%	14.2%	14.1%	14.1%	14.2%	14.3%	14.3%
25 - 29	15.4%	8.6%	9.8%	9.9%	10.0%	10.0%	10.0%	10.1%	10.0%
30 - 34	10.3%	6.1%	6.8%	7.0%	6.9%	7.0%	7.0%	7.1%	7.0%
35 - 39	8.2%	5.1%	5.8%	5.9%	5.9%	5.9%	6.0%	6.0%	5.9%
40 - 44	9.9%	5.2%	5.9%	6.0%	5.9%	5.9%	6.0%	6.0%	6.0%
45 - 49	9.5%	4.8%	5.5%	5.6%	5.5%	5.6%	5.6%	5.6%	5.6%
50 - 54	8.6%	5.2%	5.9%	6.0%	6.0%	6.0%	6.0%	6.1%	6.0%
55 - 59	9.4%	5.5%	6.2%	6.3%	6.3%	6.3%	6.4%	6.4%	6.3%
60 - 64	8.8%	4.8%	5.3%	5.5%	5.4%	5.5%	5.4%	5.5%	5.4%
65 - 74	1.8%	1.5%	1.6%	1.5%	1.6%	1.5%	1.5%	1.4%	1.4%
15 - 74	**10.9%**	**6.2%**	**7.0%**	**7.2%**	**7.4%**	**7.3%**	**7.2%**	**7.2%**	**7.3%**

Table 6.14: Male Unemployment Rates by age-group

Age Group (males)	2015	2020	2025	2030	2035	2040	2045	2050	2060
15 - 19	23.2%	14.3%	16.1%	16.4%	16.3%	16.4%	16.5%	16.6%	16.4%
20 - 24	15.9%	8.3%	9.4%	9.5%	9.5%	9.5%	9.6%	9.6%	9.6%
25 - 29	9.5%	5.6%	62%	6.4%	6.3%	6.4%	6.4%	6.5%	6.4%
30 - 34	6.6%	4.1%	4.6%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%
35 - 39	6.1%	3.9%	4.4%	4.4%	4.4%	4.4%	4.5%	4.5%	4.5%
40 - 44	6.6%	4.2%	4.7%	4.8%	4.8%	4.8%	4.8%	4.9%	4.8%
45 - 49	7.1%	4.2%	4.7%	4.7%	4.7%	4.7%	4.8%	4.9%	4.8%
50 - 54	6.5%	2.7%	3.0%	3.1%	3.0%	3.1%	3.1%	3.1%	3.1%
55 - 59	4.9%	3.1%	3.5%	3.5%	3.5%	3.5%	3.6%	3.6%	3.6%
60 - 64	5.9%	2.9%	32%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
65 - 74	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15 - 74	**7.7%**	**4.4%**	**4.9%**	**4.9%**	**4.9%**	**4.9%**	**4.9%**	**4.9%**	**5.0%**

Table 6.15: Female Unemployment Rates by age-group

6.6.4 Employment Projections

Turning to the employment projections, it can be seen that the employment rate as a % of the overall population (for individuals aged 20 to 64) in Ireland is projected to increase from 69% in 2015 to 72% in 2021 (at the end of the short term projection period), thereafter reducing marginally to 71% and remaining consistently at that level for the remainder of the projection period.

The breakdown of the employment rates across the genders is shown in the two tables that follow.

Age Group (males)	2015	2020	2025	2030	2035	2040	2045	2050	2060
15 - 19	11.5%	15.2%	14.6%	15.4%	15.1%	15.3%	15.1%	15.0%	14.9%
20 - 24	51.7%	61.2%	59.9%	59.6%	60.2%	60.0%	60.0%	59.9%	59.8%
25 - 29	71.6%	78.7%	77.7%	77.5%	77.5%	77.6%	77.5%	77.4%	77.5%
30 - 34	81.7%	84.2%	83.7%	83.6%	83.6%	83.5%	83.5%	83.5%	83.5%
35 - 39	84.6%	86.6%	84.3%	84.3%	84.4%	84.3%	84.3%	84.3%	84.3%
40 - 44	82.6%	85.2%	83.6%	82.1%	82.2%	82.1%	82.1%	82.1%	82.1%
45 - 49	81.0%	83.2%	82.3%	81.3%	79.9%	79.9%	79.9%	79.9%	79.9%
50 - 54	79.4%	81.8%	79.4%	79.3%	78.5%	77.0%	77.1%	77.1%	77.1%
55 - 59	72.1%	73.8%	73.9%	73.0%	73.1%	72.2%	71.0%	71.0%	71.1%
60 - 64	56.8%	58.7%	57.5%	59.0%	58.3%	58.4%	57.4%	56.6%	56.6%
65 - 74	27.8%	29.7%	32.0%	33.5%	34.7%	34.2%	34.5%	33.2%	33.2%
15 - 74	**63.5%**	**65.9%**	**63.9%**	**63.3%**	**62.5%**	**62.1%**	**61.8%**	**61.9%**	**62.5%**

Table 6.16: Male Employment Rates by age-group

Age Group (females)	2015	2020	2025	2030	2035	2040	2045	2050	2060
15 - 19	11.7%	15.1%	14.4%	15.4%	15.2%	15.3%	15.1%	15.0%	15.0%
20 - 24	49.0%	58.3%	57.3%	57.0%	57.7%	57.6%	57.6%	57.5%	57.3%
25 - 29	69.5%	74.5%	73.9%	73.9%	73.9%	73.8%	73.8%	73.8%	73.8%
30 - 34	72.1%	71.7%	72.6%	72.6%	72.6%	72.6%	72.5%	72.5%	72.6%
35 - 39	69.5%	72.2%	69.8%	71.0%	71.0%	71.0%	71.0%	70.9%	71.0%
40 - 44	66.6%	72.6%	71.8%	70.0%	71.1%	71.1%	71.0%	71.0%	71.0%
45 - 49	65.6%	69.9%	73.4%	73.0%	71.5%	72.4%	72.4%	72.3%	72.4%
50 - 54	64.1%	66.3%	69.2%	73.0%	72.6%	71.1%	72.0%	72.0%	72.0%
55 - 59	55.1%	60.3%	61.5%	64.9%	68.5%	68.0%	66.6%	67.4%	67.6%
60 - 64	36.5%	42.8%	46.6%	48.8%	51.6%	54.5%	53.7%	52.8%	53.4%
65 - 74	11.6%	15.1%	20.9%	24.8%	26.5%	27.9%	29.8%	28.7%	28.8%
15 - 74	**52.4%**	**55.5%**	**55.3%**	**55.8%**	**55.8%**	**55.6%**	**55.2%**	**54.9%**	**55.9%**

Table 6.17: Female Employment Rates by age-group

Despite the negative prospects for population developments, including the rapid ageing of the population (as a proportion of the overall population), projected migration inflows which increase the labour supply, coupled with increased participation rates (particularly among female workers), is projected to contribute to an increase in the projected number of individuals employed during the period 2015 to 2060 (about 0.3 million increase from 2.0 million persons to 2.3 million persons).

Age Group (000's)	2015		2035		2060	
	Employed	Unemployed	Employed	Unemployed	Employed	Unemployed
15 - 19	35	13	52	11	55	12
20 - 24	138	32	162	22	189	26
25 - 29	209	30	209	19	256	23
30 - 34	276	26	242	15	239	15
35 - 39	298	23	250	14	231	13
40 - 44	266	25	284	16	240	14
45 - 49	238	22	304	16	247	13
50 - 54	214	18	267	13	277	13
55 - 59	170	14	217	11	273	14
60 - 64	110	9	149	7	191	9
65 - 74	57	1	90	1	127	1
15 - 74	**2,012**	**213**	**2226**	**144**	**2,325**	**152**

Table 6.18: Total Employment and Unemployment numbers by age-group (000s)

6.7 Assumed mortality improvement rates and associated Life expectancies

There is considerable uncertainty as to the rate of mortality improvements into the future and particularly the long term future.

Although people do continue to live longer than previously, the actual rate of improvement observed in the most recent study and reported on in the CSO Population and Labour Force Projections 2016 - 2046 was significantly below the expected levels from their 2011 set of projections. In the 2016 population projections, therefore, the CSO softened their rate of projected mortality improvements over the first 25 years of the projection, as compared with the previous projections 2011- 2036. This finding (of a lower rate of observed mortality improvement as compared with expectations) is consistent with other mortality studies in the UK, for example.

Further details on the CSO's population projections model are included in Box 6.1.

In agreeing assumptions on mortality for this set of projections the Expert Group decided to adopt the same targeting approach, whereby both a short and a long term rate of improvement were employed. The long-term rate of improvement is assumed to be 1.5 per cent and is unchanged since the last report. The short-term rate declines linearly over a 25 year period to the long term rate. Rates of improvement are projected separately for males and females. The short-term rate of improvement (the annualised weighted average of the 4 years 2006 to 2010) is calculated at 3 per cent for males and 2.5 per cent for females, representing a softening of expected improvements since 2007 (from 5 per cent for males and 3.5 per cent for females). These rates are assumed to apply to all ages up to age 90.

Under these assumptions male life expectancy at the end of period in 2046 is projected to be 85.1, a gain of 7.2 years over the 30 year period, whereas for females there is a projected gain of 5.8 years to 88.5. As can be seen from the resulting gains, the projections assume that the recent narrowing of the gap in life expectancy between males and females will continue over the projection period.

Box 6.1: Extract from CSO Population and Labour Force Projections 2016 – 2046 dated April 2013

6.7.1 Population Projections – further detail on mortality assumptions

As described in Section 6.2, in arriving at a base case for mortality and indeed population projections which in turn feed into all income and more particularly expenditure of the SIF, we replicate the above described mortality improvements in our population model. We amended the 2015 baseline mortality rates by allowing for the 3.5% per annum and 2% per annum mortality improvements for males and females respectively, reducing linearly to the long term rate of 1.5% per annum over a 25 year period.

This resulted in longer male life expectancies in particular as compared with the 2015 based Eurostat population projections as discussed in Section 6.2**.**

6.7.2 Differences in age structure – CSO projections and Eurostat 2015 based population projections

Table 6.19 shows the resulting differences in the population and in particular the over 66 year old population on the Eurostat and base case assumptions (which reflect CSO mortality improvement rates). As can be seen, notwithstanding differences in allowances for mortality improvement rates in the underlying methodologies, the population projections are very similar except at the outer end of the projection period.

Age Group	2035		2055		2071	
	Eurostat	**Base Case**	**Eurostat**	**Base Case**	**Eurostat**	**Base Case**
0 - 19	1,330	1,325	1,418	1,408	1,436	1,423
20 - 65	3,061	3,069	3,065	3,070	3,296	3,294
66 +	1,016	1,052	1,452	1,527	1,439	1,539
Total	**5,407**	**5,446**	**5,935**	**6,005**	**6,171**	**6,256**
0 - 19	25%	24%	24%	23%	23%	23%
20 - 65	57%	56%	52%	51%	53%	53%
66 +	19%	19%	24%	25%	23%	25%
Pensioner Support ratio	**3.0**	**2.9**	**2.1**	**2.0**	**2.3**	**2.1**
Total Support Ratio	1.3	1.3	1.1	1.0	1.1	1.1

Table 6.19: Population Structure (000's); Eurostat and base case mortality assumptions at various spot years

6.8 Irish Demographics relative to other EU Countries

Ireland's demographics are currently more favourable than across the EU as a whole which primarily reflects our historically higher fertility rate than many of our European counterparts. The dependency ratios in the table below reflect a definition of a "working age population" of 15-64 year olds based on the demographics prevailing and projected at the time of production of the 2015 Ageing Report.

Old age dependency ratios as per the 2015 Ageing report						
	2015	**2025**	**2035**	**2045**	**2055**	**2060**
IE	3.3	2.6	2.1	1.7	1.7	1.6
EU	2.3	2.0	1.7	1.6	1.6	1.5

Table 6.20: Old age dependency ratios as per 2015 Ageing Report

Table 6.20 shows the progression of the Irish old age dependency ratio and that of the EU as a whole. Although our demographics are currently more favourable than the EU's, (3.3 workers for every old age pensioner in 2015 as compared with 2.3 workers in the EU as a whole), they fall much faster and more dramatically.

The Irish old age dependency ratio based on this definition of working age being 15-64 is projected to fall by 48% over the 30 year period to 2045 versus 30% across the EU as a whole.

The fall in Irish support ratios is driven in the main by significantly lower fertility rates than prevailed historically (fertility rates in excess of 3 prevailed for much of 1960s – 1980s with a sharp drop in fertility rates in the1990s and onward to at or below the natural replacement rate of 2.1). A further attributing factor affecting the ageing of the population is the impact of increasing life expectancy.

Traditionally we have experienced net outward migration as a country albeit we did for a period in the 2000's switched from a country of origin to a destination country.

According to CSO statistics, Ireland returned to net inward migration in 2016 for the first time since 2009 (a modest net 3,100 individuals).

Eurostat in its 2015 population projections allows for Ireland to experience increasing levels of net inward migration from 2016 onward as shown in Tables 6.7 and 6.8.

6.9 Is ageing of the Irish population inevitable?

We saw earlier in this Chapter that the Irish population is projected to age substantially over the coming decades and that this change is projected to start impacting in the not too distant future. For example, by 2035 the pensioner support ratio is projected to reduce from 4.9 workers today to 2.9 workers at that stage.

Given that Irish fertility rates have been below "replacement levels" since the 1990s, and projected to remain below 2 into the long term future, the remaining "levers" within policymakers' control to reverse the ageing trend are to:

- increase the working lifetime by, for example, extending the age at which individuals stop working through increasing the SPA or other measures to increase the "effective" retirement age;
- encourage greater labour force participation particularly amongst currently under-represented groups;
- encourage a greater inflow of workers.

The impact by 2035 of increasing the SPA from 66 to 68 is seen by observing the difference in the projected pensioner support ratio before and after the change at Tables 6.1 and 6.2 i.e. an increase from 2.9 to 3.4 workers for every pensioner.

1.4 million is the additional number of workers needed (in the context of the then projected working age population of 3.2 million) by 2035 to ensure that the pensioner support ratio remains the same as current levels of 4.9 workers for every pensioner. By 2055, 3.6 million additional workers would be needed in order to maintain the pensioner support ratio at current levels.

6.10 Age-related expenditure – Impact on SIF and other Government Expenditure

This chapter has focused on population and labour force projections and in particular the changing age distribution of the population through time. The ageing of the population clearly impacts on the pension-related expenditure line items of the SIF (SPC, WPC primarily). It also poses a challenge for Invalidity Pension expenditure and to a lesser extent Jobseeker's Benefit at older ages, particularly where mandatory retirement ages and effective retirement ages remain below the SPA.

It is worth bearing in mind that the challenge of an ageing population as discussed in this Chapter impacts wider expenditure items (outside the SIF) including healthcare and long term care including nursing home care. The following quote on the age-related expenditures and the need to adopt a holistic approach to these is taken from the 2015 Ageing Report:

"Demographic projections are helpful in highlighting the immediate and future challenges posed to policy makers. The ageing of the EU population may entail additional government expenditure, namely on old-age pensions, long-term healthcare, and social assistance services. It is recommended that governments adopt a holistic approach to policy-making to account for this."

The 2015 Ageing report covers projections for various age-related expenditures, for example, one of which is pensions but additionally healthcare, long term care, education, and unemployment benefits. The projections feed into a variety of policy debates at EU level so as to identify policy challenges in the analysis of the impact of ageing populations on the labour market and potential economic growth.

6.10.1 Interaction between population ageing, employment, healthcare and other costs

It is anecdotally said that in countries where access to healthcare is available, the peak age for hip replacements is one year after retirement age, as individuals delay having the treatment until they are retired. Conversely in countries where healthcare access may be linked to employment, the peak age is before retirement age. Notwithstanding this, the interaction between employment, population ageing, longevity improvements, economic advancement and healthcare costs is complex.

However, it is inescapable that:

- healthcare costs will increase as the population ages;
- healthcare costs will increase as longevity improves; and
- changes to employment and retirement patterns may impact healthcare usage, just as changes to healthcare availability may impact employment patterns.

Any assessment of the adequacy of individual retirement income (Chapter 12 contains some commentary) needs to ensure that any future shift of healthcare costs to the individual is considered fully.

7 Base Case Results

This chapter gives an overview of the core results from our Review as follows:

- Projections of the level of income and expenditure up to 2071. We highlight the deficit that arises in real (2017 price) terms and as a percentage of GDP
- The break-even contribution rates needed to meet the total expenditure for a range of future time periods
- Comparison of pension and non-pension related expenditure over the projection period
- The discounted present value of future expected shortfalls

7.1 Income and Expenditure Projections – base case

Based on the methodology described in Chapters 5 and 6, we have projected the future income and expenditure of the Fund for the projection term to 2071.

Each of the tables in this chapter show results under the base case scenario.

The base case reflects the mortality projections included as part of the 2015 based population projections produced by Eurostat[43] with an adjustment to the mortality projections to incorporate an allowance for stronger mortality improvements in line with the CSO's most recent population projection model[44]. A fuller description of these demographic assumptions and indeed other demographic and macroeconomic assumptions underlying the projections is included in Chapter 5.

Table 7.1 shows the projected income and expenditure for each year up to 2030 and for spot years thereafter, up to 2071. All figures shown are in 2017 real price terms. The receipts and expenditure are both exclusive of the National Training Fund Levy which was €0.39 billion in 2016.

[43] 2015 based population projections produced by Eurostat intended to be used in the production of "The 2018 Ageing Report"; a Report to be prepared by the European Commission (DG ECFIN) and the Economic Policy Committee (EPC)
[44] Population and Labour Force Projections 2016 – 2046 dated April 2013

Income and Expenditure Projections				
Year	**Receipts**	**Expenditure**	**Surplus / (Shortfall)**	**(Shortfall) as a % of GDP**
2015	8.5	8.6	(0.1)	0.0%
2016	9.2	8.8	0.4	0.2%
2017	9.6	9.1	0.5	0.2%
2018	9.8	9.5	0.2	0.1%
2019	9.9	9.9	0.0	0.0%
2020	10.0	10.3	(0.2)	(0.1%)
2021	10.2	10.8	(0.6)	(0.2%)
2022	10.3	10.9	(0.6)	(0.2%)
2023	10.4	11.4	(1.0)	(0.3%)
2024	10.6	11.9	(1.3)	(0.4%)
2025	10.7	12.4	(1.7)	(0.5%)
2026	10.8	12.9	(2.1)	(0.6%)
2027	11.0	13.6	(2.7)	(0.8%)
2028	11.1	13.9	(2.8)	(0.8%)
2029	11.2	14.1	(2.9)	(0.8%)
2030	11.3	14.6	(3.3)	(0.9%)
2035	12.1	17.8	(5.6)	(1.4%)
2045	14.2	25.6	(11.4)	(2.4%)
2055	16.9	34.2	(17.3)	(3.1%)
2071	22.5	44.7	(22.2)	(2.9%)

Table 7.1: Progression of total income and expenditure (€ billions) and deficit as percentage of GDP for each future year up to 2030 and spot years thereafter

We note the following in relation to these projections:

- There is a small opening surplus in 2016 reflecting a significantly different opening position as compared with the 2010 Review when there was a shortfall of €1.5 billion and a PRSI base of €7.5 billion in 2011.
- Small surpluses are projected to continue to materialise to 2019 and by 2020 the Fund is projected to experience a small shortfall, increasing thereafter.
- In the absence of any changes to PRSI rates or subventions from the State, projected expenditure in excess of income is anticipated to reach just under €1.7 billion by 2025 and €3.3 billion by 2030 in real 2017 price terms, increasing markedly thereafter.
- We anticipate that the shortfall will continue to grow modestly to 2.4% of GDP by 2045 and to 3.1% of GDP in 2055 thereafter reducing modestly to 2.9% by 2071.

We would point out that the base case differs as compared with the 2010 Review:

- The assumptions adopted have been updated to reflect the current economic outlook;
- The SPC expenditure calculations have been performed reflecting the current “yearly average” contribution rules throughout. By contrast, the 2010 Review reflected the current “yearly average” contribution rules to 2019 only, with new entries from 2020 onward anticipated to retire under the “total contributions approach” described in the National Pensions Framework.
- Anticipated expenditure includes the projected Christmas bonus at 85% of one week’s payment on the long term schemes for each year into the future. The expenditure also reflects the 2017 Budget measures which extended Treatment Benefit to the self-employed from March 2017 and Invalidity Pension from December 2017.

- The short term projections and the anticipated surpluses arising reflect the higher 2016 PRSI base as compared with the previous Review and reduced expenditure commitments in some of the non-pension-related schemes (e.g. the reduction in duration of Jobseeker's Benefit by up to 3 months).
- Over the longer term the overall expenditure projections continue to be driven, in the main, by the ageing of the population and the steep progression in expected pensioner numbers through time.

A range of expenditure projections reflecting a variety of different policy scenarios is included in Chapter 12. A comprehensive analysis of the reasons for the differences in income and expenditure between this review and the previous review has been conducted and described in Chapter 8.

Detailed projections of income and expenditure by line item are included in Appendix 5.

7.2 Break-Even Contribution Rates

We have calculated the break-even rates needed to meet the expenditure levels over each future time period. These rates are expressed as a multiple of the projected contribution income in each future time period i.e. the increase of revenue in that period needed to meet the shortfall. We calculate these rates over a range of time periods:

- An annual basis;
- 5 year period;
- Over successive 10 year periods;
- Over successive 20 year periods.

Table 7.2 shows the calculated break-even rates for the base case on the basis of no Exchequer contributions, and the subsequent Table 7.3 shows the calculated break-even rate on the basis of:

- No Exchequer subvention;
- An annual Exchequer subvention of 25% of the benefits paid;
- An annual Exchequer subvention of 33% of the benefits paid.

Equalised contributions – annual periods	
Year	**Equalised contribution rates**
2016	95%
2017	95%
2018	98%
2019	100%
2020	102%
2021	106%
2022	106%
2023	109%
2024	113%
2025	116%
2035	147%
2045	181%
2055	202%
2065	201%
2071	199%

Table 7.2: Equalised annualised contribution rates to 2025 and at spot years thereafter

The individual years equalised contribution rates commence at 95% in 2016 and increase to circa 202% in 2055. This would mean that by 2055 if no Exchequer subvention was available PRSI rates would need to be more than double what they are otherwise projected to be in that year in order to balance income and expenditure. More immediately, the above figures show that by 2025 PRSI rates would need to be 16% higher than currently in order to balance income and expenditure (where no Exchequer subventions are available).

Equalised Contribution Rates over 5, 10, 20 years and whole projection period

Equalised Contribution rates over range of periods			
Starting	**No Subvention**	**Subvention of 25%**	**Subvention of 33%**
	Equalised Contributions for 5 year period		
2018	102%	77%	69%
	Equalised Contributions for 10-year period		
2018	110%	82%	73%
2028	139%	104%	93%
2038	173%	130%	116%
2048	197%	148%	132%
2058	202%	151%	135%
	Equalised Contributions for 20-year period		
2018	125%	94%	84%
2038	186%	140%	125%
2058*	201%	151%	134%
	Equalised Contributions for whole projection period		
2018	174%	131%	117%

Table 7.3: Equalised Contribution Rates

*13 year (as opposed to 20 year) year period beginning 2058 and ending in 2071.

Referring to Table 7.3, where only five years' worth of SIF-related expenditure is considered, a circa 2% increase in contribution income is necessary in order to be adequate to meet benefit outgo.

However, in the medium to longer term, more significant step changes in income would be required – the corresponding increase for the ten year period 2028 - 2038 is 39%.

By way of explanation, the 148% highlighted in column 3 of Table 7.3 indicates that PRSI receipts of 48% higher than is currently projected based on current rates in force, coupled with state subventions of 25% of expenditure each year would be necessary to keep the Fund in balance for the 10 year period commencing in 2048.

Over the entire projection period, an increase of 74% of PRSI rates or significant reductions in expenditure or substantial Exchequer subventions (or a combination of approaches) will be required to balance income and expenditure.

In summary the table demonstrates that either substantial state subventions, increased PRSI receipts (or reduced expenditure) or a combination will be needed to keep the Fund in balance.

7.3 Comparison of Pension and Non-Pension Benefits

Table 7.4 shows the projected expenditure of the Fund split by pension and non-pension benefits for each year to 2030 and at spot years thereafter.

Base Case				
Year	**Receipts**	**Pension Expenditure**	**Other expenditure**	**Total Expenditure**
2015	8.5	5.9	2.7	8.6
2016	9.2	6.1	2.7	8.8
2017	9.6	6.4	2.7	9.1
2018	9.8	6.7	2.8	9.5
2019	9.9	7.0	2.9	9.9
2020	10.0	7.3	2.9	10.3
2021	10.2	7.6	3.2	10.8
2022	10.3	7.6	3.3	10.9
2023	10.4	8.0	3.4	11.4
2024	10.6	8.4	3.5	11.9
2025	10.7	8.8	3.6	12.4
2026	10.8	9.2	3.7	12.9
2027	11.0	9.8	3.8	13.6
2028	11.1	9.7	4.1	13.9
2029	11.2	9.9	4.2	14.1
2030	11.3	10.3	4.3	14.6
2035	12.1	12.9	4.9	17.8
2045	14.2	19.5	6.1	25.6
2055	16.9	27.5	6.7	34.2
2071	22.5	35.7	9.0	44.7

Table 7.4: Pension and non-pension related expenditure (€ billions) under base case assumptions

We have compared the pension and other benefits as a percentage of both contribution income and benefit outgo.

The results indicate that pension expenditure as a proportion of total social insurance expenditure would rise from roughly 69% in 2015 to 80% in 2071.

Similarly, although contributions have not been explicitly hypothecated to different benefits, pension related expenditure as a proportion of total PRSI receipts is projected to rise from 69% in 2015 to 159% in 2071.

7.4 Discounted value of future shortfalls in the Fund

Table 7.5 shows the discounted value at the date of the Review of the projected shortfalls of the Fund. It is €335 billion using a real discount rate of 1.5% per annum.

This is defined as the present value of the Fund shortfalls (i.e. the difference between projected contribution income and expenditure) over the period in question.

It is important to realise that the discounted value of the future shortfalls is a hypothetical figure reflecting the “pay as you go” nature of the system. It is however a useful measure (expressed in 2017 real price terms).

Discount rate used in the calculation of the present value of future shortfalls

A discount rate is required for the calculation of the present value of future shortfalls. The "real" discount rate, specifically, is critical to the determination of the value of the present value of future shortfalls.

There are a number of approaches which could be used in setting the discount rate to value the shortfalls. These are described further in Appendix 6.

Ultimately we have used a discount rate of 3.5% per annum nominal (or circa 1.5% per annum "real" in the long term) for the calculation of the shortfalls.

The results are highly sensitive to the real discount rate chosen which is a crucial assumption reflecting the projection horizon and the fact that most of the substantial shortfalls arise in the later periods.

- If, for example, a real discount rate of 2% per annum was chosen as per the 2010 Review, the €335 billion would reduce to €280 billion. (€324 billion was the assessed value at the 2010 Review based on 2010 data and the macro-economic and demographic outlook at that point.)
- If a real discount rate of 3% per annum was used the figure would reduce further to €197 billion.

Net present value of projected future shortfalls				
Period	**"Real" discount rate assumptions (p.a.)**			
	1%	**1.50%**	**2%**	**3%**
5 years to 2020	1.0	1.0	1.0	1.0
10 years to 2025	-3.8	-3.6	-3.5	-3.1
20 years to 2035	-35.6	-33.0	-30.7	-26.5
30 years to 2045	-104.0	-93.4	-83.9	-68.1
Full period to 2071	**-404.2**	**-335.4**	**-279.6**	**-196.9**

Table 7.5: Net Present Value of projected future shortfalls (€ billions) as at 31 December 2015 under a range of alternative "real" discount rate assumptions

Sustainability or fiscal gap

The present value of future shortfalls is an important and relevant figure arising from the 2015 Review in terms of any attempt to ascertain the sustainability of the SIF.

As we later point out in Chapter 10, it is only possible to draw conclusions about the sustainability of a social security scheme by comparing pension and indeed other social security obligations with the respective assets (in the case of the Irish system the present value of future PRSI receipts). The resulting residual amount of obligations and assets represents the sustainability or fiscal gap. It represents the stock which has to be set aside today to sustain the present social insurance expenditure system (in its legal status quo) into the long term.

The present value of the shortfalls represents the present value of the amounts which will need to be paid by way of Exchequer subvention to sustain the social insurance expenditure system over the 55 year projection period. The €335 billion is the present value of the balances projected to be required from future Exchequer subventions and is 1.2 times Irish GDP[45] in 2016.

[45] GDP in 2016 was €275.510 billion per the CSO's National Income and Expenditure Annual Results in constant price terms

8 Comparison with 2010 Review

This chapter sets out the principal differences between this Review and the 2010 Review. These differences include:

- Comparison of Results between Reviews - Overview
- Actual versus Expected experience between Reviews
- Revised outlook for projections
- Legislative and policy changes affecting contribution income and benefit payments
- The effect of assumptions changes (macro-economic and demographic)
- Modelling changes / projections into the future

8.1 Comparison of results between Reviews - Overview

We have compared the results of the 2010 and 2015 Reviews in this Chapter.

We start with a comparison of actual to expected, in terms of overall income, expenditure, and shortfall, followed by a review of actual versus expected expenditure split into pension and non-pension components.

We then analyse the change in the projections of income, expenditure, and shortfall and the main components feeding into these elements. This reflects the changed macroeconomic and demographic outlook changed eligibility conditions for access to benefits and pensions and modelling refinements, particularly in respect of SPC.

	Actual			Expected at 2010 Review		
Year	Income	Expenditure	Excess / (Shortfall)	Income	Expenditure	Excess / (Shortfall)
2011	7,544	9,004	-1,460	7,544	9,029	-1,485
2012	6,786	8,870	-2,084	7,087	8,915	-1,828
2013	7,318	8,632	-1,314	7,194	9,218	-2,024
2014	7,891	8,433	-542	7,496	9,504	-2,008
2015	8,498	8,617	-119	7,647	9,687	-2,040

Table 8.1: Actual cash-flows (€ millions) during inter-review period versus expected at 2010 Review

The previous review was carried out in 2012, in a very different economic environment. There had been a large deterioration in income coupled with the significant increase in expenditure, particularly in non-pension benefits such as Jobseeker' Benefit.

Since then there has been a significant turnaround in the position of the Fund in terms of both higher income and reduced expenditure.

The €1.9 billion variance in the Fund finances compared with what was expected by 2015 in the previous review comprised a combination of €850 million more PRSI income than expected and €1 billion less in overall expenditure.

We will see in the sections that follow that the main attributing factors to the changed position were actions taken in the interim with respect to the finances of the Fund:

- In terms of the changed PRSI income compared with that expected, the main contributing factor was the measures taken in the intervening period to broaden the PRSI base;

- The main reason for the differences in benefit expenditure (both pension and non-pension related) was the lower level of rate increases granted over the period to 2015 as compared with expected, coupled with changes to some of the non-pension benefit expenditure which had not been anticipated at the 2010 Review.

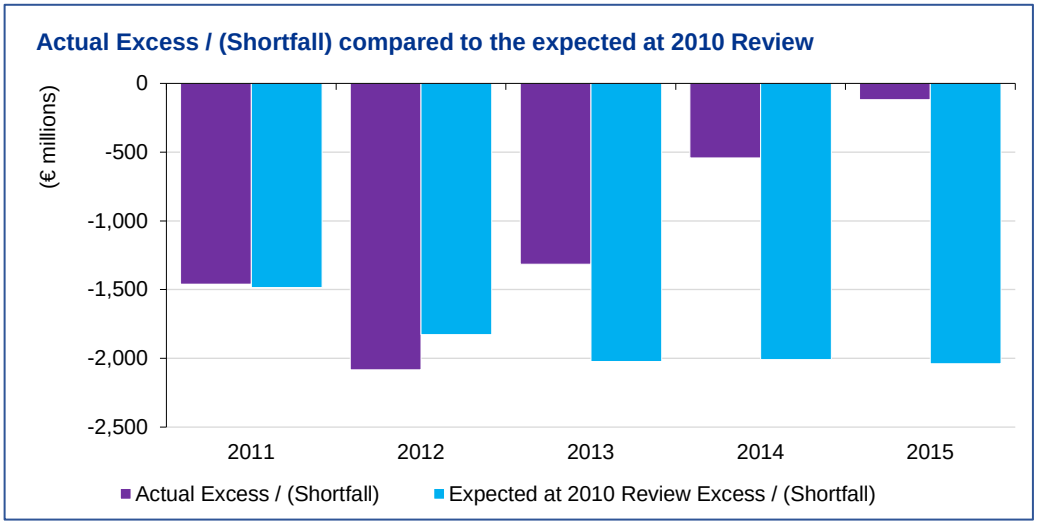

Figure 8.1: Chart of actual excess / shortfall (€ millions) of income over expenditure versus expected

8.1.1 PRSI Income

The main reason for the differences on the PRSI side reflect the various PRSI base broadening measures (just under €800 million) carried out since the 2010 Review which made a strong contribution to the restoration of the Fund's finances. There was a marginally (circa 1%) higher overall earnings base[46] (€85 million) due in the main to the sharp reduction in unemployment over the period mitigated by the impact of lower average earnings growth than anticipated.

One of the more significant budgetary measures taken with respect to the PRSI base was the 2013 Measure which abolished the weekly PRSI-free allowance of €127 for people paying at Class A, H, E and the abolition of the €26 PRSI free allowance for modified rate contributors. The full list of Budgetary measures taken with respect to PRSI are included in Chapter 3.

8.2 Actual versus Expected to 2015

Table 8.2 compares the actual expenditure by type over the period since the previous review (2011 to 2015 inclusive) with projected expenditure:

	Actual			Expected at 2010 Review		
Year	Pension related	Non-pension related	Total Expenditure	Pension related	Non-pension related	Total Expenditure
2011	5,120	3,884	9,004	5,131	3,898	9,029
2012	5,320	3,549	8,870	5,288	3,627	8,915
2013	5,498	3,133	8,632	5,758	3,460	9,218
2014	5,641	2,792	8,433	5,977	3,527	9,504
2015	5,907	2,710	8,617	6,211	3,476	9,687

Table 8.2: Actual expenditure (€ millions) by type (pension and non-pension) during inter-review period versus expected at 2010 Review

[46] Per CSO statistics total earnings in 2015 were €58,837 million compared with €56,008 million in 2010. At the previous review cumulative nominal earnings growth of 3.8% was anticipated over the 5 year period which would have increased total earnings to €58.1m (€56,008m x 1.038) were our assumptions realised. The composition of the change however rseulted from a broadly unchanged average earnings (average earnings increased marginally from €33,547 to €33,743 between 2010 and 2015) but higher than expected employment numbers due to the sharp reduction in unemployment.

8.2.1 Pension benefits expenditure

Overall the projected SPC expenditure was €6.2 billion, whereas €5.9 billion materialised. The majority of the difference is attributable to rate increases over the period which were lower than those expected. The projections in 2010 allowed for nominal rate increases overall of circa 4% by 2015 which meant the SPC would be maintained at 33% of Average Earnings by 2015 whereas by 2015 the SPC had not been increased[47]. Had rates increased as expected the €5.9 billion would have increased to €6.1 billion.

8.2.2 Non-pensions benefits expenditure

Projected 2015 non-pension benefits expenditure was €3.5 billion (2016 real price terms) compared to the actual €2.7 billion that materialised in that year. Much of the divergence in expenditure reflects lower rate increases on the non-pension benefits to 2015 as compared with expected.

The expenditure on certain non-pension benefits such as Jobseeker's Benefit naturally reduced due to the reduction in unemployment rates as compared with those expected at the 2010 Review.

Further there were some curtailments to benefits over the period since the 2010 Review due to the introduction of measures including:

- the 2013 Measure which reduced the duration of Jobseeker's Benefit by up to 3 months.
- the 2014 Measure which reduced the weekly rate of Invalidity Pension payable to 65 year olds from €230.30 per week to €193.50 per week from January 2014.

The starting point of this Review in terms of current income and expenditure of the Fund at 31 December 2015 (€8.5 billion and €8.6 billion, respectively) is therefore quite different to what was anticipated in 2012 (€7.7 billion and €9.7 billion[48]).

8.3 Revised outlook for Cash-flow Projections

The following table compares selected results from the previous 2010 Review and the results of the 2015 Review.

	Comparison of annual shortfall results (€ millions) at 2010 and 2015 Reviews - various spot years					
Shortfall	**2015**	**2025**	**2030**	**2045**	**2060**	**2066**
2010 Review	2,039	4,102	5,551	15,315	23,917	25,736
2015 Review	119	1,703	3,279	11,438	19,316	21,283

Table 8.3: Projected cash-flows (€ millions) expected at 2010 and 2015 Reviews

	Comparison of PRSI (€ millions) at 2010 and 2015 Reviews - various spot years					
Shortfall	**2015**	**2025**	**2030**	**2045**	**2060**	**2066**
2010 Review	7,647	10,343	11,779	15,615	20,747	23,542
2015 Review	8,498	10,723	11,332	14,182	18,477	20,579

Table 8.4: Projected PRSI (€ millions) expected at 2010 and 2015 Reviews

[47] The SPC has since been increased between 2015 and 2017 from €230.30 to €238.30.
[48] These figures do not include the impact of price inflation in the 5 intervening years

The main reason for the difference at outset has been explained in the preceding sections. Proejcted PRSI income starts out ahead of expectations at the 2015 Review. It continues ahead of expectations up to circa 2028 at which point the impact of the lower projected working age population at this Review begins to bite (see Figure 8.3). By 2066 (the end of the projection period at the previous Review) projected PRSI income circa 13% lower.

	Comparison of expenditure (€ millions) at 2010 and 2015 Reviews - various spot years					
Shortfall	**2015**	**2025**	**2030**	**2045**	**2060**	**2066**
2010 Review	9,687	14,445	17,330	30,930	44,664	49,278
2015 Review	8,617	12,426	14,612	25,620	37,792	41,862

Table 8.5: Projected expenditure (€ millions) expected at 2010 and 2015 Reviews

In terms of expenditure projections, the cash-flows are below expectations compared with the 2010 Review primarily because of a combination of lower expenditure at outset as compared with expectations, higher numbers of deaths of the existing stock of beneficiaries (due to higher mortality rates in 2015 primarily and lower projected improvement rates) coupled with lower numbers of new entries to the SPC due to a combination of lower projected population size and refined modelling of individuals in each of the retiring datasets to qualify and hence claim SPC.

8.3.1 Other observations on differences between the 2010 and 2015 Reviews

- The projected population of over 65 year olds by 2066 is significantly lower in absolute terms compared with the 2010 Review as can be seen from Figure 8.3 resulting from lower net inward migration, lower assumed life expectancies, and lower fertility assumptions. A walk showing the differences between Reviews of the projected population in 2066 is shown at figure 8.6.
- Consequently, the annual shortfall in 2066 (the end of the projection period at the 2010 Review) is expected to be lower at this Review - a shortfall of €20.5 billion in 2017 real price terms versus a shortfall of €25.7 billion identified at the 2010 Review in 2012 real price terms.
- The projected split between pension and non-pension expenditure at this Review by 2066 is €32.9 billion: €7.9 billion (4.2:1), whereas the equivalent ratio at the previous Review was €42 billion: €7.3 billion (5.8:1).
- The pensioner support ratio at the 2010 Review was projected to reduce from 5.3 workers to every pensioner (over age 68) in 2010 to 2.5 by 2065, whereas the findings of this Review are that the support ratio will reduce from 4.9 workers in 2015 to 2.4 workers for every pensioner over age 68 by 2065. The change in the later years is explained in part by the lower assumed fertility assumption and lower absolute net inward migration numbers[49].
- The 2012 changes to pensions had a more positive impact on projected SPC expenditure by the end of the projection period than was anticipated at the previous Review.
- At the previous Review we anticipated the 2020 changes which had been mooted in the National Pensions Framework in our projections. At this review we allowed for current rules only (i.e. the post 2012 rates for new entries to SPC) for consistency with the approach followed for the purposes of the ADL calculation. [The effect is marginal with projected SPC

[49] The shape of the migration numbers has also changed since the 2010 Review. Although overall net inward is assumed at this Review those of working age (positive contributors to PRSI receipts) are assumed to experience net outward migration.

expenditure in 2071 of €30.1 billion using the current YA approach and €29.9 billion using the post 2020 TCA approach.]

