

# **Romania**

## **Country fiche on pension projections prepared for the Economic Policy Committee**

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Views expressed in the fiche do not necessarily represent the views of the Romanian Government.

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## PART I-DESCRIPTION OF THE ROMANIAN PENSION SYSTEM, MAIN PROVISIONS AND NEW MEASURES

The Romanian pension system is governed by Law no. 263/2010, to be replaced as from September 1, 2021 by Law no. 127/2019. This new law, legislated in 2019, brings an important change, which involves the recalculation of all existing pensions, a large amount of bureaucratic work and hence planned to enter into force only two years after being voted. Nevertheless, two articles of the new law, stating the ad-hoc values of the pension point as from September 1, 2019 (RON 1265) and as from September 1, 2020 (RON 1775) have been set to enter into force earlier, respectively at these two mentioned dates. Debates around the significant increase (RON 1265 to 1775) have followed and intensified in the context of the pandemic. The Government Emergency Ordinance no 135 from 14 August 2020 amended the law, and in particular value of the pension point as from September 1, 2020, to a new amount of RON 1442. This amendment, stipulating a lower pension point value applicable for the period between September 1, 2020 and August 31, 2021, represents the only policy change with respect to Romania's October 2019 set of projections. All the other provisions of law 127/2019 remain unchanged, including the ad-hoc value of the pension point for September 1, 2021 (RON 1875) and the indexation formula applying thereafter.

The national pension system of Romania consists of three pillars:

**Pillar I, the mandatory public pension scheme** administered by the state, is a PAYG scheme, governed by the following principles: uniqueness, mandatory contributiveness, equal rights, redistribution, and social intergenerational solidarity. This scheme includes old age pension, early retirement pension, partial early retirement pension, disability pension and survivor pension. Further to these categories, there is the social allowance for pensioners, which represents a threshold, so that if an individual's old age, disability or survivor pension is below this level, a top-up to reach this threshold will be granted.

In 2019, the average number of state social insurance pensioners related to pensions (including old age and early, disability and survivor pensions) was 4672 thousand, with a total volume of expenditures of 15.2 billion euro (RON 69.9 billion), while the monthly average number of social security taxpayers was 5632 thousand, and the total volume of contributions was RON 71.7 billion.

**Pillar II, the mandatory private pension scheme** was introduced in the 2007. It is a defined contribution scheme, with a minimum investment guarantee, based on individual accounts (part of the individual contribution from the public pension system is accumulated in such individual accounts). Pillar 2 contribution rate (out of the total employee's social insurance rate) is 3.75% with no plans for this moment to increase it further. The scheme is compulsory for all eligible persons aged up to 35 and voluntary for age group 35-45. Starting with 2018 participants who have contributed for at least 5 years can opt to transfer to the first pillar, but very few

participants have opted to transfer so far. Portfolio size by August 2020: 7.57 million participants from which active participants are 3.5 million people, total assets equivalent of 13.7 billion euro. To understand part of the effects of the COVID-19 crisis, the number of active participants to Pillar II decreased by around 0.4 million people in August 2020 compared to the beginning of year.

**Pillar III**, the **voluntary private pension scheme**, introduced also in 2007, is a defined contribution scheme with voluntary participation, based on individual accounts. Investment guarantees are permitted by the law, but not mandatory. The participants can contribute cumulatively to more than one voluntary pension fund, but the cumulated contributions to the funds are limited to 15% of the gross monthly cumulated income. In order to be eligible for a facultative pension, each participant must exceed 90 monthly contributions, achieve the age of 60 and a minimum cumulated amount in order to be able to receive the benefits. The amount representing the contributions to voluntary pension fund is tax deductible for both participant and employer within the limits of an amount representing RON equivalent of 400 EUR per fiscal year. Portfolio size by August 2020: 518 thousand participants, total assets equivalent of 550 million euro.

The social allowance for pensioners was introduced by the pension Law no. 263/2010 and addressed the public system pensioners, resident in Romania, regardless of the retirement application date, if their monthly pension amount was below the ceiling set by the law (2017 - 520 RON, the equivalent of approx. 117 euro). This social allowance tops up the old age, early and partial retirement pensions, as well as the disability and survivor ones. Before this measure, there was no supplement for the pension benefits. Those who didn't comply with the 15 year contribution period requirement got the minimum income guarantee (of 32 euro per month in 2017), replaced as of April 1st 2018 by the minimum inclusion income (up to the ceiling of 300 RON, equivalent of 65 euro per month). These social pension entitlements have evolved as follows:

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of beneficiaries (thou)	413.5	421.5	391.3	370.6	478.2	459.4	660.2	765.8	849.6
Average level of monthly allowance (euro)	21.52	20.67	21.32	23.20	28.80	31.18	38.50	44.70	49.84

This social allowance is covered from the government's budget; the level is set ad-hoc to 800 RON starting from 1 September 2020, (up from RON704).

The new pension law institutes the notion of “**minimum pension**”, to be set as percentage of the minimum gross economy-wide wage, as follows: 45% for the 15 year minimum contribution period, plus 1% for each year of contribution exceeding 15. The maximum percentage is 75%. The minimum pension replaces the social allowance for pensioners, so it represents a ceiling up to which the computed pension amount is raised, for those who comply with the 15 year contribution period criterion.

Pensioners who accomplished 10-15 years of contribution also qualify, but for a ceiling of only 40% of the minimum gross economy-wide wage, plus 1% for each year between 11 and 14. The minimum pension for the survivor pensioners is 35% of the minimum gross economy-wide wage, for each beneficiary. For pensioners who completed less than 10 years of contribution, as handicapped or blind, the level of pension would be 40% of the minimum gross economy-wide wage.

The difference from the old system is that previously the minimum pension (social allowance) was a fixed amount established in the law (on an ad-hoc basis), rather than a function of the minimum countrywide gross wage and a person’s contributory period.

Note: From the projections’ point of view, we considered a historical approximation of the minimum countrywide gross wage as 40% of the average one and then we approached the present structure of pensioners on earnings brackets. We estimated how many pensioners will contributively earn less than the projected threshold and by which bracket-average amount.

### **The old age pension**

The old age pension is granted to the insured that cumulatively fulfil the conditions of standard retirement age, set according to the date of birth and gradually increased to 65 for men (January 2015) and still increasing to 63 for women (until 2030) and the minimum contribution period (15 years, same intervals of increase). The full contribution period gradually increases up to 35 years (same intervals of increase). The standard retirement age for women in August 2020 is 61 years and 4 months, with their full contribution period 31 years and 4 months. See Table 1

For active military police corps and special public servants within national defence, public order and national security, the standard retirement age will increase gradually up to 60 (56 years and 6 months in December 2016), with a 30-year-full contribution period and a minimum contribution period of 20 years, in 2030.

Any insured participant can benefit of reduced statutory retirement age if he/she:

- worked under special or hard working conditions; or
- completed a period of contribution as disabled, the disablement having been prior to the quality of insured; or

- is a blind person who was certified to have this condition for at least one third of the full contribution period.

➤ Early retirement pension is granted provided they completed the full contributory period required by the law and exceeded it with a minimum of 8 years.

➤ Partial early retirement pension is granted to the insured persons who completed the full contribution period required by the law and exceeded it with less than 8 years. In case of partial early retirement pension, the amount was calculated by diminishing the old-age pension benefit accordingly to the next table:

Number of contribution years fulfilled, exceeding the full contributory period required	<1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Penalty for each month of early retirement	0.50%	0.45%	0.40%	0.35%	0.30%	0.25%	0.20%	0.15%

When the accumulated contribution period is calculated in order to register for early retirement, the following periods of time are considered contributory stages:

- the period when the insured received a disability pension;
- the years spent on full time higher education courses, at the end of which the individual graduated with a diploma; in case a person graduated more than one higher education institute, he will choose only one such period of education to be considered as contributory period;
- the leaves due to child raising (up to the age of 2) or temporary working incapacity;
- the time when the insured served as military, was called under arms or taken prisoner.

Numeric example (table 1 below): As one can see, the full pension benefits can be granted if:

- a) The person accomplished the minimum contributory period and reached the statutory retirement age or
- b) The person contributed for at least 8 years longer than the statutory contribution period. Someone in this situation can retire notsooner than 5 years before the statutory retirement age.

The penalty is associated with the early retirement, i.e. contributory period exceeding the statutory full contributory period with less than 8 years. Thus, considering the penalty in case of “earliest retirement age”, it means that the person retires 5 years (=60 months) before the statutory retirement age. Until September 2021, when the new law enters into force, the penalty doesn’t depend on the contribution period accomplished, and its value is  $60 \times 0.75\% = 45\%$  of



the full pension. As from September 2021 on, a person (still at the earliest retirement age) who exceeded the statutory contribution period by less than 1 year will be penalized by  $60 \times 0.50\% = 30\%$ , while someone who contributed for statutory contribution period + (7.8) years will be penalized by  $60 \times 0.15\% = 9\%$ . The penalty lasts until the person reaches the statutory retirement age.

**Table 1: Qualifying condition for retiring**

		2019	2030	2040	2050	2060	2070
Qualifying conditions for retiring with a full pension (minimum contribution years requirements)	Contributory period- men	15	15	15	15	15	15
	Contributory period- women	15	15	15	15	15	15
	Retirement age – men (STATUTORY)	65	65	65	65	65	65
	Retirement age – women (STATUTORY)	61.2	63	63	63	63	63
Qualifying conditions for retiring with a full pension (minimum retirement ages requirements)	Contributory period- men	43	43	43	43	43	43
	Contributory period- women	39.2	43	43	43	43	43
	Retirement age - men	60	60	60	60	60	60
	Retirement age – women	56.2	58	58	58	58	58
Qualifying conditions for retiring <b>without</b> a full pension (early retirement = ex-partial early retirement)	Early retirement age - men	60	60	60	60	60	60
	Early retirement age - women	56.2	58	58	58	58	58
	Penalty in case of earliest retirement age	NOT A CRITERION					
	Penalty in case of earliest retirement age AND shortest acceptable contributory period	45%	30%	30%	30%	30%	30%
	Penalty in case of earliest retirement age AND longest contributory period below requirements	45%	9%	9%	9%	9%	9%
	Bonus in case of late retirement	-	-	-	-	-	-
	Minimum contributory period - men	35	35	35	35	35	35
	Minimum contributory period - women	31.2	35	35	35	35	35
	Minimum residence period - men	-	-	-	-	-	-
	Minimum residence period - women	-	-	-	-	-	-

Note: Technically, there is no difference between early retirement and old age pensioners. Therefore, under law 127 (as from September 1, 2021 on), they will be all old-age, while the present category “partial early retirement” will be called “early retirement”.

### **Disability pension**

The disability pension is payable to the persons who lost their capacity to work, totally or partially (at least half). As from 2012, the eligibility for the disability pension is no longer

conditioned by the contribution period fulfilled, but only by the degree of disability. The amount of the disability pension is the result of the reference point value multiplied by the sum of the number of points accumulated during the contributory period and the number of “potential” points, i.e. the total points to be accumulated during the potential stage, defined as the difference between the full contribution period and the stage already achieved at the date when the disability appears.

The monthly number of potential points equals to 0.50 / 0.35 / 0.15 (law 127) of the old-age point value, depending on the degree of disability (I, II or III). The percentages provided for by the current law: 0.70 / 0.55 / 0.35). Another small change brought about by the new pension law is that the caretaker indemnity the first-degree disabled are entitled to has changed from 80% of the pension point value, to 50% of the minimum basic gross wage economy-wide.

### **Survivor pension**

The survivor pension is paid to children up to the age of 16 (or until they complete their studies, no later than at the age of 26) and to the surviving spouse (when they reach the standard retirement age). The amount of the survivor pension (percentage of the deceased’s old age pension): 50% for a single survivor, 75% for two survivors, 100% for at least 3 survivors. The full survivor pension for the spouse is granted provided that the marriage lasted at least 15 years. If the marriage lasted less than 15 years, but more than 10, the amount of the survivor pension diminishes by 0.5% per month, respectively by 6% for each year of the marriage less than 15.

If the surviving spouse is also entitled to their own pension, they can choose the more advantageous of the two. The law introduces a support for the survivor spouse of 25% of the deceased’s old age pension if one opts for their own pension, provided they fulfil the full contributory period and statutory retirement age criterion, didn’t remarry and the marriage lasted at least 10 years. Nevertheless, the total amount received will not exceed 80% of the minimum economy-wide gross wage.

### **Other pension schemes (essentially ”Special pensions”):**

“Other pensions” that are included in our Pension Projection Questionnaire are the pensions that coexist with the pillar I, II and III pensions, so they are an equivalent of the AWG-defined “Special pensions”. These “Other” or “Special” pensions are:

- Civil special pensions for civil aviation and state employees of all branches (see below)
- Military pensions
- Farmer pensions
- Special indemnities for merit earners and deprived persons (War veterans, disabled and widows; Persecuted, departed or imprisoned by the former Communist regime; Persons who served as military under the General Directorate of Working Service during 1950-1961; Merit: heroes of the Romanian Revolution December 1989) or atypical categories (Artists; Art unions; Survivor pensioner spouse).

