Social Protection Committee
Indicators Sub-group

The Secretariat

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STEERING NOTE

Guidelines for computing Theoretical Replacement Rates (TRR) for the 2021 Pension Adequacy Report (PAR)

Introduction: current and prospective theoretical replacement rates

Theoretical Replacement Rates (TRR) are defined as the level of pension entitlements the first year after retirement as a percentage of individual earnings the year before retirement at the moment of take-up of pensions. The exercise on TRR therefore gives a picture of pension systems' *adequacy*, when adequacy is understood as to what extent the level of pension benefits replace individual previous' earnings and therefore smooth the transition into retirement. In that sense TRR can be considered a proxy to the standard of living that people can achieve in retirement compared to their own situation when working.

TRR are case study based calculations, that is, they are calculated for an assumed hypothetical worker in a *base case* and a given set of *variant cases*. The base case should be treated as a priority, taking also into account that the provision of elements highlighting the representativeness of the base case is an essential aspect to complete the information provided by the calculation of TRR. Calculations for variant cases will provide very useful information on how the TRR vary for different departures from the main baseline assumptions, and thereby on the adequacy effects of reforms that entail changes on the relevant key parameters.

TRR can measure current and future adequacy. *Current* TRR describe the situation of people who retire today (in this exercise, people who retired in 2019 in the base case), while *prospective* TRR describe the foreseen situation of people starting their career today, and thus retiring in the future (in this exercise, people starting their careers in 2019 and retiring in 2059 in the base case, except for the type cases with different career lengths). In that sense, prospective TRR should allow an assessment of future adequacy of pensions that takes into account assumed future economic and demographic[1] circumstances as well as changes that have been decided in many countries as a result of recent reforms. This is important both at a general level for policy-making and for individuals' retirement planning, who need to anticipate the possible situation of their future income.

Prospective TRR rely on specific assumptions on the key economic and demographic parameters that are relevant for the calculation of future earnings and benefit entitlements. The plan in this round of TRR calculations is that such parameters will continue to be aligned to the ones used by the Ageing Working Group (AWG) of the Economic Policy Committee (EPC).

Following the work of the SPC-TRR working group in 2019, the ISG and the Working Group on Pension Adequacy (WGPA) discussed the new proposed base case and the list of additional

[1] Demographic variables are needed for instance since SPA and/or benefits are linked to life expectancy in some countries.

TRR cases for the Pension Adequacy Report 2021. The list was finalised at the WGPA working group meeting on 14 February 2020. The comments that delegates put forward during the consultations on the case list were taken into consideration while drafting the guidelines below. Subsequently, these guidelines were submitted to the ISG in a written consultation in May 2020, and adapted.

These guidelines provide information on (1) the general specifications of the calculations, (2) the main hypothesis of the base case, (3) the specifications for variant cases, (4) the main data and assumptions needed for the calculations, (5) the main background information needed on representativeness and assumptions and (6) the presentation of results. A final section on other issues concludes (7).

1. General specifications of the calculations

The definition used for TRR refers to the replacement of income obtained when people retire: it is at the moment of take-up, the ratio of pension entitlement for the first year of retirement divided by work income on the last year before retiring,. The following presents the main specifications of this general definition for this exercise.

Definition of the TRR *= pension income (at take up) / work income (last year)*

The numerator "pension income at the moment of take up" refers to the entitlement in the form of pensions from all mandatory, typical and relevant pension schemes (see section 2 below), as well as other social benefits, as applicable to the selected case (e.g. housing benefits, holiday allowance). Housing supplements can be included in the calculations, depending on each Member State framework, as means-tested benefits. Benefits in kind should not be included in the calculations, as they are not part of the disposable income.

The denominator "work income on the last year before retiring" should include earned income (including overtime pay, bonuses, 13th month, etc.) and, depending on each Member State framework, social benefits as applicable to the selected case (see section 2 below for more details).

1.1. Current and Prospective TRR (2019 and 2059 respectively in the base case)

Current TRR are to describe the situation of people who retire today, while prospective TRR will describe the situation of people who start working today and will be retiring in the future. Specific assumptions and notions underlying the base case are presented and discussed in Table 2 below. This section will give a general overview.