8.3.2 Attribution of differences arising

The main causes of the change from the 2010 to the 2015 Review in terms of the projections of future cash-flows can be categorised as discussed in the following paragraphs:

- Actual experience between the dates of the two reviews as discussed in the preceding paragraphs;
- Legislative and policy changes affecting contribution income and benefit payments;
- Changes in assumptions (macroeconomic and demographic);
- Modelling assumptions / changed outlook and judgements in particular with respect to SPC.

8.4 Policy measures taken since 2010 Review – further detail

Various different measures were taken in terms of the expenditure and income of the Fund since the 2010 Review as outlined in Chapter 3.

The initial phase covers the period 2013 to 2015 and saw the continuation of a number of measures which had commenced in 2009 designed to reduce expenditure from the Fund in order to ensure its financial sustainability into the future. Measures in the period included the 3 month reduction to the period for which Jobseekers Benefit is payable and a reduction in the rate of Invalidity Pension for 65 year olds.

The period 2015 to 2017 saw the improvement in a number of schemes and the introduction of new schemes and the restoration of previous benefits e.g. Paternity Benefit was introduced in 2016 and the Christmas Bonus was restored in December 2014 for long term welfare recipients and paid at rate of 85% from December 2016.

8.4.1 PRSI Receipts

The PRSI base broadening measures implemented since the previous Review particularly had a strongly positive impact. The more impactful measures were:

- The abolition of the earnings ceiling for the payment of employee PRSI (prior to 2009 there had been a ceiling in place of €50,700);
- The abolition of the weekly PRSI-free allowance of €127 for people paying at Class A, H and E and of the weekly €26 for modified rate contributors.

8.5 Assumptions changes between Reviews (macroeconomic and demographic)

8.5.1 Macroeconomic Assumptions

Figure 8.2 below compares the differences between assumptions used in the 2015 and 2010 Reviews.

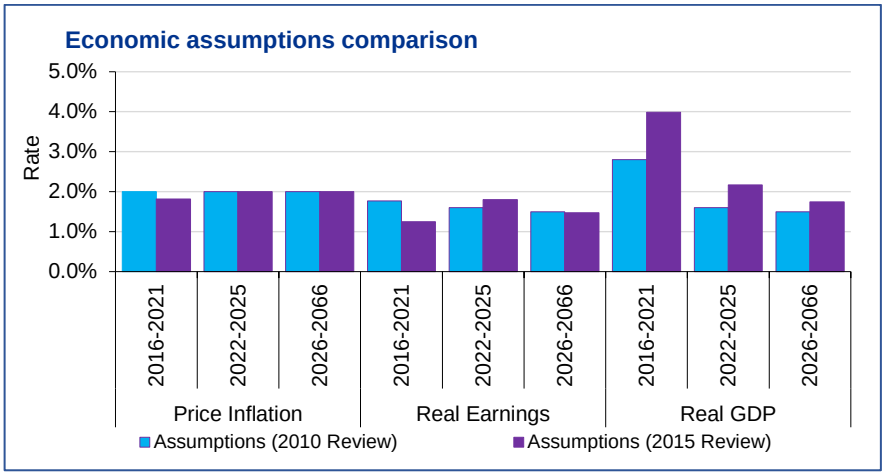

Figure 8.2: Differences in key economic assumptions 2010 and 2015 reviewsThe key differences are:

- The price inflation is broadly in line with the assumption from the 2010 Review apart from the first 5 years (2016 - 2021) when it was expected to be 2.0% per annum at the previous Review versus 1.8% per annum at this Review.
- In keeping with the assumptions set out under the SPU, real earnings are lower at this Review in the short term (2016-2021) at 1.3% versus 1.8% per annum previously. Over the medium term (2022-2025) however real earnings are assumed to be higher at 1.8% at this Review compared with 1.6% at 2010 Review and the long term assumptions (from 2026+) at both Reviews coincide at 1.5% per annum.
- For GDP growth, the economic environment is very different for the 2015 Review when compared with the 2010 Review. Real GDP growth is assumed to be materially higher at this Review (4% per annum in 2015 (2.8% in 2010) in the short term, 2.2% in 2015 (1.6% in 2010) in the period 2022 - 2025 reducing to 1.7% per annum in 2015 (1.5% per annum in 2010) thereafter.
- Although not shown on the above chart, the assumed unemployment rate is significantly lower in the short and medium terms (6.1% in the period 2016-2021, reducing to 5.7% in the years 2022-2025 inclusive) as compared with that assumed at the 2010 Review (13.7% in the period 2016-2021, reducing to 11.1% in the years 2022 - 2025 inclusive). At both reviews the long term structural unemployment rate is assumed to equal 6.2% over the period 2026 - 2066.

Overall the key macroeconomic assumption of the cumulative real earnings growth is not significantly different over the projection period. The cumulative impact of the real earnings growth assumption in the period 2016 – 2066 was to increase benefits by 211% at the 2015 Review versus 218% at the 2010 Review – a reduction of circa 3.4% in expenditure by 2066.

8.5.2 Demographic Assumptions

Figures 8.3 and 8.4 compare the population projections between the 2010 Review and 2015 Reviews for those in the working group (aged 20-64) and those over 65 respectively. The charts below show the projections on the base case and the projections which would have resulted had we allowed for the Eurostat mortality improvement assumptions. As can be seen there is a considerable difference between the projected size of the working age population at this Review as compared with the 2010 Review with the impact starting to bite from 2025 onward.

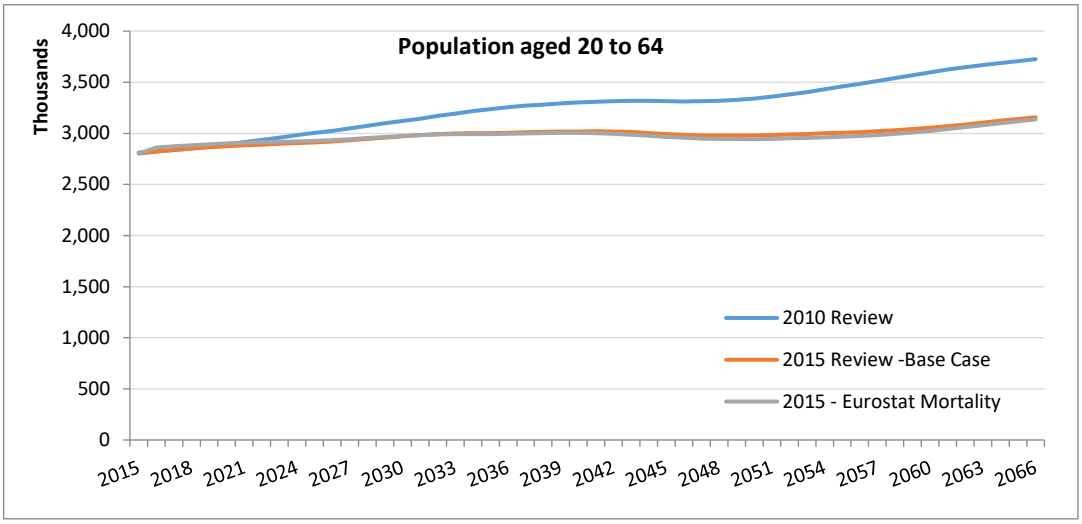

Figure 8.3: Differences in projection of working age (20-64) population; 2010 and 2015 reviews

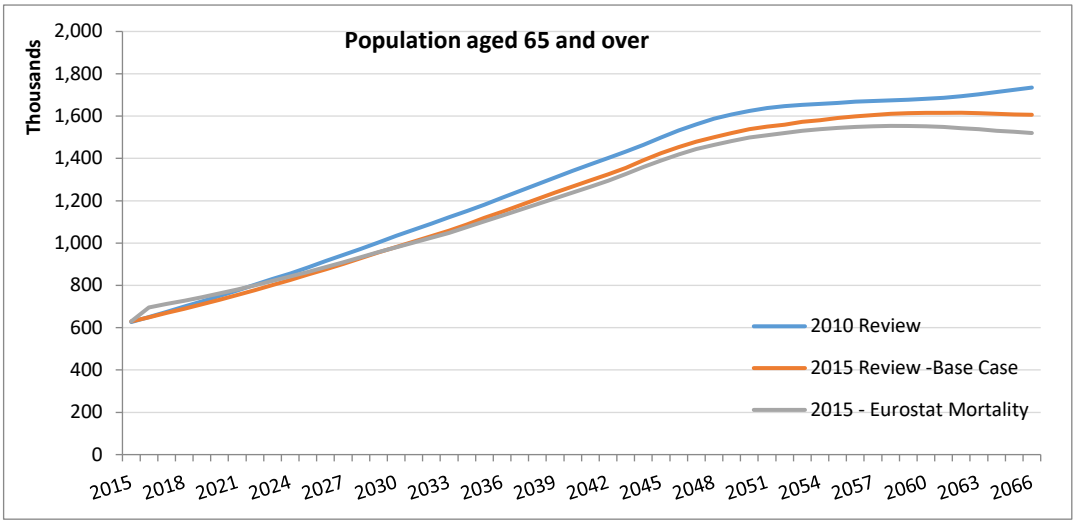

Figure 8.4: Differences in projection of population aged 65 and over; 2010 and 2015 reviews

At this review the population is projected to rise to 6.2 million by 2066 whereas at the 2010 Review, the population was projected to rise to just over 7 million by 2066. Despite the significant differences in the absolute size of the projected population, the proportion assumed to be aged 68+ (i.e. over SPA) remains unchanged between reviews at 22% / 23%.

The main reasons for the differences in the size of the projected population by 2066 are:

- the absolute numbers of inward migrants is materially lower (and over a prolonged period) than at the 2010 Review (see Figure 8.5);
- life expectancies are shorter at the 2015 Review as compared with the 2010 Review particularly for males. For example life expectancy from age 65 by 2060 had been anticipated

to be 25.8 years for males, 27.0 years for females. At this Review the different base line mortality rates and different rate of projected future mortality improvements results in comparable projected life expectancies for a 65 year old in 2060 of 24.5 years for males and 26.1 years for females;

- the distribution of the migrants across the age cohorts differs substantially as compared with the 2010 Review (a sizeable proportion of those child-bearing age are assumed to leave the country at this Review whereas previously net inward migration was assumed for this cohort at each future year);
- the fertility rate has fallen (1.92 in 2015 as compared with 2.06 projected at 2010 Review) and the projections are that future assumed fertility rates are slightly lower than those assumed at 2010.

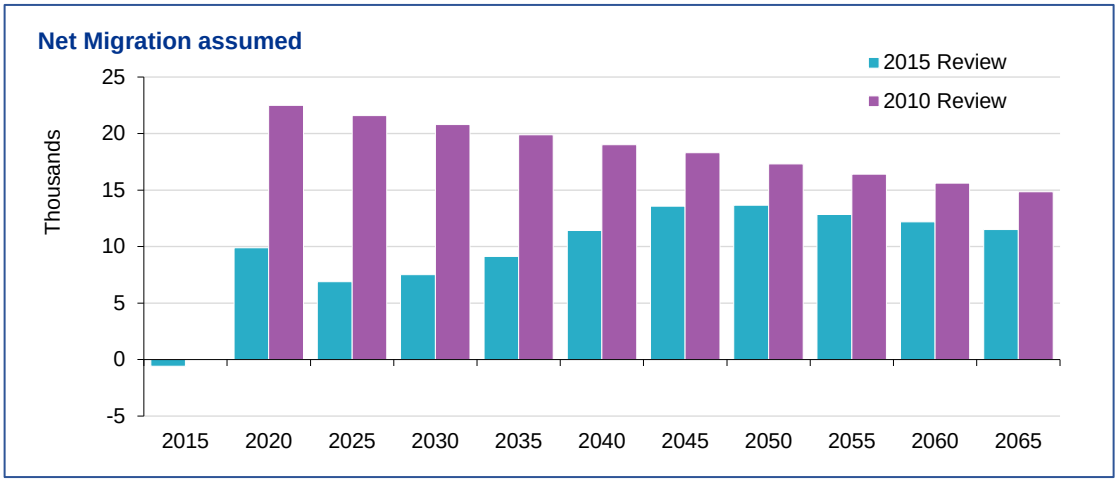

Figure 8.5: Migration numbers (000s: 2010 and 2015 Reviews)

8.6 Walk of Population Projections

Figure 8.6 shows a walk of the population projections by 2066 as anticipated at the 2010 Review (7.05 million) to the population projections under the base case of 6.2 million at the 2015 Review. As can be seen the main reasons for the difference arising are the lower migration numbers year on year (a reduction of 0.49 million by 2066) coupled with different mortality rates (particularly for males) resulting in a further reduction of 0.10 million and reduced fertility rates resulting in a reduction of 0.15 million.

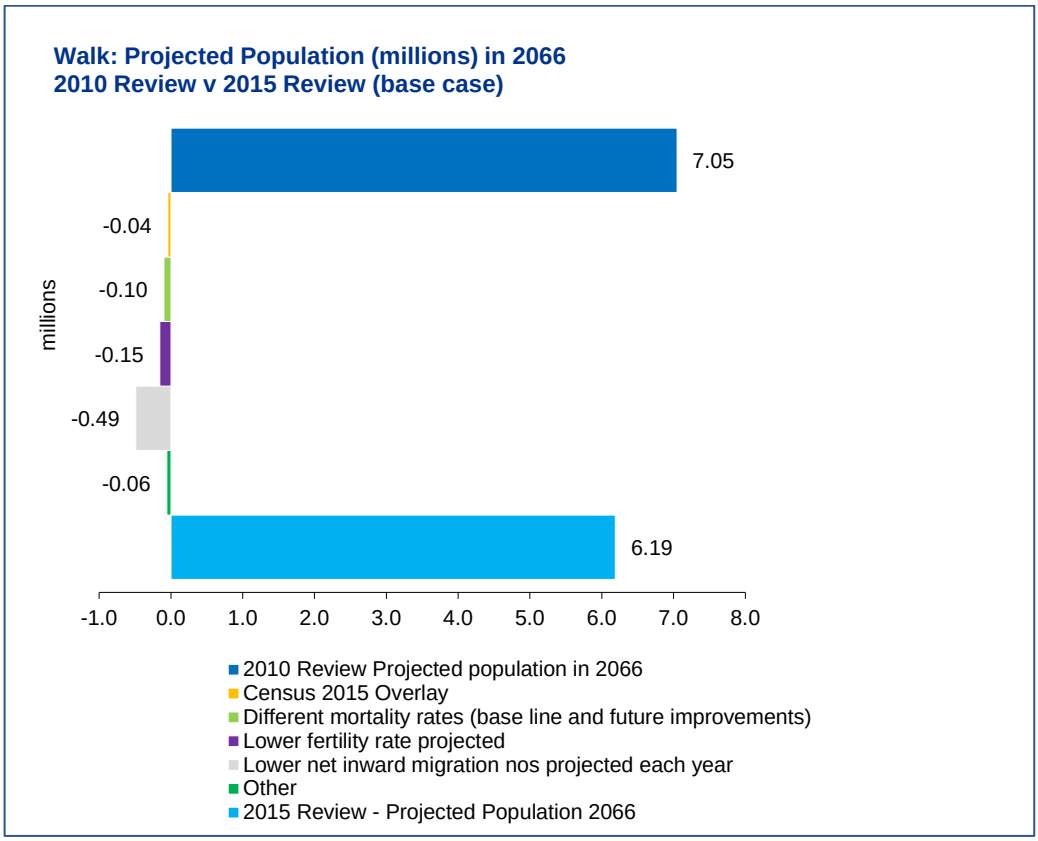

Figure 8.6: Walk of population projections in 2066 (2010 Review versus 2015 Review)

8.7 Modelling differences / projections into the future

The number of projected recipients / claimants and the associated weighted average SPC into the future differs at this 2015 Review as compared with previously.

We were provided wth additional data at this Review (datasets in resect of each retiring cohort for the first ten years of the projection period and spot years thereafter) which allowed us to assess the numbers qualifying for and claiming SPC in more detail than at the 2010 Review. Our modelling allowed for numbers qualifying based on those in the datasets with an allowance for those present today to experience mortality between now and anticipated retirement. We were provided with the rate of conversion of “potential” to actual claimants in 2016 (which translated to 90% of males and 82% of females) and allowed for this assumed conversion of actual claimants to potential qualifiers into the future. Overall the impact of the revised modelling is a more modest projected trajectory of new entries to SPC over the projection period which is reflective of the underlying data and reflects the fact at this Review that not all of those who qualify for SPC will actually claim - a portion will access other schemes such as SPNC, IQA.

There is some level of uncertainty with regard to the numbers in the future potentially qualifying for SPC (e.g. from 2030 onward). Individuals who worked here for short periods only (unlikely to return and make additional contributions and hence qualify for SPC) as distinct from individuals who have gaps in their records for other reasons and are likely to recommence making contributions in the near term. In the absence of further information (and for prudency) in all cases we assumed that all individuals (on average) would make contributions which are in line with the average rates paid in the past. This assumption will be kept under review.

Table 8.6 shows the projected numbers of claimants to 2030 based on retiring sample data (e.g. the 2030 assumption reflects those in the PRSI database with a date of birth of 1962 who will

reach SPA of 68 in 2030). It also shows the projected number of claimants to 2040. Our 2015 projections allow for a level of improvement in anticipated qualifiers (expressed as a proportion of the population) between 2030 and 2040 and is assumed to remain constant thereafter.

Retiring Year	2016	2019	2020	2030	2040
Male SPA population	21,557	22,328	23,053	25,841	31,990
Males Claimants	17,613	17,789	18,203	22,596	29,664
Claimants as a % of population	**82%**	**80%**	**79%**	**87%**	**93%**
Female SPA population	21,990	23,987	24,176	28,633	34,504
Female Claimants	11,666	11,965	12,904	16,951	24,906
Claimants as a % of population	**53%**	**50%**	**53%**	**59%**	**72%**
Total SPA population	43,547	46,315	47,228	54,474	66,494
Total Claimants	29,279	29,753	31,107	39,547	54,571
Overall Claimants as a % population	**67%**	**64%**	**66%**	**73%**	**82%**

Table 8.6: Projected SPC recipients / claimants as a % of the population at various spot years in the future – 2015 Review

9 Sensitivity of projections to assumptions

This chapter looks at sensitivities of our base case results to a range of alternative macroeconomic and demographic scenarios and key modelling assumptions.

- Fertility changes
- Longevity changes and in particular the risk of continuing unforeseen improvements
- Migration changes
- Labour market changes
- A range of macroeconomic scenarios including Brexit and changes to real earnings growth rates
- Changes in respect of projections of future SPC levels

9.1 Introduction

Given the uncertainty surrounding assumptions underpinning long-run projections, a number of sensitivity tests were carried out in addition to the base case, so as to quantify the responsiveness of projection results to changes in key underlying assumptions.

The scenarios run are intended to allow an informed reader understand the impact on the SIF of various alternative scenarios as compared with the base case.

The alternative scenarios (in each case run for a higher and lower than base case) are:

9.1.1 Fertility rates

- Higher fertility: A total fertility rate ("TFR") which increases to 2.1 by 2025 and remains at that level thereafter;
- Lower fertility: A decline in the total fertility rate from 1.92 in 2015 to 1.85 by 2020 and to 1.65 by 2030 remaining constant thereafter.

9.1.2 Life expectancy

- Higher life expectancy: An addition of life expectancy at birth of 2 years by 2071
- Lower life expectancy: Improvements in life expectancy at half the rate assumed in the population projections feeding into the base case.

	2015	2025	2035	2045	2055	2065	2071
Base Case	18.4	20.4	21.9	23.0	24.0	25.0	25.6
Life expectancy up	18.4	20.7	22.5	23.9	25.3	26.6	27.3
Life expectancy down	18.4	19.4	20.2	20.8	21.3	21.8	22.1

Table 9.1: Male life expectancy at 65 base case and alternative scenarios

9.1.3 Migration

- Higher migration: 20% higher than base case;
- Lower migration: 20% lower than base case;
- A nil migration scenario.

9.1.4 Labour force sensitivities

- Higher employment rate: Employment rate being 2% higher compared with the baseline projection for the working age group;
- Higher employment rate older workers: Employment rate of older workers 10% higher than base.

9.1.5 Real earnings growth sensitivities

Whereas the base case assumes that real earnings growth increase to 1.5% per annum in the long term (from 2036 onward) we examine a scenario where earnings growth increases to:

- Lower earnings growth scenario: 1% per annum from 2026
- Higher earnings growth scenario: 2% per annum throughout

Real earnings growth (%)	2015	2025	2035	2045	2055	2065	2071
Base case	1.90	1.51	1.44	1.54	1.54	1.54	1.54
Real earnings - 2% per annum long term	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Real earnings - 1% per annum long term	1.90	1.51	1.00	1.00	1.00	1.00	1.00

Table 9.2: Real earnings growth (%) - base case and alternative real earnings growth scenarios at varying spot years

9.1.6 Brexit and a short term shock scenario

- The Brexit scenario is projected to coincide with a real earnings growth assumption of circa 1% per annum in the long term (as compared with 1.5% per annum in base case) along with ancillary changes to employed numbers, and Jobseeker's Benefit.
- The "short term shock" scenario is a hypothetical shock occurring in 2020 of similar magnitude to the recession which commenced in 2008.

9.2 Impact on shortfall of a range of alternative scenarios

The tables that follow illustrate the impact on the shortfall at varying spot years in the future reflecting the impact of the above devised alternative scenarios on the Fund's finances.

9.2.1 Variant fertility rates

Year	Base case	Fertility up	Fertility down
2015	119	119	119
2025	1,703	1,887	1,887
2035	5,640	5,423	5,428
2045	11,438	11,190	11,370
2055	17,313	16,869	17,596
2065	20,339	19,463	20,698
2071	22,208	20,862	22,241

Table 9.3: Shortfall (€ millions) under base case and variant fertility scenarios; 2017 real price terms

Higher fertility rates impact on Fund finances in terms of higher PRSI income reflecting increased numbers in the labour force starting in circa 20 years' time and increasing with time thereafter. Whilst higher fertility rates also impact Fund expenditure (with a lag as individuals are generally net contributors earlier on in their careers) the overall net impact of higher fertility rates is positive. The impact by 2071 is relatively modest reflecting a revised shortfall of €20.9 billion rather than the €22.2 billion assumed in the base case.

9.2.2 Variant Life expectancies ("LE")

Year	Base case	Higher LE	Lower LE
2015	119	119	119
2025	1,703	1,899	1,859
2035	5,640	5,526	5,099
2045	11,438	11,765	9,674
2055	17,313	18,293	14,206
2065	20,339	21,935	15,461
2071	22,208	23,938	15,984

Table 9.4: Shortfall (€ millions) under variant mortality scenarios; 2017 real price terms

The different life expectancy scenarios examined are projected to have a material impact on shortfalls in later years of the projection period with the shortfall in 2071 anticipated to reduce from €22.2 billion to €16.0 billion under a scenario whereby the rate of assumed mortality improvements is at half the rate assumed in the base case. This is because life expectancy impacts on the length of time for which the projected pension payments (the most material benefits of the SIF) are expected to be paid.

9.2.3 Variant migration scenarios

Year	Base case	Migration up	Migration down	Nil migration
2015	119	119	119	119
2025	1,703	1,870	1,911	1,992
2035	5,640	5,385	5,465	5,626
2045	11,438	11,117	11,272	11,584
2055	17,313	16,942	17,109	17,443
2065	20,339	20,178	19,902	19,353
2071	22,208	21,935	21,793	21,513

Table 9.5: Shortfall (€ millions) under base case and variant migration scenarios; 2017 real price terms

Migration impacts both income and expenditure in the same direction albeit impacts on expenditure with a lag as typically individuals are net contributors to the Fund during their working lives before becoming net beneficiaries. If income and expenditure are taken individually the effects of migration appear large, with a 10% decrease in income in the nil migration case, but the reduction in individuals accessing benefits offset this, result in an overall approximately neutral effect.

9.2.4 Labour force sensitivities

Year	Base case	Higher employment rate	Higher employment rate older workers
2015	119	119	119
2025	1,703	1,870	1,491
2035	5,640	5,265	4,923
2045	11,438	10,957	10,646
2055	17,313	16,719	16,410
2065	20,339	19,408	19,110
2071	22,208	20,802	20,470

Table 9.6: Shortfall (€ millions) under base case and variant labour force scenarios; 2017 real price terms

The scenarios were selected by the Steering Committee to coincide with the labour force scenarios examined in the 2015 Ageing Report (Table I.5.1 of that report) as follows:

Higher employment rate: A scenario with the employment rate being 2% higher compared with the baseline projection for the age group 20-64. The increase is introduced linearly over the period 2016 to 2025 and remains 2% higher thereafter. The higher employment rate is assumed to be achieved by lowering the structural unemployment rate.

Higher employment rate older workers: A scenario with the employment rate of older workers (55-74) being 10% higher compared with the baseline scenario.

9.2.5 Overview of results of labour force sensitivities

Overall these scenarios do not have a very significant impact on Fund finances. Although the income receipts are projected to increase there is also an impact on Fund expenditure in terms of higher levels of SPC entitlement. The increased employment also increases the numbers who are entitled to Jobseeker's Benefit upon becoming unemployed, or Invalidity Pension and Illness Benefit upon incapacity to work.

9.2.6 Real earnings growth sensitivities

Year	Base case	Real earnings 1% per annum	Real earnings 2% per annum
2015	119	119	119
2025	1,703	1,650	1,716
2035	5,640	5,294	6,077
2045	11,438	10,225	12,953
2055	17,313	14,676	20,516
2065	20,339	16,353	25,226
2071	22,208	17,297	28,308

Table 9.7: Shortfall (€ millions) under base case and variant real earnings growth scenarios; 2017 real price terms

The varying real earnings growth scenarios have the biggest impact on the Fund finances (in 2017 real price terms), with the scenario reflecting 2% per annum real earnings growth in the long term giving rise to a shortfall of €28.3 billion by 2071 as compared with €22.2 billion in the base case.

Real earnings growth impacts on the increase in projected benefit expenditure as well as PRSI receipts (reflecting the policy that the SPC will be maintained in line with Average Earnings). Given the projected increase in the number of projected pension beneficiaries in the future, a year on year cumulative increase / decrease in this variable has a significant knock-on impact in terms of the overall pension expenditure by the end of the projection period and the related shortfall arising.

It is worth noting that labour productivity increases out to 2021 (which the European Commission assume translate into "real earnings growth") included in the SPU are expected to be 1.0% per annum.

As can be seen from the above table, a continuation of the 1% per annum trajectory for real earnings growth into the long term future results in a reduced shortfall for the SIF - €17.3 billion in 2071 compared with €22.2 billion in the base case.

Any scenario involving an outlook for the economy resulting in reduced output and labour productivity / real earnings growth results in reduced expenditure where the long term policy is that pensions continue to increase in line with average wage increases. Brexit is one such scenario. This holds true for so long as the SPC continues to increase in line with average wage increases.[50.]

9.2.7 Brexit

Year	Base case	Brexit
2020	236	359
2025	1,703	1,745
2030	3,279	3,197
2035	5,640	5,311
2040	8,440	7,714
2045	11,438	10,154
2050	14,449	12,468
2055	17,313	14,534
2060	19,316	15,788
2065	20,339	16,199
2071	22,208	17,137

Table 9.8: Shortfall (€ millions) under base case and Brexit scenario; 2017 real price terms

The Brexit devised scenario is based on the following assumptions:

- Due to long term negative impact on growth, labour productivity increases coinciding with real earnings growth is reduced to 1% per annum (from 1.5% per annum in the long term in the base case). This is broadly consistent with the 0.4% per annum reduction in GDP output per annum described in the Adverse World Trade Organisation Scenario covered in the ESRI and Department of Finance Working paper number 548.
- The overall employed numbers are reduced by 2% for the entire duration, with the numbers of unemployed increased by the same amount.

Perhaps somewhat counterintuitively, the projected impact of incorporating a more explicit allowance for the impact of Brexit in the Commission's long term assumptions is to reduce the projected shortfall in the Fund in 2017 real price terms.

This scenario however does not consider any potential economic shock resulting from Brexit, and instead only considers the long term potential effects on the Irish economy as described in the Working Paper. While the shortfall does decrease in 2017 real price terms, it should be noted that the shortfall expressed as a percentage of a projected (lower) GDP is slightly higher.

The reason the shortfall is lower in real price terms is driven primarily by the lower real earnings growth assumption. Given that expenditure on the main SIF line items including the SPC is linked directly to real earnings growth, a depressed outlook for labour productivity / real earnings growth reduces expenditure as well as income receipts and overall results in a reduced shortfall.

[50] The last statement on pension indexation was made in 2010 as part of the National Pension Framework. This included text around an objective to sustain the value of the State Pension at 35% per cent of average.
Notwithstanding we note from the "2015 Ageing Report: Underlying Assumptions and Methodologies" that the indexation of pensions in payment for Ireland is "at a rate reviewed annually in the Budget".

When examining the shortfall expressed as a percentage of the (lower) PRSI base in a given year under a Brexit scenario, the *real* effect of the changes are shown and it can be observed that the shortfall expressed as a % of a depressed PRSI base increases.

Year	Base case	Brexit
2015	1.4%	1.4%
2025	15.8%	17.1%
2035	41.6%	42.8%
2045	75.4%	76.5%
2055	97.6%	98.8%
2065	93.3%	94.5%
2071	91.2%	92.3%

Table 9.9: Shortfall under base case and Brexit scenario; expressed as a % of PRSI base in a given year

Where a short term economic shock was experienced as a result of Brexit involving a severe reduction in PRSI receipts, then the impact of Brexit on the Finances of the SIF would clearly be different as compared with that suggested by the application of the above scenario in isolation.

9.2.8 Short term Economic Shock

	Impact of a shock on the shortfall of the fund				
Year	**2020**	**2021**	**2022**	**2023**	**2024**
Shortfall –Base Case	236	589	607	963	1,327
Shortfall after shock	236	1,751	2,578	2,089	1,327
Difference	-	**1,161**	**1,971**	**1,126**	-

Table 9.10: Shortfall (€ millions) under base case and Short term shock scenario; 2017 real price terms

For this scenario we examined the potential impact of an economic shock that would be similar in magnitude to the 2008 recession. We assumed hypothetically the shock will commence from 2020.

The rate of change (reduction) in PRSI income for the years 2021, 2022, and 2023 was taken to be equivalent to the percentage reductions seen in 2009, 2010, and 2011 respectively. In this scenario a full recovery is assumed to be made within 5 years of the initial event, and returning to normal thereafter. The total impact of a shock of this magnitude has been costed at €4.3 billion.

We would point out that the contraction in PRSI income in this scenario reflects an assumed replication of the change in PRSI income which occurred in the three year period 2009 - 2011 inclusive. The change reflects not only the fall in PRSI income due to the economic shock at the time but also the measures taken with respect to the PRSI base in that period.

An implicit assumption within our hypothetical scenario is that a similar economic shock in 2020 would involve a policy response resulting in similar PRSI raising measures in relative terms.

This represents an extreme scenario, which saw the worst contraction of output and employment on record. The policy responses have seen output, employment and the general government balance recover towards pre-crisis levels such that the reduction in employment and output were not permanent.

Notwithstanding the impermanency of the impact of the previous recession, the impact of a shock would result in a requirement for a series of Exchequer subventions of the above illustrative order of magnitude were an economic shock similar in size to that of 2008 to be experienced in 2020. Given that the scale of the SIF benefit expenditure is projected to markedly increase through time due to the ageing of the population, any short term shock could be impactful on the SIF finances. A contraction from a larger PRSI base occurring in the absence of a material fall in SIF expenditure

(increasingly pension-related and "sticky") would result in a requirement for a series of Exchequer subventions in a downturned economy.

9.2.9 SPC qualifiers (as % of the population) into the future

A significant assumption underlying the SPC expenditure projection relates to the anticipated number of individuals reaching SPA in a given year who will potentially become entitled to and claim SPC. Our projections of the datasets received for each future retiring year allow for individuals to continue contributing for the remainder of their careers at the average levels they would have contributed at in the past.

For the base case assumptions the number of claimants as a percentage of the SPA population is assumed to increase until 2040 as indicated by the data and allowing for the above-mentioned assumption about future contribution levels.

Under this alternative scenario we assume that there is no increase in % qualifiers for SPC beyond 2030 (i.e. that the proportion of the population aged SPA claiming SPC will remain constant at 2030 levels for the remainder of the projection period). The implicit assumption under this scenario is that any improvement in the quality of contribution records will have already occurred by 2030[51] and the quality of PRSI records for later retiring cohorts will be very similar (i.e. that total contributions for those retiring in 2030 and total contributions for those retiring in 2040 will be equal).

Retiring Year	2016	2019	2020	2030	2040
Population Male (age = SPA)	21,557	22,328	23,053	25,841	31,990
Qualifiers (% of male popln) – Base	**82%**	**80%**	**79%**	**87%**	**93%**
Qualifiers (% of male popln) - Alternative	**82%**	**80%**	**79%**	**87%**	**87%**
Population Female (age = SPA)	21,990	23,987	24,176	28,633	34,504
Qualifiers (% of female popln) – Base	**53%**	**50%**	**53%**	**59%**	**72%**
Qualifiers (% of female popln) - Alternative	**53%**	**50%**	**53%**	**59%**	**59%**

Table 9.11: Shortfall (€ millions) base case and alternative SPC qualifiers scenario, 2017 real price terms

Year	Base case	Lower Claimants beyond 2030
2015	119	119
2025	1,703	1,703
2035	5,640	5,500
2045	11,438	10,638
2055	17,313	15,696
2065	20,339	18,252
2071	22,208	19,962

Table 9.12: Shortfall (€ millions) base case and alternative SPC qualifiers scenario, 2017 real price terms

It can be seen from Table 9.12 that the projected shortfall at the outer end of the projection period would be materially lower where no improvements in % qualifiers is anticipated beyond 2030. The difference in the shortfall as compared with base case is almost €2.2 billion by 2071.

[51] Individuals born in 1962 reaching SPA of 68 in 2030 who typically would have commenced work in 1984.

Key Conclusions from this Chapter:

One of the key sensitivities is to earnings growth - higher productivity increases negatively impacting due to the assumed continuation of the link of the SPC with average earnings growth.

The future rate of improvement in mortality rates which is a very subjective assumption has a material impact on the Fund's finances.

Any short term shock resulting in a contraction from a larger PRSI base occurring in the absence of a material fall in SIF expenditure (increasingly pension-related) would result in a requirement for a series of sizeable Exchequer subventions in a downturned economy.

The judgement around the projection of contributions based on contribution histories to date for individuals retiring beyond 2030 makes a sizeable impact on the shortfall at the later years of the projection period.

In terms of migrants and fertility rates, very significant movements from baseline / projected levels are needed to make a material impact on the projected shortfall.

10 Accrued to date pension liabilities

In this chapter we set out:

- Introduction to the ADL concept
- Background and Scope - EU reporting requirement
- ADL Results 31 December 2014 and 31 December 2015
- Sustainability measures
- Reconciliation between the Accrued to date Liability ("ADL") for EU reporting and the Open-system liabilities ("OSL") calculated as part of the base case of the Actuarial Review
- Overview of methodology and assumptions underpinning the calculations

10.1 Introduction

We outlined in Chapter 7 the net present value of future shortfalls over the 71 year projection period reflecting the "open system" liabilities. Under the "open system" all expenditure and income of the Fund is projected into the future. Open system liabilities allow for (i) individuals currently in receipt of pensions / benefits from the SIF, (ii) current contributors who have already "accrued" benefits based on PRSI already paid, (iii) current contributors who are projected to continue paying PRSI and accrue benefits for the future and (iii) anticipated future new entrants to the labour force who are projected to make contributions and begin accruing benefits once they start working and paying PRSI.

In this Chapter we discuss alternative measures of the "shortfall" or "debt" associated with the SIF.

The accrued to date ("ADL") measure, for example, which is required by the EU for reporting purposes excludes shortfalls in respect of future new entrants to the labour force. It also excludes the benefits that individuals who are currently contributing to the SIF are deemed not yet to have earned / "accrued". The ADL only includes within its scope certain Social Insurance type pension benefits described in further detail later in this Chapter and not the entire range of benefits potentially accessible from the SIF.

In this chapter we describe each of the above measures of the "shortfall" / "debt" in further detail. We end the chapter in a discussion on what each measure of "shortfall" means from a sustainability / fiscal gap perspective.

10.2 Background to the EU reporting requirement and scope

10.2.1 EU 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[52] on pensions schemes.

The table shows pension obligations of the various types of pension schemes using the accrued-to-date liability (ADL) concept. These pension entitlements or obligations contain 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 social contributions by current workers and remaining pension entitlements of existing pensioners. No rights accrued after the current year — by present or by future workers — are considered. The ADL provides an estimate of the cost of a hypothetical termination of a pension scheme without reneging on accrued entitlements.

Our interpretation of what is required to estimate the ADL for EU reporting purposes relies heavily on the Technical Compilation Guide for Pension Data in National Accounts produced by Eurostat and the European Central Bank[53].

10.3 ADL Results on Social Security Pension Schemes at 31 December 2014 and 31 December 2015

The below table shows the accrued to date social insurance liabilities at 31 December 2014 and 31 December 2015[54] on the base case assumption of a 5% nominal discount rate as set out in the EU technical guide.

ADL Position (€ billions)	
31-Dec-14	**31-Dec-15**
226	231

Table 10.1: ADL results 31 December 2014 and 31 December 2015 (€ billions)

[52] EU Regulation 549 / 2013 Country transmission of data to Eurostat for reference year 2015 is due by 31st December 2017
[53] Eurostat, European Central Bank. (2011) Technical Compilation Guide for Pensions Data in National Accounts. Eurostat Methodologies & Working papers
[54] The €231 billion accrued to date liability at 31 December 2015 comprises €168 billion in SPC, €46 billion in WPC, €17 billion in Invalidity Pensions

10.4 Sustainability measures

It is important to note that as per the EU methodology paper the ADL does not allow any conclusions to be drawn as to the fiscal sustainability of a pension scheme. Large pension entitlements do not necessarily mean unsustainable pension schemes, and by the same token small pension entitlements do not mean that the respective pension schemes are fiscally stable in the long term. As noted in chapter 6, Irish demographics are currently more favourable than many of our European counterparts which means that in the short to medium term our ADL is more affordable. However the Irish population is projected to age rapidly.

The ADL 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, shown as the blue section of figure 10.1. Entitlements that will accrue after that year are not included. In contrast to other liability concepts such as OSL, therefore, the time horizon of ADL is somewhat limited.

Other measures of liabilities include:

- *Current workers' and pensioners' liabilities (CWL)*: For CWL, allowance is made for the pension scheme to continue until the last current contributor dies. However, new entrants are not included. This concept covers ADL and the present value of pension entitlements that will be accrued by current contributors due to their future contributions, as seen as the sum of the blue and green sections of Figure 10.1 below.

- *Open-system liabilities (OSL*): In addition to CWL, this liability concept also includes the present value of pensions of new workers entering the respective pension scheme. It is assumed that the pension scheme will be continued under current rules for a relatively long time horizon. The present value of OSL may be compiled over an infinite time horizon. For practical reasons, however, a perspective, e.g. 200 years, is usually chosen. This is shown as the sum of the blue, green, and purple sections of Figure 10.1.

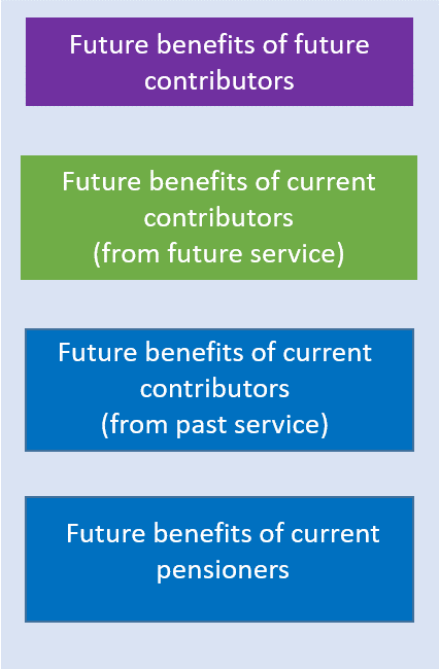

Figure 10.1: ADL (Blue), CWL (Blue + Green), OSL (Blue + Green + Purple)

10.5 Reconciliation between the Accrued to date Liability ("ADL") for EU reporting and the Open-system liabilities ("OSL") calculated as part of the base case of the Actuarial Review

10.5.1 Closed group approach "Accrued to date liability"

- Note it only includes current pensioners and current contributors
- No new entrants are permitted i.e. a closed labour force is used (no further migrants etc.)
- Assets: Only a reserve is taken into account where applicable (No future contributions)
- Liabilities: Future benefits of current pensioners and current contributors resulting from past service (no future accrual)

Figure 10.1 shows the breakdown of the €231 billion accrued to date liability figure into the future benefits of current pensioners of €78 billion and the future benefits of current contributors already accrued from past service of €153 billion.