Civil special pensions, wherever mentioned in the present fiche, include pensioners from 6 professional categories, as follows:

Diplomacy – officials of general government
Parliamentarians – state employees in the legislative branches (MPs)
Aeronautic personnel – civil aviation
Magistrates - state employees in the judicial branch
Auxiliary Court personnel – other judicial employees
Members of Court of Accounts - justice

The military pension system (army, police, intelligence, penitentiary administration staff) included circa 175 thou pensioners (3.4% of total pensioners in 2019), with a total amount of paid pensions: old age (called “service pensions” in this system), disability, survivor, of circa RON 7.9 billion (0.74% of GDP in 2019). Contributions to the State’s Budget were approximately RON 3.8 billion (0.36% of GDP in 2019). For the service pension, calculated as 80% of the average gross earnings throughout 6 consecutive months from the last 5 service years, the eligibility criterion is the reaching of the statutory retirement age (60 years), with at least 25 years of contribution, out of which at least 15 years in service.

Special pensions defined as in [Box II.1.2](#) of European Commission (DG ECFIN), Economic Policy Committee (Ageing Working Group) (2019) ‘The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016-2070)’ broadly coincide with the ‘Other pensions’ previously described<sup>1</sup>. Special pension categories are now estimated outside the model. Currently, special pensions for civil aviation and state employees of all branches represent about 9.3 thou persons (i.e. 0.2% of total pensioners in 2019), the total expenditures of which reached RON 1054.3 million in 2019 (i.e. 0.09 % of GDP in 2019). These categories are covered by the projections this round compared with PR19 and AR18, when they were not part of the 1.2% of GDP expenditure stipulated for the AR18 (see tables below). In the same AR18/PR19, military and farmers were considered as “Other pensions”, but not as “Special pensions”. For more details on the professions and indemnities under “Other pensions” or “Special pensions” in the AR21, see the Special Pensions Annex, at the end of the fiche.

### Special pension and public pension expenditure, % of GDP

	Special pension expenditure				Public pension expenditure
	Total available	Difficult conditions	Security and defence	Other special pensions	
2016 in AR18	1.2	n.a.	0.7	0.5	8.0
2016 with extended coverage in AR21	1.4	0.0	0.7	0.7	8.3
2019 in AR21	1.3	0.0	0.8	0.5	8.1

<sup>1</sup> An exception constitute atypical special pensions for clergy, which are not part of the projections but for which expenditure represents only a very small (0.003%) proportion of GDP in 2019.

## Special pensions, % of pensioners covered

	Total available	Difficult conditions	Security and defence	Other special pensions
2016 in AR18	5.3	n.a.	2.9	2.4
2016 with extended coverage in AR21	21.7	0.0	3.0	18.7
2019 in AR21	17.5	0.0	3.4	14.1

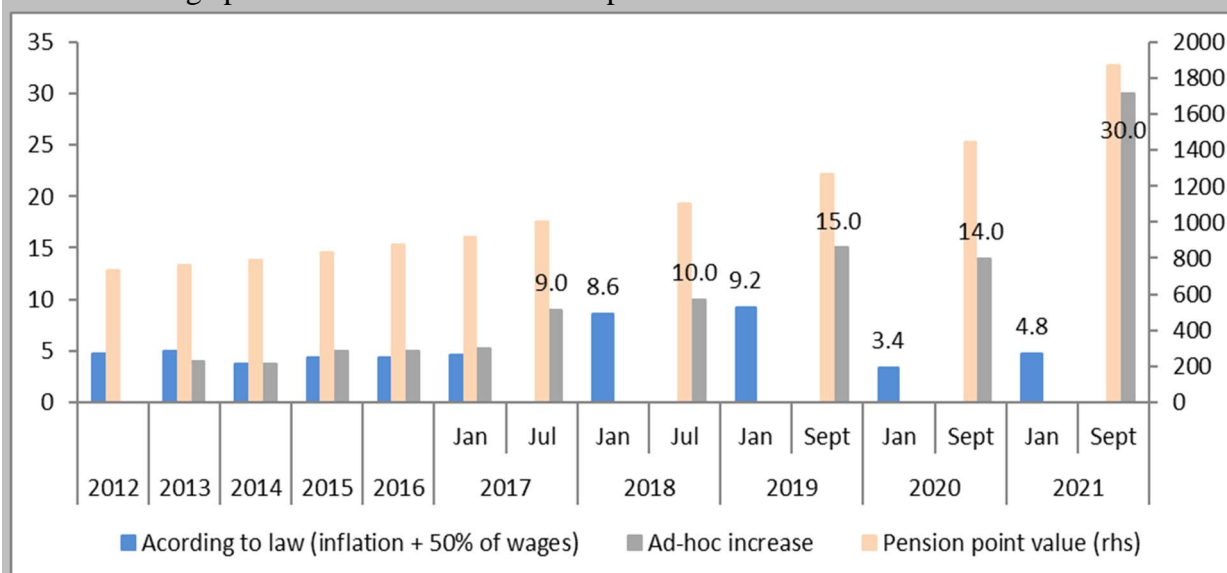
Legend: in AR18 and PR19 we included the military and farmers and only mentioned that the 6 civil special pension expenditures represented 1.2% of GDP. In AR21 we extended the coverage, as mentioned above, not only from the base year on, but also from past. Hence, we have a new figure for 2016, but also a new one for the new base year 2019.

## Calculation of pensions

Pensions are computed according to a point formula, by multiplying the average annual number of points achieved by the insured with the value of one pension point. In **2019**, the value of the pension point raised from **RON1100** to **RON1265**, followed by a 14% increase to **RON1442 (303.9 euro) in September 2020**.

According to Law 263/2010, beginning with the 1<sup>st</sup> of January 2013, the pension point value has been annually indexed with 100% of inflation rate plus 50% of the real average gross wage growth of the previous year. If one of the above mentioned indicators was to be negative, only the positive value would have been considered (this provision is still valid). In fact, the pension point values set at the beginnings of the years were equivalent to small adjustments of the values obtained with the formula 100% inflation + 50% wages

Chart 1: Regarding the history of the ad-hoc increases of the pension point in Romania, here is how the average pension evolved in the recent past:



In 2012 the point value was still frozen to its 2010 level; afterwards, the ad-hoc increases haven't been significant, until the 9% increase from July 2017.

This indexation rule (100% inflation rate plus 50% of the real average gross wage growth of the previous year) is provided for in both laws, except that, on the law to cease in

2021 the weight of the real average gross wage growth would have been gradually reduced by 5 p.p. each year, starting with 2021. Hence, starting with 2030, the pension point value was set to be indexed annually only by 100% inflation rate. The new pension law keeps constant this 100% inflation plus 50% wage rule, all along.

The new pension law also changes significantly the number of points to be considered in the calculation of the pension. Under Law 263/2010, the total number of points accumulated by a person throughout his career was divided by the statutory contribution period corresponding to the year of his retirement. Then, this number was adjusted with (multiplied by) the correction index. In the 2019 pension law, the total number of points accumulated will be divided by 25 (starting with September 2021), this figure being considered as the actual average effective contribution period in Romania. The average impact of recalculation of each pension according to the changing of the calculation formula under the new pension law (replacement of the statutory contribution period by average effective contribution period of 25 on all the pensions in payment as at September 1<sup>st</sup>, 2021, abolition of the correction index) will be a 14% increase.

Such impact of the recalculation of pensions as resulted from PR19 figures was higher (20%). The difference comes from the higher figures under the current law, mainly from the abolition of the correction index: in PR21 we thought this will happen as from 2020 on. In fact, not only the correction index will be eliminated only in 2022, but also its value in 2020 and 2021 is particularly high: 1.41. In 2020 the value is high due to the 2018 average wage resulted from the shift of contribution burden (the average nominal wage value considered in the calculation of the correction index is Y-2, e.g. 2020-2=2018). The 2021 value is the same due to the legal provision that if the new calculated index is lower than the calculated previous one, the latter will be used.

The value of the correction index, to be applied only once, at retirement, is calculated as  $43.3\% \times \text{the average economy-wide gross wage definitive figure} / \text{current point value} / (1 + \text{average inflation rate year 2011, respectively } 5.79\%)$ .

In practice, the value of the correction index is set ad-hoc, but very close to the formula-calculated one. It was 1.14 for persons who apply for retirement as of January 1<sup>st</sup>, 2017, to 1.15 for those who retired in 2018, and to 1.20 for those who retired in 2019.

Due to the 2018 shift of contributions burden, the average economy-wide wage increased by 20%, hence the correction index for 2020 is 1.41 (very high). According to the law, if the calculated new correction index is lower than the calculated prior one, the latter will be kept. Hence, as the value of the pension point changes on September 1, 2020 (from 1265 to 1442), the same high 1.41 value of the correction index must be used.

The new pension law doesn't include this correction index in the formula, anymore.

Thus, the impact of the changes in formula is stronger on the older generations of pensioners, as the new streams would have benefit of this correction index.

Here are the old and the new pension formulae:

$$\text{Pension benefit OLD}_Y = \text{PV old}_Y * N * \text{CI}_Y / T_Y$$

$$\text{Pension benefit NEW}_Y = N * \text{RPV}_Y = N * \text{PV}_Y \text{ new} / 25$$

where

N = the applicant's number of points at retirement

T<sub>Y</sub> = full or standard contributory period for the wave of new pensioners of year Y

CI<sub>Y</sub> = Correction index in year Y

PV old<sub>Y</sub> = pension point value (old law) in year Y

PV new<sub>Y</sub> = pension point value (new law) in year Y

RPV<sub>Y</sub> = reference point value in year Y

**Important: all reformed parameters used for pension calculation (correction index cancellation, 25 contributory years at the denominator instead of the full or standard contributory period, and pension point value indexation) will change not only for new pensions, but also for existing pensions, meaning that existing pensions would be recalculated as if they were new ones.**

In particular, the correction index cancellation will mitigate a part of the pension expenditure increase caused by changes in the other parameters (indexation, contributory period) in both new and existing pension expenditure<sup>2</sup> over the entire projection period.

The ratio between the average old-age earning-related pensions, calculated under the same assumptions (AR18), with only pension law changes (presented in October 2019 exercise, as versus AR18) reaches a peak of 1.82 in 2032, and then steadily diminishes down to 1.45 in 2070, as on the long run it goes down along with the fraction:

$$(1 + \text{inflation} + 50\% \text{ wage growth}) / (1 + \text{inflation} + 100\% \text{ wage growth}),$$

**A numeric example of pension calculation can be found in the Annex.**

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<sup>2</sup> This because the upward correction originally applied to pensions (number of pension points) through the correction index (CI) at the respective times of retirement of existing beneficiaries, will be now cancelled.

## Box 1

### Main legislative modifications included in the Peer Review 2019 (PR19<sup>3</sup>, 2019 ad-hoc reporting)

In October 2019, Romania presented at AWG an updated AR18 set of projections, based on the new pension law, adopted in 2019.

This new law (no. 127/2019) involves the recalculation of all existing pensions, operation which needs time and labour. Therefore, the law was set to enter into force only on September 1, 2021. Nevertheless, the law established a timetable of pension point value ad-hoc indexation, as follows:

- As from September 1<sup>st</sup>, 2019 the point value becomes RON 1,265 (271 euro),
- As from September 1<sup>st</sup>, 2020 the point value becomes RON 1,775 (381 euro) and
- As from September 1<sup>st</sup>, 2021 the point value becomes RON 1,875 (403 euro).

- i) Capping of increases in contribution rates to pillar 2 (legislated in 2017 through GEO 82): The share of contributions transferred to Pillar 2 were reduced from expected level of 6% in 2018 to 3,75%, and legislated to remain at this level.
- ii) Lower military pension indexation (only with inflation -legislated in 2017) and subsequent modification of individual contribution rate (25%, with the gross wage increased accordingly).
- iii) Shift of contribution burden from employers to employees (legislated through GEO 79/2017 and starting with 1 January 2018). This shift implies a 20% increase in the average gross wage, given that the reform intended to keep unchanged the net wage and the total cost of labour borne by the employer
- iv) Changes in several parameters of old age, minimum, disability and survivor pensions, (legislated in July 2019) as follows:

#### Old-age earnings-related (OAER) pension

The law changes several parameters used to calculate pension benefits, as follows:

- Rises the pension point value (PV), the main parameter used for pension indexation, in two ways:
  - In an ad-hoc manner, through intermediate PV increases until the full entry into force of the law on 1 Sept 2021, as follows:
    - September 1<sup>st</sup> 2019 = RON 1265
    - September 1<sup>st</sup> 2020 = RON 1775

<sup>3</sup>Wherever “PR19” is mentioned in this paper, it should be taken as an acronym for “2019 update of AR18”

- September 1<sup>st</sup> 2021 =RON 1875

- Via indexation thereafter, as the indexation factor for *existing* pensions would no longer converge towards prices, but would instead remain permanently composed of wages and prices (pensions would be annually indexed with 100% of inflation rate plus 50% of the [real] average gross wage growth of two years before).
- Shortens the contributory period used to calculate a person's pension from an average of 29.4 years as the full or standard contributory period previously applied used to range between 25 and 35 years, depending on the year of retirement, to a fix value of 25 years.
- Abolishes the correction index for *new* pensions, which used to partly link the first pension to wages; this would mitigate the overall pension expenditure increase caused by the changes in the other parameters.
- Introduces the notion of reference point value (RPV), representing the value of the pension point divided by the new average contributory period of 25y.
  - On 1 Sept 2021 when the law comes into force RPV is RON 75 (=1875/25).
  - From 2022 onwards, the RPV is annually indexed by the average annual inflation rate, plus 50% of the countrywide gross average wage real growth.