Results for current TRR should present the pension outcome for people retiring today, under the relevant pension legislation (i.e. the worker started working in 1979 and retired in 2019 in the base case, under whichever rules applied during their career). Results for prospective TRR should present the pension outcome for people retiring in the future under the pension legislation enacted by June 2020, including transitional rules to be implemented gradually that may be legislated in enacted reforms. This includes the currently legislated indexation rules for different benefits. The calculations for prospective TRR should typically reflect reformed pension systems in full maturity.

The calculation year will therefore be 2059 except for the short career cases (2057), the long career cases (2061) , as well as the entry at age 20, the age-25 to SPA case, and for the so-called 'AWG' type case where the exit year varies by country.

1.2. Gross and Net TRR

The calculations take into consideration social security contributions to statutory and supplementary pension schemes or funds. Taxes and means-tested social benefits are also included in the calculations. This makes it possible to determine the contributions of the different components of the pension systems to the pensioner's income replacement at the point of retirement.

In particular, the *gross replacement rate* is defined according to the pre-taxed income (after employer contributions, but including employee contributions). The *net replacement rate* is calculated as net of income taxes and employee contributions and including means-tested benefits. The comparison between gross and net allows assessment of how different tax treatments of income from work and pensions may affect the income replacement provided by pension provision, or in other words, the effect of tax systems in pensions' adequacy.

1.3. Steps of calculations

Table 1 clarifies the successive steps in the calculations from gross to net replacement ratios and the relevant break-downs of the replacement rates.

Table 1. Steps of the calculations

		Wage income[2] immediately before retirement	**Pension entitlement immediately upon retirement[3]**
	Compensation per employee	A	
–	Employer contribution to the first pillar pension scheme (B_1), to the other pension schemes (B_2) and other employer's social contributions (B_3).	B_1	
		B_2	
		B_3	
=	Gross earnings ($C=A-B_1-B_2-B_3$)	**C**	
	Pension income from first pillar pension schemes – J_1, of which PAYG (J_1^A) of which funded (J_1^B) and from other pension schemes - J_2		$J_1^A + J_1^B = J_1$
			J_2
	Total pension income ($J = J_1 + J_2$)		**J**
%	**1st pillar (statutory pensions) gross replacement rate - G_1,** **(of which PAYG - $G_1^A=J_1^A/C$ of which funded schemes - $G_1^B=J_1^B/C$)**		**$G_1=J_1/C$** **($G_1^A=J_1^A/C$ $G_1^B=J_1^B/C$)**
	Other pension schemes gross replacement rate – G_2		**$G_2=J_2/C$**
	Total Gross replacement rate ($G = G_1 + G_2$)		**G=J/C**

[2] 'Wage income immediately before retirement' includes in fact all wage income accumulated between 1/1 and 31/12 of the year, including 13th month, bonuses, overtime pay, etc.; also pension income includes 13th, 14th month, bonuses etc. as applicable.

[3] The pension income is the annualised rate based on the payment amount on 1st January, not accounting for any increases throughout the rest of the year.

–	Employee and pensioner contributions to pension schemes: first pillar - D_1, other pension schemes - D_2,	D_1	K_1
		D_2	K_2
–	Social insurance contributions other than for pension schemes[4]	F	M
–	Taxes	G	N
+	Means-tested benefits		O
=	Net wage and pension income ($I=C-D_1-D_2-F-G$) ($P=J-K_1-K_2-M-N+O$)	**I**	**P**
%	**Total Net replacement rate (N=P/I)**		**N=P/I**
	Of which means tested benefits in pp of total net replacement rate		**O/I**

The former table also highlights how, in order to be useful for policy-making and for individual retirement planning, the replacement ratios should be clearly broken down into individual components of retirement income. For instance, countries with a two-tiered first pillar should present the Pay As You Go (PAYG) and funded components separately rather than merging them into a single first pillar replacement rate. Likewise the "means-benefit" component of the total net replacement rate should also be reported separately, as outlined in Table 1. This will also make it possible to examine the extent to which one's own pension arrangements (or those of certain groups) depart from the 'typical' situations described by the replacement ratios.