Overall given reserves / assets of nil in the Irish context the net liabilities on a "closed group" basis are €231 billion.

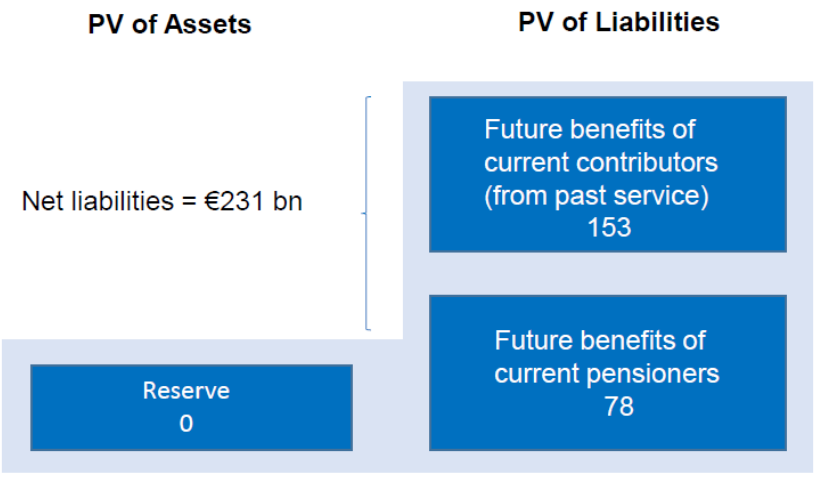

Figure 10.2: Closed group Approach – ADL at 31 December 2015.

10.5.2 Open group approach – Open System Net Liabilities (OSNL)

As shown in Figure 10.2 the "open group approach" provides a complete picture of the financial status of a social security contributory pension scheme. It includes

- Current pensioners as well as current and future contributors
- Assets: Reserve plus all future contributions (current and future contributors)
- Liabilities: All future benefits of current pensioners, current contributors (past and future service) and future contributors.

10.5.3 Open group approach - 31 December 2015

A summary of the "open group approach" figures for Ireland at 31 December 2015 are shown in the chart below. Note the reserves at 31 December 2015 are negligible (<€1.5m where the overall SIF expenditure is of the order of €8.6 billion). This shows total gross liabilities on an open group basis of €450 billion over a 55 year projection period. The corresponding attributable PRSI "asset" is €289 billion, leaving net liabilities of €161 billion.

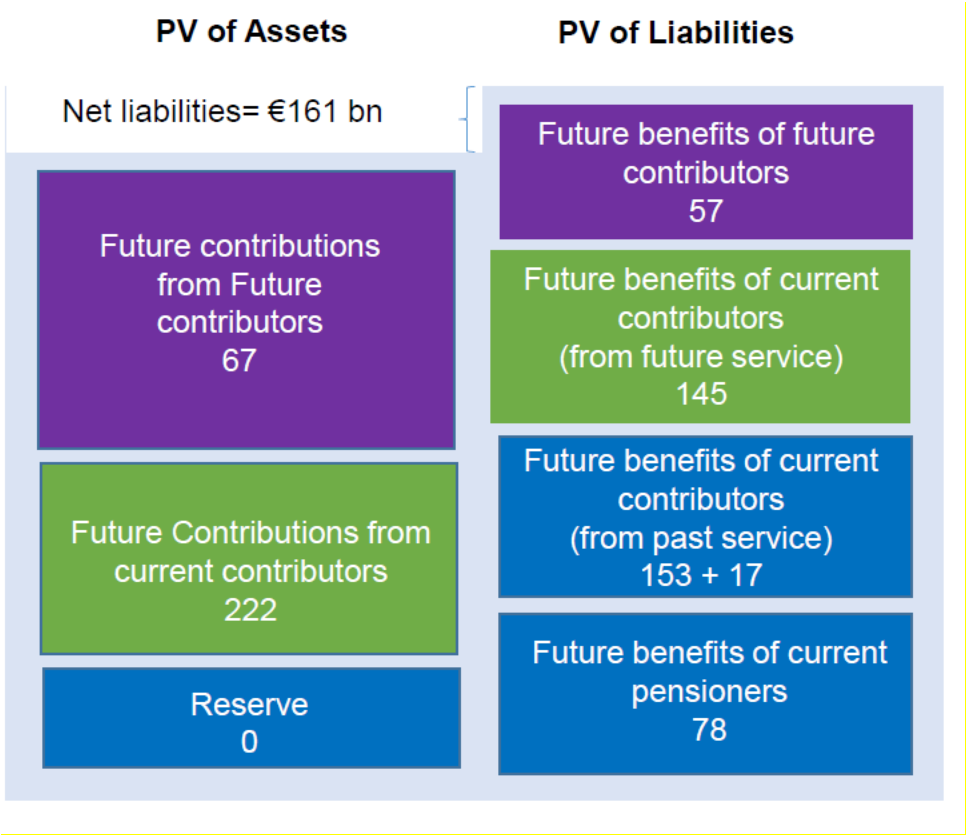

Figure 10.3: ADL (Blue), CWL (Blue + Green), OSNL (Blue + Green + Purple)
Note the €17 billion shown above relates to the means tested payments associated with those benefits included within scope of the ADL which are included for OSNL but not ADL purposes.

10.5.4 Sustainability or fiscal gap

However, it is only possible to draw conclusions about the sustainability of a social security scheme by comparing these pension obligations with the respective assets. The resulting residual amount of obligations and assets represents the open-system net liabilities (OSNL), also known as the sustainability or fiscal gap. In contrast to the ADL, it represents the stock which has to be set aside today to sustain the present pension system (in its legal status quo) in the long term.

The respective assets in the case of the Irish system are the present value of future PRSI receipts, or more specifically that portion of PRSI which could be deemed attributable to pension expenditure (this changes through time) plus the value of future Exchequer Subventions.

The present value of future PRSI receipts deemed attributable to pensions[55] is shown above as a present value of €289 billion over the projection period leaving a balance to be funded of €161 billion. This remaining balance will be required from Exchequer subventions into the future.

Legally the Exchequer is the residual financier of the Social Insurance Fund (which includes both the long-term benefits including pensions and also shorter term benefits). Exchequer subventions were the norm for over 40 years – for example in 1967 the Exchequer subvention was 38% of Fund expenditure. However, no Exchequer contribution was required between 1997 and 2009 as the Fund was in surplus on foot of contributions from employers and workers in those years. In the years 2010-2013 inclusive sizeable Exchequer subventions were made (averaging €1.7 billion over the period or just under 20% of expenditure). The subvention fell significantly in 2014 and 2015. As and from 2016 the SIF has returned to surplus.

While the ADL only take into account a fraction of the future demographic development, because of the requirement to use a "closed population", as can be seen from the above the OSL considers the long-term development of the overall population.

10.5.5 Reconciliation of the above OSL figures (benefits in scope of ADL) with SIF shortfall

The net present value of the shortfalls in the Fund on a 3% real discount rate over the 55 year projection period as shown in Chapter 7 (Table 7.5) is €197 billion. The equivalent figure using Eurostat mortality improvements is €192 billion. This compares directly with the €161 billion (84% of the overall shortfall across all benefit lines) calculated above reflecting only those items included within scope of the ADL on a 5% nominal or 3% real discount rate.

By way of a sense check, the benefits within scope of the ADL represent 76% of overall expenditure at outset increasing to 87% by the end of the projection period.

We would point out that because the fund operates on a PAYG basis and because there are no assets / reserves built up, there is not a direct link between the cost of benefits arising / cost of accrual and contributions being paid. For example contributions of current contributors (€222 billion) are needed and used to pay for benefits of current pensioners (€78 billion), as well as future benefits of current contributors arising from both past (€170 billion) and some future service (€145 billion).

10.5.6 Scope of the ADL

The supplementary table covers social insurance-type pension schemes (e.g. State Pension (Contributory) and Widow's, Widower's or Surviving Civil Partner's Pension (Contributory)) but not schemes based on social assistance-type benefits (State Pension (Non-Contributory)) and private savings benefits. The additional age-related payment (currently payable as and from reaching age 80) which is not a means-tested payment is included in the liabilities.

Note pension benefits are predominantly old-age pensions. However, survivors' pensions — consisting of widows' and orphans' pension benefits — and disability / invalidity and early retirement pensions also fall under the term pension benefits.

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 SPA (currently 66) as they automatically transfer to SPC at that stage.

[55] The €289 billion represents the present value of PRSI receipts which can be notionally attributed to pension benefits (SPC, Widows, Invalidity pensions) and was calculated by projecting the overall PRSI cash-flow in each future year and attributing a notional amount of that PRSI in the ratio of the pension-related expenditure to overall expenditure in that year. The cash-flows were discounted to present values in the normal manner using a 5% nominal discount rate.

Only enacted pension reforms are recorded in the supplementary table. They affect the estimates of pension entitlements in the year in which the reform is enacted and subsequently.

10.5.7 Out of scope – Social assistance benefits and means tested payments

Ireland's State Pension (Non-Contributory) being a social assistance benefit is out of scope.

Further it is stated that in section 10.1 of the EU technical guide that "any kinds of means-tested social assistance is excluded wherever feasible." For that reason we have also excluded the cost of the independent qualified adult allowance and independent qualified child allowances in addition to the basic contributory schemes for future retirees

10.5.8 Scope of ADL versus Open System Liabilities used for "core" actuarial review

The following expenditure line items of the SIF with the noted exceptions are included within scope of the ADL:

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

For each of the above expenditure items we have excluded the associated independent qualified adult/child allowance for the purpose of the ADL calculation given that this is a means tested payment.

Whereas we have valued the "Christmas bonus" for the purpose of the "core" actuarial review we exclude this element here.

Note that for Invalidity Pensions the liabilities arising from the class S extension at December 2017 is not reflected in the ADL given that this extension to the invalidity entitlement had not as yet been enacted at the reference date of 31 December 2015. The invalidity extension will be captured in the December 2017 balance sheet and subsequent.

10.6 Methodology and assumptions

The methodology and each of the assumptions used for the ADL are taken from the Technical Compilation Guide for Pension Data in National Accounts produced by Eurostat and the European Central Bank. In summary, the assumptions which are guided to be used coincide with those produced by the Commission for the purposes of the Ageing Report 2018. These assumptions coincide with the assumptions used to project income and expenditure for the "base case" of the core actuarial review albeit for the ADL the price inflation assumption is set at 2% per annum throughout representing a very marginal change.

The demographic assumptions reflect the 2015 based population projections produced by Eurostat.

When discounting the projected cash-flows to net present values in order to obtain a measure of the ADL a nominal discount rate of 5% (3% real) per annum is guided in the Technical Guide. We have therefore used the 5% discount rate in our calculation of the ADL.

A full description of the methodology and assumptions used for the purposes of the ADL is included in Appendix 4.

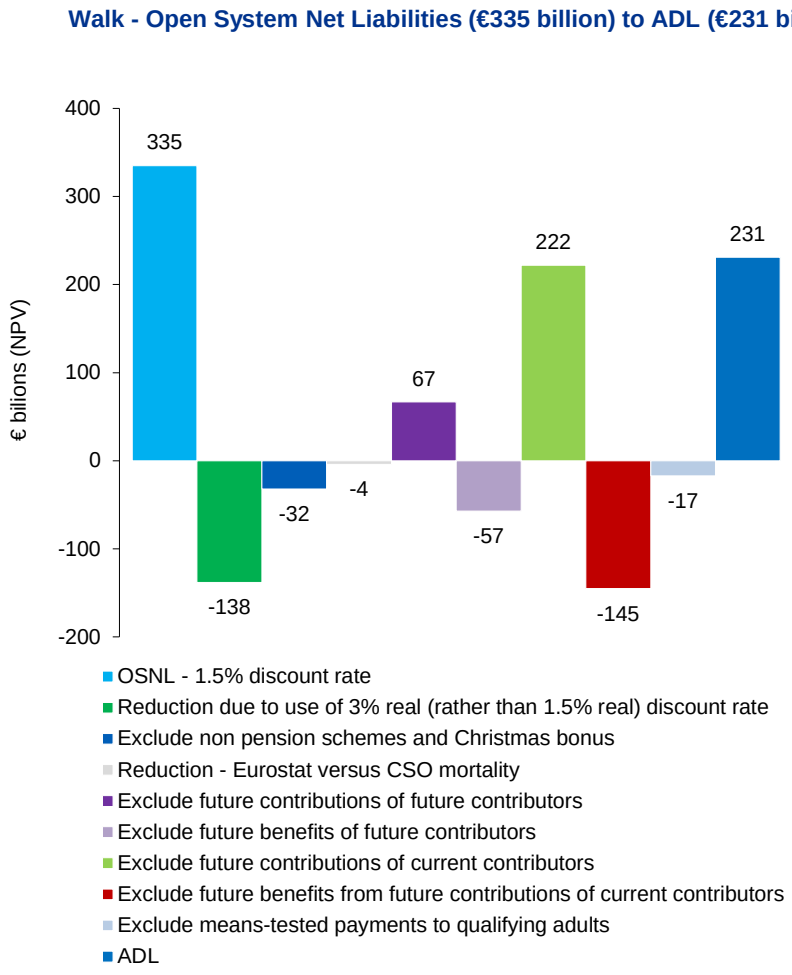

Figure 10.4: Walk OSNL to ADL

11 Value for money projection

This chapter looks at the value for money provided by the Fund on a range of scenarios:

- Value for money provided by the Fund to those paying Class A contributions for late and early entrants into the PRSI system
- Value for money provided by the Fund to those paying Class A by gender
- Impact of credits on value for money
- Impact of the change to the State Pension Age on value for money
- Value for money to the Self-employed / Class S Contributors
- Impact on VFM of extending Invalidity, Illness, Jobseeker's to Class S
- The annualised contribution rates which, if paid into a hypothetical pension pot and invested to retirement, would be sufficient to replicate benefits broadly equating to the SPC and other major benefit payments (Invalidity, Illness, Jobseeker's)
- Impact of the National Pension Framework "Total Contributions Approach" and a proposed alternative TCA design on the VFM provided to Class A PRSI contributors

11.1 Introduction

This chapter addresses Item 4.3.8 of the RFT: "The review must propose "value for money" or "money's worth" indicators for sample/proxy contributors to the Social Insurance Fund. These indicators can be based on the ratio of lifetime benefits to lifetime contributions for the sample cases, and/or through other methods to be specified in the proposal. The sample cases evaluated should highlight differences between various groups of contributors and beneficiaries, specifically based on:

i) Demographics (age group, gender)

ii) PRSI Class

iii) Level of Income

iv) Varying Contribution History

The value for money impact of the planned reforms of the National Pensions Framework (Ref. Section 4.3.9) and the options for self-employed contributors (Ref. section 4.3.10) should also be assessed across the dimensions above."

11.2 Approach taken

For each scenario / individual tested we calculated a "value for money index" based on the lifetime benefits to lifetime contributions to calculate a value for money index as follows:

$$Value\ for\ money\ index = \frac{Present\ value\ of\ projected\ benefits}{Present\ value\ of\ contributions\ (Employer's\ and\ Employees')}$$

Where this ratio is greater than 1 this indicates good value for money for the recipient in absolute terms as the projected benefits from the Fund are greater than the projected value of contributions paid into the Fund.

Each of the scenarios examined reflects the contribution rules and weekly rates in force in 2017 and looks at SPC and the other three main benefits paid from the Fund; Invalidity Pension, Illness, and Jobseeker's Benefit. This analysis does not capture the full potential value for money provided by the Fund given that a range of other benefits can also be accessed and we have not included a valuation for these benefits in this chapter. The inclusion of Invalidity Pension, Illness, and Jobseeker's Benefits into the value for money assessment is a refinement of the methodology employed at the 2010 Review (which examined the value for money associated with SPC only) and should be borne in mind when making any comparisons.

In most cases we calculated the value for money indices on varying earnings levels (from minimum wage up to 3 times' Average Earnings ("NAE")) as well as on a range of PRSI contribution histories, giving rise to varying average weekly contribution calculations and therefore varying pension entitlements at retirement. To calculate the present value of projected SPC, an annuity-factor reflecting the expected length of time the pension would be payable, was applied to the expected pension amount at retirement. To reflect the cost of Invalidity Pension, Illness, and Jobseeker's Benefits, the average claim rates at each age and typical duration of payment of each benefit was used.

An increase for a "qualified adult" was included in addition to the main life annuity. The "qualified adult" payment is essentially an increase to the main life payment due in respect of a dependant (usually a spouse, civil partner, or cohabitant). The term is explained fully in the glossary. The increase for qualified adults is in line with the rate of qualified adults we observed from the male and female new SPC qualifiers in 2015[56] and is applied to male contributors only given the negligible number of female recipients with qualified adults.

We calculated the value for money indices for males and females separately but present average rates with the exception of the series of 11.2 Tables, where we separately examine value for money by gender.

The value for money index for females is higher than for males (all else being equal) due to longer female life expectancy. For example in 2015, 65 year old females are expected to live 2.6 years'

[56] Of the 27,371 (16,465 male, 10,906 female) new qualifiers into SPC in 2015, 3,841 males or 24% of the retiring male population were entitled to a qualified adult increase, whilst the corresponding figure for females was 180 or 1.65% of the retiring female population. The average qualified adult payment was €173 or €173 / €230.30 = 75% of full rate SPC. There was a negligible impact due to the small number of male qualified adults associated with female recipients. We therefore allowed for a reversionary annuity to a female qualified adult of male recipients (only) equivalent to 24% x 75% = 18%.

The impact of allowing for the reversionary annuity in addition to the single life annuity for males whilst only a single life annuity is used for females, means that broadly overall the same value is ascribed to males and females.

longer than men. (Note the gap in terms of the male and female life expectancy differential has reduced since the previous Review at which point it was 3.4 years).

However, taking account of the additional value in respect of contributions paid by males, manifested largely through additional IQA payments (made directly to their wives/partners), means that the value for money is broadly equivalent. (Negligible qualified adult payments are made on female pension payments.)

When other benefits are considered in addition to the SPC such as Invalidity, Illness, and Jobseeker's Benefits, males in fact achieve better value for money than females due to their higher propensity to claim these benefits.

Overall the difference in value for money by gender is reduced due to the effects discussed above:

- the inclusion at this Review of a qualified adult's annuity attaching to male recipients;
- the fact that whilst women are projected to continue to live longer than men, the gap between male and female life expectancy is reducing. See Chapter 6 for further detail on life expectancies;
- the inclusion at this Review of a wider array of benefits within the value for money assessment (Jobseeker's, Illness and Invalidity) which men are more likely to access.

While the value for money index will capture the monetary value of the SPC (and the other main benefit types paid by the Fund including Invalidity Pension, Illness, Jobseeker's) to individuals, there are some non-monetised qualities which will not be captured in our measure such as, for example, the fact that payments are backed by the State.

Note throughout this chapter that where good value for money is achieved (i.e. the value for money index is greater than 1) we have shaded these individuals in grey.

11.3 Assumptions

The calculation of the present value of contributions and benefits were based on the following assumptions:

- Benefits and Contributions of a male and female with qualified adult as appropriate (in practice male recipients only have non-negligible attaching qualified adult amounts);
- Value for money indices were calculated for an individual joining the work force aged 25 and aged 35 with a varying combination of histories thereafter;
- Value for money indices and calculations in this section reflect the current SPA of 66. The impact of the change in the SPA to 68 is examined at 11.4.4.

The assumptions that follow hereunder are reflective of those set out in Society of Actuaries Actuarial Standard of Practice PEN-12 (effective 1 April 2016): Statements of Reasonable Projection – Occupational Pension Schemes and Trust RACs:

- All benefits were assumed to increase with earnings growth, at a fixed growth rate of 2.5% per annum (1.5% price inflation and 1.0% "real earnings" growth (pre and post retirement));
- Present values of the various contributions and benefits were calculated assuming a nominal discount rate of 3.75% per annum in the period up to retirement and a nominal 2.0% per annum post retirement;

- Average Earnings is €37,236 (as per CSO statistics for Q4 2016);
- The annuities in this section use gender-specific rather than unisex annuities as specified in the Standard of Practice PEN-12.

Note the above assumptions differ from the "base case", the results of which are outlined in Chapter 7. The assumptions used in this chapter are in line with those set out in ASP PEN-12 and reflect long term projections for inflation, real earnings growth, and assumptions for mortality which are in keeping with those experienced by occupational pension scheme contributors.

11.4 Value for money Calculations

11.4.1 State Pension (Contributory) for Class A contributors entering the PRSI system aged 25

We examined the value for money index based on combined Employer and Employee PRSI contributions for males and females in Class A entering the PRSI system at age 25 (Table 11.1(a) and 11.1(b) below).

We have assumed in our initial analysis that all contributions have been "paid", i.e. that none of the contributions have been "credited"[57]. We have separately considered the impact of a PRSI history comprising a combination of "paid" and "credited" contributions in Section 11.4.3.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	4.3	1.4	0.7	0.5
€233.60	5.0	1.6	0.8	0.5
€214.20	6.1	1.9	1.0	0.6
€202.80	8.7	2.8	1.4	0.9
€155.20	8.9	2.8	1.4	0.9
€95.20	8.2	2.6	1.3	0.9

Table 11.1 (a): Value for money on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC only. It allows for qualified adult payments attaching to male recipients, SPA=66.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	4.9	1.6	0.8	0.5
€233.60	5.7	1.8	0.9	0.6
€214.20	6.9	2.2	1.1	0.7
€202.80	9.6	3.1	1.5	1.0
€155.20	9.6	3.1	1.5	1.0
€95.20	9.0	2.9	1.4	1.0

Table 11.1 (b): Value for money on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC, Invalidity, Illness and Jobseeker's Benefits. It allows for qualified adult payments attaching to male recipients, SPA=66.

[57] Credited contributions ("credits") form an integral part of the social insurance system. They are awarded in circumstances where normally active labour force participants face circumstances where they may not be in a position to make paid social insurance contributions. They may be used to secure entitlement to short term and long term social insurance benefits, but the claimant must in the first instance have a specified number of paid contributions before the credits become of any value.

11.4.2 State Pension (Contributory) for Class A contributors entering the PRSI system aged 25 – Gender Analysis

The differences between the three tables that follow are:

- Table 11.2 (a) reflects the value for money in respect of pension benefits only. It does *not* reflect any allowance for the additional value for money for contributions made by males due to the fact that qualified adult payments to their wives are payable in addition.
- Table 11.2 (b) reflects the value for money in respect of pension benefits only. It *does* reflect an allowance for the additional value for money to males due to the fact that qualified adult payments are payable in addition (as above).
- Table 11.2 (c) reflects the value for money in respect of pension benefits and Invalidity, Illness, and Jobseeker's Benefits. It *does* reflect an allowance for the additional value for money to males due to the fact that qualified adult payments are payable in addition and includes a costing for the probability of requiring Invalidity, Illness and/or Jobseeker's Benefit at each age to retirement.

Weekly Pension	Minimum Wage		NAE		NAE x 2		NAE x 3	
	M	F	M	F	M	F	M	F
€238.30	3.8	4.3	1.2	1.4	0.6	0.7	0.4	0.5
€233.60	4.4	5.0	1.4	1.6	0.7	0.8	0.5	0.5
€214.20	5.4	6.1	1.7	1.9	0.9	1.0	0.6	0.6
€202.80	7.7	8.7	2.4	2.8	1.2	1.4	0.8	0.9
€155.20	7.8	8.9	2.5	2.8	1.2	1.4	0.8	0.9
€95.20	7.2	8.2	2.3	2.6	1.1	1.3	0.8	0.9

Table 11.2 (a): Value for money by gender on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC only. This table does NOT reflect the impact of the additional reversionary pension payable in respect of a qualified adult attaching to a male recipient.

Weekly Pension	Minimum Wage		NAE		NAE x 2		NAE x 3	
	M	F	M	F	M	F	M	F
€238.30	4.3	4.3	1.4	1.4	0.7	0.7	0.5	0.5
€233.60	5.0	5.0	1.6	1.6	0.8	0.8	0.5	0.5
€214.20	6.1	6.1	1.9	1.9	1.0	1.0	0.6	0.6
€202.80	8.7	8.7	2.8	2.8	1.4	1.4	0.9	0.9
€155.20	8.9	8.9	2.8	2.8	1.4	1.4	0.9	0.9
€95.20	8.2	8.2	2.6	2.6	1.3	1.3	0.9	0.9

Table 11.2 (b): Value for money by gender on a range of earnings levels, entering the PRSI system aged 25. This table compares directly with 10.1 (a) and takes account of SPC only. This table reflects the impact of the additional reversionary pension payable in respect of a qualified adult attaching to a male recipient.

Weekly Pension	Minimum Wage		NAE		NAE x 2		NAE x 3	
	M	F	M	F	M	F	M	F
€238.30	5.0	4.8	1.6	1.5	0.8	0.8	0.5	0.5
€233.60	5.8	5.6	1.9	1.8	0.9	0.9	0.6	0.6
€214.20	7.1	6.8	2.2	2.2	1.1	1.1	0.7	0.7
€202.80	9.8	9.5	3.1	3.0	1.6	1.5	1.0	1.0
€155.20	9.8	9.5	3.1	3.0	1.6	1.5	1.0	1.0
€95.20	9.1	8.9	2.9	2.8	1.5	1.4	1.0	0.9

Table 11.2 (c): Value for money by gender on a range of earnings levels, entering the PRSI system aged 25. This table compares directly with 10.1 (b) and takes account of SPC, qualified adult payment to a make recipient and also Invalidity, Illness and Jobseeker's Benefits.

We note the following in relation to the series of Tables 11.1 and 11.2:

- The calculations demonstrate that those with lower earnings and those with shorter contribution histories will continue to obtain the best value for money from the Fund.
- Value for money reduces as earnings increase. Contributions from higher earners are therefore partially subsidising the pension payments of lower earners, indicating that the system is strongly redistributive. This effect can also be seen from Tables 11.10 (a) and 11.10 (b).
- The Fund provides better value to female rather than to male contributors qualifying at the same pension levels due to higher female life expectancy. However, taking account of the additional value in respect of contributions paid by males, manifested largely through additional IQA payments (made directly to their wives / partners), means that the value for money is broadly equivalent.
- When other benefits are considered in addition to the SPC such as Invalidity, Illness, and Jobseeker's Benefits, males in fact achieve better value for money than females due to their higher propensity to claim these benefits.
- In the case of those on the minimum wage, an employee contribution is typically not payable while the employer contribution is 7.8% (8.5% less 0.7% to the National Training Fund). Accordingly, pension recipients in this category receive good value for money from the Fund.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	€56	€176	€352	€527
€233.60	€47	€147	€293	€440
€214.20	€35	€110	€220	€330
€202.80	€23	€73	€147	€220
€155.20	€17	€55	€110	€165
€95.20	€12	€37	€73	€110

Table 11.3: Average pension level that could be purchased if Class A accumulated contributions were invested and used to purchase a hypothetical private pension.

Table 11.3 shows the average weekly pension that the accumulated employment contributions (employer and employee) into the Fund would purchase in a hypothetical defined contribution pension scheme. In other words, it is the pension a Class A contributor might expect to receive if they invested all of their and their employer's cumulative PRSI contributions in a defined contribution pension scheme[58] and at retirement purchased a pension with the accumulated value of the invested contributions.

The resulting calculations are an alternative way of looking at the question of value for money consistent with Tables 11.1 and 11.2 and highlights that the level of SPC provided to those Class A contributors on lower incomes is greater than the pension their accumulated contributions would otherwise purchase in a hypothetical defined contribution pension scheme. This is particularly true for those who qualify for the lower weekly pension amounts. The corollary is true or those on higher incomes.

If we consider the highlighted individual in the above table with Average Earnings, the rate of the weekly personal pension payment received is 65% or €155.20. Accumulating the same PRSI

[58] Based on the assumptions set out in the actuarial statement of practice in force in 2017.

(employee and employer) contributions over the projection period, we have estimated the pension they could secure from their hypothetical defined contribution pension scheme would be €55 per week - 35% of the SPC this same individual would receive from the Fund.

11.4.3 Impact of credited contributions on value for money

Table 11.4 below shows the value for money index of the Fund, where 10 years[59] of contributions to the Fund are "credited" rather than "paid".

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	6.3	2.0	1.0	0.7
€233.60	7.3	2.3	1.2	0.8
€214.20	8.8	2.8	1.4	0.9
€202.80	12.3	3.9	2.0	1.3
€155.20	12.3	3.9	2.0	1.3
€95.20	11.5	3.7	1.8	1.2

Table 11.4: Value for money on a range of earnings levels, entering the PRSI system aged 25, where 10 years of contributions are credited. The above table takes account of SPC, Invalidity Pension, Illness, and Jobseeker's Benefit.

This table directly compares to Table 11.1 (b) and shows the incremental value for money for an individual credited with 10 years contributions as distinct from an individual with 100% paid contributions (i.e. no credits).

As expected, the value for money increases in this case as the level of benefits is the same, however there are 10 years less "paid" contributions into the Fund. For example, if we consider an individual on Average Earnings and entitled to full rate pension, their value for money index is 1.6 when all contributions are 100% "paid", but increases to 2.0 when we adjust to allow for 10 years "credited" contributions.

11.4.4 Impact of change to State Pension Age from 66 to 68 on value for money

Tables 11.5 (a) and (b) below compare directly with Tables 11.1 (a) and 11.1 (b) above, except that it shows the value for money index provided by the Fund where the SPA is 68 in 2028 rather than 66.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	3.5	1.1	0.6	0.4
€233.60	4.1	1.3	0.7	0.4
€214.20	5.0	1.6	0.8	0.5
€202.80	7.1	2.3	1.1	0.8
€155.20	7.3	2.3	1.2	0.8
€95.20	6.7	2.1	1.1	0.7

Table 11.5 (a): Value for money on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC only. It allows for qualified adult payments attaching to male recipients, allows for SPA=68.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	4.1	1.3	0.7	0.4
€233.60	4.8	1.5	0.8	0.5
€214.20	5.8	1.8	0.9	0.6
€202.80	8.0	2.6	1.3	0.9
€155.20	8.0	2.6	1.3	0.9
€95.20	7.5	2.4	1.2	0.8

Table 11.5 (b): Value for money on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC, Invalidity, Illness and Jobseeker's Benefits. It allows for qualified adult payments attaching to male recipients and allows for SPA=68.

[59] We have assumed that credited contributions start at age 35 and end at age 45.

As expected, the value for money reduces. While the level of benefits received is the same, the pension is payable for a shorter period of time whilst contributions (employee and employer PRSI) are payable for a longer period. Comparing and contrasting Tables 11.1 (a) and 11.5 (a), it can be seen that the value for money for an individual on Average Earnings who is presumed to access the SPC only reduces from 1.4 to 1.1, for example.

There is a slightly more muted impact on value for money where the fuller range of benefits are taken into account. Although the pension benefits themselves are impacted as described above the other benefits costed (Invalidity Pension, Illness, Jobseeker's) are assumed to be available / payable for a longer period of time. Comparing and contrasting Tables 11.1 (b) and 11.5 (b), it can be seen that the value for money for an individual on Average Earnings who is presumed to access the SPC and also Invalidity Pension, Illness, Jobseekers Benefits (based on propensity of claiming each for every age) reduces from 1.6 to 1.3, for example.

11.4.5 Value for money when entering the PRSI system aged 35

Table 11.6 below shows the value for money on later entry to the PRSI system.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	6.6	2.1	1.1	0.7
€233.60	7.7	2.5	1.2	0.8
€214.20	9.4	3.0	1.5	1.0
€202.80	13.0	4.1	2.1	1.4
€155.20	13.1	4.2	2.1	1.4
€95.20	12.2	3.9	1.9	1.3

Table 11.6: Value for money on a range of earnings levels, entering the PRSI system aged 35. The above table takes account of Pension, Jobseeker's, Illness Benefits and Invalidity Pension.

If we compare Table 11.6 to Table 11.1(b), we can see that, as expected, the value for money for all pension rates and earnings levels increase the later the individual enters the PRSI system. Eligibility rules are met on the basis of the average number of weekly contributions paid before retirement; however the total value of contributions paid into the Fund is over a shorter period of time and therefore the Fund provides greater value for money.

For example, an individual who enters the PRSI system aged 25 on double the Average Earnings with entitlement of €233.60 weekly pension, has a value for money index of 0.9 meaning that this individual does not receive particularly good value for money from the Fund. On the other hand, for the same individual who enters the PRSI system aged 35, the value for money index increases to 1.2 as can be seen in the table above.

11.5 Value for money for self-employed from the State Pension (Contributory)

Currently the self-employed (Class S) PRSI contributors enjoy the same SPC entitlements as those paying Class A contributions. However, as self-employed contributors pay insurance at 4% compared to a combined Class A employer / employee contribution of 14.05%, they are not entitled to receive certain short term benefits[60], for example, Jobseeker's Benefit, and Illness Benefit.

Table 11.7 below shows the value for money a Class S contributor receives from their SPC on entering the system aged 25. This is shown on a range of different earning and pension rate levels and in all cases is well in excess of 1, indicating very good value for money is achieved.

[60] The self-employed are entitled to receive Maternity Benefit, Treatment Benefit from March 2017 and will be entitled to receive Invalidity pension from December 2017.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	8.9	4.5	2.2	1.5
€233.60	10.5	5.3	2.6	1.8
€214.20	12.8	6.4	3.2	2.1
€202.80	18.2	9.2	4.6	3.1
€155.20	18.5	9.3	4.7	3.1
€95.20	17.1	8.6	4.3	2.9

Table 11.7: Value for money for self-employed on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC pension benefits with attaching qualified adult payment only.

Table 11.8 shows the average weekly pension that the same accumulated contributions into the Fund would purchase in a hypothetical defined contribution pension scheme. In other words, it is the pension a self-employed individual might expect to receive if they invested their cumulative contributions in a defined contribution pension scheme and at retirement purchased a pension with the accumulated value of the invested contributions.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	€27	€53	€107	€160
€233.60	€22	€44	€89	€133
€214.20	€17	€33	€67	€100
€202.80	€11	€22	€44	€67
€155.20	€8	€17	€33	€50
€95.20	€6	€11	€22	€33

Table 11.8: Average pension level that could be purchased by self-employed if accumulated contributions were invested and used to purchase a private pension

The above tables highlight the fact that the SPC provides very good value for money to the self-employed. This value for money is greatest for those on the lowest income.

For example, if we consider a self-employed individual with Average Earnings and in receipt of a 100% pension, the weekly personal pension payment received is €238.30. Accumulating the same contributions over the projection period, we have estimated the pension they could secure from their hypothetical defined contribution pension scheme would be approximately €53 per week. The pension they receive from the Fund is approximately 4.5 times greater.

Self-employed contributions are charged at the rate of 4% of reckonable income over €5,000 or a flat €500, whichever is the greater. While the minimum payment has increased from €253 since the 2010 Review, self-employed contributors who pay the minimum contribution of €500 and who build up a sufficient contribution history to qualify for the SPC are getting exceptional value for money. To put this into context individuals paying at the minimum €500 per *year* over a full working life will receive a pension of €238.30 per week (circa €12,392 per annum) for each and every year during retirement.

11.5.1 Impact on value for money if Jobseeker's, Illness Benefits, and Invalidity Pension are extended to Class S PRSI contributors

To illustrate the additional value for money Class S contributors would receive if they were eligible for these additional benefits (they are already eligible for SPC and will be eligible for Invalidity Pension from December 2017), we calculate the value for money impact where all these benefits are deemed available to Class S contributors.

Table 11.9 below shows the value for money a Class S contributor receives from this range of benefits on entering the system aged 25. The table compares directly with Table 11.7 save for the inclusion of Invalidity Pension, Illness, and Jobseeker's Benefits and is shown on a range of

different earning and pension rate levels and in all cases the value for money is well in excess of 1, indicating very good value for money is achieved.

Weekly Pension	Minimum Wage	NAE	NAE x 2	NAE x 3
€238.30	10.4	5.2	2.6	1.7
€233.60	12.0	6.1	3.0	2.0
€214.20	14.6	7.3	3.7	2.4
€202.80	20.2	10.2	5.1	3.4
€155.20	20.3	10.2	5.1	3.4
€95.20	18.9	9.5	4.8	3.2

Table 11.9: Value for money for self-employed on a range of earnings levels, entering the PRSI system aged 25. The above table takes account of SPC pension benefits (with attaching qualified adult payments) and also Invalidity Pension, Illness, and Jobseeker's Benefits.

Comparing and contrasting the resulting value for money for various contributors as revealed in Table 11.7 with the assessed value for money under Table 11.9 provides an indication of the incremental value for money which would be realised by Class S contributors where all of Invalidity Pension, Illness, and Jobseeker's Benefits were available in addition to the SPC. For example, an individual on Average Earnings becoming entitled to an SPC of €202.80 achieves a value for money index of 9.2 where only the SPC benefit is assumed to be accessed. This increases to 10.2 where in addition to SPC, Invalidity Pension, Illness, and Jobseeker's Benefits are also assumed to be available and accessed. The rate at which these benefits are assumed to be accessed is commensurate with the propensity for individuals to claim at each and every age up to State Pension Age at the same propensity rates as the Class A population.

For more detail on the cost of extending Jobseeker's, Illness and Invalidity benefits to Class S contributors please see Chapter 12.

11.5.2 Contribution Rates needed to replicate State Pension (Contributory)

We have calculated the annualised contribution rates that would need to be paid to replicate the SPC on a range of earnings and pension rates for individuals entering the PRSI system aged 25. This is shown in Table 11.10 (a) below and results are compared to the "effective" annual rate of PRSI payable by Class A and Class S contributors.

The effective PRSI Rate for Class A earning more than €376 per week: {10.05% x Reckonable weekly Pay *+ 4% x (Reckonable weekly pay)}*

The effective annualised rate allows for the average number of weeks that PRSI is required to be paid over the course of the year in order to qualify for a given level of SPC. The annualised effective rate to qualify for 100% SPC for example is 13.0% i.e. 14.05% x 48 / 52 i.e. in the weeks that PRSI is required to be paid, 14.05% of the salary in that month is paid in PRSI. However 13.0% of the annual salary is paid in PRSI contributions (i.e. this allows for the fact that PRSI is not required to be paid for the full 52 weeks of the year).

In each case below and for consistency of approach we assumed that PRSI was paid on average over the minimum number of weeks required to qualify for a particular rate band (e.g. to qualify for full State Pension it was assumed that PRSI was payable over 48 weeks (rather than 52 weeks) etc. Table 11.10 (b) is similar to 11.10 (a) except that in addition to calculating the hypothetical contribution rate required to replicate the SPC in the various rate bands we also incorporated the hypothetical contribution / cost (as a % of salary) of notionally taking out insurance against the probability of needing to claim Invalidity Pension, Illness Benefit, and Jobseeker's Benefit.

The "required" contribution in Table 11.10 (a) is the % of salary that would need to be paid annually on an individual's full reckonable income to replicate the State Pension. The required contribution rate in Table 11.10 (b) is the combined % of salary that would need to be paid to replicate the State Pension but also pay for the cost of potentially claiming Invalidity Pension, Illness, and Jobseeker's Benefits at each and every year up to SPA.

Weekly Pension	Minimum Wage			NAE			NAE x 2			NAE x 3		
	Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate	
		Class A	Class S		Class A	Class S		Class A	Class S		Class A	Class S
€238.30	**30.8%**	8.2%	3.7%	**15.5%**	13.0%	3.7%	**7.8%**	13.0%	3.7%	**5.2%**	13.0%	3.7%
€233.60	**30.2%**	6.8%	3.1%	**15.2%**	10.8%	3.1%	**7.6%**	10.8%	3.1%	**5.1%**	10.8%	3.1%
€214.20	**27.7%**	5.1%	2.3%	**13.9%**	8.1%	2.3%	**7.0%**	8.1%	2.3%	**4.6%**	8.1%	2.3%
€202.80	**26.2%**	3.4%	1.5%	**12.2%**	5.4%	1.5%	**6.1%**	5.4%	1.5%	**4.1%**	5.4%	1.5%
€155.20	**20.1%**	2.6%	1.2%	**9.4%**	4.1%	1.2%	**4.7%**	4.1%	1.2%	**3.1%**	4.1%	1.2%
€95.20	**12.3%**	1.7%	0.8%	**5.7%**	2.7%	0.8%	**2.9%**	2.7%	0.8%	**1.9%**	2.7%	0.8%

Table 11.10 (a): Contribution rate as % of salary required to replicate the SPC payments only. The table compares these contribution rates with the effective actual annual contribution rates payable.