The new calculation formula would apply to both new and existing pensions.

All the indexations of the pension point affect not only old age, but also disability and survivor pensions, which are based on the pension point value.

In respect of the old age pension eligibility requirements, the new pension law allows women to retire at the age of 63, even during the period of gradual increase of the statutory retirement age (to reach 63 only in 2030). On the other hand, women who completed the minimum contributory period and gave birth to 3 children whom they raised until the age of 16 can request the diminution of their statutory retirement age by 6 years. This reduction increases by one year for each child beginning with the fourth.

There is also a modification of the early retirement penalty, as from 0.75% of the old-age pension amount per each month of early retirement, to the following gradual table:

N	<1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
P	0.50%	0.45%	0.40%	0.35%	0.30%	0.25%	0.20%	0.15%

N= Number of contribution years exceeding the full contributory period

P= Penalty for each month of partial early retirement

**Minimum pension:** a social allowance covered from the government's budget.

Under the new law the minimum pension tops up the difference between the OAER, disability or survivor pension and an amount that depends on the minimum country-wide gross wage and a person's contributory period, as follows: Starting in 2021, the minimum



pension is set at minimum 45%/40% (35% for survivor) of that year's minimum wage [corresponding to the minimum contributory period of 15y/10y], plus 1% for each additional contributory year above 10 years, but not exceeding the 75% of the minimum wage. This difference with the old law is that previously the minimum pension (social allowance) was a fixed amount established in the law, rather than a function of the minimum countrywide gross wage and a person's contributory period.

### **Disability pension**

Under the new law the potential disability pension point value used in the disability pension calculation is now lower, 0.50/0.35/0.15 of the regular old-age pension point depending on the disability degree (I, II or III) as opposed to 0.70/0.55/0.35 under the old law. The new law also modifies the calculation basis for the caretaker indemnity the first degree disabled are entitled to: from 80% of the pension point value to 50% of the minimum basic gross economy-wide wage.

### **Survivor pension**

The new law introduces a support for the survivor spouse of 25% of the deceased's old age pension (previously, if the surviving spouse is also entitled to their own pension, they could choose the more advantageous of the two). Under the new pension law, this option remains and, additionally, if one opts for their own pension, they are entitled to a monthly allowance of 25% of the deceased spouse's old age pension, provided they fulfil the full contributory period and statutory retirement age criterion, didn't remarry and the marriage lasted at least 10 years. Nevertheless, the total amount received will not exceed 80% of the minimum economy-wide gross wage.

### **Mandatory private pensions (pillar II)**

From 2019 (GOE), the individuals who contribute at least 5 years in the second pillar can reinstate their entire 25% social insurance contribution rate to the first pillar. Thus, they will return totally to the public pension system. However, the amount of money accumulated in their 2<sup>nd</sup> pillar accounts will be available only at retirement. Very few participants have chosen this option so far. Another provision affecting the private pension market is the diminution of the administration fees from 2.5% to 1%.

### **Pension taxation**

At the time of AR18 the pension was taxed as follows: the difference between pension gross benefit (only if greater than RON 1000), minus the contribution for health insurance (5.5 applied to pension benefit), minus the threshold set up by law (RON 1000) was subject to personal income tax (by a tax rate of 16%). This system was modified in 2017, so no more health insurance contribution was paid by the pensioners, while the ceiling for tax was raised from 1000 to RON 2000. Another change has been adopted at the beginning of 2018: the tax rate has been decreased from 16% to 10%.

## Box 2

### Main legislative modifications included in the Ageing Report 2021 (September 2020) versus the Peer Review 2019 (October 2019 pension projections)

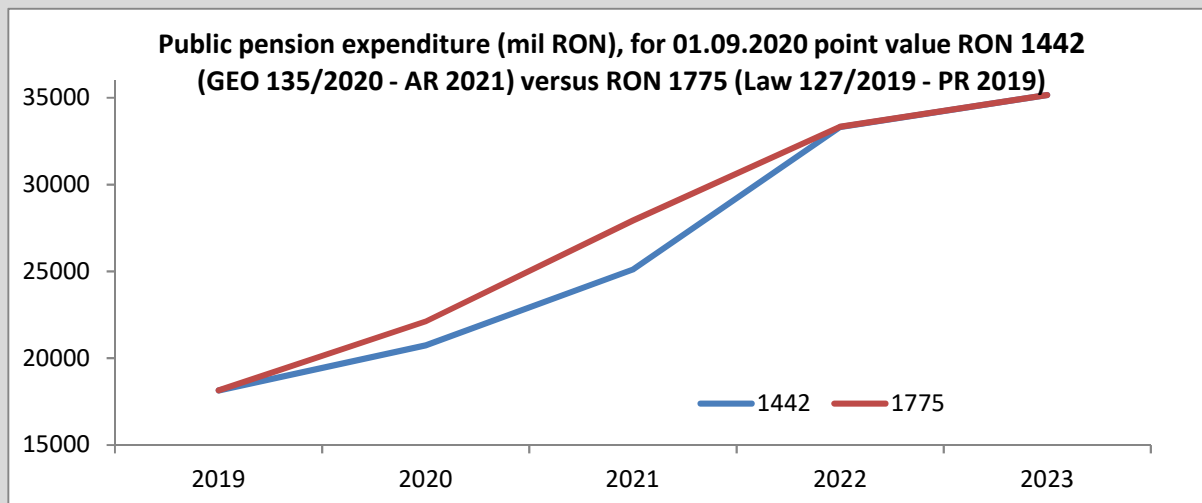
The present set of projections, completed at the end of August 2020, follows a quasi-identical legal framework as described in Box 1. Over the period Sept 2019-August 2020, the value of the pension point was RON1265 /month, while the pension point level at the date when the law enters into force (Sept 2021) could be changed by the government only closer to that date and according to economic developments.

The only change with respect to October 2019 projections concerns the value of the pension point during the period 01.09.2020-31.08.2021. In this respect, the government recently issued the emergency decree GEO 135 /2020, setting the pension point level at RON 1442 /month, instead of 1775. As this budget amendment needs to be approved by the Parliament and could be, in case of disagreement, further contested at the Constitutional Court, the political debate on this issue is not yet concluded and may extend into 2021.

The measures currently proposed in the 2020 emergency decree GEO 135 /2020 and modelled in the projections are the following (changes with respect to previous provisions **in bold**):

- Pension point ad-hoc values:
  - September, 1 2019 = RON1265
  - **September, 1 2020 =RON 1442 (+14% y/y)**
  - September, 1 2021 = RON1875 (+30% y/y)
- Social allowance ad-hoc values:
  - September, 1 2019 =RON 704
  - **September, 1 2020 = RON800 (+14% y/y)**

Surely, on medium and long run, this measure doesn't change the projections, as shown the be diagram below, reflecting the differences in public pension expenditures between the two rounds of projections (PR 2019 and AR 2021), for 2020 and 2021.



## PART II - DEMOGRAPHIC AND LABOUR FORCE ASSUMPTIONS

### II.1 Demographic development

According to Eurostat data, Romania's population is expected to decrease from 19.35 million people in 2019 to 13.65 million people in 2070, the total population being projected to be smaller by about 5.5 million inhabitants in 2070.

The old-age dependency ratio (the ratio of people 65+ years in relation to the age cohort 15-64 years) doubles from 28.6% (in 2019) to 56.9% (in 2070) due to the baby boom generation that has reached retirement age, but also as a result of increased life expectancy. For men, life expectancy at birth is expected to increase by 11.6 years during the projection period, from 71.9 years (in 2019) to 83.5 (in 2070). For women, life expectancy at birth is expected to increase by 9 years, from 79.5 years (in 2019) to 88.5 years (in 2070).

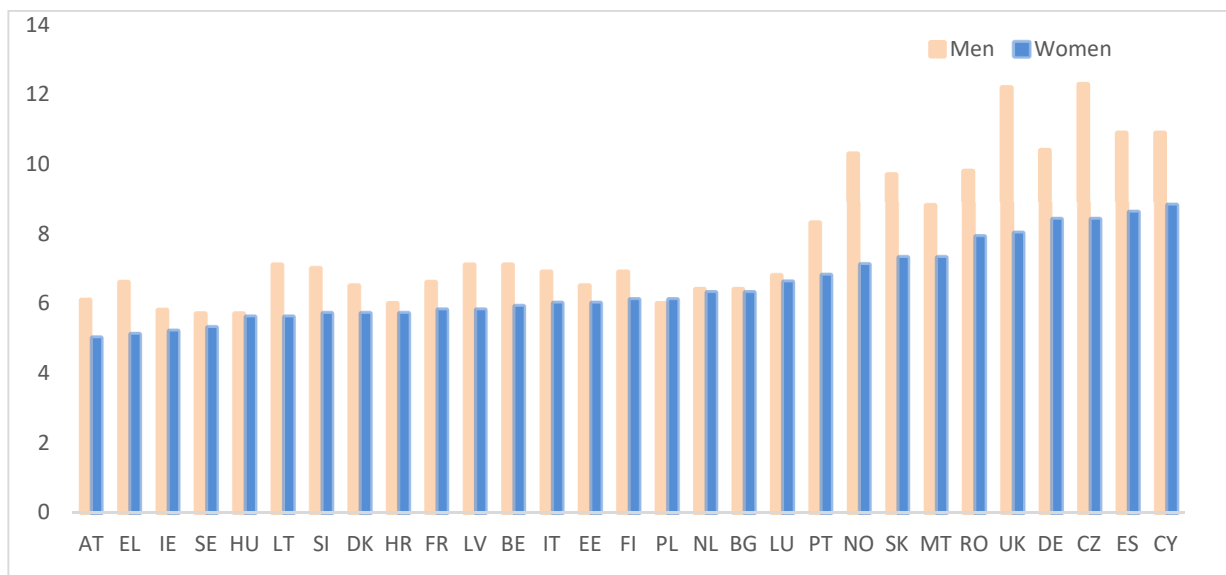
**Table 2 – Main demographic variables evolution**

Demography	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Population (thousand)	19,348	17,742	16,519	15,453	14,494	13,652	19347.8	2019	-5696
Population growth rate	-0.6	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5	2070	0
Old-age dependency ratio (pop 65+ / pop 20-64)	31.1	37.1	48.9	59.8	64.3	62.1	64.8	2057	31
Old-age dependency ratio (pop 75+ / pop 20-74)	11.4	15.6	18.3	25.4	30.8	31.7	32.6	2065	20
Ageing of the aged (pop 80+ / pop 65+)	25.2	26.6	31.0	33.3	41.0	45.4	45.4	2070	20
Men - Life expectancy at birth	71.9	74.7	77.2	79.5	81.6	83.5	83.5	2070	12
Women - Life expectancy at birth	79.5	81.6	83.5	85.3	87.0	88.5	88.5	2070	9
Men - Life expectancy at 65	14.9	16.5	18.0	19.5	20.8	22.1	22.1	2070	7
Women - Life expectancy at 65	18.6	20.1	21.6	22.9	24.2	25.4	25.4	2070	7
Men - Survivor rate at 65+	73.8	79.1	82.9	86.1	88.7	90.8	90.8	2070	17
Women - Survivor rate at 65+	87.9	90.3	92.0	93.4	94.5	95.5	95.5	2070	8
Men - Survivor rate at 80+	38.0	46.7	54.1	60.9	66.9	72.2	72.2	2070	34
Women - Survivor rate at 80+	61.0	67.7	73.1	77.7	81.5	84.8	84.8	2070	24
Net migration (thousand)	-73.5	-40.0	-20.2	-2.0	10.4	21.0	21.0	2070	95
Net migration over population change	0.6	0.3	0.2	0.0	-0.1	-0.3	0.6	2019	-1

Life expectancy at 65 increases by about 7 years for both men and women between 2019 and 2070, keeping the gap between men and women throughout the projection period.