2. Specifications of the base case

In the base case, TRR are calculated for an assumed hypothetical worker with a given earnings and career profile and a corresponding affiliation to the pension schemes taken into consideration. The base case individual is chosen to reflect as closely as possible current actual situations and institutional frameworks. However, given the diversity of situations across Member States, the base case may not necessarily be representative of workers in all Member States and therefore, TRR need to be analysed in the light of background information aimed at showing in particular how "representative" the hypothetical worker is in a specific Member State (see section 5 below).

Table 2 summarises the main assumptions for the base case.

Table 2. The main assumptions for the base case

Professional status	Workers covered by the **most general scheme** (i.e. private sector scheme: if there are different schemes by professions/sectors, assumptions of the work sector are necessary. If considered relevant, Member States may also calculate replacement ratios for public sector employees, self-employed or other professional groups)
Career length	40 years
Age at retirement	National sex-specific standard pensionable age (SPA) [5]

[4] Includes all contributions, for instance health care contributions.

[5] The standard pensionable age is defined as the earliest age at which the individual with 40-year career can retire without any exit penalty. There is one exception, Luxembourg, whose SPA is currently set at 65 to enhance TRR comparability.

Type of employment	Full-time work
Marital status	Single person (calculated for both men and women)
Year of retirement	Current replacement rates should be calculated for retirement in 2019 (pension in 2019 with respect to work earnings in 2018)[6]. Prospective replacement rates should be calculated for retirement in 2059.
Coverage of pillars in pension income	First pillar, supplementary (occupational or personal) provision and means-tested supplements as applicable to the selected case (see below)
Earnings level	100% of **average earnings** of the corresponding year
Earnings profile	Constant relation to current average earnings (100%) over the whole period of employment

Coverage of pillars in pension income of the theoretical individual

Calculations should include all (and only) pension schemes that are mandatory, typical or with wide-reaching coverage in a country. For each country the main schemes for private-sector employees should be modelled. Special schemes for civil servants, public-sector workers and special professional groups are excluded.

Statutory pensions include classical pay-as-you-go schemes (Defined-benefit (DB) or Notional defined-contribution (NDC)), and the mandatory Defined-contribution (DC) funded tier of the statutory scheme existing in some Member States.

Resource-tested benefits for which retired people may be eligible are also to be modelled. These can be means-tested, where both assets and income are taken into account, purely income-tested or withdrawn only against pension income. The calculations should assume that the base case individual takes up all the entitled benefits. The income test has to be taken as binding. There are no assumptions about sources of income such as accumulated assets, dividends or other source not provided within social protection systems, and these are not included.

An increasing number of countries have a broad coverage of occupational pensions, either through collective agreements or through the employer, with an increasingly important role in providing retirement income. Therefore, these pensions that can be either DB or DC in type, are to be included in the base case calculations.

Individual schemes in principle should NOT be included in the calculations as these are typically voluntary and not so widely developed. They should be included only if they are part of official pension provisions and of substantial significance (such as, for example, in the case of the German Riester scheme),. These insertions must be fully justified on the basis of the current and perspective coverage of such pension arrangements among workers. Saving arrangements that do not tie up savings till retirement age can never be considered.

In case of doubts, Member States should contact the ISG secretariat and the EC to decide how to treat a certain scheme. Moreover, Member States should be encouraged to provide background information on the different schemes introduced, explaining briefly the institutional framework, the type of membership and current and expected coverage. The EC will request a list of schemes each country applied, and this will be annexed to the Pension Adequacy Report 2021.

[6] Except in case a MS needs to refer to a different moment of time.

Table 3 summarises the types of schemes to be included in the calculations.

Table 3. The types of schemes to be included in the calculations

	Covered by TRR calculations	Type of scheme
Statutory schemes	YES	Minimum pension provision
		Means tested benefits for pensioners, such as housing
		Universal flat rate linked to residency or to social insurance contributions
		Earnings related PAYG (with or without reserve fund)
		Earnings related, totally funded (by social contributions) – funded tier of general statutory schemes. Partly funded schemes.
Occupational schemes	YES	Mandatory for employer (sectoral or cross-sectoral) or resulting from collective agreement (which makes membership mandatory)
		Resulting from collective agreement (membership not mandatory but coverage is wide)
	Only if justified (broad coverage)	Resulting from collective agreement (membership not mandatory)
		Possibility to subscribe to pension scheme through one's employer
		Contractual or unilateral by employer (including book reserve or group plans)
Individual schemes	Only if justified (broad coverage)	Voluntary individual schemes (no employment link is necessary to become member), that can be adhered collectively (for instance through associations or Unions)
		Individual contracts with pension funds, life insurance companies or pension savings institutions that deliver annuities
	NO	Long term savings not specifically for pension purposes

3. Specifications of variant cases

In variant cases the key assumptions of the base case are changed in order to illustrate how the replacement rates vary for different variations on the main assumptions, with the purpose of studying the effects of changes on the related key parameters.