Weekly Pension	Minimum Wage			NAE			NAE x 2			NAE x 3		
	Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate		Required PRSI Rate	Effective Annual Rate	
		Class A	Class S		Class A	Class S		Class A	Class S		Class A	Class S
€238.30	**36.6%**	8.2%	3.7%	**18.4%**	13.0%	3.7%	**9.2%**	13.0%	3.7%	**6.1%**	13.0%	3.7%
€233.60	**35.4%**	6.8%	3.1%	**17.8%**	10.8%	3.1%	**8.9%**	10.8%	3.1%	**5.9%**	10.8%	3.1%
€214.20	**31.7%**	5.1%	2.3%	**16.0%**	8.1%	2.3%	**8.0%**	8.1%	2.3%	**5.3%**	8.1%	2.3%
€202.80	**29.1%**	3.4%	1.5%	**13.7%**	5.4%	1.5%	**6.9%**	5.4%	1.5%	**4.6%**	5.4%	1.5%
€155.20	**22.1%**	2.6%	1.2%	**10.4%**	4.1%	1.2%	**5.2%**	4.1%	1.2%	**3.5%**	4.1%	1.2%
€95.20	**13.6%**	1.7%	0.8%	**6.4%**	2.7%	0.8%	**3.2%**	2.7%	0.8%	**2.1%**	2.7%	0.8%

Table 11.10 (b): Contribution rate as % salary required to replicate the SPC payments, Invalidity, Illness and Jobseeker's Benefits. The table compares these contribution rates with the effective actual annual contribution rates payable.

The individuals highlighted in grey in the above tables are those who are getting good value for money from the Fund in that they are paying a lower effective annual rate of contribution than the hypothetically required rate.

By way of example an individual on Average Earnings would need to pay 15.5% of salary to replicate the €238.30 SPC 100% level assumed payable from age 66. Where the Invalidity, Illness and Jobseeker's Benefits are also taken into account the 15.5% would increase to 18.4%. This compares to the current effective PRSI rates of 13.0% (combined employer and employee), paid under Class A and 3.7% paid under Class S respectively.

Note that whilst the SPC is at the rates shown in the above table (leftmost column), the Jobseekers, Illness Benefit, and Invalidity Pension levels are assumed to be at rates appropriate to / commensurate with the typical PRSI history for the contributor in question. The combined cost compares directly with the "effective PRSI rate". Where the required PRSI rate is greater than the effective annual rate this indicates good value for money.

- For those on minimum wage and Average Earnings the level of contributions hypothetically required far outweighs the effective Class A and Class S contributions indicating very good value for money is obtained.
- At higher earnings levels (Average Earnings x 2 and Average Earnings x 3+), the opposite is true. Effective annual Class A PRSI contributions rates (employer and employee) are approximately on a par with or in excess of the hypothetically required PRSI contribution rates.
- This outcome (that those with earnings in excess of Average Earnings x 2 do not get value for money) is consistent with the results from Table 11.1 (b), and these individuals effectively subsidise those at lower income levels. For example, under our assumptions, an annual contribution rate of 4.6% of earnings would be sufficient to be paid by an individual on Average Earnings x 3 in order to replicate a pension of €214 per week. However this Class A contributor and his / her employer would have been required to pay between them an effective annual rate of PRSI of 8.1%.
- The Class S contributor on the same earnings level pays an effective rate of 2.3% and continues to receive good value for money from the Fund.

11.6 Impact of 2020 / National Pension Framework changes on value for money

We have investigated the National Pension Framework changes proposed to come into effect by 2020 (item 2 in the tables that follow) and examined how these are likely to impact on individuals' value for money. We have also investigated the impact of our illustrative 2020 design as described further in Chapter 12. Firstly, we have considered the impact on three sample insured persons / PRSI contributors all reaching pensionable age in 2020 as follows:

Impact of Total contributions approach on value for money for those retiring in 2020 – 2024 inclusive			
	Member A	**Member B**	**Member C**
	No Gaps but mostly "credits"	**Small Gaps**	**Large gaps**
Entry into PRSI system	1974	1974	1974
Total full rate contributions	690	1,637	912
Total Credits	1,702	57	96
Total	2,392	1,694	1,008
Average weekly contribution	52	36	21
Resulting pension under:			
1.Current Rules (Yearly average)	100%	**90%**	**85%**
2. National Pension Framework– Total contribution approach[1]	77%	**100%**	**63%**
Increase/Decrease on move to TCA as proposed at 2	Decrease	Increase	Decrease
3. Increase/Decrease on move to illustrative TCA design[2]	Unchanged	Increase	Unchanged

Table 11.11: Sample retiring pensioners in 2020

1 Total contributions approach based on 30ths for every year with a 10 year cap on credits

2 Total contributions approach based on 30ths for every year with a 10 year cap on credits for the five years 2020-2024 going to 35ths for retirees from 2025 onward. Guarantee that for those retiring 2020 – 2024 inclusive, the pension is at least as great as would have been obtained under the existing yearly average contribution rules – see Chapter 12.

The above example illustrates that those with strong PRSI records will fare better under the changes to be implemented in 2020 when total contributions are taken into account and anomalies associated with

the current system are addressed e.g. where an individual with higher total contributions can have a lower "average'" record and hence a lower pension entitlement.

Having examined the data, however, we found that the move to a TCA approach as proposed in the National Pensions Framework involved more individuals losing than winning under the proposed 2020 Framework and this was particularly the case in the early years of proposed introduction. The alternative illustrative 2020 design as described in Chapter 12 would ensure that nobody has reduced SPC entitlement in the first five years, reflecting the fact that by design all new retirees are guaranteed to get a SPC which is at least as great as that available under the current yearly average rules.

Impact of Total contributions approach on value for money for those retiring in 2025+			
	Member A No Gaps but mostly "credits"	**Member B** Small Gaps	**Member C** Large gaps
Entry into PRSI system	1984	1984	1984
Total full rate contributions	690	1,637	912
Total Credits	1,702	57	96
Total	2,392	1,694	1,008
Average weekly contribution	52	36	21
Resulting pension under:			
1.Current Rules (Yearly average)	**100%**	**90%**	**85%**
2.Proposed alternative 2020 design (35ths from 2025)	**66%**	**91%**	**54%**
3.Increase or Decrease on proposed illustrative 2020 design	Decrease	Increase	Decrease

Table 11.12: Sample pensioners in 2030 (similar impacts 2025+)

Table 11.12 shows how the position changes for the sample contributors once the "guarantee" expires and the 35ths formula is applied.

Table 11.13 shows the change in value for money for pension benefits for each of these sample contributors retiring in 2020. The 2020 TCA rules column affects the value for money attributable when the rules change to 30ths with a 10 year cap on credits. The alternative proposed TCA rules reflect the design described in Chapter 12 and reflects a "guarantee" for the first five years of operation that the pension will be no worse than under the current yearly average rules.

	Current Rules (YA)	2020 TCA rules	Alternative proposed TCA rules
Member A	1.3	1.0	1.3
Member B	1.1	1.3	1.3
Member C	1.1	0.8	1.1

Table 11.13: How value for money varies for each sample member retiring in 2020 between current "yearly average" rules, "Total contributions approach" rules and illustrative alternative design rules.

More generally having reviewed our retiring datasets[61] from the PRSI database retiring in 2020 and 2030 (see Chapter 12 for discussion on the impact of 2020 on pension rates), we note there are some key consequences of the National Pension Framework proposed changes:

- There will be an increase in the number of individuals in receipt of the 100% pension. This reflects those contributors who are negatively impacted by the averaging approach and therefore benefit from the more comprehensive total contributions approach.

[61] The datasets reflect all individuals in the PRSI database with date of births 1954 and 1962 (i.e. those due to retire in 2020 (aged 66) and 2030 (aged 68)).

- For others with a solid contribution history the new pension rules are a slightly positive change (those at the 98% level currently will more than likely enjoy a pension at the 100% level, for example).
- There will be a decrease in the number of contributors in receipt of pensions in the range of 85% to 99%. For a small minority of individuals the cap on credits (10 year limit) will push them into a lower pension band. Also, for some contributors to the system (e.g. late entrants and those with more broken histories) the averaging approach has proved more beneficial than the total contributions approach but gives rise to significant anomalies because of the failure to take into account the total PRSI history.
- There will be an increase in the number of individuals with pensions between 33% and 40% (the minimum level of SPC currently is 40%).
- Our illustrative design in Chapter 12 guarantees that individuals retiring for the first five years of operation of the new scheme will be no worse off than under the current rules. This implies that where this alternative design is implemented the above observations will only be relevant in respect of any individuals retiring as and from 2025 onwards.

Distribution by gender for 2020 and 2030 retiring datasets

2020 Retiring Dataset

2020 Retiring Dataset - Males			2020 Retiring Dataset - Females	
Personal Rate	**Pension % YA**	**Pension % TCA - 30ths**	**Pension % YA**	**Pension % TCA - 30ths**
100%	49%	53%	44%	38%
90-99%	38%	10%	34%	10%
80-89%	8%	9%	16%	16%
70-79%	0%	6%	0%	13%
60-69%	4%	9%	5%	17%
50-59%	0%	5%	0%	5%
33-49%	2%	8%	0%	0%

Table 11.14: Distribution of the 2020 retiring dataset across the various pension rate bands (expressed as a % of claimants) – males and females shown separately

2030 Retiring Dataset

2030 Retiring Dataset - Males			2030 Retiring Dataset - Females	
Personal Rate	**Pension % YA**	**Pension % TCA - 30ths**	**Pension % YA**	**Pension % TCA - 30ths**
100%	54%	72%	48%	69%
90-99%	33%	7%	37%	9%
80-89%	9%	6%	10%	8%
70-79%	0%	5%	0%	9%
60-69%	3%	4%	3%	5%
50-59%	0%	3%	0%	0%
33-49%	2%	2%	2%	0%

Table 11.15: Distribution of the 2030 retiring dataset across the various pension rate bands (expressed as a % of claimants) – males and females shown separately

The **findings of this Review** are broadly consistent with the 2010 Review:

- Those on lower incomes fare considerably better than those on higher incomes.
- Those with qualified adults achieve better value for money than those without.
- Those with short contribution histories have the potential to fare better than those with full contribution histories under the current rules.
- For a male and female both becoming entitled to the same level of SPC for a given contribution history, the Fund provides better value to females (all else equal) due to longer female life expectancy and hence their likelihood to receive a SPC pension for longer duration.
- Factoring in the additional value in respect of contributions paid by males, manifested largely through additional IQA payments (made directly to their wives/partners), means that the value for money is broadly equivalent across the genders as far as SPC entitlements are concerned. (Negligible qualified adult payments are made on female pension payments.)
- The value for money assessment is highly dependent on which benefits are assumed to be accessed from the Fund. When for example other benefits are considered in addition to the SPC such as Invalidity Pension, Illness, and Jobseeker's Benefits, males in fact achieve better value for money than their female counterparts due to males' higher propensity to claim these benefits.
- The self-employed achieve very good value for money compared with the employed – when the comparison reflects that both employer and employee contributions are payable in respect of an employed person.
- If Jobseeker's and Illness Benefits are extended to the self-employed they will enjoy even more favourable value for money.
- For those at the higher end of the income distribution, the Fund is redistributive and these individuals generally get back less than they pay in.

12 Policy Impacts

This chapter is divided into 3 main sections – (i) a short section on the impact of changing the assumed rate of increase on the SPC expenditure from real earnings growth to CPI, (ii) an examination of a wide variety of policy impacts in respect of proposed changes to SPC in 2020 and (iii) the impact of extending a variety of benefits to Class S contributors.

12.1 Indexation on the State pension

Differing approaches have been taken over time to increases in the level of State pensions, reflecting budgetary conditions as well as differing views as to whether increases should be linked for instance to inflation or to salary increases. The National Pensions Policy Initiative (May 1998) report recommended that the State pension should be increased from its then level of 28.5% of average industrial earnings to 34% of national average industrial earnings.[62]

This 34% target was reiterated in the National Pensions Review (October 2005).

The National Pensions Framework published in 2010 stated the following *"...In order to maintain this aim of preventing poverty for older people, the Government will seek to sustain the value of the State pension at 35 per cent of average weekly earnings and will support this through the PRSI contribution system".*

The State pension increased by approximately 56% over the 10 year period 2005 to 2015 (well ahead of increases in both earnings and inflation); at a time when the Consumer Price Index ("CPI") increased by approximately 11%[63]. The maximum rate is €238.30 per week effective March 2017 (33% of Average Earnings[64]).

Based on the above, we have assumed in our base case scenario that the SPC will continue to increase in line with real earnings growth and therefore be maintained at 33% of Average Earnings.

In the section that follows, we examine a number of scenarios whereby State pensions are indexed at alternative rates.

12.2 Indexation Options examined

In our base case we assumed that benefits would increase in line with projected future real earnings growth i.e. that the SPC would be maintained at 33% of Average Earnings. Alternative indexation scenarios examined as requested at 4.3.7 of the RFT were as follows:

- Indexation of benefits in line with projected CPI;
- An increase in the SPC to 40% of projected Average Earnings by 2029 (i.e. over a 10 year phase-in after 2019)[65]; indexation beyond this date in line with earnings inflation.

In examining the indexation options, we made assumptions about future levels of CPI (2% per annum in the long run) and earnings growth (1.5% per annum above CPI in the long run) as set out in Chapter 5.

[62] Statistics on average industrial earnings are no longer collected.
[63] As measured by the CSO's CPI index – mid December 2005 to mid-December 2015
[64] As per the CSO "Average Earnings" In Quarter 4 2016 Average Earnings were €716.06. Preliminary estimates for Q1 2017 are €723.08.
[65] We refined the scenario as the RFT sought an increase in line with approximately 35% - 40% National average earnings. This required us to make an assumption about how quickly the SPC would notionally increase to 40%.

Table 12.1 and Figure 12.1 illustrate the differing impacts a variety of policy indexation measures would have on the level of projected shortfalls under our base case assumptions.

Surplus / (Shortfall) as a % of GDP			
Year	Base Case (Keeping pace with Average earnings growth)	CPI Indexation	40% of Average earnings by 2029, increases in line with AE thereafter
2016	0.2%	*0.2%*	*0.2%*
2017	0.2%	*0.2%*	*0.2%*
2018	0.1%	*0.1%*	*0.1%*
2019	0.0%	*0.1%*	*(0.0%)*
2020	(0.1%)	*0.0%*	*(0.2%)*
2021	(0.2%)	*(0.0%)*	*(0.3%)*
2022	(0.2%)	*0.0%*	*(0.3%)*
2023	(0.3%)	*(0.0%)*	*(0.5%)*
2024	(0.4%)	*(0.1%)*	*(0.6%)*
2025	(0.5%)	*(0.1%)*	*(0.8%)*
2030	*(0.9%)*	*(0.3%)*	*(1.3%)*
2035	*(1.4%)*	*(0.4%)*	*(1.9%)*
2040	*(1.9%)*	*(0.6%)*	*(2.5%)*
2045	*(2.4%)*	*(0.7%)*	*(3.1%)*
2050	*(2.8%)*	*(0.6%)*	*(3.6%)*
2055	*(3.1%)*	*(0.5%)*	*(4.0%)*
2060	*(3.2%)*	*(0.3%)*	*(4.0%)*
2065	*(3.0%)*	*0.0%*	*(3.8%)*
2071	*(2.9%)*	*0.3%*	*(3.7%)*

Table 12.1: Projected (Surplus) / shortfall (as a % GDP) for various policy indexation measures

Re-rating benefits in line with CPI reduces the shortfall drastically over the review period.

Indexation of benefits in line with projected CPI means that projected expenditure broadly equal receipts over the entire projection period.

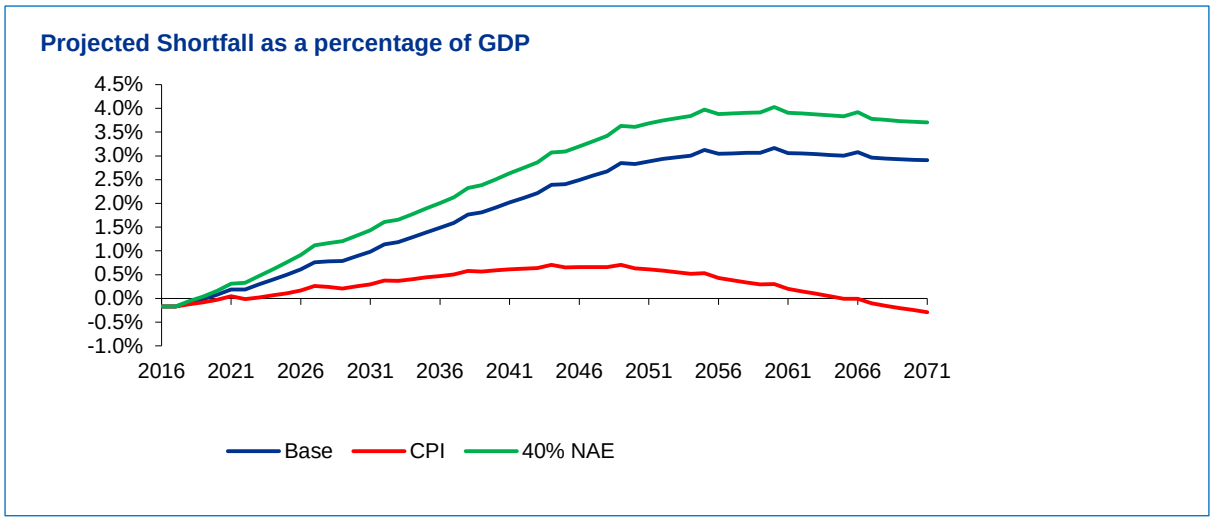

Figure 12.1: Projected Shortfall as a % of GDP – variety of policy indexation options

The above variety of indexation options were examined for illustrative purposes only, with a view to illustrating the impact that the up-rating of benefits at various levels has on the Fund over a prolonged period.

It is important to note that the constituents of the CPI index as a measure of price inflation may not always be appropriate when considering price inflation experienced by pensioners. For example, between 2007 and 2015, CPI (all items) increased by 3.1%, however education rose by 61.2%, alcohol/tobacco by 23.1% and healthcare by 15.3%, whereas clothing/footwear fell by 32.7%.

Adequacy of individual retirement income considerations

Whilst a policy of maintaining the SPC at 33% of Average Earnings maintains the real purchasing power of the SPC over the long term, a policy of increasing SPC in line with CPI would erode the purchasing power. For example, where price inflation is 1.5% below real earnings growth over the long term after say 30 years a policy of indexing the SPC in line with CPI would translate to a pension of 21% of Average Earnings.

Such a policy would mean that the SPC would most likely reduce below the "at risk of poverty[66] threshold" as defined in the EU Survey of Income and Living Conditions (SILC).

12.3 2020 Framework for Pensions

The Department requested at 4.3.9 of the RFT that we analyse a variety of National Pensions framework changes. In this section we set these out as follows:

2020 Changes

- SPC Projection based on current (yearly average) rules
- SPC Projection based on current (yearly average) rules to 2019 with 2020 rules thereafter
- SPC Projection reflecting an ascending scaling approach (30ths in 2020 rising to 35ths from 2025)
- Cost / savings analysis of a variety of current rules (yearly average) versus a variety of total contributions approaches ("TCA") which could potentially be implemented 2020 - 2030
- Expenditure neutral TCA approach (from 2020), along with the number of years' worth of contributions required to qualify for the highest pension and/or optimum banding/pro rata system
- A costing for a provision whereby, for a period of 5 years, new pensioners could choose the greater benefit of the current "Yearly Average" post 2012 rules method or the newer "TCA"
- *SPNC* Projection based on current rules for SPC
- *SPNC* Projection based on revised rules for SPC from 2020 as per above (30ths, credits cap)
- Deferment scheme - a cost analysis shall be performed for a deferment scheme, whereby people working past State Pension Age could defer drawdown of their State Pension contributory, in return for a higher rate of payment on retirement.

12.4 Recent Developments and Government Commitments – Pensions

Key recent developments and measures introduced affecting pension-related expenditure (given its importance to the overall Fund) are outlined below. Unlike the 2010 Review where all of these known changes (affecting both expenditure and income) were reflected in our base case actuarial model, for the purposes of this Review the base case reflects legislated for changes only. In other words, we have incorporated the SPA changes but not the mooted 2020 changes (including the proposed migration from an average to a total contributions approach) in the base case. We have, however, run scenarios

[66] 60% of median income or circa €12,000 in 2017 price terms

allowing for these proposed 2020 changes using a variety of different parameters and these are set out later in this Chapter.

The National Pensions Framework provided for a range of changes to the qualifying conditions for State pension and some additional changes have been in place since September 2012. We have outlined below a timeline of recent and upcoming changes (some confirmed, some anticipated and denoted accordingly).

Date	Outline of Measure
Sep-12	The number of rates bands for State Pension (Contributory) was increased. (Budget 2012 announcement)
Dec-13	The total number of paid contributions needed to qualify for Widow(er)'s and Surviving Civil Partner's Contributory Pension increased from 156 to 260.
2014	State Pension (Transition) was abolished. This standardised State Pension Age at 66 for all. (Social Welfare and Pensions Act 2011).
2020	It is planned that there will be a switch from the current yearly averaging system for State Pension (Contributory) to a total contributions approach. This has not yet been legislated for but it is a working assumption. As part of this reform, it is intended to move from a system of disregards to credits for homemakers in calculating eligibility. (Further detail on how it is intended it will operate is included in the National Pensions Framework and described in this chapter.
2021	State Pension Age will increase to 67. (Social Welfare and Pensions Act 2011)
2028	State Pension Age will increase to 68. (Social Welfare and Pensions Act 2011)
Under consideration	For those people who wish to postpone drawing down their State pension, consideration is being given to enabling them to receive an actuarially increased benefit when they decide to retire. The actuarial adjustment applied will not impose any additional burden on the Exchequer.

Table 12.2: Implemented and upcoming / expected changes to pension policy

12.4.1 Changes in the Rate Bands (for new recipients) from September 2012

The change to rate bands, effective September 2012, is in line with the move towards a planned change to a "total contributions approach" (a version of which was envisaged to be implemented in 2020 under the National Pensions Framework). Before September 2012 a person with an average of 20-47 PRSI contributions per year over their working life received a weekly State pension which is only €4.50 less than a person with a yearly average of 48 or more PRSI contributions. The changes to the rate bands in September 2012 supported the policy objective of ensuring that the rate of pension paid relates more closely to the contributions made during working lives.

Table 12.3 illustrates the change in the rates for the SPC pre and post September 2012. [The rates shown are updated to 2015 rates being the effective date of the Review.]

Pre September 2012			Post September 2012		
State Pension (Contributory) Rate bands			State Pension (Contributory) Rate Bands		
Yearly Average Contributions	**% of full SPC**	**Personal Rate Per Week (2015)**	**Yearly Average Contributions**	**% of full SPC**	**Personal Rate Per Week (2015)**
48 or over	100%	€230.30	48 or over	100%	€230.30
20 to 47	98%	€225.80	40 to 47	98%	€225.80
			30 to 39	90%	€207
			20 to 29	85%	€196
15 to 19	75%	€172.70	15 to 19	65%	€150
10 to 14	50%	€115.20	10 to 14	40%	€92

Table 12.3: State Pension (Contributory) Rates pre and post September 2012

By way of illustration, the impact on an individual with, say, an average of 25 yearly contributions:

- Pre September 2012 it can be seen from Table 12.3 that this individual would have been entitled to a SPC of €225.80 per week.
- Post the September 2012 changes the same individual would be entitled to a SPC of €196 per week.

Analysis produced by the Department of Employment Affairs and Social Protection in November 2016 illustrated the impact of the September 2012 changes on those SPC recipients who became pension age between September 2012 and November (split by gender) is set out below in Table 12.4.

Customers who are pension age after 01 September 2012				
	Affected By Sept 12 changes		**Unaffected By Sept 12 changes**	
SPC Test Type	**Female**	**Male**	**Female**	**Male**
Yearly average 10 to 14	986	944		
Yearly average 15 to 19	2,806	1,976		
Yearly average 20 to 29	9,164	4,355	1,054	442
Yearly average 30 to 39	7,733	6,035	942	625
Yearly average 40 to 47			3,082	8,082
Yearly average 48+			8,382	36,382
Non Yearly Average			8,466	9,661
EU / Bilateral / Mixed	4,527	5,083	445	678
Totals	**25,216**	**18,393**	**20,375**	**54,803**

Table 12.4: DSP analysis of new SPC recipients between Sept 2012 and Nov 2016 impacted by changed rules

The analysis clearly shows that the September 2012 changes had a greater proportionate impact on female recipients of SPC as compared with their male counterparts, with some 60% of those affected being women. 25,216 females were affected by the rate band changes between September 2012 and November 2016, compared with 20,375 unaffected. In other words, of the total females reaching SPA and paid SPC, circa 55% were affected by the changes. By contrast, circa 33% of males paid SPC were affected (18,393 / 73,196). The more marked impact on females arose due to greater numbers of females with lower yearly average contributions (many of whom had a yearly average in the range 20-47). These figures do not include women and men who as a result of the changes were instead paid a higher rate SPNC or IQA, and so the numbers impacted would be expected to be somewhat lower. Based on the pre September 2012 rules individuals with yearly average contributions of anywhere between 20 and 47 were qualifying for pension at the 98% level whereas post September 2012 a more direct relationship between yearly average contributions and SPC qualification levels prevailed such that those with yearly averages of 40-47 were qualifying for the 98% level as before but those with yearly averages of 20-29 were qualifying for 85% of full rate SPC. Table 12.5 summarises the impact of the above-mentioned changes to rate bands, qualification conditions, and SPA as they relate to individuals (varying by date of birth):

Date of Birth between		SPA	State Pension (Contributory) Rates basis	Qualifying conditions
01/01/1900	31/03/1946	66	Those already in receipt continue at existing pre September 2012 rates.	260 paid contributions
01/04/1946	31/08/1946	66	Pre September 2012 rates.	520 paid contributions
01/09/1946	31/12/1953	66	New September 2012 rates (i.e. the number of rates bands increases).	520 paid contributions
01/01/1954	31/12/1954	66	To be decided. Possibly some form of total contributions approach: Pension rates ranging from 33% to 100% (i.e. 10/30ths to 30/30ths), or 25% to 100% (i.e. 10/40ths to 40/40ths) depending on PRSI history and what final design is decided upon. To be decided as to whether there will be a limit on credits which count towards the total and what the minimum (e.g. 10 years) will be?	TBC e.g. 520 paid contributions
01/01/1955	31/12/1960	67		
01/01/1961+		68		

Table 12.5: State Pension (Contributory) entitlements at future state retirement ages (varying by DOB)

In relation to Table 12.5 above, we would point out that no one will reach SPA in 2021 as individuals turning 67 in that year will have reached SPA at age 66 in 2020. Similarly, no one will reach SPA in 2028 as anyone turning 68 in that year will have already reached SPA at age 67 in 2027.

As a result of the increase to the SPA and the abolition of the SPT with effect from 1 January 2014, we observed that a significant proportion of those affected (between age 65 and State Pension Age of 66) accessed other benefits of the Fund (e.g. Jobseeker's Benefit) and more typically means tested payments payable outside the Fund including Jobseeker's Allowance. We have allowed for this effect in our projections of future costs – an effect which will become more pronounced as the SPA is further increased to 67 in 2021 and 68 in 2028. Our approach to the incorporation of an allowance for individuals to access other benefits of the SIF as the SPA is extended is described in more detail in the methodology section - Section 5. These second order impacts should be borne in mind when assessing the savings related to measures to increase the SPA.

12.4.2 National Pensions Framework – 2020 changes

The rationale for the changes to the qualification conditions for State pensions in 2020 is set out in the National Pensions Framework document and is briefly summarised as follows:

- Given that social insurance is long established and is very comprehensive in terms of the workforce covered, it was considered that a "total contributions approach" should be adopted to replace the current averaging system. From 2020 the level of pension paid will be directly proportionate to the number of social insurance contributions paid by a person over his or her working life, thereby removing some of the anomalies associated with the current averaging approach.
- From 2020, 30 years (1,560 contributions) will qualify a person for the maximum level of SPC. A person will accumulate 1/30th of a pension for each year of contributions / credits up to a maximum of 30 / 30ths. Upon introduction of the total contributions approach in 2020, the maximum number of credits (currently unlimited) which can be counted for pension purposes will be restricted 520 weeks (i.e. 10 years).
- Credited contributions ("credits") form an integral part of the social insurance system. They are underwritten by the SIF and are designed to protect the social insurance entitlement record of insured workers who – for reasons relating to incapacity, ill-health, unemployment, early retirement, professional training or the provisions of care (i.e. for children, the disabled or the elderly) – are not in a position to make PRSI payments.

12.4.3 Programme for a Partnership Government 2016

In the Programme for a Partnership Government 2016, the Government stated that it would increase the State Pension and the Living Alone Allowance above the rate of inflation. There was also a reference within the programme for support for an increase in the Disability Benefit and Allowance, Carer's Benefit and Allowance, and Blind Person's Pension.

Variety of alternative 2020 scenarios

As part of the scope set out in the RFT we were asked as part of this Review to examine a variety of alternative 2020 scenarios including:

- an ascending scaling system (from 2020 onwards) where the total number of years' worth of contributions required to qualify for the highest State pension rate increases from 30 to 35 on an annual basis;
- a Cost/Savings analysis of Yearly Average ("YA") against a variety of Total Contribution Approach ("TCA") options which can be implemented in the period 2020-2030;
- an expenditure neutral TCA approach, along with the number of years' worth of contributions required to qualify for the highest pension and/or optimum banding / pro rata system;
- a provision whereby, for a period of 5 years, new pensioners could choose the greater benefit of the current YA method or the newer TCA.

In the sections that follow we examine each of the requirements of the RFT with respect to 2020 in turn.

12.5 SPC Projection based on current (yearly averaging) rules

Based on the methodology described in Chapters 5 and 6, we have projected the future expenditure of the SPC for the projection term to 2071. Table 12.6 below shows the projected SPC expenditure for each year up to 2025 and for each 5 year period thereafter, up to 2071. All figures shown in this table and the tables that follow are in real 2017 price terms.

SPC Expenditure (€ millions)	
Current "Yearly average" rules	
Year	**Expenditure**
2015	4,476
2016	4,662
2017	4,845
2018	5,057
2019	5,313
2020	5,566
2021	5,733
2022	5,685
2023	6,018
2024	6,359
2025	6,703
2030	7,938
2040	12,912
2050	19,846
2060	26,042
2071	30,117

Table 12.6: Projected SPC expenditure under the current rules (yearly average approach) - for each year to 2025 and for each 5 year period thereafter. Figures are in "real" 2017 price terms

As in previous reviews it can be seen from Table 12.6 that SPC is expected to increase steeply through time from e.g. €4.7 billion in 2016 to €5.6 billion in 2020 and further to €6.7 billion in 2025 with the steep trajectory continuing thereafter. The increased expenditure reflects the increasing numbers reaching SPA coupled with improvements in life expectancies for both existing and newly retiring recipients.

12.6 SPC Projection based on current (yearly average) rules to 2019 and thereafter "Total Contributions Approach" (as described in the National Pensions Framework)

Table 12.7 below shows the projected SPC expenditure for each year up to 2025 and for each 5 year period thereafter, up to 2071. The projected expenditure in this table reflects current yearly average rules to 2019 and the Total Contributions Approach as described in the National Pensions Framework from 2020 onward i.e. a person reaching State Pension Age as and from 2020 will accumulate 1/30th of a pension for each year of contributions up to a maximum of 30 / 30ths. The maximum number of credits applicable for pension purposes will be 520 (i.e. 10 years). As with other figures in this Chapter, homemakers credits post 1994 are reflected in the post 2020 TCA calculations and homemakers' disregards for the period post 1994 are reflected in the YA calculations in the base case.

Year	SPC Expenditure (€ millions)	
	Base Case "Yearly average" contributions	Current rules to 2019, National Pension Framework thereafter
2015 (act)	4,476	4,476
2016	4,662	4,662
2017	4,845	4,845
2018	5,057	5,057
2019	5,313	5,313
2020	5,566	5,558
2021	5,733	5,719
2022	5,685	5,661
2023	6,018	5,980
2024	6,359	6,307
2025	6,703	6,638
2030	7,938	7,828
2035	10,142	10,000
2040	12,912	12,739
2045	16,110	15,911
2050	19,846	19,627
2055	23,356	23,136
2060	26,042	25,811
2065	27,773	27,510
2071	30,117	29,829

Table 12.7: Projected SPC expenditure under the current rules (yearly average approach) to 2019 and reflecting the Total Contributions approach ("TCA") described in the National Pensions Framework thereafter.

The above table shows that the expenditure on SPC reflecting 2020 changes as proposed in the National Pensions Framework is only marginally different to that under the current YA rules. This reflects the fact that:

- the weighted average pension under the 2020 regime is not significantly different to the current yearly average rules (in 2020 the weighted average pension is 93.3% under current rules and is anticipated to reduce to 89.2% under the National Pensions Framework ("TCA") rules);
- the 2020 changes only impact new entries to the SPC and not the existing recipients in respect of whom the majority of the expenditure arises.

In the sections that follow we examine a range of alternative 2020 scenarios. None of these have a material impact in the early years following introduction in 2020. It takes a number of years for changes in expenditure of any note to emerge in the SPC.

The table below shows that of the total expenditure in 2020 under the current YA rules of €5.6 billion, €208 million is attributable to new entries. Any changes to SPC rules affecting new entries only (particularly with the objective of remaining broadly expenditure neutral) will clearly take a number of years before impacting on headline expenditure.

For example in the table below, where new entries in 2020 would comprise €208 million[67] of expenditure under existing rules, this would reduce to €199 million under the proposed National Pensions Framework rules (i.e. a TCA whereby individuals accrue 1/30th for each year of contributions to a maximum of 30 / 30ths allowing for the inclusion of credits of no more than 10 years) and increase to €211 million where the rules change such that the greater of current rules and National Pension Framework rules apply.

See the sections that follow for further analysis.

Expenditure New Recipients SPC - YA and 2020 Variants (€ millions)		
Retiring in spot year	**2020**	**2030**
Current rules ("YA")	208	323
2020 Variants ("TCA")		
30ths	199	320
31sts	197	317
32nds	195	315
33rds	192	312
34ths	190	309
35ths	188	306
40ths	177	292
Greater of YA and 30ths	211	330
Greater of YA and 35ths	209	327

Table 12.8: Expenditure (€ millions) for new recipients to SPC – 2020 retiring sample and 2030 retiring sample under a variety of different "TCA" rules

12.7 Cost / savings analysis of a variety of current rules (yearly average) versus a variety of total contributions approaches ("TCA") which can be implemented

Table 12.9 shows the projected SPC expenditure for each year up to 2025 and for each 5 year period thereafter, up to 2071 under a variety of alternative TCA scenarios.

The first two expenditure columns are as per Table 12.7, reflecting the base case under the YA rules and the TCA rules as described in the National Pensions Framework. The third column shows a TCA approach which is directly comparable with the second (National Pension Framework) column but shows expenditure based on 35ths rather than 30ths.

Finally, the rightmost column reflects expenditure under an ascending scaling system from 2020 onwards where the total number of years' worth of contributions required to qualify for the highest State pension rate increases from 30 to 35 on an annual basis i.e. in 2020 rules are based on 30ths, 2021 rules are based on 31sts etc., rising to 35ths by 2024 and remaining at 35ths thereafter.

[67] The expenditure for 2020 and 2030 shown reflects projected new entries assumed to be uniformly distributed throughout the year, meaning the expenditure attributable to new entries in the year is roughly half of what would be expected for a full year's expenditure.

In all cases a 10 year cap on credits is assumed to apply as described in the National Pensions Framework.

Costs / savings can be seen by observing the difference in expenditure for a particular scenario versus the projected expenditure under the current rules (YA (base case)) appearing in the leftmost column.

Year	SPC Expenditure (€ millions)			
	Base Case (YA)	2020 rules-30ths	2020 rules-35ths	2020 rules-30ths ascending to 35ths
2015	4,476	4,476	4,476	4,476
2016	4,662	4,662	4,662	4,662
2017	4,845	4,845	4,845	4,845
2018	5,057	5,057	5,057	5,057
2019	5,313	5,313	5,313	5,313
2020	5,566	5,558	5,547	5,558
2021	5,733	5,719	5,697	5,719
2022	5,685	5,661	5,630	5,659
2023	6,018	5,980	5,928	5,972
2024	6,359	6,307	6,233	6,288
2025	6,703	6,638	6,543	6,605
2030	7,938	7,828	7,641	7,721
2035	10,142	10,000	9,685	9,791
2040	12,912	12,739	12,281	12,412
2045	16,110	15,911	15,304	15,458
2050	19,846	19,627	18,866	19,041
2055	23,356	23,136	22,246	22,440
2060	26,042	25,811	24,829	25,041
2065	27,773	27,510	26,468	26,692
2071	30,117	29,829	28,700	28,943

Table 12.9: Cost saving analysis – impact on SPC expenditure (€ millions) of various "TCA" designs versus current ("YA") rules.

12.8 Impacts of illustrative TCA approachdes (from 2020) –"optimum" design options

We were requested as part of the RFT to determine an expenditure neutral TCA approach, along with the number of years' worth of contributions required to qualify for the highest pension and / or optimum banding / pro rata system.

There are a very wide range of approaches available when considering the design of potential TCA models. These are dependent on the following "levers":

- The accrual rate (e.g. 30ths, 35ths).
- The total number of credits (homemaking or otherwise) which can be counted towards total contributions, referred to as a "cap" on credits. For all illustrative scenarios, where a cap applies it is assumed to be a 10 year cap on credits.
- The period over which homemaking credits are to be awarded, e.g. from 1994 or earlier.
- Whether a "greater of" approach should be adopted whereby pensioners get the greater of the pension under the revised TCA rules but subject to a minimum of say 90% or 100% of the pension these individuals would have received under the current post 2012 rules – at least for an initial 5 year phase-in period. Note that where the 100% guarantee is allowed for this would mean that no individual would be worse off under the revised TCA rules as compared with the current rules during the period in which the guarantee is in effect.
- The "scalability" of the approach as PRSI records changes / improve through time. The question to be addressed is whether one linear formula reflecting the above components makes sense given that PRSI records are improving. All else being equal, a formula which is cash-flow neutral in 2020 is not neutral when applied to later retiring cohorts. Due to the fact that records are improving (reflecting increased labour force participation rates), an individual retiring in say 2030 is likely to do somewhat better under a TCA approach as compared with his / her counterpart retiring in 2020.

In attempting to derive an efficient design we reviewed the 2020 and 2030 retiring samples and applied a number of alternative approaches / formula within the overall TCA framework. It should be noted that, as envisaged in the National Pensions Framework, eligibility for SPC (at any rate of payment) would continue to be based on a minimum of 10 years paid contributions and all the scenarios outlined assume that this rule continues over the period of the review. The four alternative designs / scenarios examined are as shown in Box 12.1.

Base case reflects current YA approach. Other scenarios reflect a total contributions / pro rata:

- Scenario 1: 35ths, 10 year cap on credits, no "guarantee" that pension will be in anyway linked to what would have been received previously
- Scenario 2: 30ths, no cap on credits, "guarantee" for those retiring in the five years 2020 - 2024 that the pension will be no less than 90% of the pension that would have been received under YA rules
- Scenario 3: 30ths for five years 2020 - 2024 reverting to 35ths from 2025 onward, 10 year cap on credits. Pension under revised rules will be at least as great as 100% of the pension the individual would have received under the previous rules (YA approach). This underlying '"guarantee" will remain in place for 5 years 2020 – 2024 inclusive.
- Scenario 4: 30ths throughout, no cap on credit, 100% guarantee.