According to the chart below (Chart 1), Romania is among the countries at the top of the ranking in terms of increasing life expectancy at birth for both men and women.

**Chart 2 – Increase in life expectancy at birth for men and women: 2019 vs 2070**



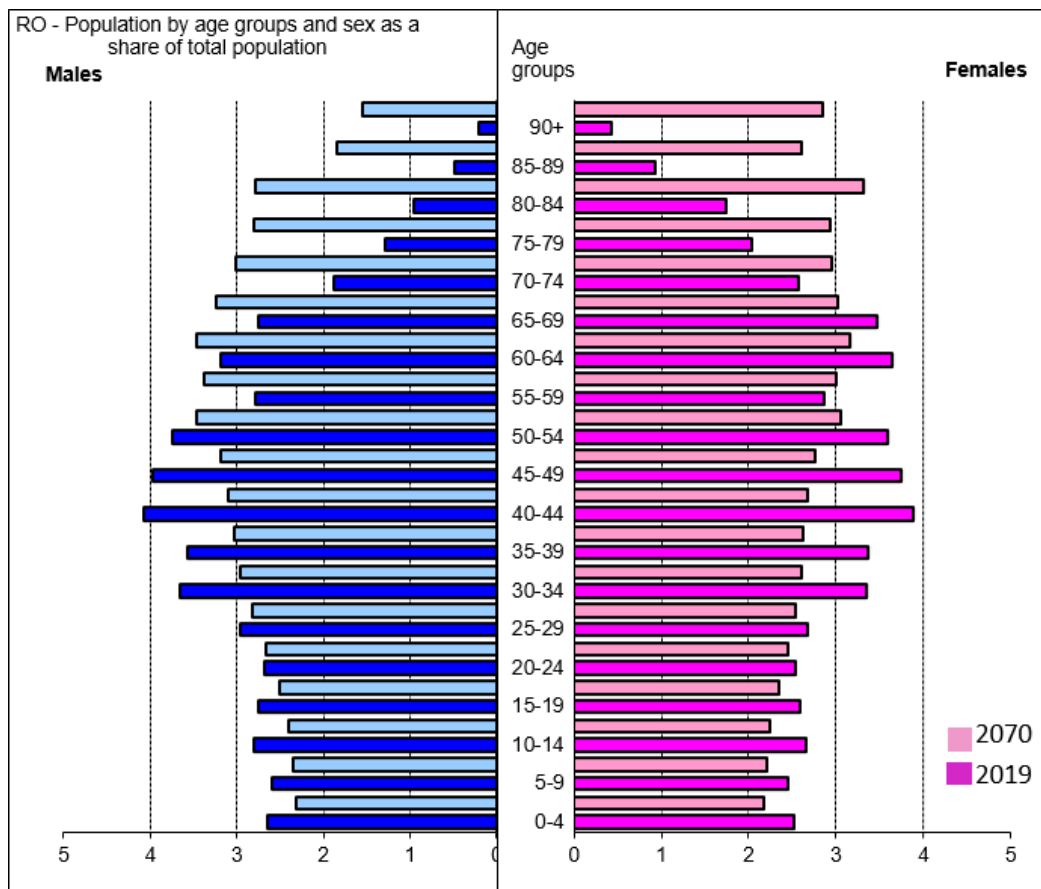
*Source: Eurostat*

The following graph shows the structure of the age groups as share of the total population or of the age pyramid by sex for 2019 and 2070. Already at the present the demographic structure is no longer depicted as a pyramid (the base has shrunk), by 2070 the structures projected to be transformed into a tube.

This graph shows that the age structure of Romania's population will change significantly. The proportions of the age of 0-25 years do not change dramatically between 2019 and 2070, both for men and women, but the share of the 60+ increased sharply during the projection period.

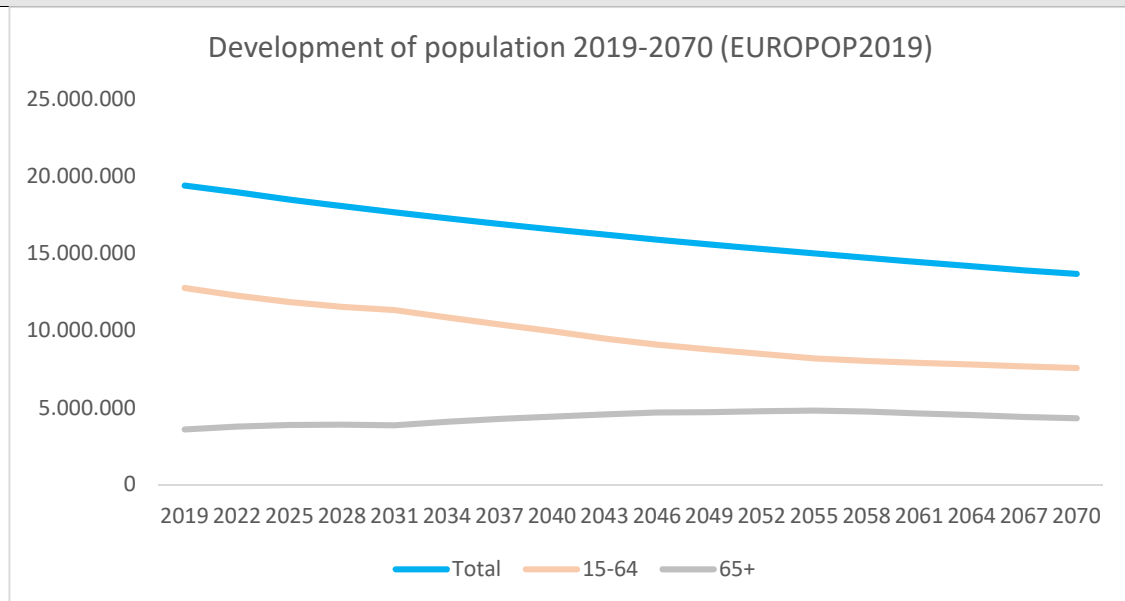
The ratio between the persons aged 65 and more and those at working age (15-65 years) increases substantially. Thus, in the view of the coming years, the resources of the public pension system will diminish as compared to the expenditures needs. This trend, of constant growth in the pension expenditures, will reverse after 2040, when the volume of new pension system entries will have been stabilized. Consequently, the pension expenditures will stop their growth. The Pension System will be balanced also due to the exit from the life cycle of the baby-boom generation. These cohorts will enter the pension system around 2030 and will begin to exit as from 2040.

**Chart 3 - Structure of population: 2019–2070**



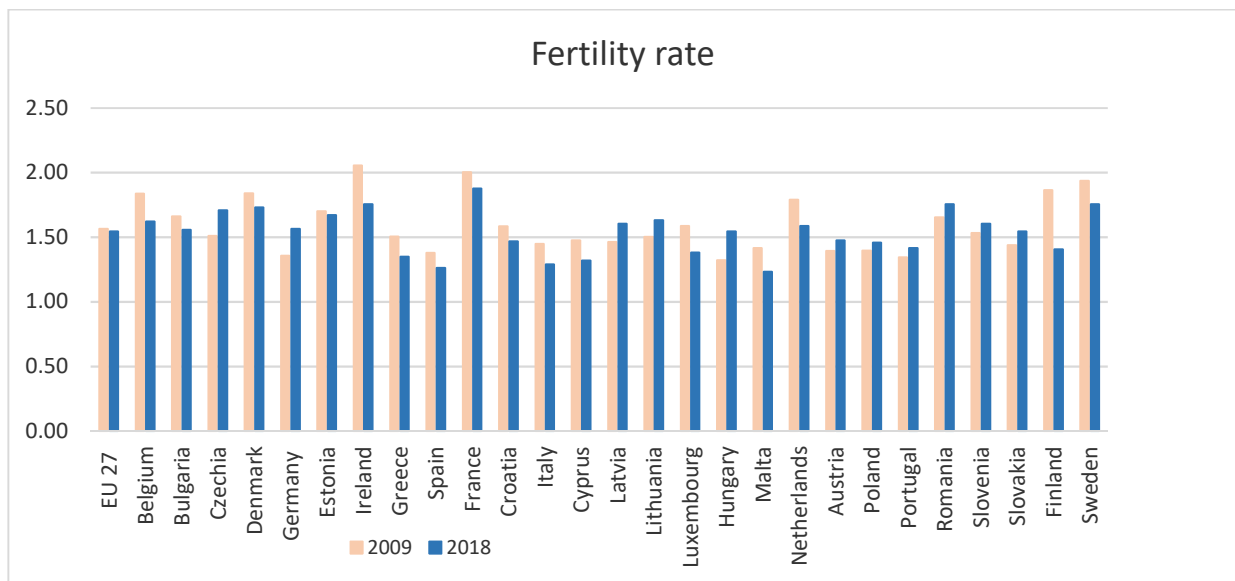
Source: Eurostat

**Chart 4-Development of population**



Source: Eurostat

**Chart 5 - Fertility rate**



*Source: Eurostat*

One of the main causes in terms of population aging in Romania is the low fertility rate. In 2015, the fertility rate was 1.76 children per woman, below the optimal replacement level. The level estimated by Eurostat for the fertility rate in Romania in 2070 is 1.89. Although the young population is declining as a result of the steady decline in the number of women of childbearing age, there are still some positive signs of rising fertility rates.

## II.2 Labour force

**Table 3: Participation rate, employment rate and share of workers for the age groups 55-64 and 65-74**

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Labour force participation rate 20-64	73.7	74.3	74.3	75.5	76.4	76.0	76.5	2057	2
Employment rate of workers aged 20-64	71.0	71.1	71.0	72.2	73.1	72.7	73.1	2057	2
Share of workers aged 20-64 in the labour force 20-64	96.3	95.6	95.6	95.6	95.7	95.6	96.3	2019	-1
Labour force participation rate 20-74	64.7	65.1	62.6	62.8	64.3	65.1	65.3	2066	0
Employment rate of workers aged 20-74	62.3	62.3	60.0	60.2	61.7	62.4	62.6	2066	0
Share of workers aged 20-74 in the labour force 20-74	96.4	95.8	95.9	95.9	95.9	95.9	96.4	2019	-1
Labour force participation rate 55-64	49.0	55.2	54.9	55.2	57.6	57.2	57.8	2065	8
Employment rate of workers aged 55-64	47.9	53.7	53.4	53.7	56.1	55.7	56.2	2065	8
Share of workers aged 55-64 in the labour force 55-64	97.6	97.3	97.3	97.3	97.3	97.3	97.6	2019	0
Labour force participation rate 65-74	13.4	15.5	17.4	16.9	17.0	17.9	17.9	2070	5
Employment rate of workers aged 65-74	13.4	15.5	17.4	16.9	17.0	17.9	17.9	2070	5
Share of workers aged 65-74 in the labour force 65-74	99.8	99.8	99.8	99.8	99.8	99.8	99.8	2019	0
Median age of the labour force	41.0	43.0	43.0	42.0	43.0	42.0	44.0	2033	1

Table 3 reflects an increase in the employment rate and labour force participation rate for age groups 55-64 and 65-74 until 2040 as a result of the cycle ending for the so-called baby-boom phenomenon, afterwards, the weight begins to stabilize until the end of the projection horizon.

**Table 4a – Exit ages and expected duration of retirement - MEN**

MEN	2020	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Average effective retirement age (administrative data)*	62.7								
Average labour market exit age (CSM)**	64.1	64.1	64.1	64.1	64.1	64.1	64.1	2037	0.0
Contributory period	37.4	36.9	36.7	36.8	36.7	36.7	37.4	2020	-0.7
Duration of retirement ***	15.6	17.2	18.7	20.2	21.6	22.9	22.9	2070	7.3
Duration of retirement / contributory period	0.4	0.5	0.5	0.5	0.6	0.6	0.6	2070	0.2
Percentage of adult life spent in retirement ****	25.3	27.2	28.9	30.5	31.9	33.2	33.2	2070	7.9
Early / late exit *****	2.2	2.0	1.6	1.3	1.2	1.3	2.2	2020	-0.8

**Table 4b – Exit ages and expected duration of retirement - WOMEN**

WOMEN	2020	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Average effective retirement age (administrative data)*	60.1								
Average labour market exit age (CSM)**	62.7	62.6	62.6	62.6	62.6	62.6	62.7	2020	-0.1
Contributory period	32.5	31.9	31.9	31.8	31.9	31.9	32.5	2020	-0.6
Duration of retirement ***	15.6	17.2	18.7	20.2	21.6	22.9	22.9	2070	7.3
Duration of retirement / contributory period	0.6	0.7	0.7	0.5	0.8	0.9	0.9	2070	0.2
Percentage of adult life spent in retirement ****	31.1	32.8	34.3	35.6	36.8	37.9	37.9	2070	6.8
Early / late exit *****	0.7	1.0	0.8	0.6	0.7	0.7	1.5	2027	0.0

\* The effective retirement age shows the age at which people on average start receiving an old-age pension benefit. It is calculated on the basis of the administrative data for 2019 (see Annex Tables A4a and A4b); \*\* The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; \*\*\* 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; \*\*\*\* The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; \*\*\*\*\* Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.