The analysis of variant cases should be considered with respect to earning profiles, thus considering a low income earner and a high income earner (as compared to the **average income earner** of the base case). The following variant cases of TRR are to be calculated in this exercise:

a) **Low income earner**: only the earnings assumptions are changed, corresponding then to a constant level of 66% of the average earning profile each year.

b) **High income earner**: only the earnings assumptions are changed, assuming now that earnings grow linearly every year from 100% of average earnings to 200% (the worksheet "*Earnings Profiles Assumptions*" in the Tables provided with these Guidelines contains the specific evolution of wages for high income earners). The aim of this variant is to represent career profiles where earnings grow over time typically at a faster pace than they do for the average earner.

The different earning profiles are only applied to some of the cases, as it was in PAR 2018. The annexed Excel table clarifies which earning profiles apply to each case.

The variant cases to be included in the current round of TRR will be the following:

3.1. Previous base case

In the base case calculations a 40 year career is typically calculated with a person retiring at the national standard pensionable age. With the "previous base case" variant, the individual will begin work at age 25 in 2019 and retire at age 65 in 2059, to replicate the a base case that was calculated in 2012, to allow for comparisons. This calculation may be impossible in some countries as retirement is not allowed at age 65; these countries should mark the cells as N/A. In figures, this will be shown as a "zero TRR" and explained in a footnote.

3.2. Increases in pension ages

In the base case calculations a 40-year career is typically calculated with a person retiring at the national standard pensionable age[2]. With the "increase in pension ages" variant, the impact of retirement age reforms can be analysed. For this variant the entry age will remain constant with the retirement age reflecting the standard pensionable age at the time. Thus, the following variant case will be calculated:

a worker retiring at the national standard pensionable age (starting point of the career is age 25 in 2019, thus the career length will change as the retirement age changes). In such case the career duration can be different from the 40 year of the base case. If the SPA is 65, however, this case will coincide with the base case.

3.3. AWG career length case

In the base case calculations a 40 year career is typically calculated with a person retiring at the national standard pensionable age. However this entry and retirement age may not reflect the average situation that occurs within a particular country. For this variant the entry age will be the national effective entry age with the retirement age being the national effective exit age. Thus, the following variant case will be calculated:

a worker retiring at national effective exit age – the so-called 'AWG' case (starting point of the career is national effective entry age, thus the career length will vary between country). The national effective entry and exit ages will be computed by the EPC-AWG and the secretariat will provide these figures; they will be gender-specific. This calculation will not be possible for all countries as retirement will not be possible at the national effective exit age in the future. These countries should mark the cells as N/A.

3.4. Different career lengths

In the base case calculations a 40 year career is typically calculated with a person retiring at the national standard pensionable age. With "different career length" variants, the dynamics of work incentives can be studied by comparing a base case worker who retires at national standard pensionable age with one that retires either 2 years earlier or later thus decreasing and increasing respectively the seniority/number of contributory years of the worker. In addition, the early entry case will give a comparison of a much longer career. Thus, the five following variant cases are to be calculated:

a) **a worker retiring at SPA with 42 years of seniority** (starting point of the career is as in the base case, thus retirement in 2061 for prospective TRR). Calculated for an average earner, both male and female.

b) **a worker retiring at SPA with 38 years of seniority** (starting point of the career is as in the base case, thus retirement in 2057 for prospective TRR). Calculated for an average earner, both male and female.

c) **a worker retiring two years after national standard pensionable age** (starting point of the career is as in base case, now with 42 year career, retirement in 2061). Calculated for an average earner, both male and female.

d) **a worker retiring two years before national standard pensionable age** (starting point of the career is as in base case, now with 38 year career, retirement in 2057). Calculated for an average earner, both male and female.

e) **a worker starting to work at age 20 and retiring at SPA** (this is the "early entry case"; the worker starts a career in 2019 at age 20 and then retire at the SPA, so the retirement year changes). Calculated for both an average and low earner, both male and female.