Box 12.1: Alternative designs / scenarios examined as part of potential 2020 changes

The tables that follow in this Section and in Appendix 7 were generated and analysed as part of that exercise. We have focused in this Chapter on one illustrative TCA design – Scenario 3 above. We have also included significant additional detail in Appendix 7 on the broader variety of scenarios examined, the impacted retirees in each case and the overall resulting weighted average pension. None of the scenarios outlined is being put forward as a potential optimum design but rather to illustrate the impact on individual future pensioners and the associated overall costs.

This illustrative design reflects a TCA approach based on 30ths with a 10 year cap on credits and applying a "guarantee" that the pension is no less than the pension the individual would have received under the current rules for the first five years of the new scheme (i.e. 2020 - 2024). After the first five years have elapsed any new retirees in the scheme will receive a pension based on a TCA approach reflecting 35ths.

Box 12.2: Illustrative design further examined in this Section as part of examination of potential 2020 changes

€ millions		SPC Expenditure under a variety of 2020 scenarios (Homemaking Base Case assumption)			
	YA	Variant TCA Approaches (Scenarios 1-4)			
Year	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current rules	35ths with Cap	Greater of 90% YA and 30ths: No cap, 5 year guarantee	Greater of YA and 30ths: Cap for 5 years, 35ths: Cap after	Greater of YA and 30ths: No Cap, 10 year guarantee
2020	208.0	188.6	207.6	211.1	211.6
2021	423.9	384.4	423.1	430.3	431.4
2022	628.5	573.0	628.3	638.4	640.0
2023	1,075.3	985.1	1,076.5	1,092.7	1,095.6
2024	1,547.1	1,421.7	1,549.8	1,572.3	1,576.4
2025	2,039.5	1,878.9	2,044.2	2,072.8	2,078.2
2026	2,547.3	2,350.6	2,550.1	2,575.8	2,595.0
2027	3,135.1	2,897.0	3,132.8	3,146.0	3,193.2
2028	3,342.3	3,090.4	3,337.9	3,344.0	3,404.4
2029	3,611.6	3,344.7	3,607.3	3,606.2	3,679.6
2030	4,179.9	3,882.4	4,176.4	4,160.1	4,260.8
2031	4,778.4	4,449.9	4,776.4	4,743.6	4,873.2
2032	5,505.8	5,138.9	5,505.7	5,454.6	5,617.2
2033	6,049.5	5,657.5	6,051.6	5,983.2	6,173.6
2034	6,726.8	6,302.4	6,731.6	6,644.0	6,866.2
2035	7,427.9	6,971.1	7,435.7	7,328.5	7,583.0
2036	8,151.9	7,662.5	8,162.9	8,035.3	8,322.8
2037	8,911.9	8,388.9	8,926.4	8,777.4	9,099.4
2038	9,896.8	9,327.6	9,915.4	9,740.2	10,105.8
2039	10,540.6	9,946.3	10,562.8	10,367.2	10,763.7
2040	11,397.2	10,767.2	11,423.5	11,203.9	11,638.5
Total	**102,125.3**	**95,609.1**	**102,226.1**	**101,127.6**	**104,209.7**

Table 12.10: SPC Expenditure (€ millions) new entries 2020 onward reflecting base case and a variety of TCA approaches

Note as described as a footnote under Table 12.8, €208 million expenditure in 2020 attributable to new entires in that year reflects the underlying assumption that new entries are uniformly distributed throughout the year, meaning the expenditure in the year is roughly half of what would be expected for a full year's expenditure.

12.8.1 Microeconomic impacts of illustrative Scenario – Scenario 3 above

The impact on a variety of individual contributors of introducing the TCA rules underlying Scenario 3 is outlined in Tables 12.11 to Tables 12.14. Scenario 3 rules are as follows:

A TCA approach based on the best 30 years of contributions and credits (30ths) with an overall cap of 10 years credits, including homemaking credits, and applying a "guarantee" that the pension is no less than the pension the individual would have received under the current rules for the first five years of the new scheme (i.e. 2020 – 2024 inclusive). After the first five years have elapsed any new retirees in the scheme will receive a pension based on a TCA approach reflecting 35ths and a 10 year cap on credits.

Overall Impact on individuals

Overall profile of those impacted	YA	Illustrative TCA design	YA	Illustrative TCA design
Retiring Sample	**2020**		**2030**	
	Current rules	**Greater of YA and 30ths: Cap**	**Current rules**	**35ths**
Overall weighted average pension	**93.3%**	**94.9%**	**94.4%**	**89.4%**
Increased SPC	0	10,661	0	8,366
Decreased SPC	0	0	0	14,965
Greater than 10% increase SPC	0	153	0	0
Greater than 10% decrease SPC	0	0	0	9,945
Total in Sample	31,107	31,107	39,547	39,547

Table 12.11: Overall profile of impacted individuals. Current Rules and illustrative "TCA" / 2020 design

Impact on individuals reaching State Pension Age in 2020

- Sample size 31,107 (i.e. all those currently in the PRSI base with DOB 1954 expected to claim SPC aged 66 in 2020).
- Overall weighted average pension under current yearly averaging rules is 93% and this would increase to 95% under this illustrative design.
- There are no retirees with reduced SPC entitlement for the first 5 years as the pension rate payable over the period to 2024 would be guaranteed to be at least as great as the pension which the individual would have been entitled to under current yearly average rules. This guarantee would continue to apply into the future for those who became pensioners during the period, but would not apply to new pensioners from 2025.
- 10,661 pensioners would have increased SPC entitlements with a small minority (153) receiving "significantly" increased SPC (where "significant" is a pension which is more than 10% higher than would have been received had the rules not changed).

Impact on individuals reaching State Pension Age in 2030

- Sample size 39,547; (i.e. all those currently in the PRSI base with DOB 1962 expected to claim SPC aged 68 in 2030);
- Overall weighted average pension under current yearly averaging rules is 94% which would reduce to 89% under this design reflecting a move to 35ths with a 10 year cap on credits from 2025;
- Overall, 14,965 pensioners would have lower SPC entitlements of whom 9,945 have "significantly" reduced SPC i.e. pension would be more than 10% lower than had it been calculated on current yearly average rules. On the other hand, circa 8,366 individuals will become entitled to an increased SPC under these rules. The increase for these individuals will

be within 10% of the pension they would otherwise have been entitled to under the former YA rules.

Overview

Scenario 3 results in improved pensions for some individuals in the shorter term - the overall weighted average pension is 95% versus 93% under current rules for the 2020 retiring sample. For those retiring from 2025 onward, however, a marked change in the overall pension expenditure and the average weighted pension is observed when compared with what would have arisen under YA rules. This arises as the "guarantee" / link with previous rules would no longer apply and the pension rate would be calculated based on a pro-rata of 35 years. Current rules would give rise to a weighted average pension in 2030 of 94% versus 89% under these revised rules for example. By definition there are no retirees in 2020 with reduced SPC entitlement under this scenario but there are 14,965 retirees with reduced SPC from a sample of 39,547 in 2030, when the guarantee is no longer in place. There are retirees with increased SPC entitlements in 2030 but very few with "significantly increased" SPC.

Impact of Scenario 3 on Future Pension Costs

During the period in which the guarantee is expected to apply (2020 - 2024), the impact on the pension expenditure is quite low, with a total of €62 million increase in expenditure over the 5 year period. After the guarantee is removed, and the calculations for new entries are changed from 1 / 30th for every year to 1 / 35th, the expenditure begins to fall. Overall a total of €1 billion is saved in the 20 year period.

€ millions	SPC Expenditure for post 2020 entries	
Year	**Base Case**	**Scenario 3**
	YA	**30ths 2020-2024, 35ths 2025+, 10 year Credit cap, 5 year 100% guarantee**
2020	208.0	211.1
2021	423.9	430.3
2022	628.5	638.4
2023	1,075.3	1,092.7
2024	1,547.1	1,572.3
2025	2,039.5	2,072.8
2026	2,547.3	2,575.8
2027	3,135.1	3,146.0
2028	3,342.3	3,344.0
2029	3,611.6	3,606.2
2030	4,179.9	4,160.1
2031	4,778.4	4,743.6
2032	5,505.8	5,454.6
2033	6,049.5	5,983.2
2034	6,726.8	6,644.0
2035	7,427.9	7,328.5
2036	8,151.9	8,035.3
2037	8,911.9	8,777.4
2038	9,896.8	9,740.2
2039	10,540.6	10,367.2
2040	11,397.2	11,203.9
Total	**102,125.3**	**101,127.6**

Table 12.12: SPC Expenditure (€ millions) for new entrants after illustrative pension changes

Gender analysis

The tables that follow show the profile of male and females projected to be impacted by proposed changes under this illustrative scenario (scenario 3).

Impact on the 2020 and 2030 retiring sample of males and females

Impact of Scenario 3 changes on Male SPC		
	2020 Retiring Sample	**2030 Retiring Sample**
Overall weighted average pension	**96.0%**	**89.7%**
Increase	5,827	3,611
Decrease	0	7,628
Greater than 10% increase	15	0
Greater than 10% decrease	0	5,281
Total in Sample	**18,203**	**22,596**

Table 12.13: Impacted males under illustrative "TCA" / 2020 design for the 2020 and 2030 retiring samples

Impact of Scenario 3 changes on Female SPC		
	2020 Retiring Sample	**2030 Retiring Sample**
Overall weighted average pension	**93.2%**	**89.0%**
Increase	4,834	4,755
Decrease	0	7,338
Greater than 10% increase	138	0
Greater than 10% decrease	0	4,664
Total in Sample	**12,904**	**16,951**

Table 12.14: Impacted females under illustrative "TCA" / 2020 design for the 2020 and 2030 retiring samples

Comparing and contrasting the above two tables, it can be seen that by 2020 females are projected to have lower overall weighted average pensions than men at 93.2% compared with 96% under the illustrative design which reflects the greater of current rules and 30ths. By 2030, women's overall weighted average pensions almost converge with those of their male counterparts at 89% as compared with 89.7%. This reflects improving female records over time coupled with the fact that by 2030 homemaking gaps are expected to be largely filled by credits under this illustrative scenario given that homemaking will have typically occurred post 1994.

12.8.2 Impact of extending the above illustrative scenario to the existing stock of retired population (those retired in 2012 – 2019)

We have costed the impact of extending the measures in the illustrative 2020 design ("Scenario 3") to the existing retired population of those who have and are expected to claim SPC in 2012 – 2019 inclusive (a total of circa 200,000 individuals).

In order to perform the costing we examined the full PRSI history data in our 2016 retiring sample (a year which was broadly midway through the period).

Noted that there were circa 29,000 new SPC claimants in that year. The cost of extending the benefit to this cohort would have been €6 million. We estimated the impact at total new entries 2012 – 2019 inclusive at circa €40 million in the first full year in 2020.

[This allows for assumed 2020 SPC rates in real price terms. Noted that the cost will increase through time where the SPC rate changes but will reduce due to the impact of mortality of this cohort.]

12.9 A costing for a provision whereby for a period of 5 years, new pensioners could choose the greater benefit of the current "Yearly Average" method or the newer "TCA"

The expenditure here reflects the greater of the YA and the newer illustrative TCA design (described above as Scenario 3).The table is directly comparable with Table 12.12 but rather than merely showing expenditure for new entries post 2020 it also includes expenditure in respect of the "existing stock" of recipients throughout.

In the first five years of introduction post 2020 this provision is more costly than either the SPC (current rules) or those under a 30ths TCA approach, reflecting the cost of the "greater of" optionality available to individuals. Once the first 5 years have elapsed and the guarantee period has expired, new entries from that point forward receive a pension based on 35ths, resulting in lower expenditure in respect of these new entries.

Year	SPC Expenditure (€ millions)	
	Base Case	"Greater of" current rules and revised rules for 5 years, thereafter reverting to 35ths / TCA
2015	4,476	4,476
2016	4,662	4,662
2017	4,845	4,845
2018	5,057	5,057
2019	5,313	5,313
2020	5,566	5,570
2021	5,733	5,743
2022	5,685	5,695
2023	6,018	6,036
2024	6,359	6,384
2025	6,703	6,736
2035	10,142	10,043
2045	16,110	15,813
2055	23,356	22,882
2065	27,773	27,184
2071	30,117	29,462

Table 12.15: Projected SPC expenditure under the current rules (yearly average approach) to 2019 and reflecting the greater of yearly contributions average and Total Contributions Approach ("TCA") thereafter for five years 2020-2024 reverting to 35ths Total Contribution Approach from 2025 onward

12.10 SPNC Projection based on current rules for SPC

It should be noted that the SPNC projections interact with the SPC projections as individuals who pass the means test required to potentially qualify for SPNC receive a pension equal to the greater of the SPC and SPNC.

Inter-scheme adjustments occur between Vote 37 State Pension Non-Contributory and Social Insurance Fund State Pension Contributory. This is intended to occur where a pensioner receiving SPNC has an underlying entitlement to SPC. The SIF is then expected to pay across an amount in respect of the cohort of individuals in receipt of SPNC who originally had an underlying entitlement to SPC. The adjustment was just under €100 million in 2016.

Individuals can become entitled to SPNC where they pass the means-test and either (i) are not entitled to SPC at all based on their PRSI record or (ii) would be entitled to SPC but at a lower rate band than the SPNC. We analysed new recipients of SPNC in 2016 to ascertain the number who would otherwise

have qualified for SPC (and at varying rate bands) by matching their SPNC customer IDs to their PRSI contribution histories (provided as part of the retiring sample of SPCs in 2016).

Of the circa 5,897 retiring SPNCs in 2016, over 80% (4,764) would not appear to have been entitled to any SPC. The remaining 20% (1,132) would have had an underlying entitlement to SPC at a lower rate than the rate at which their SPNC is in payment. The inter-scheme transfers are in respect of those 1,132 individuals in 2016.

SPNC new entries in 2016 - rate band of SPC for which they would otherwise have qualified (i.e. the underlying SPC entitlement)					
	M	W	M	W	Overall
100%	neg	neg	neg	neg	neg
98%	61	17	1%	0%	1%
90%	162	92	3%	2%	4%
85%	140	223	2%	4%	6%
65%	62	137	1%	2%	3%
40%	45	86	1%	1%	2%
0%	2,506	2,258	42%	38%	81%

Table 12.16: SPNC new entries in 2016 (5,897 in total) and the split out of rate bands of SPC which they would otherwise have qualified for

Given the strong correlation between the numbers who do NOT qualify for SPC (primarily because they do not meet the 520 minimum paid contributions requirement) and those who DO qualify for SPNC, the projected new entries to SPNC is strongly correlated with the trend in those not qualifying for SPC. New entries to this benefit type therefore decline through time as PRSI records are improving and more individuals qualify for SPC in their own right. More detail on our SPNC modelling approach is included in Chapter 5.

Another closely related issue is means-tested increased payments for independent qualified adult beneficiaries (IQAs) - this is another route by which individuals who did not make enough contributions *themselves* to qualify for SPC can nonetheless gain access to a payment. We have assumed in our modelling that the take up of this payment remains constant given the inherent uncertainty in take up.

A review of our sample data for those retiring at various years into the future corroborated the finding at the 2010 Review that higher numbers of individuals (as a % of the population) are projected qualify for SPC in their own right as PRSI continue to improve through time, meaning the number of new entries to SPNC is projected to reduce. However offsetting this is the ageing of the population effect which means more individuals are qualifying for some form of pension payment. Our methodology for projecting SPNC expenditure which separately looks at the 2 cohorts of qualifiers (the 80% of qualifiers who would not have been entitled to any SPC, the remainder who had an underlying entitlement to SPC but receive the higher SPNC payment) is outlined in Chapter 5. SPNC expenditure (paid outside the SIF) in 2015 was €0.97 billion.

12.11 SPNC Projection based on revised rules for SPC from 2020 (30ths, credits cap)

As described in the preceding section, there is an interaction between expenditure on SPNC and SPC. Where more individuals qualify for SPC at higher levels, expenditure on the means-tested SPNC reduces in respect of the affected cohorts.

The interaction is immaterial on changing the pension rules in 2020:

- our analysis shows that, of the new entries to SPNC in 2016, 80% of them would not have qualified for SPC in any event. The qualification conditions for SPC are proposed to remain unchanged on a change to the 2020 rules (i.e. the minimum 520 “paid” contribution requirement will remain).

- There is a frictional expenditure change in respect of the small numbers (20% of new SPNC qualifiers in 2016) in terms of the intra-scheme transfer to the extent the formula (SPNC less the revised SPC rate) differs for each as compared with previous rules.

Table 12.17 below shows the SPNC expenditure under the YA approach for SPC and the TCA approach for SPC. The SPNC expenditure shown includes the Christmas bonus expected to be maintained at 85% of one week's pay.

Year	SPNC Expenditure (€ millions)	
	Base Case "Yearly average" contributions for *SPC*	TCA approach for *SPC*
2015 (act)	972	972
2016	982	982
2017	988	988
2018	1,037	1,037
2019	1,092	1,092
2020	1,147	1,152
2021	1,183	1,189
2022	1,172	1,182
2023	1,239	1,257
2024	1,302	1,329
2025	1,368	1,405
2030	1,548	1,635
2035	1,724	1,903
2040	1,806	2,097
2045	1,812	2,217
2050	1,861	2,378
2055	1,933	2,535
2060	1,987	2,642
2065	2,030	2,719
2071	2,152	2,889

Table 12.17: Projected SPNC expenditure under (i) the current rules for *SPC* (Yearly Average approach) throughout and (ii) Yearly Average approach to 2019 and reflecting the Total Contributions approach ("TCA") described in the National Pensions Framework thereafter.
Christmas bonus at 85% of one week's pay is included from 2017 onward.

12.12 A deferment scheme

The Department requested at 4.2.9 of the RFT, that we analyse a deferment scheme: Cost analysis shall be performed for a deferment scheme, whereby people working past SPA could defer drawdown of their State Pension Contributory, in return for a higher rate of payment on retirement. While there will be default values provided for the report by the Department, the model should allow input of variables for (a) the rate of increase in pension per month deferred, (b) the expected percentage take up of the scheme, (c) the average duration of the deferments under the scheme, and (d) the average life expectancy of those who avail of the scheme.

The following comments were made in this National Pension Framework on this topic.

"People are living longer, and many people want to have the option of working longer. For those people who wish to postpone drawing down their state pension, arrangements will be put in place to enable them to receive an actuarially increased benefit when they decide to retire. The actuarial adjustment applied will not impose any additional burden on the Exchequer."

In the UK the way the deferment scheme works is that once you're 4 months away from State Pension Age, you can either claim your State Pension or delay (defer) claiming it. Deferring your State Pension could increase the payments you get when you decide to claim it. Your State Pension increases by 1% for every 9 weeks you defer. This works out as just under 5.8% for every full year. The extra amount is paid with your regular State Pension payment.

Box 12.3: Summary of the UK state pension deferment scheme

12.2.1 Illustrative Analysis

For our illustrative analysis, we used the 2018 retiring sample with the following assumptions:

- The rate of increase in pension per month deferred =0.45% per month deferred;
- The expected percentage take up of the scheme = 3%;
- The average duration of the deferments under the scheme = 18 months;
- Life expectancy for those who avail of the scheme = approximately 21.5 years life expectancy for males and 24 years life expectancy for females at age 66, compared to 17.6 years for males and 20.1 years for females for "normal" population life expectancy[68].

Our analysis showed that whilst expenditure was broadly neutral overall, the cash-flow profile is different – lower in early years and higher in later years because of the deferment.

We have examined projected future expenditure allowing for the above assumptions around deferment. Given the low assumed take up (3%) which will only affect new entries to SPC (circa 7% of total SPC expenditure in 2015) and not affect the existing stock of recipients at all, the impact on overall cash-flows was negligible.

We therefore performed expenditure analysis for a deferment scheme, whereby people working past SPA could defer drawdown of their SPC, in return for a higher rate of payment on retirement. We took into account the rate of increase in pension per month deferred, and the average life expectancy of those who avail of the scheme. For the purpose of this analysis we used a real discount rate of 1.5% as per base case.

Table 12.18 shows the cumulative expenditure for the 2018 retirees anticipated to take the deferment scheme where available.

[68] "Normal" / typical population life expectancies are shown at Table 6.4 and consistent with the above 17.6 for 66 year old males and 20.1 for 66 year old females in 2015.

€ millions	Cumulative pension expenditure	
	Base Case	Deferment
2018	6	0
2019	18	0
2020	30	13
2021	43	26
2022	55	40
2023	67	53
2024	79	66
2025	92	80
2030	155	148
2035	218	216
2040	278	281
2045	328	335
2050	362	372
2053	371	381

Table 12.18: Cumulative expenditure for 2018 retirees projected to take deferment scheme, if offered

12.2.2 Expenditure neutral uplift

In order to calculate an expenditure neutral case, the increase per month for deferring a scheme was considered. A rate of 0.25% per month, or 3% per annum was calculated as optimal. This level of monthly increase would render the cost of the deferment scheme equal to the actuarial cost of the cash-flows otherwise arising under the current “YA” rules.

€ millions	Cumulative pension expenditure	
	Base Case	Deferment
2018	6	0
2019	18	0
2020	30	13
2021	43	26
2022	55	39
2023	67	52
2024	79	65
2025	92	78
2030	155	144
2035	218	211
2040	278	274
2045	328	326
2050	362	362
2053	371	372

Table 12.19: Cumulative expenditure for 2018 retirees projected to take deferment scheme, if offered

It should be noted that for all cases the effect of the deferment scheme will only be fully realised when the entire SPC population has been offered the option to defer payments, and the expenditure will be lower than otherwise prior to this as the saving from unclaimed pensions is higher than the cost of increased pensions for those opting for deferment.

12.13 Extension of benefits to Class S

The Programme for a Partnership Government (2016) contains a commitment as follows: "*We will seek to introduce a PRSI scheme for the self-employed and provide a supportive tax regime for entrepreneurs and the self-employed".* In line with this commitment, it was announced in Budget 2017 that cover for Treatment Benefits and Invalidity Pension would be extended to PRSI Class S contributors from March 2017 and December 2017, respectively.

The Department requested at 4.3.10 of the RFT that we project expenditure (disaggregated annually up to 2025 and then at 5 yearly intervals) for Class S self-employed contributors if they were to receive certain benefits for which they currently do not qualify or where it has been announced that cover would be extended (4.6.2).

We were also requested to project the PRSI contribution rates required to provide each of these benefits to Class S contributors on a revenue neutral basis.

In terms of extension of benefits to Class S this section of the chapter sets out:

- Projection of additional expenditure on Invalidity Pension
- Projection of additional expenditure on Illness Benefits
- Projection of additional expenditure on Jobseekers Benefit
- Projection of additional expenditure on Carer's Benefit
- Projection of additional expenditure on all four of Invalidity, Illness, Jobseeker's and Carer's Benefit due to extension to Class S
- PRSI Contribution rates required to provide each of these benefits to Class S contributors on a revenue neutral basis.

12.14 Background to policy relating to Class S

12.14.1 Budget 2017 measures

- Invalidity Pension extended to Class S Contributors from December 2017;
- Treatment Benefit extended to Class S Contributors from March 2017;
- Range of Treatment Benefits (for employees and self-employed) extended from September 2017 to provide further Dental and Optical Benefits.

12.14.2 Background

Currently the self-employed / Class S pay social insurance contributions at 4% of earnings and are entitled to the state pension subject to the same qualification conditions as other PRSI classes but cannot access a number of other benefits, the most material of these being Jobseekers, and Illness Benefit.

In addition to SPC, Class S contributors or self-employed are entitled to the following benefits:

- Maternity Benefit
- Adoptive Benefit
- Paternity Benefit
- Widow(er)'s and Surviving Civil Partners (Contributory) Pension
- Guardian's Payment (Contributory)
- Treatment Benefit (from March 2017)
- Invalidity Pension (from December 2017)

Class S do not, however, receive the following benefits:

- Jobseeker's Benefit
- Illness Benefit
- Health and Safety Benefit, Occupational Injuries Benefit
- Carer's Benefit.

12.15 Approach

The approach to costing the extension to the various benefit types (Invalidity, Illness, Jobseeker's) involved taking the following steps:

- We examined the annual numbers of Invalidity / Illness / Jobseeker's including new claimants by age and gender in 2015 and a number of preceding years;
- We identified the populations currently entitled to these benefits (e.g. Class A with > 260 paid contributions for Invalidity Pension by examining current qualification conditions and payment rates for each benefit types. Full list of qualification conditions for each benefit type are included in the Appendix);
- The break-down of new claims by age and gender in a year expressed as a proportion of the population currently eligible provided an annual new claims incidence rate;
- We applied these incident rates to the population of Class S by age and gender (with > 260 paid etc.) i.e. the new " exposed to risk";
- This gave us total numbers from Class S likely to qualify in each year (assumed to commence in December 2017 for invalidity as already announced and 2018 for Illness and Jobseeker's);
- We projected this into the future by examining the change in the projected Class S population through time and allowing for uprating of the benefits etc.

We did not cost benefits other than Invalidity, Illness and Jobseekers Benefits. Other benefits which the self-employed are currently not entitled to include e.g. Health and Safety Benefit and Occupational Injuries Benefit both of which are relatively immaterial in overall Fund expenditure terms but are clearly beneficial for those individuals who enjoy these benefits currently.

We discuss our approach to and various considerations to be borne in mind with respect to the costing for each benefit type in turn below:

12.15.1 Invalidity Pension

- Incidence of Invalidity Pensions in the Class A population in a particular year
- Break down of new claims by age and gender in a year - annual new claims incidence rate
- Applied Class A annual new claims incidence rate to Class S population by age and gender
- 1st year cost - assumed applications made evenly throughout the year for Illness and Jobseeker's and December 2017 only for Invalidity Pension.
- 2nd year cost - full year cost of previous years applications PLUS assumed applications made evenly throughout the year
- 3rd and subsequent years - as above

Note Invalidity Pension differs slightly from the other benefit types in that it is a longer term benefit than either of Jobseeker's or Illness. It takes circa **10 years to get to full "steady state" expenditure.**

12.15.2 Illness Benefit

The nature of the benefit is different to Invalidity Pension. Individuals can receive benefit for either up to 1 year or up to 2 years depending on PRSI paid. Depending on the nature of the illness, the benefit is paid for varying durations including relatively short durations.

Given that Illness Benefit is much more of a short term benefit than Invalidity Pension it is likely that the build-up of cost associated with this scheme when extended to Class S will emerge more immediately than for the Invalidity Pension.

12.15.3 Jobseeker's Benefit

We have costed the extension of cover for Jobseeker's Benefit to Class S contributors based on the current rules for that scheme i.e. that similar rules to those currently applicable to employees would apply. Accordingly, particular features of Jobseeker's which need to be borne in mind when assessing the likely costs are the fact that:

- Individuals can claim Jobseekers even where working 3 days a week. This is likely to affect the self-employed population disproportionately as compared with the PAYE population
- The incidence rates associated with Jobseeker's Benefit amongst the self-employed may be somewhat different to the incident rates in the Class A population given that in effect Class S are self-certifying that they are unable for but actively seeking work (for at least 4 days out of 7).

12.15.4 Identification of populations – those currently and potentially entitled to various benefit types

- We received PRSI data in respect of 2015 which reflected complete records for Class A but partial records for Class S. [There is a lag in terms of the collection of data in respect of the self-assessed.]
- We also received data in respect of 2014 which reflected complete records for both those in Class A and Class S and indeed across all other PRSI classes. Note the PRSI database was segmented according to those in "primary Class A", "primary Class S" etc. The definition in each case reflected those with a majority of PRSI in each class by contributions (i.e. where >26 weeks in Class S this individual is denoted "primary Class S". Where an individual has equal numbers of contributions across two classes (e.g. an individual with 52 weeks Class S and 52 weeks Class A, this individual's primary class would be regarded as "Class A" and therefore capable of fulfilling the contribution conditions for Jobseeker's Benefit based on their Class A contributions. To the circa 244,000 primary Class S contributors we added those who were "relying" on their Class S contributions in order to derive the full population potentially entitled of 254,000. This compared with a population of primary Class A contributors currently entitled of 1.852m
- In deriving the costings in each case we used the disaggregated populations of "primary Class A" and "primary Class S" by age and gender.
- The disaggregated data showed that Class S are generally much older than Class A with a greater proportion of males.

12.15.5 Lag in terms of build-up of first "full year" costs on Jobseeker's and Illness Schemes

Jobseeker's Benefit

In costing the extension of Jobseekers to the self-employed we allowed for a small lag in terms of the build-up of the costs in going from year 1 to year 2.

The scheme although short term in nature is unlikely to reach maturity until year 2 onward. The reason for this is the lag in cash-flow associated with recipients in the scheme at a given point in time. Even where recipients are anticipated to claim from the scheme from outset (which we do assume for prudence) the cash-flows for some of these recipients will not emerge until year 2 (e.g. given that Jobseeker's can claim for up to 9 months a portion of the cash-flow for any new claimants from April

onward will arise in year 2). By year 2 full costs will emerge and "normal" / steady state expenditure reflecting the combination of cash-flows arising from new claimants in year 2 plus the payments in respect of those recipients who first signed on in prior and continue to claim in the current year.

An examination of the data received suggests that the typical duration of the payment is 7-9 months. Therefore an increasing portion of expenditure associated with new recipients from June onward will arise in year 2. Taking 7 month's as typical, cash-flow in respect of claimants from recipients from June onward will arise year 2 – on average 7 / 12 times the recipients in a typically fully mature year times 3.5 months' cash-flow will be deferred.

Illness Benefit

This scheme is slightly longer term in nature than Jobseeker's. Jobseeker's claims can last for up to 9 months' duration whereas Illness Benefit can be paid out for up to 2 years. There will therefore be a slower build-up of costs relating to that cohort of longer term Illness Benefit recipients who make claims for an extended number of months or up to two years' duration. Overall we estimate that the scheme will reach full maturity by year 4 and near full maturity by year 3.

Taking into account the typical duration for which individuals claim, we have allowed for 60% of the number of recipients which would be expected when the scheme is fully mature. In year 2 we have allowed for 75%, 95% by year 3 and 100% by year 4.

Carer's Benefit

The Carer's Benefit expenditure is relatively immaterial by comparison with Illness Benefit and Invalidity Pension. In estimating the costs of extending Carer's Benefit to Class S, we allowed for the same proportionate increase onto existing projected Carer's Benefit expenditure as emerged when we costed the impact of extending the Illness Benefit to Class S.

12.16 Results – Additional costs associated with extension of Invalidity Pension to Class S

It can be observed from Table 12.20 below that expenditure relating to the Class S extension builds up steeply over the first circa 10 years of introduction after which time the scheme is almost at "maturity" or in a "steady state". The fact that most of the expenditure builds up over a 10 year period reflects the long term nature of the benefit and the fact that most Invalidity Pensions currently are paid to individuals aged 55 - 65.

Given that Invalidity Pensions are automatically transferred to SPC at the 100% level on attaining SPA, small additional costs will arise due to the second order impact of individuals qualifying for SPC at the 100% level who otherwise (based on their PRSI record alone would have qualified for a reduced level of SPC or indeed may not have qualified for SPC at all.

Year	Invalidity Benefit Expenditure (€ millions)		
	Total Invalidity Expenditure reflecting those currently entitled only	Total Invalidity Expenditure reflecting class S in addition	Incremental Invalidity Expenditure due to extension
2015	649	649	0
2016	645	645	0
2017	662	662	3
2018	696	726	30
2019	734	793	59
2020	769	856	87
2021	894	1,020	125
2022	953	1,105	152
2023	1,009	1,185	176
2024	1,051	1,249	198
2025	1,085	1,303	218
2030	1,433	1,771	338
2035	1,691	2,120	429
2040	1,924	2,420	496
2045	2,124	2,674	551
2050	2,071	2,608	537
2055	2,139	2,702	563
2060	2,277	2,879	601
2065	2,502	3,167	665
2071	2,982	3,782	800

Table 12.20: Projected expenditure on Invalidity Pension (€ millions) currently and where extended to Class S

Note the above expenditure profile[69] does not include allowance for small knock on impact on SPC expenditure of more Invalidity Pensioners transferring across to 100% SPC at ages 66+. Note the costs in respect of 2017 above reflect 1 month only.

12.16.1 Possible refinement to the approach

In costing Invalidity Pension extension we have assumed that incidence rates in the Class S population will be similar to those observed in the Class A in due course (as “demand” under the scheme builds up and there will be similar numbers of individuals seeking Invalidity Pension at each age and gender from amongst Class S as currently prevails under Class A).

Note that at December 2015 there are some 51,500 Invalidity Pensioners of whom c 5,700 became Invalidity Pensioners over the course of 2015. Separately, there are circa 20,000 on Illness Benefit of greater than 2 year duration. These are individuals who were in receipt of Illness Benefit under the pre 2009 rules which allowed Illness Benefit to be paid for a longer period (and was not capped at 2 years as is currently the case). These individual are expected to either transition off Illness Benefit by transitioning onto SPC / SPNC or transfer across to Invalidity Pension over the course of the next number of years.

The qualification criteria for Illness Benefit and Invalidity Pension differ but where Invalidity Pension had been available to these individuals pre 2009 it could be argued that a portion of these 20,000 would have been on Invalidity Pension had the long term Illness Benefit not been available at the time. Therefore the future claim rates for invalidity are expected to increase (all else being equal) as the rates currently being experienced by Class A are arguably temporarily somewhat supressed.

[69] The analysis of the costs was performed at an early stage in the Review before finalising modelling which explains the €3,782 million shown above for the year 2071 wereas finalised figures in Appendix 5 show €3,725 million for the cost of Invalidity pension for Class A and S. The incremental expenditure profile is of very similar magnitude (within 2%).Note the base case already incorporates expenditure in respect of both Class A and S with respect to Invalidity (2017 Budget Measure).

12.17 Results: Additional costs - extension of Illness Benefit to Class S

Table 12.21 shows a projection of (i) the cost of illness scheme under the current qualification criteria, (ii) the aggregate projected cost[70] under a scenario whereby Illness Benefit is extended to Class S from 2018 onward and (iii) the difference between (i) and (ii) which reflects the cost of extending illness to Class S.

Year	Illness Benefit expenditure (€ millions)		
	Total Illness expenditure reflecting those currently entitled only	Total Illness expenditure reflecting class S in addition	Incremental Illness expenditure
2015	620	620	0
2016	597	597	0
2017	590	590	0
2018	621	661	40
2019	627	681	54
2020	634	706	72
2021	670	758	88
2022	679	772	94
2023	689	788	99
2024	696	800	104
2025	700	808	108
2030	758	901	143
2035	793	965	172
2040	826	1,023	198
2045	863	1,085	222
2050	880	1,103	223
2055	934	1,171	237
2060	1,012	1,268	256
2065	1,113	1,395	282
2070	1,248	1,570	322
2071	1,277	1,607	331

Table 12.21: Projected expenditure (€ millions) on Illness Benefit currently and where extended to Class S

Note the projected additional illness expenditure arising due to the extension of the benefits to Class S reflects an assumed lag in the build-up of cash-flows as described at 12.11.

[70] The analysis of the costs was performed at an early stage in the Review before finalising modelling which explains the €1,277 million shown above for the year 2071 whereas finalised figures in Appendix 5 show €1,265 million which gives rise to a negligible difference in terms of assessed incremental expenditure.

12.18 Results – Additional costs associated with extension of Jobseeker's Benefit to Class S

Table 12.22 shows a projection of (i) the cost of Jobseeker's scheme under the current qualification criteria, (ii) the aggregate projected cost[71] under a scenario whereby Jobseekers Benefit is extended to Class S from 2018 onward and (iii) the difference between (i) and (ii) which reflects the cost of extending Jobseeker's to Class S.

Year	Jobseeker's Benefit Expenditure (€ millions)		
	Total JB expenditure reflecting those currently entitled only	Total JB expenditure reflecting class S in addition	Incremental JB expenditure due to extension
2015	387	387	0
2016	356	356	0
2017	343	343	0
2018	301	346	45
2019	282	340	58
2020	291	351	60
2021	304	367	63
2022	318	385	67
2023	336	407	71
2024	354	429	75
2025	375	455	81
2030	410	500	91
2035	453	556	103
2040	500	613	112
2045	547	670	123
2050	581	705	125
2055	624	758	134
2060	671	815	144
2065	737	895	158
2070	820	1,000	179
2071	840	1,025	185

Table 12.22: Projected expenditure (€ millions) on Jobseeker's Benefit currently and where extended to class S

Note the projected additional Jobseeker's expenditure arising due to the extension of the benefits to Class S reflects an assumed lag in the build-up of cash-flows as described at 12.11.

[71] The analysis of the costs was performed at an early stage in the Review before finalising modelling which explains the €840 million shown above for the year 2071 whereas finalised figures in Appendix 5 show €830 million which gives rise to a negligible difference in terms of assessed incremental expenditure.

12.19 Results – Additional costs associated with extension of Carer's Benefit to Class S

Table 12.23 shows a projection of (i) the cost of Carer's Benefit under the current qualification criteria, (ii) the aggregate projected cost under a scenario whereby Carer's Benefit is extended to Class S from 2018 onward and (iii) the difference between (i) and (ii) which reflects the cost of extending Carer's to Class S.

Year	Expenditure on Carer's Benefit (€ millions)		
	Total Carer's Expenditure reflecting those currently entitled only	Carer's Expenditure incremental due to class S in - Base Case	Incremental Carer's
2015	30	30	0
2016	33	33	0
2017	34	34	0
2018	34	37	3
2019	35	38	3
2020	35	40	4
2021	36	40	5
2022	36	41	5
2023	37	42	5
2024	37	43	6
2025	38	44	6
2030	41	49	8
2035	45	55	10
2040	49	61	12
2045	53	67	14
2050	58	73	15
2055	63	79	16
2060	69	86	18
2065	75	94	19
2060	81	103	21
2071	82	103	21

Table 12.23: Projected expenditure on Carer's Benefit currently and where extended to Class S

12.20 Results – Projection of additional expenditure on Invalidity Pension, Illness, Jobseeker's, Carer's Benefits

The table below shows the projected costs reflecting the extension of each of the benefit types and in totality.

Year	Projected costs of extending Invalidity, Illness, Jobseekers Benefit, Carer's Benefit				
	Invalidity	Illness	Jobseeker's	Carer's	Total
2015 (act)	0	0	0	0	0
2016	0	0	0	0	0
2017	3	0	0	0	3
2018	30	40	45	2	118
2019	59	54	58	3	173
2020	87	72	60	4	223
2021	125	88	63	5	281
2022	152	94	67	5	317
2023	176	99	71	5	351
2024	198	104	75	6	382
2025	218	108	81	6	413
2030	338	143	91	8	579
2035	429	172	103	10	714
2040	496	198	112	12	817
2045	551	222	123	14	910
2050	537	223	125	15	899
2055	563	237	134	16	950
2060	601	256	144	17	1,018
2065	665	282	158	19	1,124
2070	775	322	179	21	1,297
2071	800	331	185	21	1,337

Table 12.24: Additional Projected expenditure (€ millions) on various benefit types where extended to class S

Note the projected expenditure above allows for Jobseeker's Benefits assuming the same incidence rate as prevail in the Class A population i.e. there is no explicit allowance for any potential moral hazard associated with Class S self-assessing themselves as unfit for work (due to the degree of uncertainty associated with this variable).

12.21 PRSI Results – Projection of additional expenditure on Invalidity Pension, Illness, and Jobseeker's Benefits

We estimate that where Invalidity, Illness, Jobseeker's, and Carer's Benefits are extended to Class S (Invalidity from December 2017 and Illness, Jobseeker's, and Carer's from January 2018), PRSI paid by Class S would need to increase substantially over the projection period in order to ensure that the benefits are delivered in a revenue neutral manner. The increase in Class S PRSI rates (from 4%) to deliver these incremental benefits is as per Table 12.25.

Starting	No Subvention	Subvention of 25% Benefits	Subvention of 33% Benefits	No Subvention	Subvention of 25% Benefits	Subvention of 33% Benefits
% Increase in Contributions for 5-year period				Actual rate of Class S PRSI for 5-year period		
2018	41%	32%	28%	5.6%	5.3%	5.1%
% Increase in Contributions for 10-year period				Actual rate of Class S PRSI for 10-year period		
2018	56%	43%	38%	6.2%	5.7%	5.5%
2028	95%	72%	64%	7.8%	6.9%	6.6%
2038	108%	81%	73%	8.3%	7.2%	6.9%
2048	100%	75%	67%	8.0%	7.0%	6.7%
2058	96%	72%	64%	7.8%	6.9%	6.6%
% Increase in Contributions for 20-year period				Actual rate of Class S PRSI for 20-year period		
2018	78%	59%	53%	7.1%	6.4%	6.1%
2038	103%	78%	70%	8.1%	7.1%	6.8%
2058*	97%	73%	65%	7.9%	6.9%	6.6%
% Increase in Contributions for whole projection period				Actual rate of Class S PRSI for whole 55 year period		
2018	94%	71%	64%	7.8%	6.8%	6.6%

Table 12.25: Percentage increase in the amount of PRSI contribution and actual rate of PRSI required where various benefit types are extended to Class S under a scenario of no subventions from Exchequer, 25% subvention, a 33% subvention.