Increasing life expectancy for females and males leads to a longer period of life spent at retirement so in the absence of an increase in pensionable age, it adds further pressure on the pension system. The private pensions system (Pillar II) has been implemented in order to reduce this potential burden over the public system and to ensure more adequate resources for the pensioners.

The assumptions related to the average labour market entry and exit ages are relatively constant in the model. Consequently, the average effective duration of the career will also be a constant. However, the contribution period grows over the projection horizon by approximately 2.3 years for males and 2.8 years for females – indicating a diminution of the early retirement effect.

The difference between the contribution period and the average effective duration of the career is explained by the fact that some persons still work, while also receiving social assistance from the State, like the disabled individuals who undergo physical examination periodically in order to assess whether they will be able to re-enter, at some point, the work force. Furthermore, the methodology used for employment by the international labour office also includes categories like day-workers and part-time employees. All these categories are considerable in Romania, they are still registered as active on the labour market, but usually don't pay social contributions (it's not compulsory). Also self-employed that have an income below the minimum wage are not obliged to pay social contributions.

## PART III - PROJECTION RESULTS

### **Pension schemes covered by the pension model:**

The model covers all mandatory public pension schemes (pillar I), this includes old age + early + partial early retirement pension, disability pension, survivor pension.

The model also includes the mandatory private pensions (pillar II).

Out of the model, minimum public pensions and the voluntary private pension scheme (pillar III) are projected.

### **Pension taxation**

There are no changes in taxation compared to the ad-hoc presentation from 2019, but compared to AR18 no more health insurance contribution is paid by the pensioners, while the ceiling for PIT exemption was raised from RON 1000 to 2000. Another change has been adopted at the beginning of 2018: the tax rate has been decreased from 16% to 10%.

### **Pension schemes not covered by the model but estimated separately (more info in the dedicated section on special pensions, page 64):**

Military (army, police, intelligence, and penitentiary staff) are estimated outside of the model, especially because cohort data is not easily accessible for these categories.

Civilian special pensions (magistrates, auxiliary Court personnel, aeronautic personnel, Court of Accounts, Diplomacy, Parliamentarians - currently about 10 thou persons) are estimated outside the model.

Farmers' pension scheme is modelled outside the model especially because is a phasing out system.

### III.1 Extent of the coverage of pension schemes in the projection

The table below shows the pension expenditure in % of GDP between 2009 and 2019, according to Eurostat's ESSPROS database and the data provided by Romania to the Ageing Working Group.

**Table 5: Eurostat (ESSPROS) vs. Ageing Working Group (definition of pension expenditure - % of GDP)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Change 2009-2019
1. Eurostat total pension expenditure	8.9	9.4	9.1	8.7	8.3	8.2	8.1	7.9	8.0	8.0	7.7	-1.2
2. Eurostat public pension expenditure	8.9	9.4	9.1	8.7	8.3	8.2	8.1	7.9	8.0	8.0	7.7	-1.2
3. Public pension expenditure AWG	8.9	9.4	9.1	8.7	8.3	8.2	8.3	8.3	8.3	8.2	8.1	-0.8
4. Difference (2)-(3)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.3	0.4	
5. <i>Expenditure categories not considered in the AWG definition</i>												

During the period 2015-2017 differences with ESSPROS data are related to the inclusion, in the present AR21 report, of some further categories of expenditures: the farmers' social pensions, the civil special pensions (6 professional categories) and the special indemnity (details in the Special Pensions chapter). We've chosen to include them because they can be assimilated to various categories defined by AWG as special pensions.

	2015	2016	2017	2018	2019
a) AWG	8.336	8.280	8.335	8.240	8.122
b) Further categories	0.282	0.357	0.351	0.345	0.455
c) a)-b)	8.055	7.923	7.984	7.995	7.667
d) Eurostat	8.1	7.9	8.0		

### III.2 Overview of the projection results

Faced with the challenge of an accelerate aging population, Romania has been reforming its pension system since the early 2000s with the goal of achieving adequate and fair pension benefits that are consistent with the long-term fiscal sustainability of the pension budget.

A major pension reform took place in 2007, when mandatory private scheme (pillar II) and non-mandatory private scheme (pillar III) were introduced. The period after the economic

crises (2009-2012) was characterized by almost no increase in the value of the pension point, considering the austerity measures needed to mitigate the crises effects and the fact that Romania had to open a BoP assistance programme of 20 billion euro with IMF, WB and European Commission in order to avoid a default.

During the period 2013-2016 we had increases of less than 4% yearly, in this period RO was still under Post-programme surveillance.

Starting with 2017, after almost a decade of low pension indexation that led to a level of pensions in Romania which was one of the lowest in EU, the pressure of increasing the pensions to a more adequate level was starting to build. Thus, the first ad-hoc increase of the pension point happened in July 2017 with 9% on top of the increase from January 2017 of 5%. This opened the road to an increase in the pension point of approximately 65% in the period 2017-2020 and awaiting another increase of 30% in 2021.

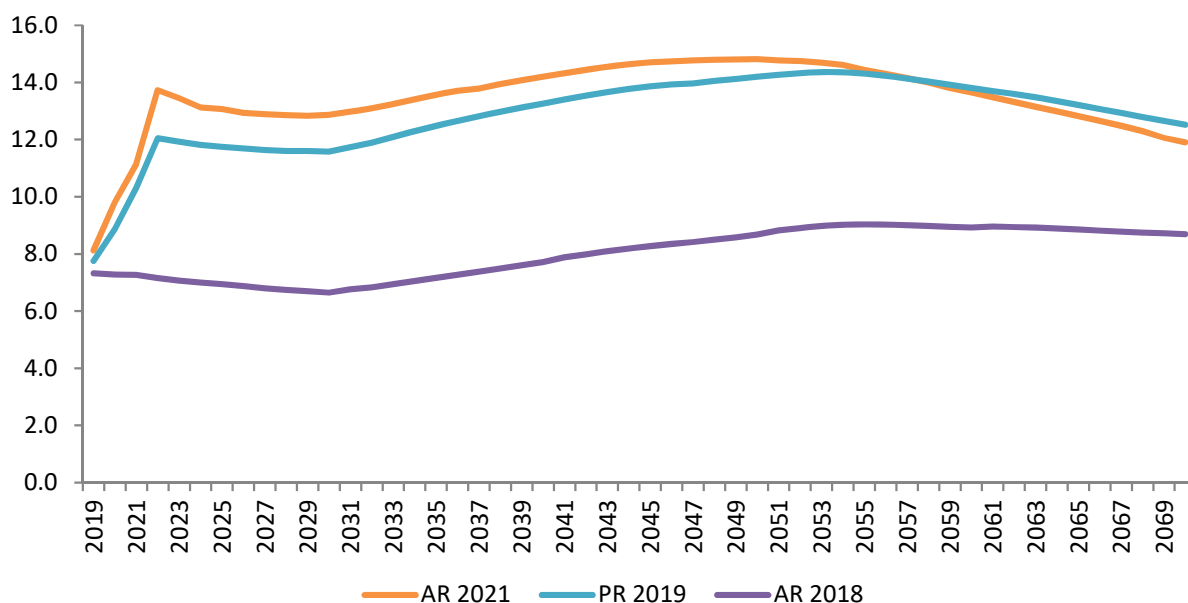
**Table 6: Projected gross and net pension spending and contributions (% of GDP)**

Expenditure	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Gross public pension expenditures	8.1	12.9	14.2	14.8	13.6	11.9	14.8	2050	+3.8
Occupational pensions	--	--	--	--	--	--	--	--	--
Private pensions	0.0	0.1	0.4	0.8	1.0	1.1	1.1	2070	+1.1
<i>Mandatory private</i>	0.0	0.05	0.3	0.7	1.0	1.1	1.1	2070	+1.1
<i>Non-mandatory private</i>	0.0	0.01	0.02	0.02	0.02	0.02	0.02	2055	+0.02
Gross total pension expenditure	8.1	12.9	14.6	15.6	14.7	13.1	15.6	2052	+4.9
Net public pension expenditure	8.0	12.7	14.0	14.6	13.4	11.7	14.6	2049	+3.7
Net total pension expenditure	8.0	12.8	14.4	15.3	14.5	12.8	15.4	2052	+4.8
Contributions	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Public pensions contributions	6.8	6.8	6.5	6.5	6.5	6.5	7.3	2021	-0.3
Total pension contributions	7.6	7.9	7.6	7.6	7.6	7.6	8.3	2021	0.0

As can be seen in the following chart, the projected evolution of the gross public pension expenditures is parallel, between AR18 and PR19, at a circa 5 pp distance, resulted from the ad-hoc increases of the pension point during period 2019-2021. Furthermore, this quasi-parallel evolution suggests some equivalence of the pension point indexation formulae. Law 263/2010 (AR 2018), still in force, provides a „boost” at retirement (when the number of pension points is adjusted with the correction index), while law 127/2019 (PR 2019) compensates with a more generous indexation rule. Of course, AR21 is very close to PR19,

with only the lower peak in 2020's point value, as other differences come from macroeconomic assumptions and demographics.

**Chart6:Gross public pensions expenditure as % of GDP**

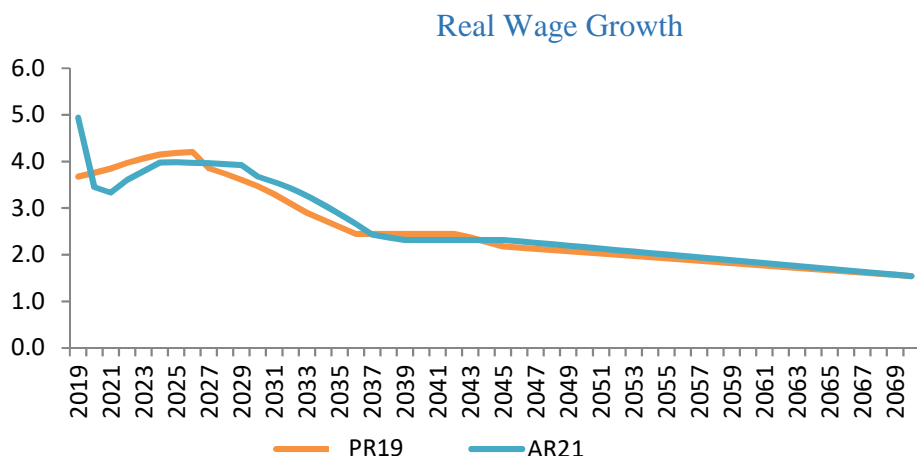


The reason the level of the pension expenditure has a higher profile than the 2019 peer review until, roughly, the mid 2050s, after which falls under the figures previously projected, has several explanations (further to the larger coverage of the special/other pensions):

- Since the pensions are indexed by inflation and half of the real wage growth, an important driver of the higher AR21 curve might be the higher level of inflation (2.5% on the long run, instead of 2% in the previous projections).
- The real wage growth is higher in AR21 until 2027, and then it is projected to fall below PR19 figures, while from 2037 on they are very close.
- Until around 2060, the number of public pensioners is higher in AR21, as a different age / gender structure of the base year contributors has been used this round (see also section III.3)
- One figure which determines a significant difference as compared to PR19 is the pension point correction index. Last year we considered abolition of the correction index as from 2020 on, but in fact this will start in 2022. Moreover, due to the 2018 transfer of contribution burden (with an afferent increase of the gross wage), the figure for 2020 turned out to be 1.41. Then, as the law stipulates that any new calculated correction index should be higher than the old calculated one, or else the latter must be used, in 2021 the figure will be the same 1.41 (the calculated one can't be as high). Thus, on short run, this might be a driver to a higher average pension (and NEW pension). And there is also one difference in the point value indexation for 2022 (first year of formula indexation), as in PR21 we applied the indexation formula to the average 2021 value while not to the end of the year (increase from 1775 lei per month to 1875 was scheduled for September 1, 2021). Historically, the point value and the correction index are set as from the beginning of each

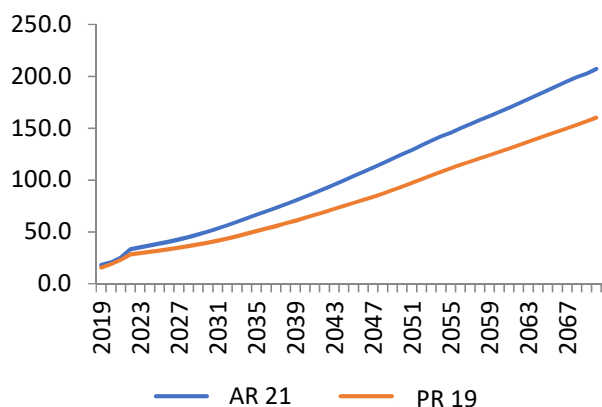
year, so we were used to apply this indexation to the average previous year value, which coincided with the end year one. Hence, this underestimation propagates until 2070

- Notably, the average pension (PR19, AR21) goes parallel and neat, hence the main differences between exercises comes from the number of pensioners (detailed under Table 10).