3.6. A worker ten years after retirement

A pension – wage ratio after 10 years of retirement should also be presented, as a complement to the base case. This should be calculated considering the value of an individual's pension 10 years after retirement, divided by the income of another average-earner worker retiring 10 years later than the previous one after a 40 year career up to the national standard pensionable age in 2059 (thus, the two retirees are in different cohorts, with 2019/2029 as the relevant entry years for the calculation of the prospective replacement rates). This will help to provide an assessment of the evolution of the relative position of the individual, typically reflecting pension indexation. The denominator for this case is the average wage in 2068.

3.7. Variant cases with career breaks

It is important to study with TRR to what extent social protection systems protect not only the current loss of income due to career breaks (for care responsibilities or in the event of unemployment), but also protect future incomes in the form of pension entitlements. This is becoming increasingly important as the number of contributory years needed for a full pension is being extended in many Member States and pension credits can make a large difference in benefits. For all career break cases the entry and exit ages are as for the base case. The following variant cases with career breaks are to be calculated in the present exercise:

a) Career breaks for childcare years: this variant case includes different sub-cases:

- ***Career break for 3 years of childcare*** The assumption for this case is that the typical earner is considered to be an average or low earner (both male and female) retiring at the country specific standard pensionable ages having entered the labour market at the base case age. The exercise assumes a childcare covering period of 3 years of absence, and the worker applies for this period to be credited. For the modelling it is assumed that two children are born two years apart, in 2022 and 2024. The assumption is that the individual can receive the highest full benefit. The child care credits are typically placed for two children born.

- ***Part time work for 10 years after 3 year break of childcare*** The assumption for this case is that the typical earner is considered to be an average earner (both male and female) retiring at the country specific standard pensionable ages having entered the labour market at the base case age. The exercise assumes a childcare covering period of 3 years of absence as for the standard childcare case (first child born in 2022, second child two years later), again credited if allowed. After the three-year break, follows a

period of 10 years of part time work at 66% of average earnings before full time work resumes in 2035 until the SPA in 2059.

b) Unemployment breaks: this variant case includes different sub-cases:

- ***Career break for 3 years of unemployment***: In this case the typical earner will be considered to be an average or low earner (both male and female) retiring at the country-specific standard pensionable ages having entered the labour market at the base case age. Three consecutive years of unemployment are assumed to take place, when the individual is allowed highest full unemployment benefits that are entitled by legislation during the entire unemployment period (2029-2032). Although several countries have early-retirement schemes, the effects of such schemes are not taken into consideration in these calculations.

- ***Twenty non-contributory years out of the labour market***: This variant is defined as an average earner worker, both male and female, who retires at standard pensionable age and entered the labour market at the base case age. They work for 10 years, then have a 20 year career break from 2029 to 2049, and then work 10 years until standard pensionable age. During the 20 year break the worker is assumed to not contribute to the pension system at all and not receive any social benefit or contribution credits, but remains resident in the Member State.

c) Career breaks for family care years

In this case the typical earner will be considered to be an average earner (both male and female) retiring at the country-specific standard pensionable ages having entered the labour market at the base case age. Three consecutive years of family care are assumed to take place, when the individual is 10 years from SPA i.e. from 2049 to 2052.

3.8. Early retirement due to disability

In this case the typical earner will be considered to be an average earner (both male and female) leaving the labour market 5 years prior to national standard pensionable age in 2054, having entered the labour market at the base case age. Disability is classed as 100% and the individual is eligible for the maximum level of credit. The individual claims the pension at the earliest possible point through any early-retirement schemes. However the replacement rate is calculated at the national standard pensionable age in 2059, indexing benefits in payment where required. The denominator is therefore the same as for the base case i.e. average wage for a full career worker in 2058.