*13 year period 2058 to 2071

What the above table suggests is that where expenditure on the additional four benefits is considered over the 10 year period 2018 – 2028 a 56% increase in PRSI income from the Class S base would be needed to ensure revenue neutrality. Where the level of increased expenditure is examined over the 20 year period the PRSI take from Class S would need to be 78% higher than currently (59% where say a subvention from the Exchequer of 25% of the benefits is paid). Finally where the costs are considered over the very long term – i.e. the entire 55 year projection period PRSI paid by Class S would need to almost double (an additional 94% in PRSI income would need to be raised).

Note these additional contributions relate only to the cost of the incremental benefits mentioned above. As already shown at Table 11.10 (a) the typical / annual cost for the accrual of SPC is of the order of 10% - 15% (depending on average earnings, date commencing PRSI etc). In total, where notional contributions for the accrual of SPC and the above incremental benefits are payable, the total rate of contribution to ensure revenue neutrality would be of the order of 20% per annum.

Table 12.26 shows the split of the required increased equalised contribution rates across each of the benefit items costed. It can be seen from the table that the increased contribution rates are primarily attributable to the cost of extending to Invalidity, with the other benefits less material. For example the table shows that when considering the increased equalised contributions for the 20 year period beginning in 2018 PRSI by Class S would need increase by 78% in the absence of Exchequer subventions. Of the 78%. 44% relates to the cost of Invalidity Pension, with a further 20% related to the cost of extending for Illness Benefit and 14% for Jobseeker's.

As mentioned earlier on in this section, there are other less material benefits for which class S are currently not entitled – Health and Safety Benefit and Occupational Injuries Benefit. Extending these benefits to Class S would involve further costs arising.

Starting	Invalidity	Illness	Jobseeker's	Total	Invalidity	Illness	Jobseeker's	All 3 Benefits
% Increase in contributions required for 5-year period					Actual rate of Class S PRSI for 5-year period			
2018	17%	13%	11%	41%	4.7%	4.5%	4.4%	5.6%
% Increase in Contributions for 10-year period					Actual rate of Class S PRSI for 10 year period			
2018	28%	16%	12%	56%	5.1%	4.6%	4.5%	6.2%
2028	57%	24%	14%	95%	6.2%	5.0%	4.6%	7.8%
2038	66%	27%	15%	108%	6.6%	5.1%	4.6%	8.3%
2048	60%	25%	14%	100%	6.4%	5.0%	4.6%	8.0%
2058	58%	24%	14%	96%	6.2%	5.0%	4.6%	7.8%
% Increase in Contributions for 20-year period					Actual rate of Class S PRSI for 20 year period			
2018	44%	20%	14%	78%	5.7%	4.8%	4.6%	7.1%
2038	63%	26%	14%	103%	6.5%	5.0%	4.6%	8.1%
2058*	58%	25%	14%	97%	6.3%	5.0%	4.6%	7.9%
% Increase in Contributions required for whole period					Actual rate of Class S PRSI for whole 55 year period			
2018	56%	24%	14%	94%	6.2%	5.0%	4.6%	7.8%

Table 12.26: Percentage increase in the amount of PRSI contribution and actual rate of PRSI required from Class S where various benefit types extended to Class S under a scenario of no subventions from the Exchequer

*13 year period 2058 to 2071

Appendix 1: How the Social Insurance Fund Works

Introduction

Most employers and employees (over 16 years of age) pay social insurance contributions into the national Social Insurance Fund (SIF). In general, the payment of social insurance is compulsory.

The Fund is made up of a current account and an investment account managed by the Minister for Social Protection and the Minister for Finance, respectively. The current account consists of contributions collected from people in employment and self-employment. This money is then used to fund social insurance payments. The investment account is a savings account that is managed by the Minister for Finance. The Comptroller and Auditor General is responsible for ensuring that the accounts are kept in order and reports are made to the Houses of the Oireachtas.

Work and Social Insurance

Employees' social insurance contributions are deducted by their employer and collected by the Revenue Commissioners.

The self-employed pay Class S social insurance contributions directly to the Revenue Commissioners. The Revenue Commissioners then pay the money into the Social Insurance Fund and send a record of the contributions from the self-employed to the Department of Employment Affairs and Social Protection.

Social Insurance Rates

For people in employment in Ireland, social insurance contributions are divided into different categories, known as classes with sub-classes in some instances.

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 Employment Affairs and Social Protection, subject to meeting the qualifying criteria.

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 11 different social insurance classes in Ireland are described below:

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.

Class B applies to civil servants and Gardaí recruited before 6 April 1995, and registered doctors and dentists employed in the Civil Service. It provides cover for only a limited number of social insurance payments.

Class C applies to Commissioned Army Officers and members of the Army Nursing service recruited before 6 April 1995. It provides cover for only a limited number of social insurance benefits.

Class D applies to permanent and pensionable employees in the public service, other than those mentioned in Classes B and C, recruited before 6 April 1995. It provides cover for only a limited number of social insurance payments.

Class E applies to ministers of religion employed by the Church of Ireland Representative Body. It covers all social insurance payments except Jobseeker's Benefit and Occupational Injuries Benefit.

Class H applies to NCOs and enlisted personnel of the Defence Forces. It provides cover for all social insurance payments except Occupational Injuries Benefit

Class J applies to people earning less than €38 per week. However, people aged over 66 or people in subsidiary employment, regardless of the level of earnings, are always insurable at Class J. Typically, this would involve people insurable at Class B, C, D or H in their main employment and who have a second job which is of a subsidiary nature or of inconsiderable extent. Class J social insurance provides cover for Occupational Injuries Benefit only.

Class S applies to self-employed people including certain company directors, people in business on their own account and people with income from investments and rents. It covers only a limited number of social insurance payments.

Class K applies to certain office holders (i.e. TDs, members of the Judiciary etc.) whose annual office holder income exceeds €5,200; the self-employed income of civil and public servants recruited prior to 1995; and unearned income received by employees and early retirees, where that unearned income is their only non-employment income. Class K PRSI is charged at a rate of 4% and does not give access to social insurance entitlements. These employees and pre-1995 civil and public servants generate social insurance entitlements based on PRSI paid on their employment income.

Class M applies to employees with no liability to contribute to social insurance such as employees under 16 years of age, persons under 66 years in receipt of occupational pensions and office holders with less than €100 per week.

Class P applies to fishermen or fisherwomen who are classified as self-employed and who are already paying PRSI under Class S. It covers them for social insurance payments not covered by Class S. These are limited Jobseeker's Benefit, limited Illness Benefit and Treatment Benefit.

The amount of PRSI payable depends on earnings and the class under which an individual is insured.

Social Insurance benefits and payments

There are a wide range of benefits that are available to people who have paid social insurance. Entitlement to these benefits is dependent on a number of conditions other than the social insurance contribution requirement. The social insurance qualifying criteria vary, depending on what payment they are applying for. In general, when an individual applies for a social insurance payment the following will be examined:

- the class/classes of social insurance they have paid;
- their age when they started making social insurance contributions (this applies in the case of State pensions);
- the number of paid and/or credited contributions they have made since entering insurable employment;
- the number of contributions paid and/or credited in the relevant tax year before the benefit year in which they make the claim. The relevant tax year is the second last complete tax year before they make a claim;
- the yearly average number contributions in the case of some pensions.

The social insurance payments that are available include the following:

Jobseeker's Benefit

This is a weekly payment to people who are out of work and are covered by PRSI. If an individual does not qualify for Jobseeker's Benefit they may qualify for Jobseeker's Allowance.

Illness Benefit

This benefit is paid to insured workers aged under 66 who cannot work because of sickness or illness.

Maternity Benefit

Maternity Benefit is a payment made to insured women who are on maternity leave from work. The amount of money paid each week will depend on earnings. If the woman is already on certain social welfare payments, she may get half-rate Maternity Benefit in addition to that other payment.

Adoptive Benefit

Adoptive Benefit is a payment to an adopting mother or a single male who adopts a child. It is available to both employees and self-employed people. An individual must meet certain PRSI contribution conditions on their own insurance record. Adoptive Benefit is paid for a continuous period of 24 weeks from the date of placement of the child.

Health and Safety Benefit

Health and Safety Benefit is a weekly payment for employed women who are pregnant or breastfeeding, and who are granted health and safety leave by their employer. Women are granted health and safety leave from employment if their employer cannot remove a risk to their health while they are pregnant, or breastfeeding, or assign alternative "risk-free" duties. To qualify for Health and Safety Benefit, they must meet certain criteria and PRSI contribution conditions. An employer pays the first 21 days of health and safety leave, and the Department of Employment Affairs and Social Protection pays the remainder.

Invalidity Pension

Invalidity Pension is a weekly payment to insured people who cannot work because of a long-term illness or disability. At age 66, recipients are transferred to State Pension (Contributory).

Invalidity Pension is taxable. Individuals are entitled to a Free Travel Pass. They may also get extra social welfare benefits such as the Household Benefits Package.

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

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.

Guardian's Payment (Contributory)

An individual who is taking care of an orphan may get a guardian's payment. It is not necessary to be a legally appointed guardian. A guardian's payment may be paid if the orphan lives with the guardian and s/he is responsible for the orphan's care. The payment must benefit the orphan.

If an orphan is attending a full-time education course, is aged between 18 and 22 years of age and is not living with or in the care of a guardian, the payment can be paid directly to the orphan. The payment can be contributory (based on PRSI payments paid by the parent) or non-contributory (based on a means-test).

State Pension (Contributory)

The State Pension (Contributory) is paid to people from the age of 66 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 the in 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.

Treatment Benefit

The Treatment Benefit provides dental, optical and aural services to qualified people. The Treatment Benefit Scheme is available to insured workers and retired people who have the required number of PRSI contributions.

Occupational Injuries Benefit

Injury Benefit is one of the benefits available under the Occupational Injuries Benefit Scheme. It is a weekly payment made to individuals if they are unfit for work due to:

- an accident at work
- an accident while travelling (on an unbroken journey) directly to or from work
- an occupational disease.

To get Injury Benefit, the claimant must be unfit for work for more than 6 days as a result of the accident or disease (excluding Sundays or paid holiday leave). However, even if they are not unfit for work for more than 6 days they are entitled to a declaration that an occupational accident occurred. This safeguards future rights to benefits under the Occupational Injuries Benefit Scheme (as not all work accidents and diseases result immediately in illness or disablement).

Carer's Benefit

Carer's Benefit is a payment made to insured persons in Ireland who leave the workforce to care for a person(s) in need of full-time care and attention.

An individual gets Carer's Benefit for a total period of 104 weeks for each person being cared for. This may be claimed as a single continuous period or in any number of separate periods up to a total of 104 weeks. However, if an individual claims Carer's Benefit for less than six consecutive weeks in any given period they must wait for a further six weeks before they can claim Carer's Benefit to care for the same person again. If they are caring for more than one person, they may receive payment for each care recipient for 104 weeks. This may result in the care periods overlapping or running concurrently.

Maintaining Social Insurance – Credited Contributions and Voluntary Contributions, working outside the state

For individuals outside the workforce or leaving the workforce, it is possible to maintain a social insurance record either by way of credited contributions or in certain circumstances by way of voluntary contributions (see below).

It is also possible to add Irish contributions and contributions paid in certain other states while working abroad to qualify for a social insurance payment.

Credited Contributions

Individuals out of work may qualify for a credited contribution. A credited social insurance contribution is a contribution given to individuals and recorded on each social insurance record. Some social welfare payments allow for a combination of a person's paid and credited contributions to enable an individual to qualify for a social insurance payment.

Pre-entry credits when one starts work

When an individual starts work they are automatically given pre-entry credits. These credits are normally given once and cover a person from the beginning of the tax year of entering employment, up to the actual date employment started. The credits also cover the two previous income tax years. Pre-entry credits help an individual quality for the following social insurance payments:

- Illness Benefit
- Jobseeker's Benefit
- Treatment Benefit
- Maternity Benefit
- Adoptive Benefit
- Health and Safety Benefit

Credits during unemployment

Credits are automatically given to those who are fully unemployed and getting Jobseeker's Benefit. A person continues to get credits if they have used up their entitlement to Jobseeker's Benefit and qualifies for Jobseeker's Allowance.

An individual does not automatically get credits if they are getting Jobseeker's Allowance. They must have paid or credited PRSI contributions in either of the last two tax years in order to do so.

It is possible to sign on for credits, if an individual is not entitled to a social welfare payment or is not a qualified adult on a spouse's, civil partner's or cohabitant's social welfare payment as long as the individual is:

- Unemployed;
- available and capable of work;
- genuinely seeking work and;
- has paid or credited PRSI contributions in either of the last two tax years.

An individual can sign on for credits if they are on strike from work.

If an individual is unemployed and getting credits they can continue to get credits if they take part in one of the following:

- Back to Education Allowance Scheme (BTEA);

- Vocational Training Opportunities Scheme (VTOS);
- SOLAS / Cert / BIM / Teagasc training courses.

Credits during illness

Credits are awarded to individuals getting Illness Benefit, Injury Benefit and Invalidity Pension, and who satisfies the conditions for Credits. Where a person exhausts his/her entitlement to Illness Benefit or Injury Benefit and qualifies for Disablement Benefit, s/he can continue to get credits provided they continue to submit medical certificates. Individuals who apply for Illness Benefit or Injury Benefit and do not qualify for payment may still be entitled to credits if they have paid or credited contributions in the last two tax years.

Individuals in receipt of Disability Allowance having exhausted entitlement to Illness Benefit will get credits. To get credits while on Disability Allowance they must have paid or credited contributions in the last two years. Public servants who give up work because of ill health can protect their entitlement to certain payments by sending in medical certificates once a year.

Individuals can continue to get credits during illness, if they take part in the Back to Education Allowance Scheme.

Credits for carers

A person who gives up work to care for someone and who qualifies for Carer's Allowance or Carer's Benefit will be awarded credits. They will also get credits if they do not get one of these payments, but are on Carer's Leave from work. If however, they avail of unpaid statutory Carer's Leave they must get their employer to complete an application for Carer's Leave "credits" on returning to work.

Credits and homemakers

The Homemaker's Scheme can make it easier for homemakers to qualify for a State Pension (Contributory). Those who give up work to look after a child under 12 years of age, or a disabled child, or adult, can get credits from the date they give up work to the end of that contribution year. If they are out of the workforce for the complete contribution year the complete year is disregarded when they are assessed for a State Pension (Contributory).

The homemaker may not work outside the home. However they may engage in limited self-employment (yearly reckonable income of less than €5,000) or employment (less than €38 per week) provided the full time care and attention requirement is satisfied.

Student credits

Student credits are only given once, and can cover periods in full-time education. To qualify an individual must have worked and paid PRSI Class A before starting their course. They must have started their course before reaching 23 years of age and before they have taken up full-time insurable employment.

An individual applies for student credits when they are applying for a social insurance payment. They must supply written confirmation from the school or college stating that they were a student there, and the dates they attended. They may also have to show that they have started full-time employment. This can mean submitting a P60 or a letter from their employer.

Credits for maternity leave, adoptive leave, parental leave, Health and Safety Benefit

An individual will automatically be awarded credits while they are getting Maternity Benefit, Adoptive Benefit or Health and Safety Benefit.

If however they avail of unpaid statutory maternity leave they must get their employer to complete an application for maternity leave credits when they return to work. Similarly, if they avail of unpaid statutory adoptive leave they must get their employer to complete an application for adoptive leave credits when they return to work.

For individuals who take parental leave, their employer must contact the Records Section of Department of Employment Affairs and Social Protection, detailing the weeks they have not worked, so that they can get credits for this time.

Volunteer development worker's credits

If an individual spends time as a volunteer development worker abroad, they may be entitled to credits for the time they spend as a volunteer development worker abroad up to a maximum of five years. Volunteer development worker's credits can help them to maintain their social insurance record.

Voluntary Contributions

Individuals between the age of 16 and 66 who are no longer covered by compulsory PRSI by way of insurable employment, self-employment or credited contributions may opt to pay Voluntary Contributions.

Payment of Voluntary Contributions can help maintain or improve an individual's contributory pension entitlements. They do not provide cover for any short term benefits such as Jobseeker's, Illness, Maternity or Treatment Benefits.

The qualifying conditions to become a voluntary contributor:

In order to be admitted as a voluntary contributor an individual must:

- have at least 520 weeks PRSI paid under compulsory PRSI in either employment or self-employment;
- apply within 60 months after the end of the contribution year (where the contribution year is the same as the income tax year so it runs from January to December);
- during which an individual last paid compulsory PRSI or had a credited contribution ("credit");
- the payment of the voluntary contribution in respect of any particular year will be within twelve months of the date of issue of notification of the amount of voluntary contribution due by him or her, or as specified "if the Minister is satisfied that there is good cause for late payment".

Under EU legislation it not possible for a person to be subject to the social insurance systems of two or more member states at the same time. This means that they cannot pay Voluntary Contributions in Ireland at the same time as they are in insurable employment, self-employment, receiving credited contributions or paying Voluntary Contributions in another EU member state.

Note: Contributions paid at the Class J rate cannot be used to satisfy these conditions. However, it is possible to pay PRSI at Class J and Voluntary Contributions at the same time.

Appendix 2: Summary of detailed data provided (including accounts)

The table below summarises the accounts of the Fund between 1 January 2011 and 31 December 2016 (€'000s). 2016 figures are based on provisional outturn.

	2016	2015	2014	2013	2012	2011
FUND AT START OF YEAR	**1,477**	**1,477**	**1,477**	**1,477**	**1,477**	**1,477**
Receipts						
Contribution Income	9,170,618	8,451,885	7,859,650	7,307,776	6,786,340	7,426,480
Health Contribution	4,242	6,537	7,324	5,061	13,676	115,257
Receipts from Investments	0	0	56	51	369	999
Other Receipts	41,668	39,287	24,314	14,739	12,524	1,147
Total	**9,216,528**	**8,497,709**	**7,891,344**	**7,317,505**	**6,785,557**	**7,543,883**
Payments						
Long-Term Benefits						
State Pension (Contributory)	4,662,224	4,475,691	4,185,233	3,983,264	3,802,795	3,622,746
State Pension (Transition)	245	1,185	73,768	137,270	146,629	132,395
Widow(er)'s (Contributory) Pension	1,437,022	1,422,098	1,369,759	1,349,840	1,343,198	1,337,865
Invalidity Pension	644,928	649,220	651,666	707,769	604,024	606,502
Deserted Wife's Benefit	74,314	77,435	79,105	80,400	83,565	85,828
Household Benefit & Fuel Allowance[i]	225,939	218,246	213,135	249,882	291,655	311,575
Occupational Injury Benefits						
Treatment Benefit	30,855	29,893	28,736	33,428	18,986	23,040
Occupational Injuries Benefits / Death Benefit etc	102,307	102,007	101,475	98,830	100,189	102,261
Short-Term Benefits						
Illness Benefit	597,460	620,007	625,975	648,938	773,959	875,549
Maternity Benefit	255,284	259,791	269,930	292,597	303,527	309,141
Jobseeker's Benefit	355,806	387,152	420,398	560,460	736,881	926,900
Paternity Benefit	2,005					
Adoptive Benefit	288	279	169	309	465	1,075
Health & Safety Benefit	408	523	536	578	526	643
Guardian's Payment (Contributory)	12,201	11,942	10,989	10,967	10,768	11,416
Carer's Benefit	32,746	30,117	23,652	22,443	24,498	24,474
Redundancy & Insolvency	38,383	43,218	88,214	148,146	323,420	326,184
Bereavement Grant	10	56	4,271	20,286	19,755	19,436
Widowed or Surviving Civil Partner Grant (Contributory)	5,693	5,771	5,658	6,331	5,968	6,228
Partial capacity benefit	13,083	11,310	9,972	7,377	2,107	
Other Payments						
Administration Expenses	272,632	270,842	270,501	272,520	276,652	280,987
National Training Fund						
Total	**8,763,833**	**8,616,783**	**8,433,142**	**8,631,635**	**8,869,567**	**9,004,245**
Excess of Receipts over Payments	452,695	-119,074	-541,798	-1,314,130	-2,084,010	-1,460,362
Transfer to the Exchequer	452,695	119,074	541,798	1,314,130	2,084,010	1,460,362
FUND AT END OF YEAR	**1,477**	**1,477**	**1,477**	**1,477**	**1,477**	**1,477**

Table A2.1: Income and Expenditure of the Social Insurance Fund (in € thousands)

Appendix 3: Summary of Key Data Provided and Checks Performed

The table below summarises the number of male and female recipients of the State Pension (Contributory) at the end of 2015 together with the weekly Personal Pension Rate.

2015 Data Summary			
Rate level	**Male**	**Female**	**Weekly Personal Rate**
Full Pension	148,308	54,769	€230.30
98% Pension	46,525	33,128	€225.80
90% Pension	4,934	6,497	€207.00
85% Pension	3,902	8,220	€196.00
75% Pension	5,869	6,614	€172.70
65% Pension	1,478	2,304	€150.00
50% Pension	15,749	16,164	€115.20
40% Pension	840	1,039	€92.00
Other Pensions	3,408	1,921	€37.60
Total	**231,013**	**130,656**	Weighted Average
	361,669		€210.88

Table A3.1: Recipients Breakdown by level of Personal Pension Rate and Gender

The two following figures illustrate the distribution of male and female recipients of SPC before September 2012 changes. As 2012 was an incomplete year the number of 2012 recipients (aged 69 in 2015) has been annualised for illustrative purposes.

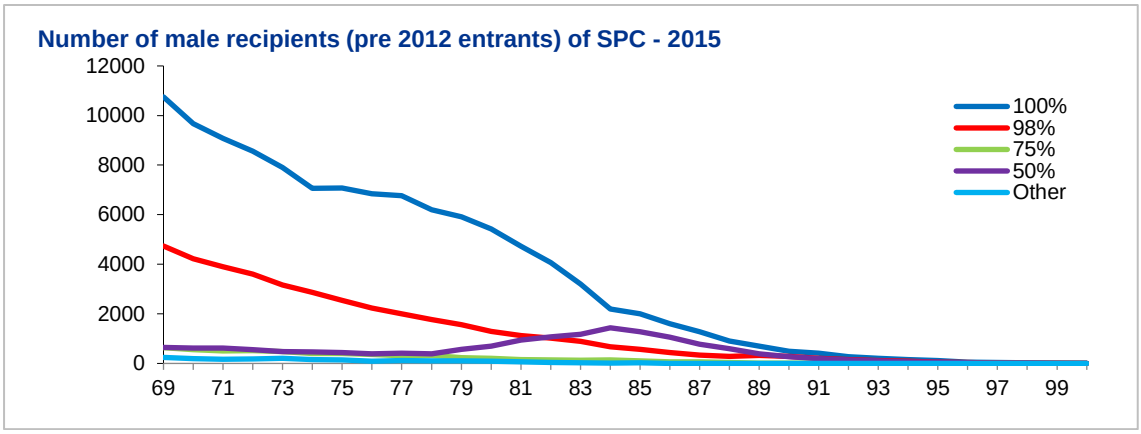

Figure A3.2: Number of male recipients of the State Pension (Contributory) in 2015 who qualified for SPC before September 2012 changes came into effect

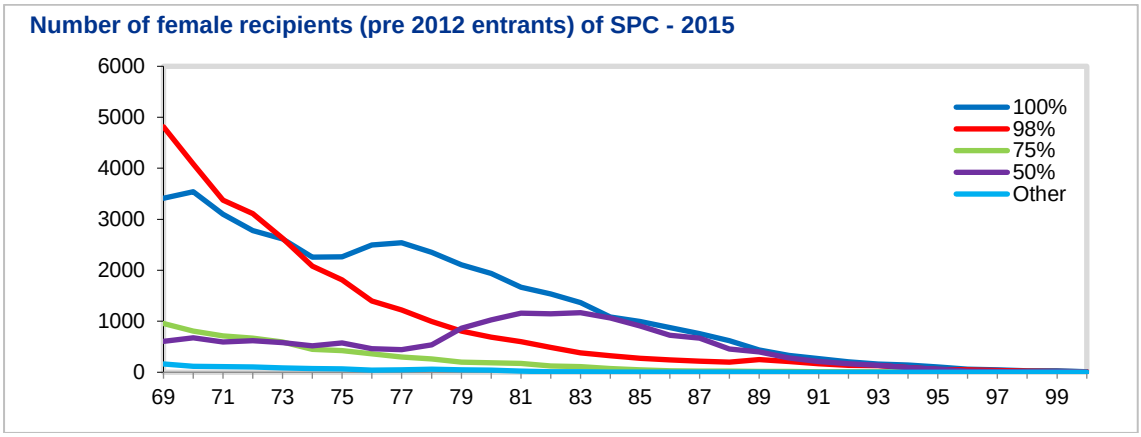

Figure A3.3: Number of female recipients of the State Pension (Contributory) in 2015 who qualified for SPC before September 2012 changes came into effect.

Post 2012 Entrants to SPC – Male

Pension rates by age for post Sept 2012 entrants (Male)				
Age	**66**	**67**	**68**	**69**
100%	10,689	11,154	10,442	2,495
98%	2,038	2,039	1,655	319
90%	1,336	1,626	1,294	376
85%	1,050	1,208	1,059	316
65%	458	446	346	72
40%	188	198	154	113
Other	371	473	396	70
Weighted Average pension	94.6%	94.2%	94.7%	93.8%

Table A3.2: Male Recipients (post 2012) breakdown by level of Personal Pension Rate

Post 2012 Entrants to SPC – Female

Pension rates by age for post Sept 2012 entrants (Female)				
Age	**66**	**67**	**68**	**69**
100%	4,082	3,907	3,774	970
98%	858	761	613	159
90%	2,044	1,956	1,607	411
85%	2,370	2,581	2,184	529
65%	677	745	551	117
40%	213	250	195	113
Other	258	294	237	42
Weighted Average pension	89.3%	88.4%	89.3%	88.8%

Table A3.3: Female Recipients (post 2012) breakdown by level of Personal Pension Rate

Other Benefits

Below we have summarised the number of male and female recipients and average weekly benefits associated with other benefit categories of the Fund.

2015 Data Summary			
SI Scheme	**Male**	**Female**	**Average Weekly Benefit**
Invalidity	25,710	31,163	€219.52
Illness	19,413	36,127	€214.68
Jobseeker's	16,741	17,051	€208.42
Maternity	-	21,687	€230.37
Widow's/Widower's	17,324	102,387	€228.45

Table A3.4: Summary of the number of recipients and average weekly benefit by SI scheme and gender

The average weekly benefit includes payments for Qualified Adults and Qualified Children.

The following table shows the recipients split by age:

	Invalidity		Illness		Jobseeker's		Maternity	Widow's / Widower's	
Age	**M**	**F**	**M**	**F**	**M**	**F**	**F**	**M**	**F**
<20	-	-	-	-	8	4	19	-	-
20-24	-	3	238	386	984	815	759	-	1
25-29	42	72	673	1,569	1,834	1,918	3,050	3	22
30-34	258	455	1,386	3,318	2,470	2,891	8,562	36	194
35-39	674	1,214	1,865	4,107	2,623	2,695	7,651	138	463
40-44	1,304	2,046	2,105	4,622	2,246	2,144	1,569	342	1,059
45-49	1,940	3,032	2,217	4,813	1,854	1,746	73	663	1,886
50-54	3,368	5,096	2,664	5,171	1,714	1,716	4	1,208	3,442
55-59	5,807	7,390	3,132	5,325	1,484	1,563	-	2,142	5,690
60-64	9,730	9,654	4,133	5,728	1,524	1,559	-	3,167	8,627
65-69	2,587	2,201	1,000	1,088	-	-	-	2,981	12,017
70-74	-	-	-	-	-	-	-	2,358	14,672
75-79	-	-	-	-	-	-	-	1,849	17,607
80+	-	-	-	-	-	-	-	2,437	36,707
Total	**25,710**	**31,163**	**19,413**	**36,127**	**16,741**	**17,051**	**21,687**	**17,324**	**102,387**

Table A3.5: Number of recipients of other SI Schemes, by age and gender

Data Checks

- Recipient numbers and total expenditure by category and in aggregate for 2015 were compared with the statistical review ("Statistical Information on Social Welfare Services 2015").
- We analysed the trend in expenditure between 2010 and 2015 and noted any change in qualifications conditions as well as budgetary and macroeconomic changes impacting on either recipient numbers or overall expenditure amounts. This is outlined in detail in Appendix 4.
- 2015 actual numbers were compared with numbers from the 2010 Review.

	2011		2012		2013		2014		2015	
Employer PRSI	5.461	72.4%	4.996	73.7%	5.331	72.9%	5.749	73.0%	6.165	72.6%
Employee PRSI	1.617	21.4%	1.480	21.8%	1.580	21.6%	1.704	21.6%	1.826	21.5%
Self-Employed PRSI	0.348	4.6%	0.310	4.6%	0.397	5.4%	0.406	5.2%	0.460	5.4%
Income from Health Contribution	0.115	1.5%	-0.014	-0.2%	-0.005	-0.1%	0.007	0.1%	0.007	0.1%
Investment Income	0.001	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%
Other Receipts	0.001	0.0%	0.007	0.1%	0.008	0.1%	0.014	0.2%	0.039	0.5%
Total Income	7.54	100.0%	6.780	100.0%	7.310	100.0%	7.881	100.0%	8.497	100.0%
Expenditure	9.004		8.864		8.625		8.423		8.616	
Surplus / (Deficit)	-1.460		-2.084		-1.314		-0.542		-0.119	

Table A3.6: Sources of Finance for the Social Insurance Fund 2011 – 2015 (in € billions)

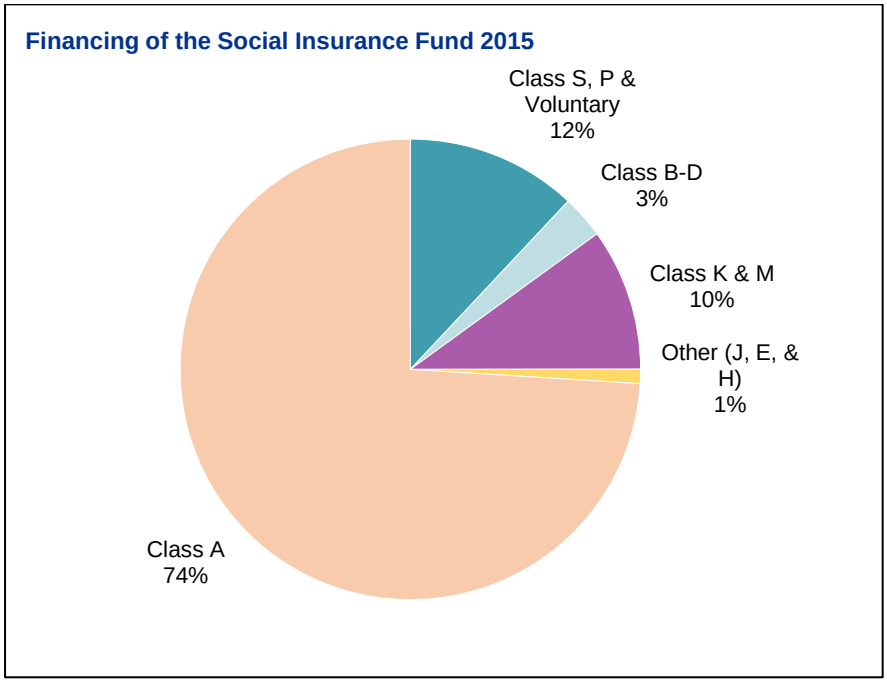

Figure A3.4: Financing of the Social Insurance Fund in 2015

In the section that follows, we examine expenditure trends and weekly average payment amounts by recipient for the key expenditure line items in the Fund.

State Pension (Contributory) (52% of total SI Expenditure)

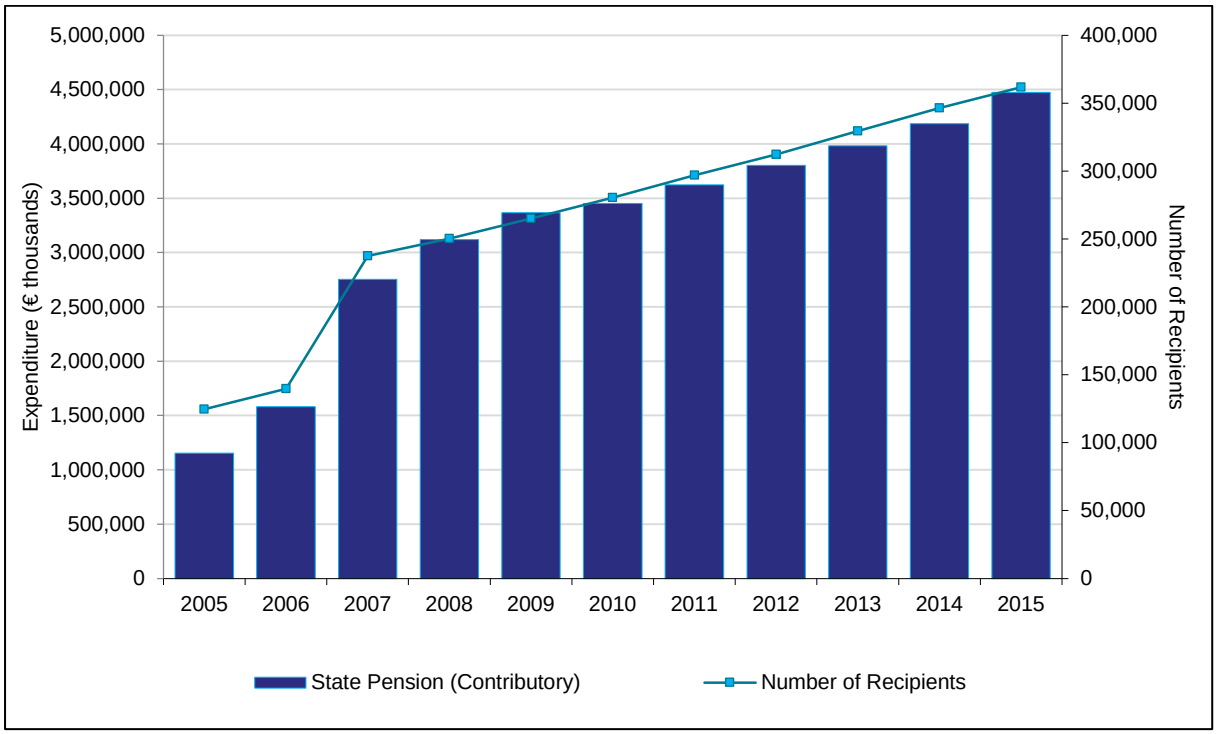

Figure A3.5: Expenditure versus number of recipients for State Pension (Contributory) from 2005 to 2015 inclusive.

Expenditure value and the number of recipients increased slightly in 2006 and sharply in 2007 due to introduction of new State pensions instead of Age related pensions in September 2006. Recipients of the Invalidity Pension aged 66 or over are automatically transferred to State Pension (Contributory) on reaching that age threshold.

Qualified Adult (QA) and Qualified Child (QC) increases are applicable.

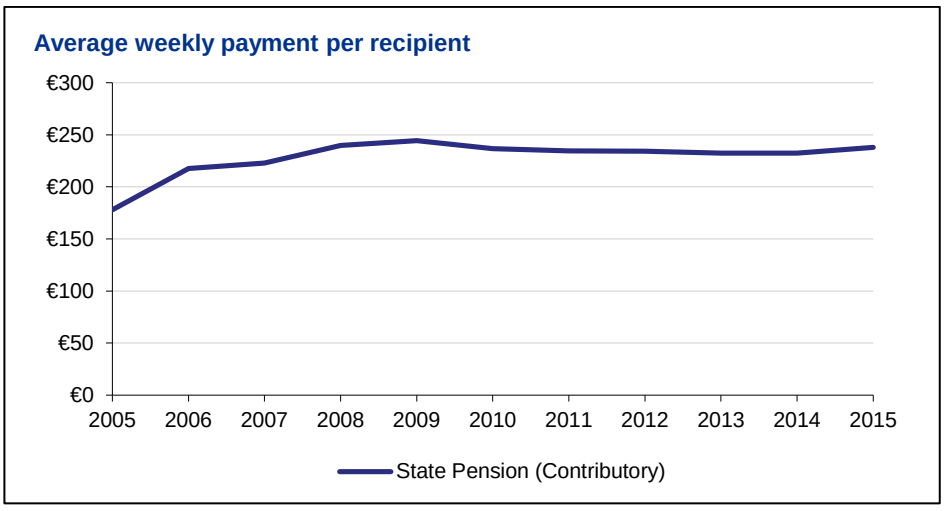

Figure A3.6: Average weekly payment for State Pension (Contributory) from 2005 – 2015 inclusive

Widow(er)'s (Contributory) Pension (17% of total SI Expenditure)

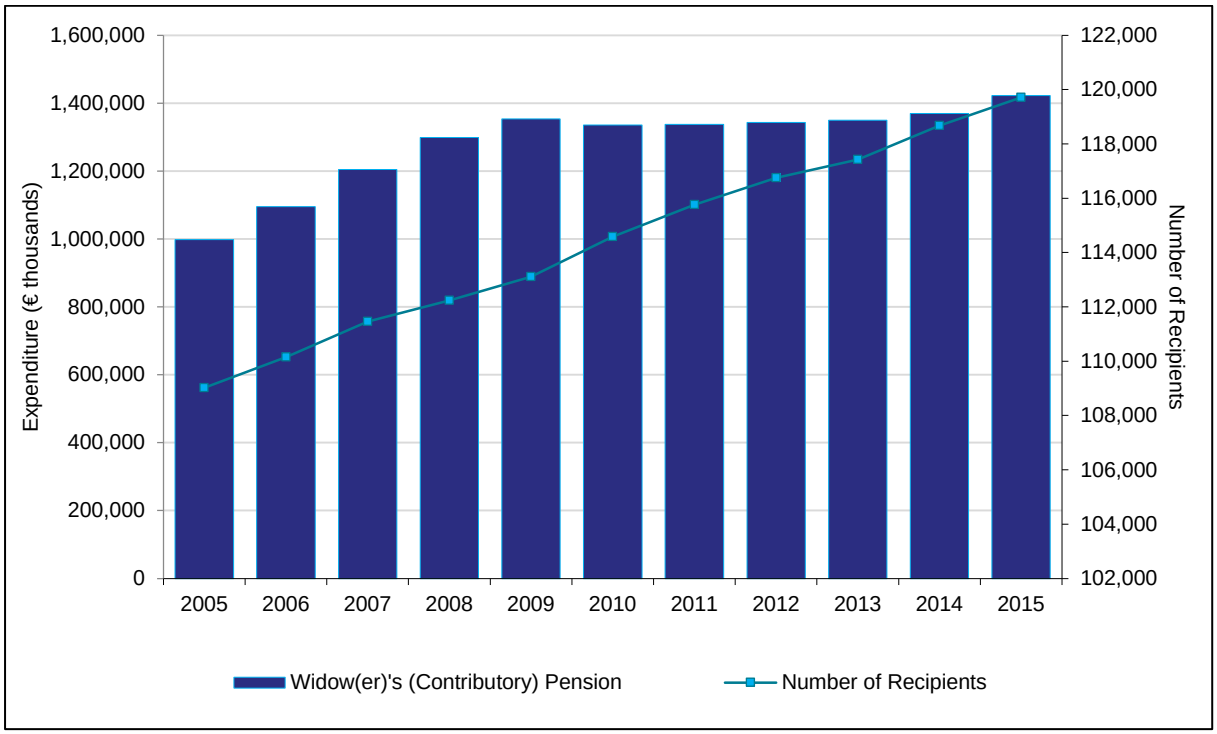

Figure A3.7: Expenditure versus number of recipients for Widow's, Widower's or Surviving Civil Partner's (Contributory) from 2005 to 2015 inclusive.