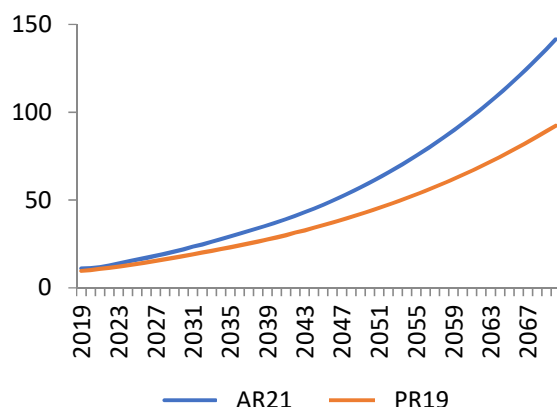


Very small differences in the dynamics of the average wage series compared to the underlying assumptions occur during the years 2020-2024, this happens because the model uses a preliminary calibration step in order to run the final output, and during this process it slightly alters the dynamics of the real wage.

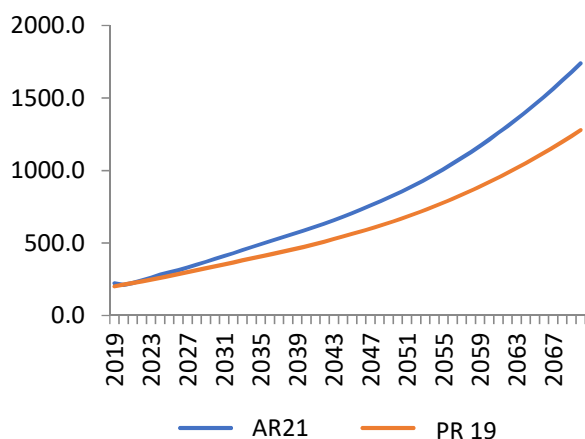
Nominal gross public pension expenditures, billion euros



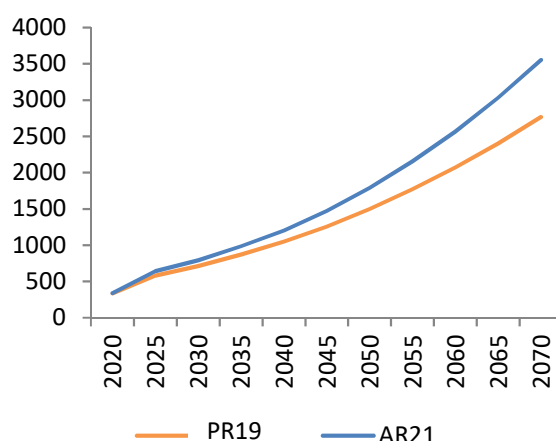
Average gross wage 1000 euro



GDP current prices, billion euro



Average monthly old age and early earnings-related pension (euro)



**Table 7: Projected gross public pension spending: by scheme (as % of GDP)**

Pension type	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Total public pensions	8.1	12.9	14.2	14.8	13.6	11.9	14.8	2050	+3.8
of which Old age and early pensions	5.9	10.4	11.7	12.3	11.4	9.8	12.3	2050	+3.9
of which earning related	5.9	10.3	11.6	12.1	11.2	9.6	12.1	2050	+3.7
Minimum pensions (non-contributory)	0.1	0.1	0.1	0.2	0.2	0.3	0.3	2068	+0.2
Disability pensions	0.47	0.80	0.71	0.65	0.58	0.54	0.82	2022	+0.08
Survivor pensions	0.42	0.53	0.55	0.57	0.54	0.52	0.57	2052	+0.10
Other pensions*	1.3	1.14	1.26	1.29	1.16	1.03	1.43	2020	-0.26

\*Special pensions for security and defence forces (military, police) farmers, civil aviation, state employees of all branches (6 civil categories) and special indemnities for merit and deprived (8 categories)- see details in Part I. Description of the Romanian pension system and the “Special pensions” Annex (let. I), at the end of the fiche

Special pension (or ‘Other pension’) expenditure projections can be further detailed as follows:

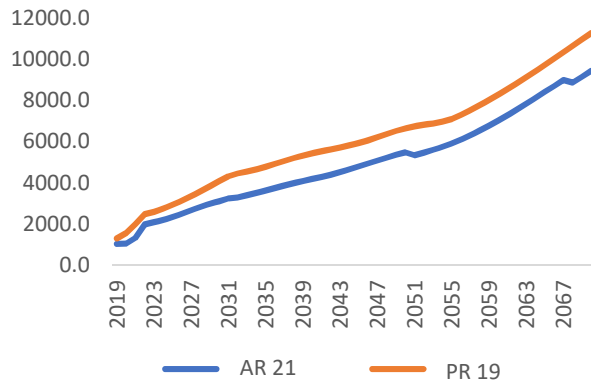
Special pension schemes	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Security and defence	0.77	0.87	1.07	1.12	0.99	0.86	1.12	2046	0.09
Merit and deprived	0.23	0.11	0.07	0.07	0.07	0.07	0.23	2020	-0.16
Judicial civil servants	0.08	0.06	0.06	0.06	0.07	0.07	0.09	2020	-0.01
Civil servants in the legislative or executive	0.02	0.02	0.03	0.03	0.03	0.03	0.03	2070	0.01
Other special pensions (farmers)	0.20	0.08	0.02	0.01	0.00	0.00	0.20	2019	-0.20

For *old age and early earnings-related pensions*, the comparative evolution of the projections in these two subsequent rounds can be explained on similar grounds to the gross

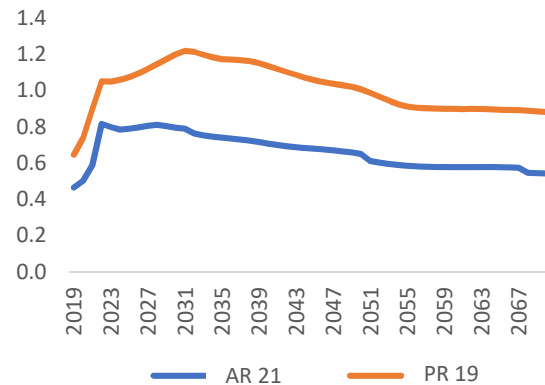
public pension expenditure shown above, including in terms of the behaviour in the number of pensioners.

### Disability pensions

Nr. of pensions (1000)

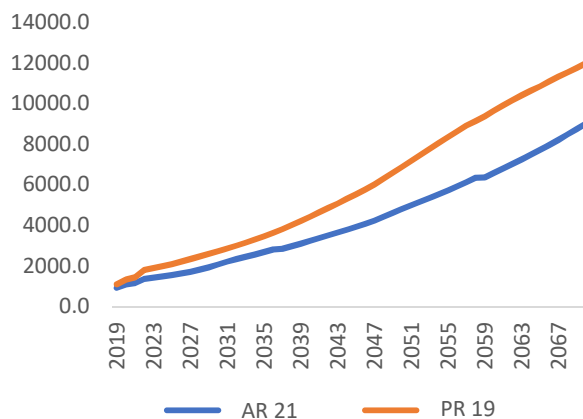


Expenditure as % of GDP

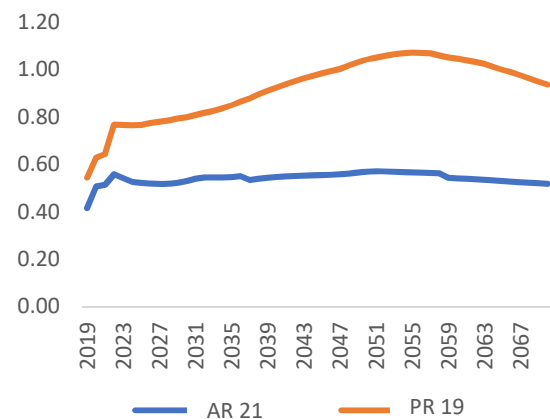


### Survivor pensions

Nr. of pensions (1000)

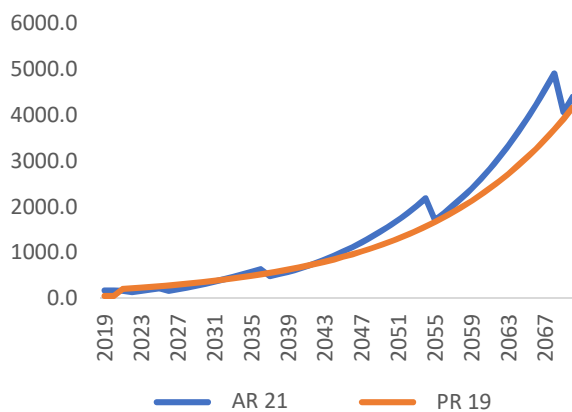


Expenditure as % of GDP

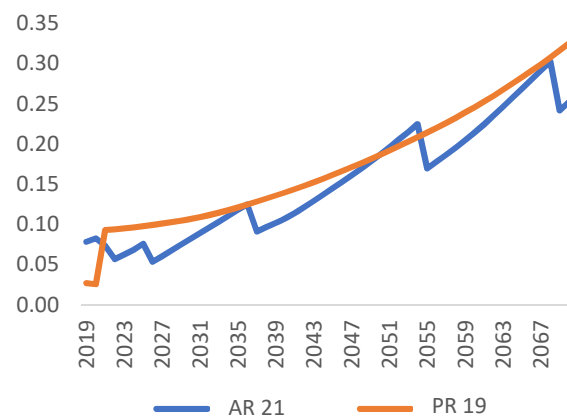


### Minimum pensions

Nr. of pensions (1000)



Expenditure as % of GDP





*Disability and survivor pension* expenditure show lower profiles in the AR21 compared to 2019 PR. This is the result of two effects, of which the former prevails: i) a lower number of disabled and, especially, survivor pensioners this round, in line with new demographic assumptions (same methodology) and ii) higher average disability and survivor pensions (for more details see Methodological Annex, letters C and D).

Regarding the *minimum pension*, there is no significant change as compared with PR19. Both sets of projections considered a fixed threshold value for 2020 (indexation 10% in PR19, and a real indexation of 14% in AR21), starting with 2021 according to the new law formula the indexation is linked to the minimum wage. Figures in PR19 seemed to be overestimated: 16% of pensioners falling below this threshold in 2070, as compared to 8% in 2019 (and to 4% estimated in the previous exercise). Hence, we tried to refine the projection (only 14% beneficiaries of this supplement in 2070), including more detailed income brackets. The weight of expenditures in GDP would reach 0.25% in 2070, instead of 0.43% (PR19), but currently in the year 2019 it's 0.08%, so probably there is still some overestimation.

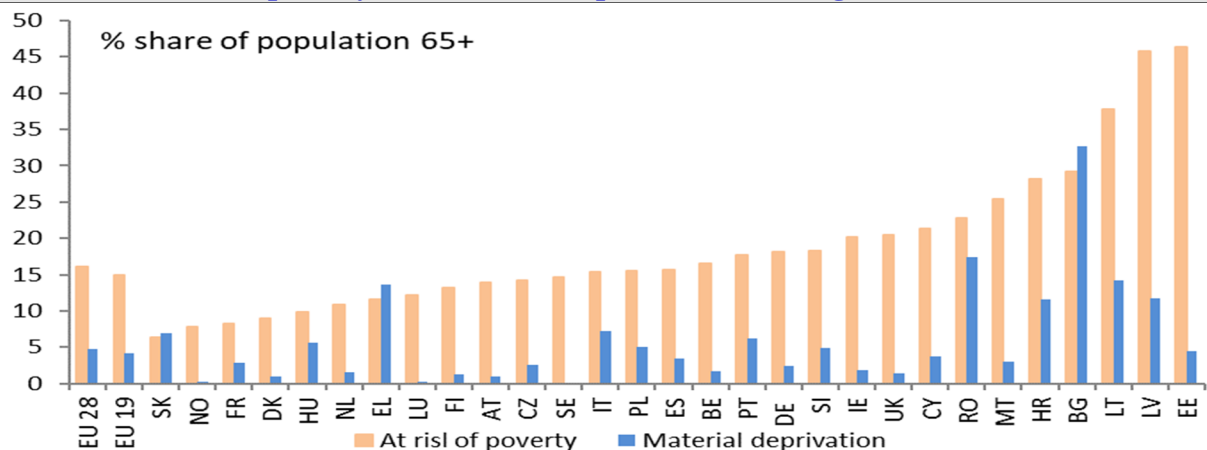
Regarding the evolution of the minimum pension from the graph, the reason it was smoother in PR19 it is because then we did an interpolation between the 2021 and 2070 figures. Now we keep the projected figures all along the horizon, while the evolution of the threshold might be higher than a number of income brackets which can vary, so there would be some jumps.