3.9. Pension rights of surviving spouses

With women having traditionally had shorter careers than men when within a couple pension systems often account for this disparity within the survivor entitlements. In all cases the male partner is assumed to die immediately at the point of having first claimed the pension. Thus the four following cases are to be calculated:

a) **a couple retiring at SPA after each having a 40 year career** The careers are exactly as in the base case at average earnings. The male partner dies at retirement. The numerator is the pension entitlement of the woman from either her own pension or that

of her deceased spouse or a combination of both as per the rules for survivor pensions. The denominator is the average wage at retirement. This case will be compared with the single female average earner base case.

b) **a couple retiring at SPA after having 40 year and 20 year careers** The male partner career is as in the base case (40 years at average earnings) with the female partner career as in the short career case (10 years at average earnings, 20 year break with no credit and then 10 years at average earnings). The male partner dies at retirement. The numerator is the pension entitlement of the woman from either her own pension or that of her deceased spouse or a combination of both as per the rules for survivor pensions. The denominator is the average wage at retirement. This case will be compared with the single female short career at average earnings case.

c) **survivor pension ratio of a couple retiring at SPA after each having a 40 year career at average earnings** The careers are exactly as in the base case at average earnings. After retirement the male partner dies. The ratio is

$$\frac{Woman\ Old\ age\ pension + Survivor\ pension}{Woman\ old\ age\ pension + Man\ Old\ age\ pension}$$

The numerator is case (a) above. The denominator is the replacement rate for a couple at average earnings as a proportion of average earnings.

d) **survivor pension ratio of a couple retiring at SPA after having career as in case b above, i.e., 40 year (man) and 20 year (woman, 10-20-10) both at average earnings)**. The male partner dies right after retirement. The ratio is

$$\frac{Woman\ Old\ age\ pension + Survivor\ pension}{Woman\ old\ age\ pension + Man\ Old\ age\ pension}$$

For this calculation neither the numerator nor the denominator have been calculated before.

Numerator – survivor pension for a couple retiring at SPA after having careers at average earnings (man 40 year, woman 20 years) The male partner career is as in the base case (40 years at average earnings) with the female partner career as in the 20-year career case. The male partner dies at retirement. The calculation is the pension entitlement of the woman from either her own pension or that of her deceased spouse or a combination of both as per the rules for survivor pensions.

Denominator - Couple pension for a couple retiring at SPA after having 40 year careers at average earnings The male partner career is as in the base case (40 years at average earnings) with the female partner career as in the 20-year case, at average earnings.

The ratio is simply the numerator divided by the denominator.

3.10. Other possible variants

In addition to the above, Member States are strongly encouraged to elaborate other variants they deem relevant in their national context; reflecting key dimensions that can strengthen the quality of information provided by mandatory variants. These may in particular include calculations for different ages of retirement that would seem more representative of the national situation, or calculations for civil servants, self-employed or farmers.

4. Data and assumptions

In addition to the specifications listed above for the base case and variant cases, the following data are typically needed for the modelling of current and prospective TRR calculations:

- average earnings of the base case theoretical individual
- wage growth
- GDP growth
- inflation rate
- rates of return and annuities
- tax and social insurance data
- demographic variables (life expectancy / mortality tables)

- average labour market entry and exit, AWG projections

Input data on these variables are needed for the whole 40 year period of the individual's career: either historical data referred to the past 40 years (for the calculation of current TRR) or assumptions on the relevant variables for the next 40 years (for the calculation of prospective TRR). The following explains in more detail what input data should be used in this round of TRR.

4.1. Current TRR calculations: based on past historical data

Calculations of current TRR should be based on historical data for all the macro economic and demographic variables listed above. Country delegates are invited to use EU-level statistics such as the AMECO macro economic databank of DG ECFIN[7], EUROSTAT data[8] or national sources to extract the necessary input data for the modelling. The data sources used should be indicated when reporting the results.

The average earnings of the base case theoretical individual can be calculated either as (i) "Compensation of employees (before employers' social contributions) divided by the number of salaried employees in each country" or else as (ii) "wages and salaries (after employers' social contributions) divided by the number of salaried employees in each country". In any case, note that employers' social security contributions should be netted out for the calculation of gross TRR (see section 1 above), thus if option (i) is taken, employers' social contributions have to be deducted from the aggregate "compensation of employees". Furthermore, in the denominator, it would be more appropriate to use data on **full-time equivalent** wage and salary employees, since the structure of employment in terms of hours worked differs greatly across countries.