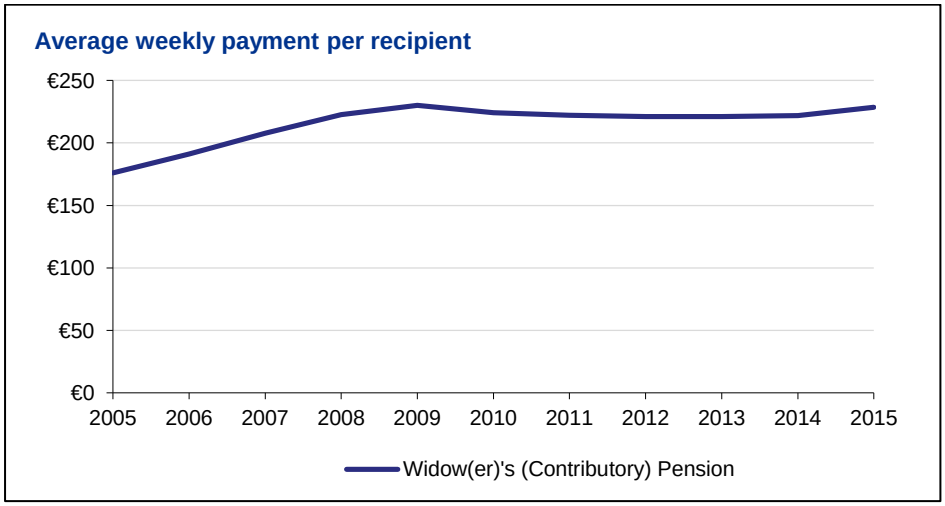

Figure A3.8: Average weekly payment for Widow's, Widower's or Surviving Civil Partner's (Contributory) from 2005 – 2015 inclusive.

Invalidity Pension (8% of total SI Expenditure)

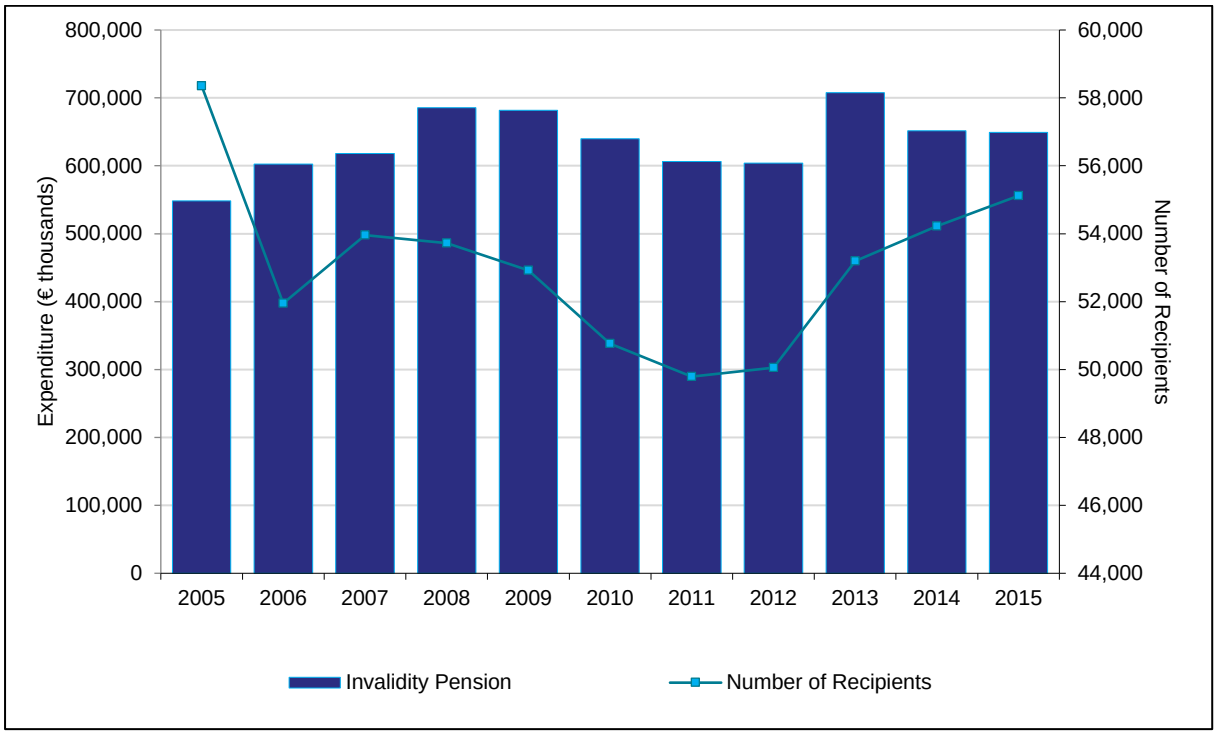

Figure A3.9: Expenditure versus number of recipients for Invalidity Pension from 2005 to 2015 inclusive.

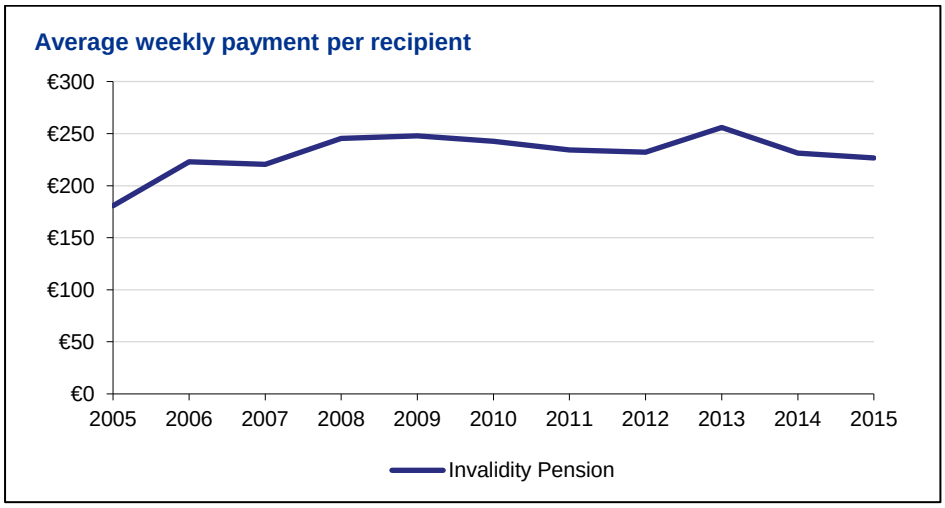

Figure A3.10: Average weekly payment for Invalidity Pension from 2005 – 2015 inclusive.

- The number of recipients decreased in 2006 due to introduction of new State pensions instead of Age related pensions in September 2006. Recipients of the Invalidity Pension aged 66 or over are automatically transferred to State Pension (Contributory) on reaching that age threshold.
- Qualified Adult (QA) and Qualified Child (QC) increases are applicable.

Illness Benefit (7% of total SI Expenditure)

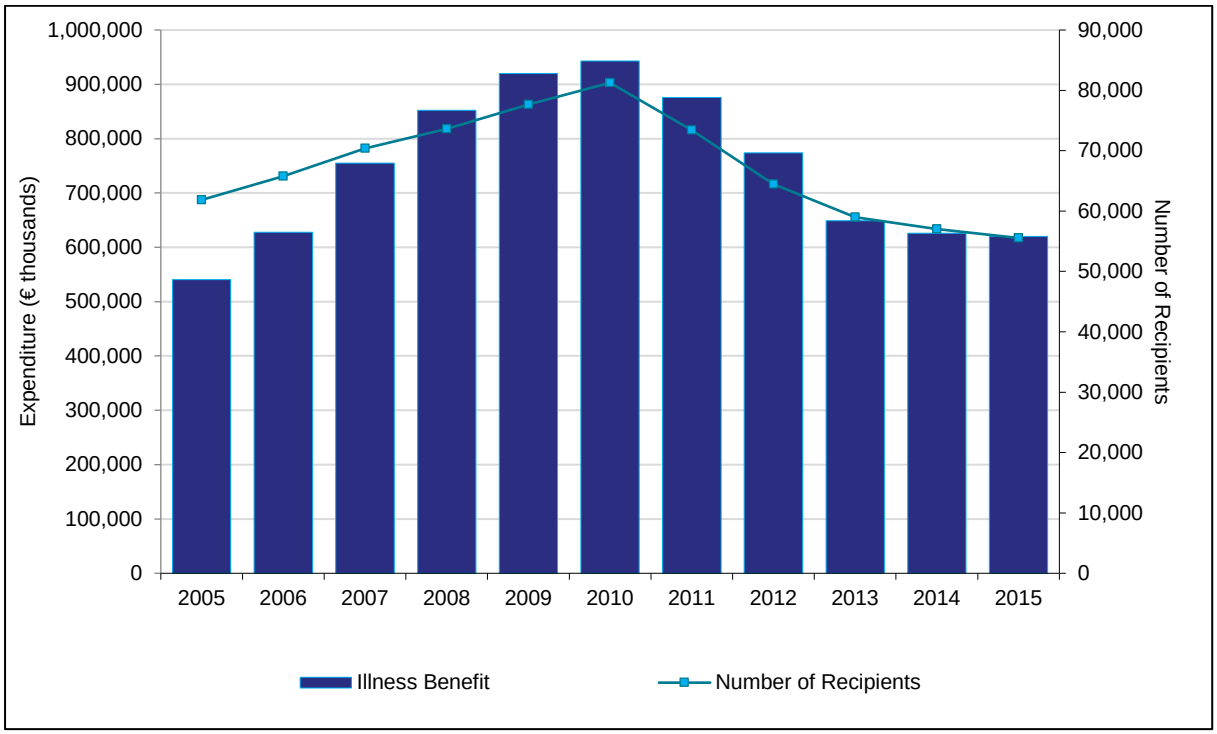

Figure A3.11: Expenditure versus number of recipients for Illness Benefit from 2005 to 2015 inclusive.

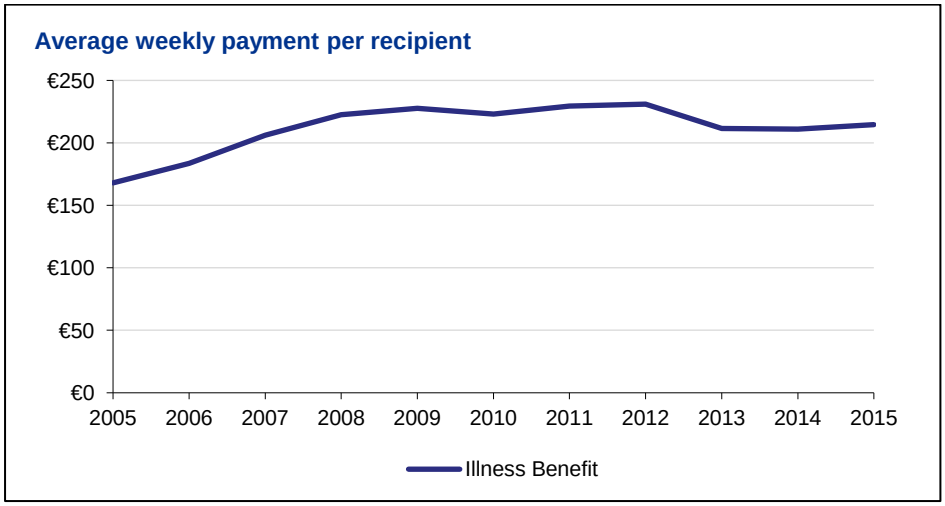

Figure A3.12: Expenditure versus number of recipients for Illness Benefit from 2005 to 2015 inclusive.

Jobseeker's Benefit (4% of total SI Expenditure)

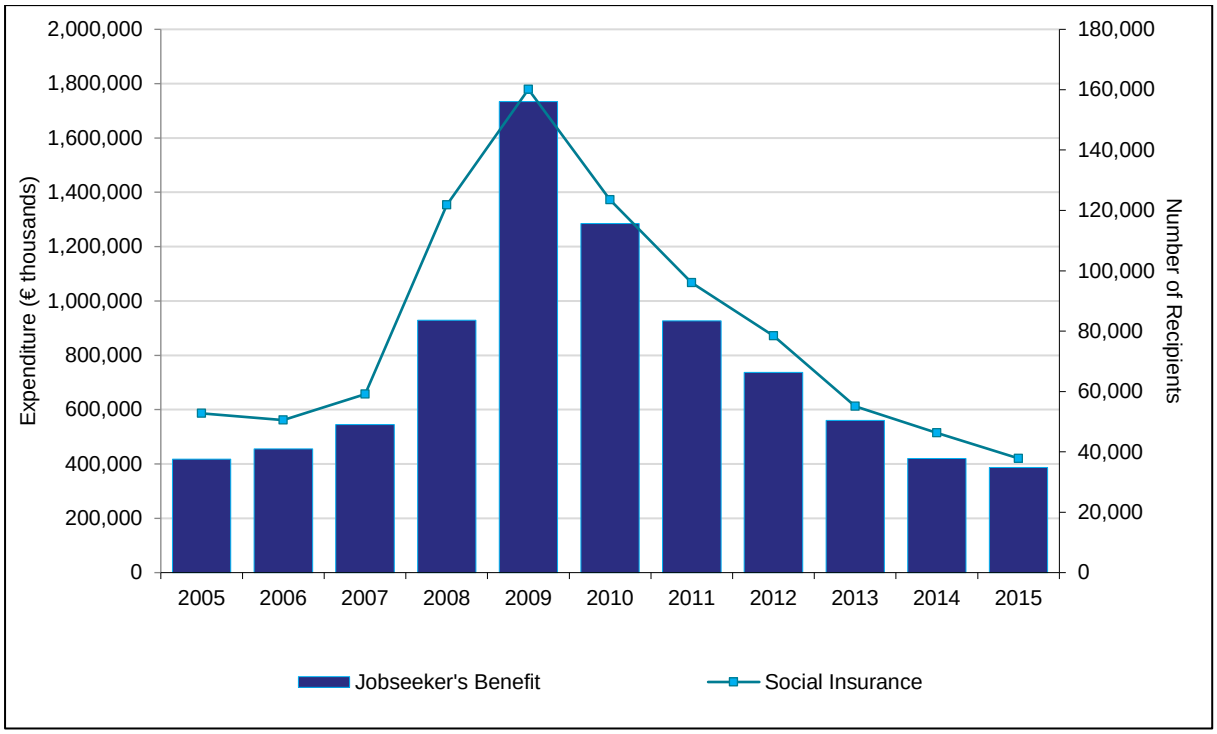

Figure A3.13 Expenditure versus number of recipients for Jobseeker's Benefit from 2005 to 2015 inclusive.

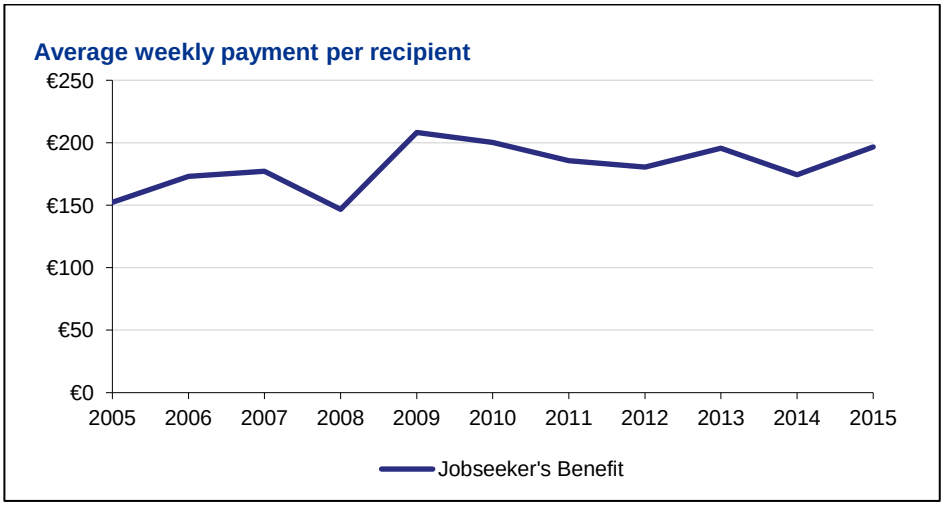

Figure A3.14: Expenditure versus number of recipients for Jobseeker's Benefit from 2005 to 2015 inclusive.

Appendix 4: Accrued to Date Liability ("ADL") – Methodology and Assumptions

In this section we provide further detail on the methodology and assumptions underlying the calculation of the ADL.

ADL Methodology

Estimating social security pension entitlements

As mentioned above only social security pension entitlements or obligations are considered.

Accrued-to-date liabilities (ADL): These pension entitlements or obligations contain 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 social contributions by current workers and remaining pension entitlements of existing pensioners. No rights accrued after the current year — by present or by future workers — are considered. The time horizon of this concept is, therefore, somewhat limited.

The compilation of ADL is based on a net present value approach. The ADL provides an estimate of the cost of a hypothetical termination of a pension scheme without reneging on accrued entitlements.

Projected Benefit Obligation ("PBO") Method

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. Benefits are to be uprated in line with wage growth (where appropriate) and pensions indexed in accordance with indexation rules be adopted.

Distinguishing between current retirees and current contributors

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 accrued-to-date liabilities, it is important to take into account that current contributors have not yet accrued 100 per cent of their future (expected) full pension benefits upon retirement. They still have an (expected) contribution period ahead of them whether this is one year (in case of a 65- year-old) or 40 years (in case of a 28-year-old, for example).

Estimating individual entitlements for current retirees

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.

Estimating individual entitlements for current contributors

The estimation of pension entitlements for current contributors closely follows the approach for current retirees with a further two aspects which need to be considered when calculating the accrued pension rights of this group:

- The fact that present contributors are not yet entitled to the full pension they would receive after a complete contribution career need to be taken into account.
- Further, given that the current contributors are not yet retired, their future pension payment needs to be estimated.

The accrued proportion of the full pension under the PBO approach depends on contribution periods where Accrued pension = approximated future full pension x T / N where T = Contribution period of the participant until the base year and N = total expected contribution periods of the participant until retirement.

The projection of the future contribution career start after the year for which the latest data on past earnings is available i.e. from 2016 onwards.

For the projection of the future contribution career, it is stated in the EU technical guide that is appropriate to base the calculation on a constant contribution profile over time.

The pension benefit at the future point of retirement has been directly estimated for these cohorts for whom detailed samples have been obtained and then projected over the remaining retirement phase.

ADL Assumptions

The actuarial calculations of the ADL require a number of careful assumptions to be made. They include assumptions about future life expectancy which determine the payout period of future pensions. Assumptions on future wage growth and on an appropriate discount rate are also needed to calculate the accrued to date.

The discount rate and indeed the wage growth assumption which is used to index the pensions in payment are crucial assumptions.

A summary of all assumptions adopted for the ADL calculation for the opening and closing stock of social security pension obligations for EU reporting purposes is set out at Table A.4.1.

	31-Dec-14	31-Dec-15
Discount rate[1] (nominal)	5%	5%
Price Inflation	2%	2%
Indexation (Wage growth & pensions in payment)	1.5% real (i.e. 3.5% nominal) with short term adjustments	
Mortality	2015 based population projections produced by Eurostat	

Table A.4.1: Assumptions for ADL purposes for EU Balance sheet 31 December 2014 and 31 December 2015
[1] The equivalent "real" (i.e. net of price inflation) discount rate is 3% per annum.

Each of the individual assumptions are discussed in turn below:

Discount rate

The choice of discount rate assumption is crucial for estimating the present value of long term liabilities such as those associated with pension schemes and even more particularly social security schemes. This is because the accumulated impact of the rate chosen to discount back projected cash-flows over a prolonged 55 year period is very high.

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 should be based on the following criteria:

1) 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.

2) The maturity of these debt securities should be similar to that of pension entitlements, i.e. at least 10 years, but preferably longer.

3) 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.

4) 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 3% in real terms and 5% in nominal terms.

Inflation

For the future an inflation rate 2% should be applied. This is in line with the ECB's inflation rate target of just under 2% over the medium term.

Wage growth and Indexation of Pensions

Since the development of future wages is uncertain, assumptions have to be made here as well. Generally, 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 European Commission for use in the 2018 Ageing Report — reflecting productivity growth per capita — should if possible be used for the estimation of pension entitlements.

The labour productivity per hour growth rate for Ireland was taken from the projections run by the Commission and sent to Member States to form the basis of the 2018 Ageing Report. This labour productivity growth rate i.e. the real earnings growth rate coincides with that used for the base case of the core actuarial review also for the years 2022 onward. For the years prior to that the real earnings growth rate are assumed to increase in line with the productivity growth reflected in the SPU.

Average wage increases / labour productivity per hour (growth rate %)											
	2015	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**2065**
Real	1.80	2.43	1.51	1.30	1.44	1.49	1.54	1.54	1.54	1.54	1.54
Nominal	3.84	4.47	3.54	3.33	3.47	3.52	3.57	3.57	3.57	3.57	3.57

Table A.4.2: Average wage growth rates per Commission projections intended to form the basis of the 2018 Ageing report

It can be seen from the above table that the nominal rates reflect a constant 2% inflation assumption throughout plus the "real" labour productivity growth rates.

Noted that the assumptions for wage growth should be reviewed and updated on a regular basis. The latest productivity projections produced by the European Commission should always be applied. These forecasts are revised generally every three years.

Life expectancy / mortality rates

Assumptions provided by Eurostat regarding future life expectancy should thus be applied as well. In doing so:

- Eurostat's most recent population projections must always be used. The most recent update of has been made available in spring 2017 and this series are known as the 2015 based population projections.
- There are several possible population change scenarios. In the case of the above described population projections, the convergence scenario must always be assumed.

The same mortality tables as used for the core actuarial Review (the 2015 based population projections produced by Eurostat) have been used for ADL purposes albeit the ADL incorporates an allowance for mortliaty improvement rates into the future in line with the Eurostat projections.

Life expectancies under these tables from age 66 (SPA) for illustration purposes are shown again here in Table A.4.3 for completeness.

	2015	2025	2035	2045	2055	2065	2071
Male	17.6	18.6	19.6	20.5	21.4	22.2	22.7
Female	20.1	21.3	22.4	23.4	24.3	25.2	25.8

Table A.4.3: Life expectancy at age 66 - 2015 to 2071; base case assumptions for ADL purposes (i.e. Eurostat mortality)

As the mortality projections incorporate an allowance for future mortality improvements, the average life expectancy is projected to increase over the period in question.

Disability / invalidity prevalence rates

The supplementary table covers all types of pensions, including disability and Invalidity Pensions. In order to estimate entitlements to disability and Invalidity Pensions, assumptions thus need to be made regarding the probability of becoming disabled in the future. This probability is reflected in the so-called prevalence rate, which is defined in this context as the total number of disabled persons divided by the total population.

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.

Appendix 5: Detailed Projections on base case assumptions

In € billions	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2035	2045	2055	2065	2071
Total Receipts	9.217	9.599	9.754	9.931	10.050	10.167	10.251	10.431	10.587	10.723	12.111	14.182	16.914	20.210	22.500
Expenditure															
Pensions															
State Pension (Contributory)	4.662	4.845	5.057	5.313	5.566	5.733	5.685	6.018	6.359	6.703	10.142	16.110	23.356	27.773	30.117
Widow's / Widower's / Surviving Civil Partner's (Contributory)	1.437	1.444	1.539	1.583	1.630	1.706	1.737	1.799	1.857	1.914	2.463	3.045	3.653	4.308	4.924
Death Benefit Pension	0.009	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.013	0.018	0.024	0.033	0.040
Christmas Bonus	0.000	0.118	0.124	0.130	0.136	0.142	0.143	0.151	0.159	0.166	0.245	0.361	0.489	0.579	0.638
Working Age Income and Employment Supports															
Jobseeker's Benefit	0.356	0.343	0.302	0.282	0.291	0.303	0.317	0.334	0.352	0.372	0.447	0.539	0.611	0.726	0.830
Deserted Wife's Benefit	0.074	0.071	0.070	0.069	0.068	0.066	0.065	0.063	0.062	0.060	0.042	0.020	0.004	0.000	0.000
Maternity Benefit	0.255	0.266	0.266	0.264	0.263	0.261	0.261	0.262	0.262	0.262	0.294	0.390	0.451	0.506	0.544
Redundancy & Insolvency	0.041	0.031	0.020	0.020	0.020	0.021	0.021	0.022	0.022	0.022	0.026	0.031	0.036	0.043	0.048
Treatment Benefits	0.031	0.048	0.083	0.085	0.086	0.088	0.090	0.093	0.095	0.097	0.117	0.143	0.174	0.208	0.231
Partial Capacity Benefit	0.013	0.015	0.015	0.015	0.015	0.016	0.016	0.017	0.017	0.017	0.021	0.025	0.031	0.037	0.041
Illness, Disability and Carer's															
Illness Benefit	0.597	0.590	0.598	0.604	0.611	0.646	0.655	0.666	0.673	0.678	0.778	0.858	0.923	1.101	1.265
Invalidity Pension	0.645	0.662	0.728	0.794	0.858	1.023	1.109	1.189	1.253	1.308	2.131	2.691	2.655	3.108	3.725
Disablement, Carer's, Injury Benefit, Medical Care	0.126	0.129	0.129	0.130	0.130	0.130	0.130	0.130	0.131	0.131	0.133	0.135	0.137	0.140	0.141
Children															
Child-related payment	0.018	0.019	0.019	0.018	0.018	0.018	0.018	0.018	0.018	0.019	0.021	0.027	0.032	0.037	0.042
Supplementary Payments, Agencies and Miscellaneous Services															
Household benefits package / Fuel Allowance	0.226	0.232	0.242	0.255	0.267	0.275	0.272	0.288	0.305	0.321	0.486	0.772	1.120	1.331	1.444
Total Schemes and Services	8.491	8.820	9.199	9.571	9.968	10.436	10.530	11.060	11.574	12.081	17.358	25.164	33.696	39.931	44.030
Administration	0.273	0.308	0.311	0.314	0.318	0.321	0.328	0.334	0.340	0.345	0.393	0.456	0.531	0.619	0.678
Total Expenditure	**8.764**	**9.128**	**9.510**	**9.885**	**10.286**	**10.757**	**10.858**	**11.394**	**11.914**	**12.426**	**17.752**	**25.620**	**34.227**	**40.549**	**44.708**
Excess of Expenditure over Income	**-0.453**	**-0.471**	**-0.243**	**-0.046**	**0.236**	**0.589**	**0.607**	**0.963**	**1.327**	**1.703**	**5.640**	**11.438**	**17.313**	**20.339**	**22.208**
as a % of GDP	-0.2%	-0.2%	-0.1%	0.0%	0.1%	0.2%	0.2%	0.3%	0.4%	0.5%	1.4%	2.4%	3.1%	3.0%	2.9%

Table A5: Income and detailed expenditure under base case scenario (€ billions)

Notes:

SPC projections are based on the current YA contributions approach.

Christmas Bonus projections reflect the application of an assumed 85% of one week's payment to the various long term schemes this is applied to. Although included within the "pension" category of expenditure the Christmas Bonus is paid out on other long term schemes also such as Invalidity Pension. It is included within the various long term schemes' line items for 2016 and separated out for 2017 onward.

Treatment Benefit reflects the full year impact from 2018 onward of the 2017 Budget measures (extension to self-employed from March 2017).

Invalidity Pension projections reflect the extension of the benefit to the self-employed from December 2017.

Appendix 6: Choice of discount rate assumption to be used for "core" Actuarial Review

A discount rate is required for the calculation of the present value of future cash-flows from the Fund. Specifically, the real discount rate [i.e. the nominal discount rate less impact of expected inflation] is critical to the determination of the value of the present value of expenditure and related shortfalls of expenditure versus income from the Fund.

The approaches considered when setting the discount rate to value the expenditure and indeed surpluses / shortfalls are as follows:

Approach A – Borrowing Costs of the Irish Government

Where an individual "earns" social welfare benefits such as a pension payable for life from State Pension Age, one could argue that, the Irish Government is deferring the future cost of retirement benefits (i.e. annual pension payments) until the member's retirement date. Accordingly, one approach to setting the discount rate would be to reflect the current and expected long term borrowing costs of the Irish Government.

In this regard, the Irish Government issues a bond which matures in 2045 and has a yield to maturity of 1.66% per annum as at 30th December 201672. The Irish Government issues a range of long term government bonds with average yields of c.1.75% per annum (nominal) currently.

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 under Actuarial Standards of Practice, 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.

Examining borrowing costs of the Irish Government at the most recent year end date – 31 December 2016 – would imply use of a discount rate of 1.75% per annum (nominal).

Approach B – Use an approach which is consistent with the accounting standards that govern the valuation of defined benefit pension liabilities for the accounts of private sector companies

For the valuation of pension liabilities for the accounts of private sector companies, Financial Reporting Standards No 102 ("FRS 102") is used or local GAAP with International Accounting Standard 19 ("IAS 19") used otherwise. With respect to the discount rate, FRS 102 and IAS 19 indicate that this assumption should be set based on the yield available on high quality corporate bonds (i.e. AA rated) of the same duration and currency as the liabilities as at the measurement date.

The typical duration of retirement benefits for the youngest contributors to the SIF is of the order of 40-50 years whilst the average duration of defined pension scheme liabilities is approximately 25 years.

A discount rate of c.2.0% per annum would be considered appropriate for FRS102 purposes for a scheme with a duration of 25 years. Given that the expenditure associated with the SIF is over a longer

[72] The Irish Government issued a 100 year bond in March 2016 at a yield of 2.35% per annum. However, this was a small bond issuance which has a longer duration than required for these purposes.

time horizon (the projection period is 55 years), a discount rate of up to 2.5% per annum (nominal) under this approach to reflect the longer duration of these liabilities was proposed.

Using an approach consistent with the accounting standards that govern the valuation of defined benefit pension liabilities for the accounts of private sector companies gives a discount rate of 2.5% effective December 2016.

Approach C – Use of an approach which is consistent with the approach adopted by funded schemes in the private sector

Under this option, the discount rate reflects the assumed investment return on the assets used to provide these pension and non-pension related liabilities. As at 30th December 2016, Eurozone Government AAA Bonds (Merrill Lynch, AAA rate 15+ years) were yielding 0.79% per annum.

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 Standards of Practice, 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.

It was assumed that yield reversion of 0.75% will take place over time and that expected long term yields on Eurozone Government AAA bonds will be 1.54% per annum.

The discount rate is a critical assumption for funding purposes in the case of a prefunded pension scheme and is heavily interlinked with investment strategy.

The baseline is a 100% bond / LDI investment strategy (the “least risk” portfolio) which gives a discount rate of 1.54% per annum.

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.

In relation to the setting of the equity risk premium (“ERP”), the Finance and Investment Committee of the Society of Actuaries have provided the following guidance:

“*The actuary may decide to use an ERP to allow for the additional expected return from taking on the relatively higher risk of the equity market. To help inform the setting of the equity risk premium, the Society has prepared a database of historical economic data. However, it is not clear yet which specific parts of it have the most value and credibility and, therefore, how the database should be used for the purpose of determining a reasonable ERP assumption. Using different historical data—either different stock markets or different periods—produces significantly different estimates for the ERP, and there appears to be no fundamental reason to choose a particular market or period over any other. Using different assumptions or analysis would also lead to different ERPs. This means there is considerable uncertainty about what an appropriate ERP is. Because of this, we think it sensible to recommend a range for the ERP rather than a central estimate.*

Using reasonably long periods and large economies (as observed today), high-level analysis of the database could support an ERP anywhere from 2.0% to 5.5% per annum in excess of the lowest-risk return, that is, 2.0% to 5.5% per annum in excess of the return expected on low-risk cash over the

projection period, so we recommend using an ERP within this range, recognising both the range of outcomes observed historically and the variety of portfolio structures an assumption may be applied to. Please also note that ERPs near the extremes of the above range have not been very common in the past, so before using such an ERP, actuaries should consider whether they expect such historically atypical economic conditions to prevail over the relevant investment horizon. Actuaries should consider reducing (or increasing) the ERP following successive years of equity returns above (or below) long term averages."

In keeping with the above, an equity risk premium of 3.75% per annum was considered reasonable.

Using a long term investment strategy of 67% equities and 33% long dated euro area government bonds with an assumed investment return of 4.54% per annum on equities and 1.55% per annum on bonds, a long term discount rate of 3.5% per annum was calculated.

Approach D – Use of an approach which is consistent with the accrued liability project which is required by EU Regulation 549 / 2013

The valuation of the State's total accrued liability in respect of the public service pensions and social security pensions is currently being calculated as at 31st December 2015 as required by EU Regulation 549 / 2013. The aspects which are relevant to social security benefits are discussed further in Chapter 10.
Under this option, the discount rate is prescribed in Eurostat's Technical Compilation Guide for Pension Data in National Accounts, which states:

"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 should be 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."

In line with the above criteria, it is recommended to set the nominal discount rate at 5% per annum.

However, the Eurostat Technical Guide was prepared in 2011. As at 31st December 2010, AAA Euro Government Bonds with a long duration were yielding 3.725% per annum.

As at 31st December 2016, this had reduced to 0.8% per annum.

However, it is stated that the discount rate should be stable, a reflection of a yield reversion of 0.75% as above giving an overall discount rate of 1.55% per annum.

Ultimate choice of discount rate:

While a number of approaches are valid a “smoothed” discount rate was used which could otherwise be plausibly used for funding purposes i.e. Approach C or 3.5% per annum nominal or circa 1.5% per annum “real” in the long term.

A single asset-based discount rate of 3.5% per annum (nominal) was deemed appropriate to use reflecting the fact that the State as sponsor of a notional fully funded scheme would not need to de-risk assets as individuals approach retirement in the same way as for a typical pre-funded private sector pension scheme.

Appendix 7: 2020 Total Contributions Approach Scenarios examined

Base case reflects current YA approach. Other scenarios reflect a total contributions (TCA) / pro rata:

- **Scenario 1:** 35ths, 10 year cap on credits, no “guarantee” that pension will be in anyway linked to what would have been received previously
- **Scenario 2:** 30ths, no cap on credits, “guarantee” for those retiring in the five years 2020-2024 that pension will be no less than 90% of the pension that would have been received under YA rules
- **Scenario 3:** 30ths for five years 2020-2024 reverting to 35ths from 2025 onward, 10 year cap on credits. Pension under revised rules will be at least as great as 100% of the pension the individual would have received under the previous rules (YA approach). This underlying ‘”guarantee” will remain in place for 5 years 2020 – 2024 inclusive.
- **Scenario 4:** 30ths throughout, no cap on credits. Pension under revised rules will be at least as great as 100% of the pension the individual would have received under the previous rules (YA approach). This underlying ‘”guarantee” will remain in place for 10 years 2020 – 2029 inclusive.

A number of variant 2020 “total contributions” pro rata scenarios were costed and compared with the “base case” yearly average approach to determine the extent to which these scenarios are expenditure-neutral or otherwise. We have set out two sets of expenditure tables hereunder –the first reflects expenditure under the existing Homemaking scheme which allows for credits for service post 1994, the second table reflects expenditure where the post 1994 restriction on Homemaking credits disregards / periods is removed.

€ millions		SPC Expenditure under a variety of 2020 scenarios (Homemaking Base Case assumption)			
	YA	Variant TCA Approaches (Scenarios 1-4)			
Year	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current rules	35ths with Cap	Greater of 90% YA and 30ths: No cap, 5 year guarantee	Greater of YA and 30ths: Cap for 5 years, 35ths: Cap after	Greater of YA and 30ths: No Cap, 10 year guarantee
2020	208.0	188.6	207.6	211.1	211.6
2021	423.9	384.4	423.1	430.3	431.4
2022	628.5	573.0	628.3	638.4	640.0
2023	1,075.3	985.1	1,076.5	1,092.7	1,095.6
2024	1,547.1	1,421.7	1,549.8	1,572.3	1,576.4
2025	2,039.5	1,878.9	2,044.2	2,072.8	2,078.2
2026	2,547.3	2,350.6	2,550.1	2,575.8	2,595.0
2027	3,135.1	2,897.0	3,132.8	3,146.0	3,193.2
2028	3,342.3	3,090.4	3,337.9	3,344.0	3,404.4
2029	3,611.6	3,344.7	3,607.3	3,606.2	3,679.6
2030	4,179.9	3,882.4	4,176.4	4,160.1	4,260.8
2031	4,778.4	4,449.9	4,776.4	4,743.6	4,873.2
2032	5,505.8	5,138.9	5,505.7	5,454.6	5,617.2
2033	6,049.5	5,657.5	6,051.6	5,983.2	6,173.6
2034	6,726.8	6,302.4	6,731.6	6,644.0	6,866.2
2035	7,427.9	6,971.1	7,435.7	7,328.5	7,583.0
2036	8,151.9	7,662.5	8,162.9	8,035.3	8,322.8
2037	8,911.9	8,388.9	8,926.4	8,777.4	9,099.4
2038	9,896.8	9,327.6	9,915.4	9,740.2	10,105.8
2039	10,540.6	9,946.3	10,562.8	10,367.2	10,763.7
2040	11,397.2	10,767.2	11,423.5	11,203.9	11,638.5
Total	**102,125.3**	**95,609.1**	**102,226.1**	**101,127.6**	**104,209.7**

Table A7.1: SPC expenditure (€ millions) for new entries from 2020 onward base case (yearly average) and a variety of TCA scenarios 1-4 – base case homemaking

Expenditure where post 1994 restriction is removed from Homemaking scheme

The expenditure profile in the table below is the same as that at the above table with the exception that we have estimated the impact of removing the post 1994 restriction on the Homemakers' scheme.

€ millions		SPC Expenditure under a variety of 2020 scenarios (Homemaking assumption where post 1994 restriction is removed)			
	YA	YA			
Year	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current rules	35ths with Cap	Greater of 90% YA and 30ths: No cap, 5 year guarantee	Greater of YA and 30ths: Cap for 5 years, 35ths: Cap after	Greater of YA and 30ths: No Cap, 10 year guarantee
2020	211.4	196.5	212.9	214.7	215.6
2021	431.1	400.7	434.3	437.9	439.7
2022	639.0	596.0	644.5	649.4	652.2
2023	1,093.3	1,022.4	1,103.6	1,111.6	1,116.3
2024	1,573.3	1,473.5	1,588.3	1,599.5	1,606.2
2025	2,074.6	1,945.6	2,094.4	2,108.9	2,117.5
2026	2,592.1	2,432.5	2,613.4	2,621.4	2,644.6
2027	3,191.9	2,996.9	3,212.2	3,202.9	3,255.4
2028	3,406.4	3,199.2	3,426.0	3,407.8	3,474.0
2029	3,684.8	3,464.1	3,705.9	3,678.3	3,758.6
2030	4,267.7	4,019.5	4,292.3	4,245.3	4,354.7
2031	4,882.7	4,606.3	4,911.3	4,843.6	4,983.1
2032	5,631.1	5,319.8	5,664.6	5,573.6	5,745.6
2033	6,193.2	5,858.0	6,230.6	6,119.0	6,316.0
2034	6,894.0	6,528.5	6,936.1	6,801.5	7,025.5
2035	7,623.0	7,226.9	7,670.0	7,511.9	7,761.4
2036	8,368.8	7,941.6	8,420.9	8,238.5	8,512.8
2037	9,144.8	8,685.5	9,202.2	8,994.5	9,294.7
2038	10,158.2	9,655.5	10,222.6	9,983.2	10,317.3
2039	10,806.4	10,278.6	10,875.3	10,612.6	10,968.5
2040	11,651.6	11,089.4	11,726.5	11,435.5	11,819.8
Total	**104,519.2**	**98,936.8**	**105,187.7**	**103,391.6**	**106,379.6**

Table A7.2: SPC expenditure (€ millions) for new entries from 2020 onward base case (yearly average) and a variety of TCA scenarios 1-4 - homemaking scenario where post 1994 restriction removed

Impact on individuals

We have examined each of the above scenarios 1 - 4 to determine the impact both in 2020 and through time. We have taken the retiring sample in 2030 as an illustrative future year. We also look at the gender impact of each of the scenarios as compared with the current yearly average rules. It should be noted that where an individual has a reduced SPC entitlement they may have an entitlement to Qualifying Adult or SPNC payments at a higher rate than the new SPC rate, reducing the level of impact compared with the figures shown.

The profile for impacted individuals for the retiring sample in 2020 and 2030 for the various scenarios is shown below.

In general the number of people with a lower SPC entitlement on the move to a TCA is minimised with the incorporation of a "guarantee" that the pension will be no less than that which would have been received under the current YA rules. Where a 100% guarantee is in place there are no individuals with lower SPC (by definition) for that period.