For *other pensions*, differences boil down to the coverage of special pensions this round (see, for more details section 'Part I. Description of the Romanian pension system, main provisions and new measures' and the Methodological Annex, letter I).

### Social aspects:

The risk of poverty and social exclusion among the elder is high in Romania, compared to other Member States. In 2018, over 20% of older people in Romania were affected by poverty or social exclusion. The share of older people that are at risk of poverty increased constantly since 2012 while material deprivation even if it is at a high level compared with other MS has reached an all-time low in recent data for RO.

**Chart 7: At risk of poverty and material deprivation in old age (65+), 2018, %**



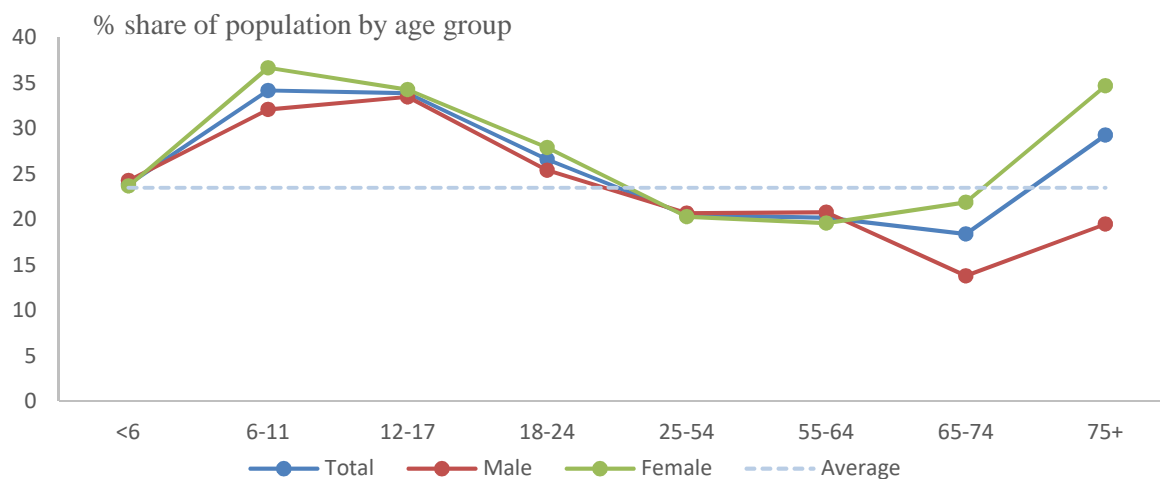
Source: Eurostat

Note: at risk of poverty cut-off point: 60% of median equated income after social transfers

Under these circumstances, policy measures aimed at improving the standard of living for the elderly were needed. Thus, successive increases of the pensions were granted in the period 2016-2020 by approximately 65% (the pension point increased from RON 871 in 2016 to RON 1442 on September 1, 2020).

The increase of pensions in recent years has led to a lower risk of poverty for older population than the average population.

**Chart 8: At risk of poverty by age groups, 2018, %**



Source: Eurostat

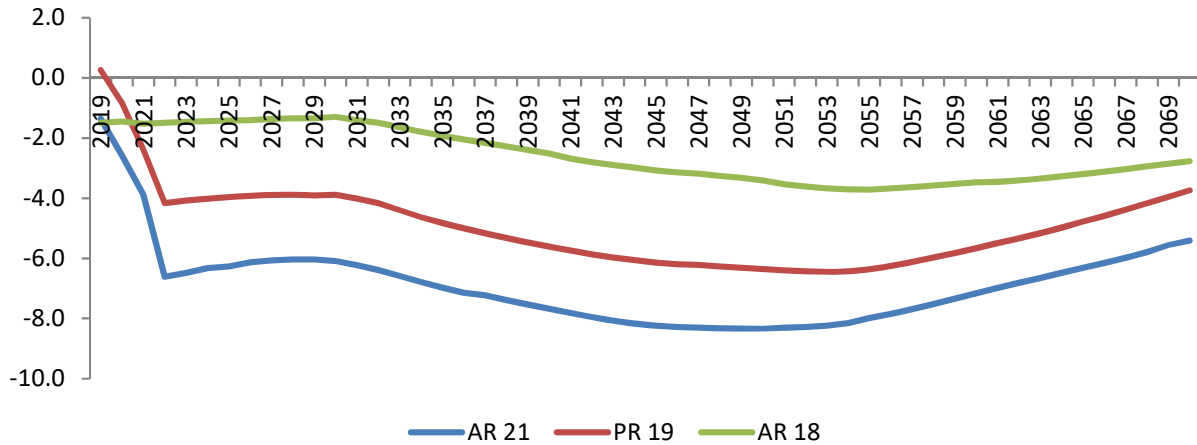
Further high increases of the pensions are not warranted from pension adequacy or social aspects considerations, taking into account that people at age groups 25-54 and 55-64 are at a higher risk of poverty than age group 65-74, more support could be targeted to these groups of population.

However, there are still certain groups of older people (75+) who are more vulnerable to poverty, such as older women, people on minimum pensions or people on farmer pensions. Thus, old age retirees are not vulnerable as a group, but certain categories of retirees would probably need more support.

### Pension budget sustainability:

The pension ad-hoc changes are intended to be more generous with the pensioners, as one can see from the following graph:

**Chart 9: Projected deficit of the pension budget**



The indexation rule for of the pension point, the ad-hoc increases as well as the change in the calculation of the pensions put extra expenditure pressure on the pension systems. This will generate deficits higher the 5% of GDP for almost all the projected period. As a safeguard, the new pension law maintains the old law's provision that in case the expenditures are forecasted to go beyond the fiscal rules ceilings (especially the 3% deficit stated in the Stability and Growth Pact), the pension point can be increased differently than in the pension law, through the law of the budget expenditure ceilings specified in the fiscal-budgetary framework.

In practice, the law of budget expenditure ceilings is approved according to the budget calendar in the second part of the year together with the fiscal-budgetary strategy. If by that time, each year, the fiscal-budgetary situation shows that there is a certainty that for the next year the expenditures with the pensions will lead to a larger deficit than the threshold of 3% established by the SGP, then, through the law of the ceilings, new percentages of increasing the pension point can be established to meet the approved spending limits and accommodate the 3% deficit.

### III.3 Description of main driving forces

This part provides more details about the development of public pension expenditures (Table 9). It uses a standard decomposition of a ratio of pension expenditures to GDP into the dependency, coverage, benefit ratio, employment rate and labour intensity.

$$\frac{\text{pension expenditure}}{\text{GDP}} = \overset{\text{dependency ratio}}{\downarrow} \frac{\text{population } 65+}{\text{population } 20-64} \times \overset{\text{coverage ratio}}{\downarrow} \frac{\text{number of pensioners}}{\text{population } 65+} \times \overset{\text{benefit ratio}}{\downarrow} \frac{\text{average pension income}}{\text{hours worked } 20-74} \times \overset{\text{labour market effect}}{\downarrow} \frac{\text{population } 20-64}{\text{hours worked } 20-74} \quad [1]$$

$$\frac{\text{number of pensioners}}{\text{population } 65+} = \overset{\text{coverage ratio old-age}}{\downarrow} \frac{\text{number of pensioners } 65+}{\text{population } 65+} + \left( \overset{\text{coverage ratio early-age}}{\downarrow} \frac{\text{number of pensioners } \leq 65}{\text{population } 50-64} \times \overset{\text{cohort effect}}{\downarrow} \frac{\text{population } 50-64}{\text{population } 65+} \right) \quad [2]$$

$$\frac{\text{population } 20-64}{\text{hours worked } 20-74} = \overset{1/\text{employment rate}}{\downarrow} \frac{\text{population } 20-64}{\text{employed people } 20-64} \times \overset{1/\text{labour intensity}}{\downarrow} \frac{\text{employed people } 20-64}{\text{hours worked by people } 20-64} \times \overset{1/\text{career shift}}{\downarrow} \frac{\text{hours worked by people } 20-64}{\text{hours worked by people } 20-74} \quad [3]$$

Note: 'Average pension' = social security pension expenditure divided by the number of pensioners

Furthermore, the same decomposition is proposed, but taking into consideration the number of pensions, instead of the number of pensioners.

On the overall projection horizon, the public pension expenditures as percentage of GDP increases by 3.8 percentage points, less than the 4.6 pps of GDP estimated in the intermediary peer review (PR 19), and hence much higher than the 0.7 pps of GDP under the AR 18 (Law 263/2010 still in force in September 2020.)

As expected, the main pressure related to the increase of the pension expenditures comes from the dependency ratio, as result of worsened demographics and population ageing, which will dramatically change the ratio between the active and the old-age population. This peak of the dependency is forecasted to be reached during the decade 2030-40, when the generations born in 1967-1970, representing the Romanian „baby boom” phenomenon, will exit the labour supply.

The effects of the ratio between the labour market and the labour intensity will have a limited impact on the expenditures, as percentage of the GDP. This factor is forecasted to remain, practically, constant along the projection horizon.

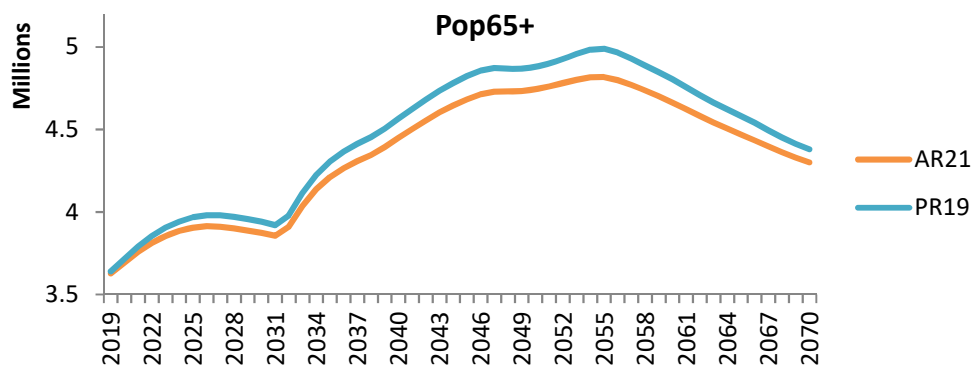
The benefit ratio will constantly drop, as labour productivity will grow faster than the pension benefits. For this reason, the decade 2020-2030 will be characterized by an important reduction of the benefit ratio (almost half of its total diminution until 2070): the pension reform decelerates the increase of the average pension benefits, while the resuming of the economic growth will lead to lower benefit ratios.

**Table 8: Factors behind the change in public pension expenditures between 2019 and 2070 (in percentage points of GDP) – pensioners**

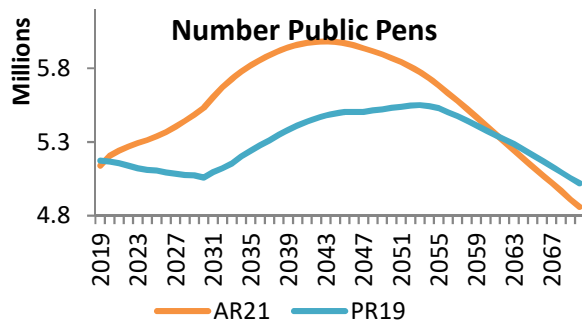
	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
<b>Public pensions to GDP</b>	4.7	1.3	0.6	-1.2	-1.7	3.8
<b>Dependency ratio effect</b>	1.8	3.9	3.1	1.1	-0.5	9.4
<b>Coverage ratio effect</b>	0.3	-0.8	-1.1	-0.9	-0.4	-3.0
Coverage ratio – old age*	1.0	-0.2	-0.5	-0.6	-0.7	-1.1
Coverage ratio – early age*	-1.9	0.7	0.1	-1.5	0.0	-2.5
Cohort effect*	0.4	-3.3	-3.8	-1.3	0.9	-7.1
<b>Benefit ratio effect</b>	2.6	-1.2	-0.9	-1.2	-1.1	-1.7
<b>Labour market / Labour intensity effect</b>	0.0	-0.3	-0.2	-0.1	0.1	-0.6
Employment ratio effect	0.0	0.0	-0.2	-0.2	0.1	-0.3
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	-0.1	-0.3	0.0	0.1	0.0	-0.3
<b>Residual</b>	0.1	-0.3	-0.2	-0.1	0.0	-0.4

\* Subcomponents of the coverage ratio effect do not add up necessarily.