As for the reference population, the Secretariat suggests to use economy-wide averages, with no breakdown by gender or sector. The purpose, in fact, is not to reflect very accurately average earnings or cross-sectoral differences in average earnings in a given country at a given point in time, but to have a consistent image of cross-country differences in levels and past trends of earnings. However, if the pension scheme to which the calculations refer only concerns a particular section of the economy for which average earnings are significantly different from the economy-wide average, then it is possible to use earnings related to that section of the economy, provided they are available based on national accounts definitions.

[7] http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm
[8] http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes

4.2. Prospective TRR calculations: based on assumed data for the future

The calculation of prospective TRR asks for assumptions on future values of all the above-listed macroeconomic and demographic variables. In that sense, the assumptions agreed in the AWG should be used here to calculate projected TRR.

The Tables provided with these Guidelines for calculation of 2019 – 2059 TRR include such AWG assumptions on:

(i) average earnings (without employers' social security contributions) in 2019;
(ii) assumed annual average earnings' growth in real terms 2019 - 2059;
(iii) assumed annual GDP growth in real terms 2019 - 2059;
(iv) assumed annual inflation 2019 - 2059;
(v) assumed real interest rates 2019 - 2059.

The AWG assumes year-on-year figures for earnings' growth and GDP growth for the time span 2019-2059, while it assumes a path of linear convergence in both real interest rates (convergence to the 3% rate by xxxx[9], and constant rate thereafter) and inflation rates (convergence to the 2% rate by xxxx and constant rate thereafter).

The following clarifies further the use of some of the variables in the modeling exercise of prospective TRR.

a. Inflation rate

Assumptions about indexation of pensions should be made according to national legislation. Concerning discretional increases of pensions, in calculating the pension – wage ratio after 10 years, only legislated or automatic increases of pensions should be considered, not discretional ones. If one MS feels it relevant to also consider some discretional increase, this should be declared and done only if the same discretional increase is expected to be considered in the pension expenditure projection exercise.

b. Tax and social insurance

Like in previous exercises, in the absence of a clear legislative commitment to conduct a different policy, Member States should raise income tax and social insurance thresholds in line with earnings so as to avoid a reduction in net replacement rates resulting from an increasing tax burden or a gradual reduction in the scope of social insurance. Departures from this assumption have to be duly justified.

c. Rates of return and Annuities

It should be assumed that when defined contribution benefits are received upon retirement they are paid out as an annuity. Annuities are calculated according to government policies. The interest rate assumed to calculate the annuity is 0.8p.p. lower than the assumed rate used during the accumulation phase in order to account for the cost of buying the annuity, administrative and managing expenses. Therefore for the base case the assumed rate is 3%, giving an annuity rate of 2.2%. The Annuity coefficients used in the calculations take into account changes in life expectancy and are based upon the demographic projections by Eurostat.

[9] These will be finalised when the EPC-AWG finalises its assumptions.

d. Life expectancy

Eurostat's demographic projections based on EUROPOP2019 should be used, as will be the case for the AWG projections. The Tables provided with these Guidelines for calculation of 2019 – 2059 TRR contain the demographic data needed for the exercise, broken down by gender, single year of age (from 1 to 100) and single year time period (from 2019 to 2071) for each MS.

5. Background information on representativeness and assumptions

The provision of information on representativeness and on assumptions used is essential. It is indeed a key element of its comprehensiveness, as well as an essential guide for the interpretation of results (for instance, for the interpretation of differences between different cases within a Member States or for differences between the same cases between different Member States, even if the framework used does not allow straightforward comparisons of replacement rates between countries). Member States should then ensure that this background information is as complete as possible.