We have identified the sub-population of impacted individuals which could be deemed to be "significant":

- "Significantly" reduced entitlement refers to a pension which is less than 90% of the pension an individual would have received under the current YA rules.
- "Significantly" increased entitlement refers to a pension which is greater than 110% of the pension otherwise received under the current YA rules.

Individual impacts in 2020 across various scenarios examined

Homemaking scheme reflecting current rules – post 1994 restriction

Overall profile of Impacted Individuals	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current rules	35ths, 10 year credit cap	30ths, no credit cap, 5 year 90% guarantee	30ths 2020-2024, 35ths 2025+, 10 year credit cap, 5 year 100% guarantee	30ths, no credit cap, 100% guarantee 10 years
Overall weighted average pension	**93.3%**	**84.2%**	**93.2%**	**94.9%**	**95.1%**
Higher SPC	0	6,396	12,513	10,661	12,513
Lower SPC	0	16,723	9,349	0	0
Greater than 10% increase	0	0	213	153	213
Greater than 10% decrease	0	12,132	0	0	0
Total in Sample	**31,107**	**31,107**	**31,107**	**31,107**	**31,107**

Table A7.3: Individual impacts in the 2020 retiring year on base case (yearly average) and a variety of TCA scenarios 1-4 – base case homemaking assumption

Homemaking scheme – no post 1994 restriction

Overall profile of Impacted Individuals	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current rules	35ths, 10 year credit cap	30ths, no credit cap, 5 year 90% guarantee	30ths 2020-2024, 35ths 2025+, 10 year credit cap, 5 year 100% guarantee	30ths, no credit cap, 100% guarantee 10 years
Weighted average pension	**94.8%**	**87.7%**	**95.7%**	**96.4%**	**96.9%**
Higher SPC	0	6,356	13,094	10,633	13,094
Lower SPC	0	14,943	5,851	0	0
Greater than 10% increase	0	63	1,162	583	1,162
Greater than 10% decrease	0	9,969	0	0	0
Total in Sample	**31,107**	**31,107**	**31,107**	**31,107**	**31,107**

Table A7.4: Individual impacts in the 2020 retiring year on base case (yearly average) and a variety of TCA scenarios 1-4 – homemaking scenario where post 1994 restriction removed

Personal impacts in 2030 as compared with 2020 across various scenarios examined

Note the scenarios that follow reflect the current homemaking rules. Later in this section we include scenarios that reflect a lifting of the restriction on the pre 1994 homemaking periods.

Scenario 1, 35ths with 10 year Credit cap

Overall impact on individual SPC entitlements	YA	Scenario 1	YA	Scenario 1
Retiring Sample	**2020**		**2030**	
	Current Rules	**35ths with cap**	**Current Rules**	**35ths with cap**
Overall weighted average pension	**93.3%**	**84.2%**	**94.4%**	**89.4%**
Higher SPC	0	6,396	0	8,366
Lower SPC	0	16,723	0	14,965
Greater than 10% increase	0	0	0	0
Greater than 10% decrease	0	12,132	0	9,945
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.5: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 1 – base case homemaking assumption

This scenario reflects a TCA approach using 35ths throughout with a cap on credits of 10 years. The above illustrates that for those retiring in 2020 the overall weighted average pension is 84% as compared with an overall pension rate of 93% under the current yearly average approach. There are 16,723 people with lower SPC from a sample of 31,107 and 6,396 with higher SPC.

By contrast in 2030, because the quality of records is improving through time (i.e. on average people are retiring with fuller records) there are less people with lower SPC in that retiring sample. Those retirees will enjoy a higher overall weighted average pension under these rules as compared with their 2020 counterparts 89% versus 84%. There are greater numbers of retirees with higher SPC (8,366 in 2030 versus 6,396 in 2020) and corresponding lower numbers of retirees with lower SPC under this approach in 2030 as compared with 2020.

Scenario 2, 30ths with no credit cap, 90% guarantee

Overall impact on individual SPC entitlements	YA	Scenario 2	YA	Scenario 2
Retiring Sample	**2020**		**2030**	
	Current Rules	**30ths, no cap, 90% guarantee**	**Current Rules**	**30ths, no cap**
Overall weighted average pension	**93.3%**	**93.2%**	**94.4%**	**95.6%**
Higher SPC	0	12,513	0	16,766
Lower SPC	0	9,349	0	6,490
Greater than 10% increase	0	213	0	1,531
Greater than 10% decrease	0	0	0	0
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.6: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 2 – base case homemaking assumption

This scenario is broadly expenditure neutral in 2020 but gets more expensive through time as records improve, even after the removal of the guarantee. In 2030 it results in a weighted average pension of 96% for those retiring under these rules as compared with an expected 94% under current YA rules. There are no retirees with “significantly lower SPC” in 2020 under this scenario as there is a “guarantee” for all retirees that pensions will be no more than 10% lower than what would have been received under previous rules.

Scenario 3, 30ths with a 10 year credit cap and 100% guarantee for 5 years, 35ths with a 10 year cap and no guarantee thereafter

Overall impact on individual SPC entitlements	YA	Scenario 3	YA	Scenario 3
Retiring Sample	**2020**		**2030**	
	Current Rules	**Greater of YA and 30ths: cap**	**Current Rules**	**35ths with cap**
Overall weighted average pension	**93.3%**	**94.9%**	**94.4%**	**89.4%**
Higher SPC	0	10,661	0	8,366
Lower SPC	0	0	0	14,965
Greater than 10% increase	0	153	0	0
Greater than 10% decrease	0	0	0	9,945
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.7: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 3 – base case homemaking assumption

This scenario results in improved pensions for some individuals in the shorter term such that overall weighted average pension is 95% versus 93% under current rules. From 2025 onward however because the “guarantee” / link with previous rules is removed and there is a move to 35ths, an overall marked change in the overall pension expenditure as compared with what would have arisen under YA rules is observed. Current rules would give rise to a weighted average pension in 2030 of 94% versus 89% under these revised rules for example. By definition there are no people with lower SPC in 2020 under this scenario but this increases with time when the guarantee is no longer in place. There are individuals with higher SPC entitlement but none with “significantly” higher SPC entitlement.

Scenario 4, 30ths with no cap, 100% guarantee for 10 years

Overall impact on individual SPC entitlements	YA	Scenario 4	YA	Scenario 4
Retiring Sample	**2020**		**2030**	
	Current Rules	**Greater of YA and 30ths: no cap**	**Current Rules**	**30ths: no cap**
Overall weighted average pension	**93.3%**	**95.1%**	**94.4%**	**95.6%**
Higher SPC	0	12,513	0	16,766
Lower SPC	0	0	0	6,490
Greater than 10% increase	0	213	0	1,531
Greater than 10% decrease	0	0	0	0
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.8: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 4 – base case homemaking assumption

This scenario results in improved pensions for some individuals in the shorter term such that overall weighted average pension is 95% versus 93% under current rules. The position in 2020 is very similar to Scenario 3 with more people getting an increase in SPC due to the fact that credits are not capped.

The impacts and results are the same as for Scenario 2 in 2030, as the cap gets removed from this year onward. Again the improved records result in an increase in weighted average pension.

Impacted individuals in 2030 as compared with 2020 across various scenarios examined – variant homemaking

Note the tables that follow reflect the removal of the pre 1994 homemaking restriction. There are therefore more people with an increase in SPC and higher overall weighted average pensions under these scenarios as compared with the base case homemaking scenarios shown at Tables A7.5 – A7.8 inclusive.

Scenario 1

Overall impact on individual SPC entitlements	YA	Scenario 1	YA	Scenario 1
Retiring Sample	**2020**		**2030**	
	Current Rules	**35ths with cap**	**Current Rules**	**35ths with cap**
Overall weighted average pension	**94.8%**	**87.7%**	**94.9%**	**90.4%**
Higher SPC	0	6,356	0	7,743
Lower SPC	0	14,943	0	14,242
Greater than 10% increase	0	63	0	290
Greater than 10% decrease	0	9,969	q	9,126
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.9: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 1 – homemaking scenario where post 1994 restriction removed

Scenario 2

Impact on individuals	YA	Scenario 2	YA	Scenario 2
Retiring Sample	**2020**		**2030**	
	Current Rules	**30ths: no cap**	**Current Rules**	**30ths: no cap**
Weighted average pension	**94.8%**	**95.7%**	**94.9%**	**96.4%**
Higher SPC	0	13,094	0	16,306
Lower SPC	0	5,851	0	5,085
Greater than 10% increase	0	1,162	0	1,960
Greater than 10% decrease	0	0	0	0
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.10: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 2 – homemaking scenario where post 1994 restriction removed

Scenario 3

Impact on individuals	YA	Scenario 3	YA	Scenario 3
Retiring Sample	**2020**		**2030**	
	Current Rules	**Greater of YA & 30ths: Cap**	**Current Rules**	**35ths with cap**
Weighted average pension	**94.8%**	**96.4%**	**94.9%**	**90.4%**
Higher SPC	0	10,633	0	7,743
Lower SPC	0	0	0	14,242
Greater than 10% increase	0	583	0	290
Greater than 10% decrease	0	0	0	9,126
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.11: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 3 – homemaking scenario where post 1994 restriction removed

Scenario 4

Impact on individuals	YA	Scenario 4	YA	Scenario 4
Retiring Sample	**2020**		**2030**	
	Current Rules	**Greater of YA and 30ths: no cap**	**Current Rules**	**30ths: no cap**
Weighted average pension	**94.8%**	**96.9%**	**94.9%**	**96.4%**
Higher SPC	0	13,094	0	16,306
Lower SPC	0	0	0	5,085
Greater than 10% increase	0	1,162	0	1,960
Greater than 10% decrease	0	0	0	0
Total in Sample	**31,107**	**31,107**	**39,547**	**39,547**

Table A7.12: Individual impacts in the 2020 and 2030 retiring years on base case (yearly average) and TCA Scenario 4 – homemaking scenario where post 1994 restriction removed

Impacted individuals by Gender in 2020 across various scenarios examined
Homemaking scheme as per current rules (post 1994 restriction)

Males

Impact on Male SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths	Greater of 90% YA and 30ths: no cap	Greater of YA and 30ths: cap	Greater of YA and 30ths: no cap
Overall weighted average pension	**94.8%**	**87.3%**	**94.8%**	**96.0%**	**96.2%**
Higher SPC	0	3,857	6,622	5,827	6,622
Lower SPC	0	8,147	3,905	0	0
Greater than 10% increase	0	0	17	15	17
Greater than 10% decrease	0	5,640	0	0	0
Total in Sample	**18,203**	**18,203**	**18,203**	**18,203**	**18,203**

Table A7.13: Individual impacts on males in the 2020 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking assumption

Females

Impact on Female SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths	Greater of 90% YA and 30ths: no cap	Greater of YA and 30ths: cap	Greater of YA and 30ths: no cap
Overall weighted average pension	**91.2%**	**79.8%**	**91.0%**	**93.2%**	**93.5%**
Higher SPC	0	2,539	5,891	4,834	5,891
Lower SPC	0	8,576	5,444	0	0
Greater than 10% increase	0	0	196	138	196
Greater than 10% decrease	0	6,492	0	0	0
Total in Sample	**12,904**	**12,904**	**12,904**	**12,904**	**12,904**

Table A7.14: Individual impacts on females in the 2020 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking assumption

Impacted individuals by Gender in 2020 across various scenarios examined

Homemaking scheme with NO post 1994 restriction

Males

Impact on Male SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	Greater of 90% YA and 30ths: no cap	Greater of YA and 30ths: cap	Greater of YA and 30ths: no cap
Overall weighted average pension	**95.1%**	**88.2%**	**95.2%**	**96.4%**	**96.6%**
Higher SPC	0	3,572	6,285	5,510	6,285
Lower SPC	0	7,873	3,564	0	0
Greater than 10% increase	0	0	28	22	28
Greater than 10% decrease	0	5,339	0	0	0
Total in Sample	**18,203**	**18,203**	**18,203**	**18,203**	**18,203**

Table A7.15: Individual impacts on males in the 2020 retiring year on base case (yearly average) and variant TCA scenarios –homemaking scenario with no post 1994 restriction

Females

Impact on Female SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	Greater of 90% YA and 30ths: no cap	Greater of YA and 30ths: cap	Greater of YA and 30ths: no cap
Overall weighted average pension	**94.2%**	**87.1%**	**96.3%**	**96.5%**	**97.4%**
Higher SPC	0	2,784	6,809	5,123	6,809
Lower SPC	0	7,070	2,287	0	0
Greater than 10% increase	0	63	1,134	561	1,134
Greater than 10% decrease	0	4,630	0	0	0
Total in Sample	**12,904**	**12,904**	**12,904**	**12,904**	**12,904**

Table A7.16: Individual impacts on females in the 2020 retiring year on base case (yearly average) and variant TCA scenarios –homemaking scenario with no post 1994 restriction

Impacted individuals by Gender in 2030 across various scenarios examined

Homemaking scheme as per current rules (post 1994 restriction)

Males

Impact on Male SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	30ths: no cap	35ths with cap	30ths: no cap
Overall weighted average pension	**95.0%**	**89.7%**	**95.7%**	**89.7%**	**95.7%**
Higher SPC	0	3,611	8,240	3,611	8,240
Lower SPC	0	7,628	3,902	7,628	3,902
Greater than 10% increase	0	0	280	0	280
Greater than 10% decrease	0	5,281	0	5,281	0
Total in Sample	**22,596**	**22,596**	**22,596**	**22,596**	**22,596**

Table A7.17: Individual impacts on males in the 2030 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking assumption

Females

Impact on Female SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	30ths: no cap	35ths with cap	30ths: no cap
Overall weighted average pension	**93.5%**	**89.0%**	**95.0%**	**89.0%**	**95.0%**
Higher SPC	0	4,755	8,526	4,755	8,526
Lower SPC	0	7,338	2,589	7,338	2,589
Greater than 10% increase	0	0	1,251	0	1,251
Greater than 10% decrease	0	4,664	0	4,664	0
Total in Sample	**16,951**	**16,951**	**16,951**	**16,951**	**16,951**

Table A7.18: Individual impacts on females in the 2030 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking assumption

Impacted individuals by Gender in 2030 across various scenarios examined

Homemaking scheme with NO post 1994 restriction

Males

Impact on Male SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	30ths: no cap	35ths with cap	30ths: no cap
Overall weighted average pension	**95.4%**	**90.4%**	**96.1%**	**90.4%**	**96.1%**
Higher SPC	0	3,344	7,853	3,344	7,853
Lower SPC	0	7,372	3,517	7,372	3,517
Greater than 10% increase	0	0	442	0	442
Greater than 10% decrease	0	4,999	0	4,999	0
Total in Sample	**22,596**	**22,596**	**22,596**	**22,596**	**22,596**

Table A7.19: Individual impacts on males in the 2030 retiring year on base case (yearly average) and variant TCA scenarios – homemaking scenario with no post 1994 restriction

Females

Impact on Female SPC entitlements	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Current Rules	35ths with cap	30ths: no cap	35ths with cap	30ths: no cap
Overall weighted average pension	**94.3%**	**90.3%**	**96.5%**	**90.3%**	**96.5%**
Higher SPC	0	4,399	8,452	4,399	8,452
Lower SPC	0	6,870	1,567	6,870	1,567
Greater than 10% increase	0	290	1,518	290	1,518
Greater than 10% decrease	0	4,127	0	4,127	0
Total in Sample	**16,951**	**16,951**	**16,951**	**16,951**	**16,951**

Table A7.20: Individual impacts on females in the 2030 retiring year on base case (yearly average) and variant TCA scenarios – homemaking scenario with no post 1994 restriction

Impacted individuals by Gender in 2020 across various scenarios examined - distribution across rate bands

An examination of distribution across various pension rate bands pre and post the changes. Note this reflects base case homemaking (i.e. pre 1994 restriction).

Males – By Rate Bands

Male SPC entitlements by Rate bands	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
100%	8,873	9,616	13,481	13,523	14,300
90-99%	6,828	1,775	1,613	2,347	1,614
80-89%	1,490	1,710	1,178	1,321	1,278
70-79%	0	1,136	920	0	0
60-69%	671	1,599	214	671	671
50-59%	0	970	515	58	58
40-49%	340	1,026	282	282	282
1%-39%	0	371	0	0	0
Total	**18,203**	**18,203**	**18,203**	**18,203**	**18,203**

Table A7.21: Distribution of males across the various rate bands in the 2020 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking scenario with pre 1994 restriction

Females - By Rate Bands

Female SPC by Rate bands	YA	Scenario 1	Scenario 2	Scenario 3	Scenario 4
100%	5,731	4,862	9,041	9,031	10,284
90-99%	4,431	1,353	2,124	1,879	1,073
80-89%	2,034	2,094	908	1,312	907
70-79%	0	1,682	652	396	462
60-69%	647	2,211	179	287	179
50-59%	0	703	0	0	0
40-49%	62	0	0	0	0
1%-39%	0	0	0	0	0
Total	**12,904**	**12,904**	**12,904**	**12,904**	**12,904**

Table A7.22: Distribution of females across the various rate bands in the 2020 retiring year on base case (yearly average) and variant TCA scenarios – base case homemaking scenario with pre 1994 restriction

Appendix 8: Steering Committee

Project Steering Committee

Department of Employment Affairs and Social Protection

- John McKeon (Chair)
- Pat Lynch
- Darragh Doherty
- Gauri Grover
- Saidhbhin Hardiman
- Hugh Cronin
- Ciaran Judge
- Aideen Mooney
- Denis Moynihan

Secretary

Pat Lynch

Department of Public Expenditure and Reform

- John Pender

Department of Finance

- David Hughes
- Gavin Murphy
- Martina Nacheva
- Feargal O'Brolchain

CSO

- Claire Hanley
- Paul Morrin

Consulting Team

- Svetlana Gatova
- Finbarr Kiely
- Benjamin McPhee
- Brian Morrissey
- Rowena Pecchenino (Independent Economist)
- Joanne Roche

We would also like to thank the Department of Finance for their assistance particularly with respect to the assumption setting. We would like to express our appreciation to the CSO for their assistance with population projections (including updates for the 2016 Census) and their assistance with and ultimate oversight of the workings for the ADL for EU Reporting purposes.

Appendix 9: Scope

Requirements and Specification

Extract from the RFT November 2016 follows:

Tenderers must address each of the issues and requirements in this part of the RFT and submit a detailed description in each case which demonstrates how these issues and requirements will be dealt with / met and their approach to the proposed delivery of the Services. A mere affirmative statement by the Tenderer that it can/will do so or a reiteration of the tender requirements is NOT sufficient in this regard.

4.1 Project Background

The Social Welfare (Consolidation) Act, 2005 makes provision for the carrying out of actuarial reviews of the Fund, as follows:

"10 - (1) The Minister shall cause –

(a) actuarial reviews to be made to the financial condition of the Social Insurance Fund by such persons as the Minister may decide for the purpose of determining the extent to which the Fund may be expected, in the longer term, to meet the demands in respect of payment of benefits and other payments, having regard , in particular, to the adequacy or otherwise of the contributions to support benefits and other payments and such other matters as the Minister considers to be relevant as affecting the current and future financial condition of the fund,

(b) a report to be made to the Minister on completion of any such review, and

(c) a copy of every report under this section to be laid before each house of the Oireachtas within 6 months of the completion of the review.

(2) The date of completion of the first actuarial review under this section shall be a date not later than the 31st day of December, 2002, and the date of completion of each subsequent review shall be a date not later than 5 years after the date of completion of the immediately preceding review."

The first Actuarial Review of the Social Insurance Fund was completed in 2002 with an effective date of 2000, a second review in 2007 with an effective date of 2005 and a third review in 2012 with an effective date of 2010. The reports can be downloaded from the Department's website at:

http://www.welfare.ie/EN/Policy/CorporatePublications/Finance/Pages/ActRevIndex.aspx

The Department now proposes to carry out a fourth Actuarial Review with a view to informing the short, medium and long term policy development in relation to the social insurance system generally. It is envisaged that the Review will build on the findings of the 2000, 2005 and 2010 reviews in relation to social insurance based benefits and pensions.

For this Review, additional analysis will be required in relation to EU Regulation (EU) 549 / 2013, under which the Central Statistics Office (CSO) is required to compile a Supplementary Table on the gross liabilities of Irish pension schemes as part of the National Accounts.

4.2 Technical requirements summary

The Department invites proposals from suitably qualified consultants to undertake the Actuarial Review of the Social Insurance Fund as at 31 December 2015.

The base period of projection under the review will be specified by the Department. For reference, the base period for the 2010 Actuarial Review was 2010-2066. The Tenderer will be required to:

i) Produce the actuarial analysis specified in section 4.3., employing the actuarial model specified in 4.4 below where required under the terms of that section.

ii) Build an updateable and reusable actuarial model to fulfil all the technical requirements specified in section 4.4, and provide an explicit program of knowledge and intellectual property transfer in relation to same (see section 4.5.).

iii) Produce a report outlining the results of the actuarial analysis detailed in section 4.3, including a detailed presentation of the data and methodologies used. The report must include explicit reconciliations between (i) the 2010 Actuarial Review and the 2015 Actuarial Review, and (ii) the main results of the 2015 Actuarial Review and the accrued-to-date liability forecast described in section 4.3.6.

iv) The final report must be submitted for review by the Department by the last working day in March 2017 [73]

Tenderers have the option of providing separate costings for supplementary actuarial model components, detailed in section 4.6.3 - 4.6.5.

The full scope of the actuarial project work is defined in sections 4.3 to 4.5 and 4.7 below. Tenderers must specify in detail how their proposal will meet these requirements.

4.3 Scope of actuarial modelling and reporting for the 2015 Actuarial Review

4.3.1 Actuarial basis

Unless otherwise specified (see 4.3.6), all actuarial modelling is to be done on an “open group” basis and in line with relevant national and international actuarial standards.

Where relevant, modelling and analysis should have regard to the draft International Social Security Association/International Labour Organization (ISSA/ILO) Guidelines for Actuarial Work for Social Security.

4.3.2 Expenditure

The expenditure analysis below should be carried out in detail for all benefits that are in scope for this Review, as specified in section 4.6.1 below. Where benefits are in scope for the Actuarial Model described in section 4.4, this analysis should be conducted using that model.

Summary projections of other relevant expenditure (e.g. administration) should also be provided.

v) Absolute Projection of future Fund expenditure (disaggregated on an annual basis for an initial period of 10 years and disaggregated every five years thereafter) encompassing both long term and short-term benefits.

[73] At an early stage of the Review it was agreed that a draft report be submitted to the Department by the end of Quarter 1 / early Quarter 2 with the final report to be submitted and agreed by no later than the end of Quarter 2. This was to allow time to incorporate the assumptions from the European Commission which were intended to form the basis of the 2018 Ageing Report. These updated macroeconomic and demographic assumptions became available toward the end of May 2017.

vi) Distributional projection of expenditure (disaggregated on an annual basis for an initial period of 10 years and disaggregated every five years thereafter) as a percentage of the overall Fund Expenditure under each scheme.

vii) Calculation of the net contingent assets/liabilities of the Fund, discounted to present values;

viii) Sensitivity analysis based on alternative key assumptions.

4.3.3 Income

The Income projections detailed here must be produced using the Actuarial Model specified in section 4.4 below.

ix) Absolute projection (disaggregated on an annual basis for an initial period of 10 years and disaggregated every five years thereafter) of the Fund's PRSI Income.

x) Distributional projection (disaggregated on an annual basis for an initial period of 10 years and disaggregated every five years thereafter) of the number of payees by class of PRSI payments.

xi) Sensitivity analysis based on alternative key assumptions.

4.3.4 Actuarial Balance Sheet and Reconciliation to 2010 Actuarial Review

Produce an overall Actuarial Balance Sheet for the Social Insurance Fund at end-2015, on both a no-policy-change and break-even basis.

Provide a statistically robust reconciliation between the Actuarial Balance Sheet from the 2010 Actuarial Review and the 2015 Actuarial Balance Sheet, taking into account income and expenditure along with valuation, demographic, macroeconomic and policy changes between the two dates.

4.3.5 Break Even Rates

To determine break-even contribution rates (Employee, Employer and Self-Employed) as a multiple of current contribution rates to eliminate the projected shortfall between income and expenditure (if any):-

xii) With no Exchequer subvention; and

xiii) With an Exchequer subvention of 25% or of 33%.

4.3.6 Accrued to Date Liability calculation

Under EU Regulation (EU) 549/2013, the Central Statistics Office (CSO) is required to compile a Supplementary Table on the gross liabilities of Irish pension schemes as part of the National Accounts, including contributory State pensions.

For the purposes of this Actuarial Review, this means that the following analysis of pension entitlements is required for end-2014 and end-2015 – note that all calculations and outputs must use the standardised rules and assumptions specified by Eurostat[74] where required:

xiv) The present value of the accrued-to-date pension liability for the State Pension Contributory (SPC) and the Widow's, Widowers or Surviving Civil Partner's Pension (WPC)[75]: the pension entitlements of existing pensioners in receipt of the SPC and WPC and the entitlements of existing workers accumulated up to end-2014 and end-2015 based on their contribution history. The present value estimates to be calculated using a nominal discount rate of 5% for both time periods (as set by Eurostat guidelines).

[74] http://ec.europa.eu/eurostat/web/pensions/manuals-and-guidelines
[75] In addition to SPC, WPC, the scope of the ADL calculation was extended to include Invalidity Pensions reflecting revised guidelines from Eurostat on the interpretation of requirements.

xv) Accrued-to-date liability using alternative discount rates: Estimates of the accrued-to-date liability in present value terms using various nominal discount rates of 4% and 6% for 2014 and 2015 (as set by Eurostat guidelines on sensitivity analysis).

xvi) Revaluations due to changes of key model assumptions: The value of the impact of changes in the key model assumptions used in the calculation of the accrued-to-date liability (discount rate, wage rate and inflation rate) from end-2014 to end-2015.

xvii) Impact of policy changes: The value of the impact of legislated changes detailed in section 4.3.9 on the accrued-to-date liability (outlined in 4.3.6.i) (e.g. the impact on the liability of the increase in the State Pension Age).

xviii) The final report of the 2015 Actuarial Review must also provide analysis reconciling the accrued-to-date State pension liabilities detailed in section 4.3.6.i) and the present value of the corresponding contributory pension related benefit projections of the Social Insurance Fund.

4.3.7 Multiple Indexation Approach

To allow for comparison between approaches to indexing benefits, the model must produce projections indexed based on the following:

xix) Consumer Price Index

xx) Real Earnings Growth Index (in line with PRSI)

xxi) Index calculated to retain 35 - 40 % of Average Earnings at retirement

The model should include an optimum weighted average approach to indexing benefits.

4.3.8 Value for Money

The review must propose “value for money” or “money’s worth” indicators for sample/proxy contributors to the Social Insurance Fund. These indicators can be based on the ratio of lifetime benefits to lifetime contributions for the sample cases, and/or through other methods to be specified in the proposal. The sample cases evaluated should highlight differences between various groups of contributors and beneficiaries, specifically based on:

xxii) Demographics (age group, gender)

xxiii) PRSI Class

xxiv) Level of Income

xxv) Varying Contribution History

The value for money impact of the planned reforms of the National Pensions Framework (Ref. Section 4.3.9) and the options for self-employed contributors (Ref. section 4.3.10) should also be assessed across the dimensions above.

4.3.9 National Pensions framework changes (2020-2030)

Examine and report on the impact of the planned reforms in the State Pension contained in the National Pensions Framework, published in March 2010[76].

[76] http://www.welfare.ie/en/downloads/nationalpensionsframework_en.pdf

Year	Policy Change
2020	It is planned that there will be a switch from the current yearly averaging system to a total contributions approach. This has not yet been legislated for but it is a working assumption.
2021	State Pension Age will increase to 67. (Social Welfare and Pensions Act 2011).
2028	State Pension Age will increase to 68. (Social Welfare and Pensions Act 2011).

2020 Policy Change

Currently, State Pension Contributory is calculated based on a Yearly Average Contribution System (YA), wherein pension rates are awarded based on the pensioner's final yearly average of contributions (paid and credited) at retirement.

Under the Total Contributions Approach (TCA), it is envisaged that the level of pension entitlement will be determined according to the aggregate number of years' contributions made, with additional provision for Homemakers Credits.

The TCA will involve a fundamental reform of the calculation of the rate of entitlement, as the number of people qualifying for pension under the existing rate bands will change considerably. The review therefore needs to report on the following:-

xxvi) Projection of expenditure (disaggregated annually from 2020-2025 and then at 5 year gaps) under the current State Pension Contributory system based on a yearly average contributions criteria for awarding pension rates.

xxvii) Projection of expenditure (disaggregated annually from 2020-2025 and then at 5 year gaps) under the new State Pension Contributory system based on a Total Contributions criteria for awarding pension rates.

xxviii) Projection of expenditure (disaggregated annually from 2020-2025 and then at 5 year gaps) under the current State Pension Non-contributory system.

xxix) Projection of expenditure (disaggregated annually from 2020-2025 and then at 5 yearly intervals) under the State Pension Non-contributory system based on the introduction of a TCA approach for awarding contributory pensions.

xxx) Projection of expenditure under an ascending scaling system (from 2020 onwards) where the total number of years' worth of contributions required to qualify for the highest State pension rate increases from 30 to 35 on an annual basis.

xxxi) A Cost/Savings analysis of YA against a variety of TCA options which can be implemented in the period 2020-2030.

xxxii) Determine an expenditure neutral TCA approach, along with the number of years' worth of contributions required to qualify for the highest pension and/or optimum banding/pro rata system.

xxxiii) Comparative analysis of value for money for males and females under the new total contributions approach system, taking into account how the homemakers' scheme would transition from YA to TCA.

xxxiv) A costing for a provision whereby, for a period of 5 years, new pensioners could choose the greater benefit of the current "Yearly Average" method or the newer "Total Contributions Approach".

Additionally a cost analysis shall be performed for a deferment scheme, whereby people working past State Pension Age could defer drawdown of their State pension contributory, in return for a higher rate of payment on retirement. While there will be default values provided for the report by the Department, the model should allow input of variables for (a) the rate of increase in pension per month deferred, (b) the expected percentage take up of the scheme, (c) the average duration of the deferments under the scheme, and (d) the average life expectancy of those who avail of the scheme.

4.3.10 Class S (self-employed) Options

Project expenditure (disaggregated annually from 2020-2025 and then at 5 yearly intervals) for Class S self-employed contributors to receive each of the benefits for which they currently do not qualify (4.6.2).

Project PRSI contribution rates required to provide each of these benefits to Class S contributors on a revenue neutral basis.

4.3.11 Frequency/Propensity Distribution Projection:

For the purposes of Expenditure Projection, an implicit calculation of the future number of claimants under each scheme is required. The Department requires this projected propensity of claimants under each benefit to be displayed as a separate output, by age bands, income brackets, contribution rate bands, sex and any other population cohort that the Tenderer can build in consultation with the Department.

For the purposes of Income Projection, an implicit calculation of the distribution of contributors by PRSI class needs to be produced. In addition to distribution by PRSI class, the Review should also aim to provide a more distilled version of this distribution encompassing, but not restricted to, age bands, income brackets, sex and any other population cohort that the Tenderer can build in consultation with the Department.

4.4 Actuarial model – scope and technical requirements

4.4.1 Scope

The Tenderer is required to provide the Department with a well-architected, modular Actuarial Model covering the following:

xxxv) *Benefits*: State Pension (Contributory), Widow's, Widower's or Surviving Civil Partner's Pension (WPC)*

Contributions: PRSI contributions, Exchequer subventions, and investment income.

It is desirable but not required for the model to include modelling of other benefits, and in any case the architecture of the model should allow for its future extension to other benefits.

The model should be capable of producing outputs on both an "open group" basis and a "closed group" / "accrued to date" basis.

4.4.2 Updatability/Reusability

Once a data input structure has been designed, it should be possible to update the actuarial model with new source data on at least an annual basis. This should include a capacity to update the model on at least an annual basis for the accrued-to-date pension requirements set out in 4.3.6.

Additionally, the projection structure (initial 10 year disaggregation and then at 5 spot year gaps) should allow for a varying starting point, with appropriate variation of data inputs.

The model should also allow for variability within its input parameters (e.g. rules, rates, macros, demographics). For instance:

xxxvi) Projection of income and expenditure (4.3.2, 4.3.3) under varying policy, macroeconomic and demographic assumptions, as well as under varying contribution rates and/or varying benefit entitlements for different PRSI class members (such as those described in sections 4.3.9 and 4.3.10).

xxxvii) Value for Money analysis (4.3.8) for any person, under varying income distribution, demographic and policy scenarios, reflecting propensity variation as a result of any policy change, that is, a clear description of change in value for money for different cohorts if the qualifying parameters were to be changed.

4.4.3 Data Design

The Department will provide the successful Tenderer with details of the available administrative, macroeconomic and demographic data, and of any other relevant data sources. The successful Tenderer will then be required to design and agree, in consultation with the Department, a suitable data format and structure for carrying out the required Actuarial Modelling.

The Data Design will be reviewed by an Expert Group on Public Sector Pensions and Actuarial Work co-chaired by the Department.

4.4.4 Data Provision

The Department will facilitate the provision of administrative, macroeconomic, and demographic data, as well as data on rules, rates and other relevant features of the Social Welfare and Pensions systems to the Tenderer, in the format agreed by the two parties.

The Tenderer is responsible for provision of relevant actuarial assumptions and data, having regard to international actuarial and statistical standards as appropriate.

4.4.5 Data Quality Review

As part of the Actuarial Review report, the Contractor must provide an assessment of the quality of the data used for the review, clearly identifying any data limitations that might cause projections to deviate from reasonable accuracy.

This data quality review should have regard to the draft guidelines provided by the International Social Security Association/International Labour Organization (ISSA/ILO) for Actuarial Work for Social Security.

4.4.6 Model architecture

The technical architecture of the Actuarial Model is subject to agreement with the Department.

An ideal model will have a well-architected, modular design, with a clean and well-documented interface between model components to facilitate knowledge transfer

The software tools to be used by the Tenderer to develop the model must first be agreed upon by the Department. The Department holds all veto rights against any software usage recommended by the Tenderer, with a view to ensuring that future development of the model is not unnecessarily restricted.

Robust version control should be implemented for all model code and documentation.

4.4.7 Supporting Documentation

Tenderers must outline the supporting documentation that will be developed as part of this project. Supporting documentation must include:

xxxviii) Assessment and pre-processing of data input variables (e.g. explanatory data analysis, data cleansing, sample data preparation)

xxxix) Summary of actuarial models built and rationale for their retention or exclusion (where relevant);

xl) Detailed descriptions of the modelling process (assumptions, data, methodologies)

xli) Code and output of the model.

4.4.8 Intellectual property

All code and intellectual capital developed for the model must be handed over to the Department (fully annotated). The model provided to the Department under this Tender will be the intellectual property of the .Department of Social Protection.

4.5 Model Retention and capacity building

4.5.1 Skill Transfer/Training

The Tenderer must perform the skill transfer required to enable a limited number of staff nominated by the Department to operate and amend the model. This must include full documentation of the model, to facilitate its re-use and expansion.

xlii) During the course of the contract, Tenderers must ensure that skills transfer and training will be delivered to a pre-designated project team, set up by the Department (but not limited to staff of the Department). The objective is that these designated project team members will acquire the necessary skills to develop models themselves and allow the actuarial model to be maintained internally within the Department once the contract period has ended.

xliii) The development process, including code and/or analytics tools must be explained to the designated staff at each stage in the development or maintenance of the model.

xliv) Once the model has been completed, a comprehensive debriefing session must be given as a part of the handover process. This must include a detailed explanation on the composition and reasons for the outputs of the actuarial models to assist in an understanding of the model and associated risk.

4.6 List of benefits in scope for 2015 Actuarial Review

4.6.1 Long and Short Term Benefits

The following Table lists the main benefits that are in scope for this Review.

Note that the long term pension benefits paid out of the SIF carry maximum weight (especially SPC and WPC) in terms of Overall Fund Expenditure and consequently the corresponding projection approach for the same would undergo a more stringent evaluation.

In the table below, benefits paid out of the Social Insurance Fund are marked with an asterisk, while benefits in scope for the Actuarial Model described in section 4.4 are highlighted in green.

.	***Long Term Benefits***
1.	State Pension Contributory(SPC)*
2.	State Pension Non-Contributory (SPNC)
4.	Widow's, Widower's or Surviving Civil Partner's Pension (WPC)*
4.	Invalidity Pension*
5.	Guardian's Payment*
6.	Carer's Benefit*
	Short term Benefits
7.	Jobseekers' Benefit*
8.	Maternity/Paternity Benefit*
9.	Adoptive Benefit*
10.	Illness Benefit*
11.	Health and Safety benefit*
12.	Occupational Injuries Benefit*
13.	Treatment Benefit*
	Non- Cash Benefits
14.	House Hold Benefits Package*

Appendix 10: Glossary

Term	Abbreviation	Description
Accrued to date liability	ADL	Present value of future entitled benefits based on current contributions
Ageing Working Group	AWG	Provide estimates for population projections
Break even Contribution Rate		The level of contributions needed to make income equal to expenditure
Central Statistics Office	CSO	National Office for collection of economic and social information
Consumer Price Index	CPI	Inflation level used for the report
Current workers' and pensioners' Liabilities	CWL	Present value of future entitled benefits for current contributors based on current and future contributions
Exchequer Subvention		Payment to the fund to offset shortfalls
Jobseeker's Benefit	JB	Income aid for short term unemployed
Open-system (gross) liabilities	OSL	Present value of future benefits for present and future contributors
Open-system net liabilities	OSNL	Difference between future value of liabilities and assets
Pay as you go basis	PAYG	A system of meeting costs as they arise rather than when they are incurred
Pay Related Social Insurance	PRSI	Mandatory Social Insurance contributions as a percentage of earnings
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.
Social Insurance Fund	SIF	The Fund from which Social Insurance benefits are paid
Stability Programme Update	SPU	Update to the medium term fiscal plans
State Pension (Contributory)	SPC	Basic State Pension available through contributions
State Pension (Non-Contributory)	SPNC	Means based State Pension for low income households
State Pension Age	SPA	The age at which State Pension (Contributory) is available
Support Ratio	SR	Ratio of working age population to those of non-working age
Total Contribution Approach	TCA	Proposed 2020 changes to SPC, pension rate is based on total contributions
Weighted average pension		The average overall pension amount "weighted" by the number of individuals in receipt of a given pension amount
Widow(er)'s and surviving civil partner's benefit	WPC	Payment for surviving spouses of late workers or pensioners
Yearly Average	YA	Current SPC rules, rate is based on the average contributions since the beginning of employment

Appendix 11: Reliances and Limitations

There are a number of important limitations and assumptions which should be borne in mind when considering the results contained in this report. Some of the key limitations and assumptions are set out below. Other specific assumptions, caveats and limitations are contained elsewhere in relevant parts of the report. All make up an integral part of the report.

We have relied on data provided to us by the Department and have carried out some checking on the data used. We have, satisfied ourselves, as far as possible, that the information presented to us is consistent with other information obtained by us in the course of the work undertaken by us to prepare this report. We have performed overall reasonableness checks on the final figures, but are not able to give any warranty on the quality of the data used. We have assumed that the factual material and information provided to us, both in written and verbal form, provides an accurate representation of the Fund. Further commentary is included in Chapter 4 and Appendix 3. We have made observations on improvements which could be made to the quality of the data and provided these separately to the Department.

It should be recalled that the long-term projections are not forecasts, they are subject to increasing uncertainty over time, and the results are strongly influenced by the underlying assumptions.

Moreover, at the current juncture, there is also considerable additional uncertainty concerning medium-term economic developments, on top of the inherent uncertainty on longer term developments.

In practice, actual experience is likely to differ from best estimates due to factors such as changes in regulation, taxation, economic, operational and other factors. It must therefore be recognised that actual results will differ from those inherent in the values given. We caution therefore that the eventual outcome is likely to vary, perhaps materially, from our projected outcome.

Our Review is based on commonly accepted actuarial techniques applied in a consistent manner.

This report should be read in its entirety, as individual sections, if read in isolation, may be misleading.This report is delivered subject to the agreed written terms of KPMG's engagement. Our report was designed to meet the agreed requirements of the Department. Any party who chooses to rely on our report (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 report to any other party.

Judgements as to the conclusions drawn in this report should be made only after studying the report in its entirety. We assume that users of this report will seek explanation and / or amplification of any part of the report which is not clear.