Background information should encompass the following elements:

a) Background information on contribution rates:

- Overall contribution to the first pillar as percentage of individual earnings for private employees (this refers to the rate of employee and employer contributions, with possible corresponding breakdowns).
- Overall contribution to occupational schemes as percentage of individual earnings for private employees (this refers to the rate of employee and employer contributions, with the possible addition of eventual public contribution, and with possible corresponding breakdowns).

b) Background information on membership and coverage:

- Number of workers contributing to the statutory pensions: percentage of persons enrolled in the labour force.
- Active membership of occupational (or private in general) pension schemes as percentage of the labour force.
- Number of pensioners receiving statutory pensions as a percentage of population in employment and of population above retirement age (the secretariat will explore drawing this data from the EPC-AWG work).
- Number of pensioners receiving occupational pensions as a percentage of population in employment and of population above retirement age.
- Means-tested supplements and other social benefits: background information should also be provided on their coverage (as percentage of population 65+) as well as on conditions for receipt.

c) Background information on retirement ages:

- Actual legislated pension eligibility ages in 2019 and 2059 (i.e., for someone who finishes their career without penalty after 40 year career) for men and women, subject to starting career at age 25 or later for the 2059 case. The legislated retirement ages should be used in the simulations for all cases except if otherwise specified.

- Average age and seniority at retirement of new flows of retirees (men and women). This should refer to first-pillar social-security pension, excluding as far as possible disability and social assistance pensions. Moreover, seniority at retirement should refer to the number of years that on average new retirees claim for the calculation of their pension (and possibly splitting non-contributory periods, for instance for unemployment or child care).

d) Information on the macro-economic historical data used for calculation of current TRR should also be provided, including: average earnings (after employers' social contributions) in national currency in 2019, average annual earnings growth in real terms in the period 1979–2019, average annual GDP growth in real terms in the period 1979-2019, average annual inflation in the period 1979-2019 and average annual interest rates in the period 1979-2019.

e) Information on the sector of work of the theoretical individual used for the calculations should also be presented.

6. Presentation of results

Comparability between Member States of current and prospective replacement rates depends on the degree to which the commonly defined individual case is representative in different Member States. This varies considerably across Member States, impairing the direct comparability of the results based on actual replacement rate levels. Therefore, as in former rounds of TRR, the presentation of the results will focus on changes in TRR over time for a given country or differences between different profiles or alternative scenarios, rather than on comparative levels of the rates across countries.

Furthermore, in order to enable a correct interpretation of the results and reflect on the sustainability and adequacy of pensions simultaneously, considering the link between the evolution of theoretical replacement rates and the evolution of pension expenditure will be important. The exercise will therefore be complemented with information on the pension expenditure projection as calculated by the AWG (when available).

7. Other issues

a) OECD can provide calculations for prospective TRR only, although Member States are free to carry out these calculations with their national models. Please notify the Commission as soon as possible if you intend to use national calculations for the 2059 updates. When a Member State does not carry out calculations for prospective TRR in national models, it has to validate the corresponding OECD figures. At any rate, all **current** TRR need to be carried out in national models by Member States.

b) A workbook is sent together with these Guidelines in order to validate and/or update the 2019 and 2059 TRR results. Apart from the spaces to fill in the TRR figures, this workbook also contains tables on background information needed, assumptions to carry out the calculations, etc. Member States should fill in these tables according to the instructions in these guidelines.

c) The attached workbook has a colour code for Cells and Worksheets with the following meaning:

CELLS:

* The blue cells have been filled in by the OECD with the preliminary information from the APEX model. This information is basically for 2059 and needs to be validated or replaced with national calculations and information.

* The green cells need to be filled in by Member States and pertain with national calculations and background information (on contribution rates, coverage, retirement ages and macro economic historical data).

* The orange cells are formulae or information provided by the Commission and do not need to be filled in, but can possibly be used as a check of your figures during the updating and validation processes. Note that when the orange cells contain formulae, the values shown are not definitive until all the related green and blue cells that define the formula have been filled in.

WORKSHEETS:

* The yellow worksheet "SPA" should be completed to give details of the standard pensionable age for men and women in 2019 (cells D3 and E3) and for men and women in 2059 (cells D10 and E10).

* The red worksheets contain primarily all the **results** from the updates and validation of 2019 – 2059 TRR.

* The pink worksheets contain the **background information** that should be provided to complement the TRR calculations.

* The grey worksheets contain the necessary **assumptions** for the calculations.

d) In order to be useful for the forthcoming Pensions Adequacy Report, it is important that the calculations and validations carried out by Member States of the 2019-2059 TRR exercise are done in a timely fashion. For that, the TRR updates and validation for 2019 and 2059 should be delivered by 15 October 2020.