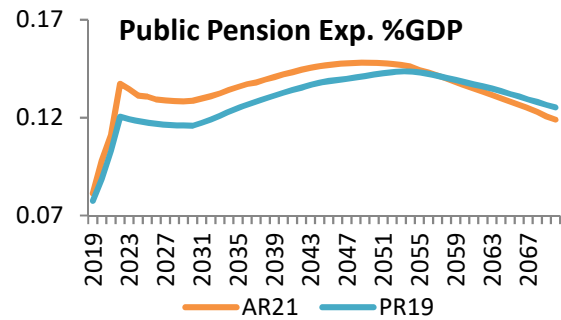
The coverage ratio effect is slightly more negative than in PR19. As you may see from the graph below, Population 65+ is projected almost similarly.



On the other hand, the number of public pensioners is higher in AR21 until around 2060, afterwards going below PR 19:



While the comparative graph of public pension expenditures looks like this:



Here is the development of the coverage ratio effect:

	2019-2030	2030-2040	2040-2050	2050-2060	2060-2070
AR21	0.3%	-0.8%	-1.1%	-0.9%	-0.4%
PR19	-0.8%	-0.9%	-0.6%	-0.2%	0.3%

The larger mitigating (more negative) effect of the coverage ratio this round is mostly driven by the last decade (60-70). In this decade, a sharper comparative fall in the nr of pensioners (numerator of the Coverage Ratio), together with a +65 population (denominator) that stays roughly similar drive the ratio down.

### Gross replacement rate (RR) and Benefit Ratio (BR)

The replacement rate at retirement represents the first pension as percentage of the last wage. The replacement rate level, within the public scheme, will steadily go down over the projection horizon, significantly below the AR18 values but similar with PR19 values (will reach 31.9% at the end of the projection horizon). This is mainly the effect of the correction index abolition. As the pension formula will change, in order to reflect the shift from the first to the second tier, the average number of pension points is considered to decline over time. On the other hand, the additional pension benefits resulted from the participation in Pillars II and III compensate the diminution resulted from the formula.

According to the old point value indexation formula, the average wage growth would have been taken into account less and less and, as from 2030 on, it wouldn't have been considered at all. Thus, on the overall pensions, the average value would have been outpaced by the economy-wide average wage. The ratio between these two indices is reflected by the benefit ratio (BR). The increase of the career's length, as result of the pension reform, will lead to the fall of the benefit ratio. Another element, which is relevant from the perspective of the wage, as development and dynamics, which are faster than the dynamics of pension benefits, is the distinctiveness of the Romanian labour market. Thus, the considerable weight of the lower-wage employees, from the primary sector, will be modified over time, by the pronounced shift toward the tertiary sector. The benefit ratio evolution goes the other way around than the replacement rate. In the sense that, as compared to AR18 (when it was supposed to stabilize at

26-27% over the projection period), now it stays at high levels, despite diminishing gradually, down to around 34% in 2060, then 31% in 2070 (as in PR19). Nevertheless, the baseline scenario does not fall under the “Declining 10%” rule, to generate the afferent sensitivity test.

**Table 9: Replacement rate at retirement and coverage by pension scheme (in %)-**

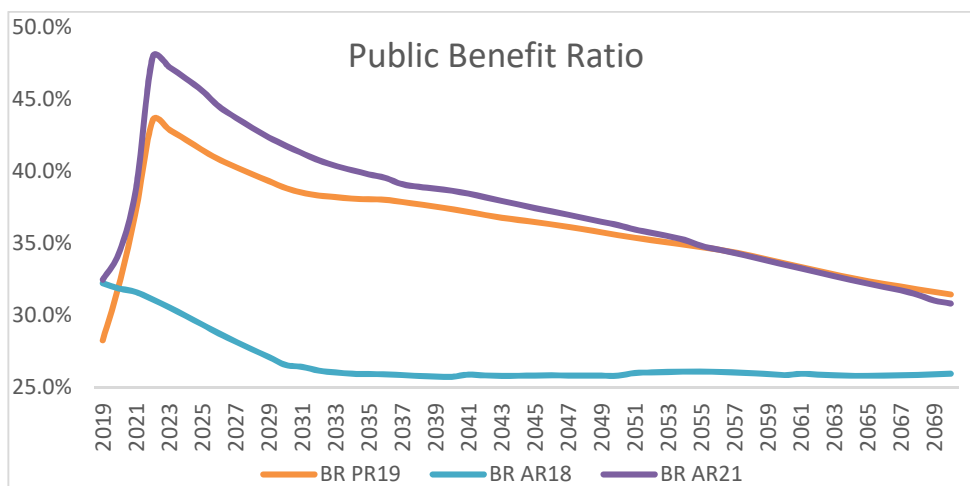
	2019	2030	2040	2050	2060	2070	Change 2019-2070
Public scheme(BR)	32.5%	41.8%	38.7%	36.3%	33.5%	30.8%	-1.7 p.p
Public scheme(RR)	31.9%	44.2%	41.5%	38.2%	34.2%	31.9%	0.0
Coverage	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Public scheme– old-age earnings related (BR)	32.8%	43.9%	39.7%	36.6%	33.8%	30.9%	-1.9 p.p
Public scheme– old-age earnings related (RR)	27.1%	42.1%	38.7%	34.8%	30.7%	27.6%	+0.5 p.p
Coverage	71.6	76.3	79.5	81.1	81.2	80.3	8.7
Private individual scheme (BR)	1.6%	2.5%	3.9%	4.9%	5.5%	5.9%	+4.3 p.p.
Private individual scheme (RR)*	1.7%	3.0%	4.8%	5.5%	5.6%	5.6%	+3.9 p.p.
Coverage	1.0	13.3	45.3	68.5	80.7	83.0	82.1
Total (BR)	32.5%	42.0%	39.7%	38.2%	36.1%	33.9%	+1.4 p.p
Total (RR)	32.0%	45.3%	44.2%	41.6%	37.8%	35.6%	+3.6 p.p

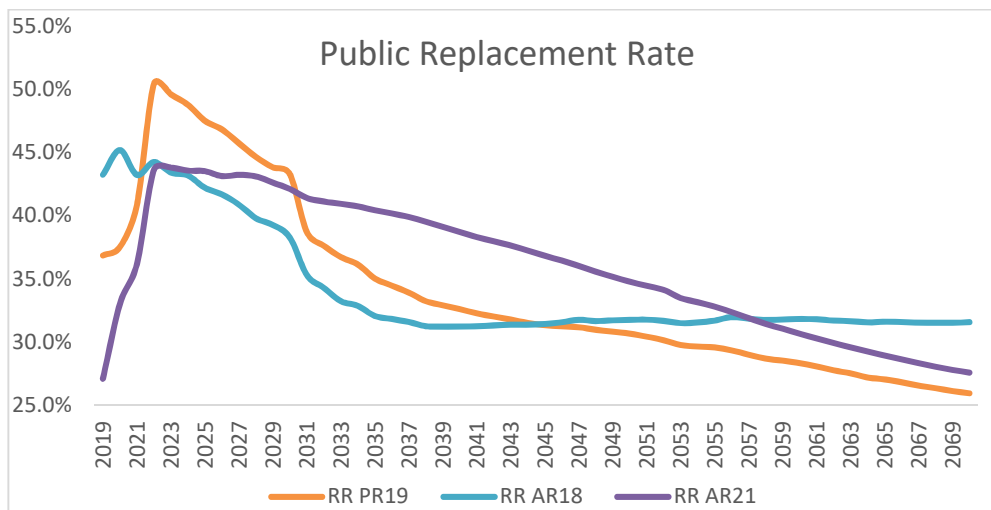
\*Summing up the private mandatory and facultative pensioners

The curves reach a maximum in 2022 (BR 48.0%, RR 46.3%), when the generous ad-hoc increases of the pension point value ends. Thereafter, pensions’ indexation formula is inflation + 50% real wage growth, so they are left behind by wages (inflation + 100% real wage growth).

The 2022 peak of BR is higher and more abrupt than RR’s one due to the abolition of the correction index (which influences directly RR and only the new stream included in BR).

**Chart 10: Projected BR and RR**





The number of pensioners is expected to augment significantly, during the years expected for the baby-boomers to live at retirement (after 2030). The peak value is expected to be reached in 2043 (5981.5 thou); afterwards it will begin to diminish, as the total volume of population will decrease (as from nearly 20 million in 2013 to 16.5 million in 2040 and 13.7 million in 2070). On the other hand, the employment will continuously go down, so that the ratio between these two will worsen, as from 0.6 back in 2016, to almost 1.0 in 2060. Nevertheless, the ratio between the number of persons aged over 65 (in constant raise) and the working-age population (which will diminish by circa 30% in 2070, as compared to the base year) will deteriorate during the entire projection horizon.

**Table 10: System Dependency Ratio and Old-age Dependency Ratio**

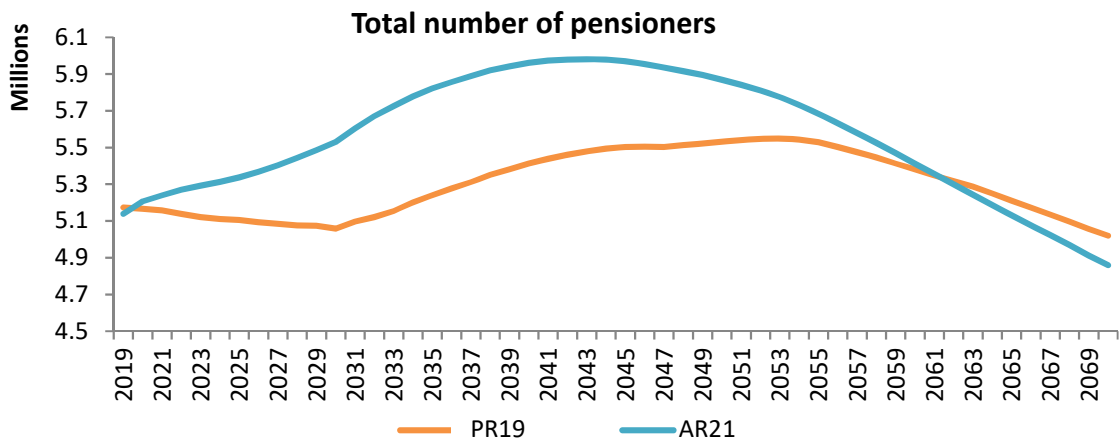
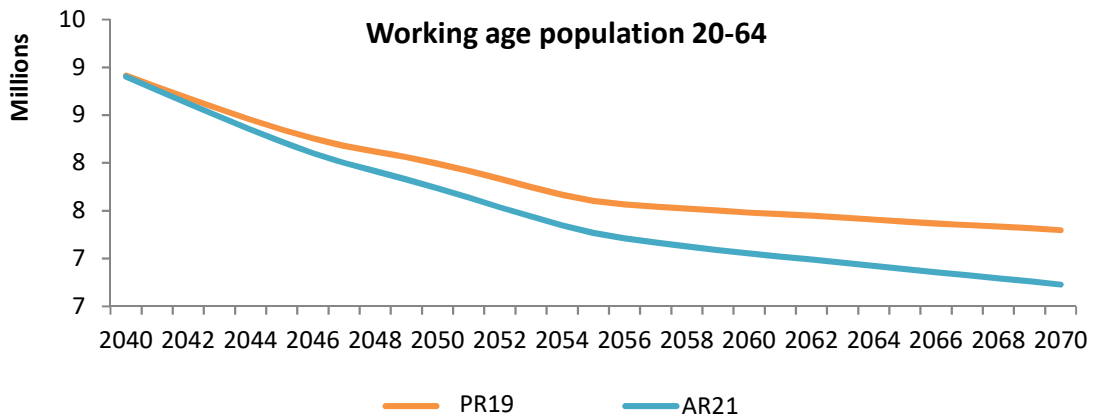
	2019	2030	2040	2050	2060	2070	Change 2019-2070
Number of pensioners (I)	5138.8	5531.8	5961.2	5869.8	5413.0	4859.0	-279.8
Employment (II)	8639.5	7792.0	6938.8	6148.3	5670.4	5370.2	-3269.3
Pension System Dependency Ratio (SDR) (I)/(II)	59.5	71.0	85.9	95.5	95.5	90.5	31.0
Number of people aged 65+ (III)	3627.5	3873.0	4450.1	4745.4	4663.9	4301.2	673.7
Working age Population 20-64 (IV)	11654.5	10439.3	9102.5	7932.1	7252.3	6926.9	-4727.6
Old-age Dependency Ratio ODR (III/IV)	31.1	37.1	48.9	59.8	64.3	62.1	31.0
System efficiency SDR / ODR	1.9	1.9	1.8	1.6	1.5	1.5	-0.5

As the labour force will decline sharply, more elderly people will choose to continue their career, moreover that the health condition at their age will improve as compared to



nowadays. The better health and the higher life expectancy will also lead to the diminution of the number of disability and survivor pensioners. On the other hand, the estimated diminution of the total employment will dramatically contribute to the decline of the support ratio. The rate of the contributors within the total employment will hopefully increase over time, as the “grey” economy will be combated and gradually eliminated.

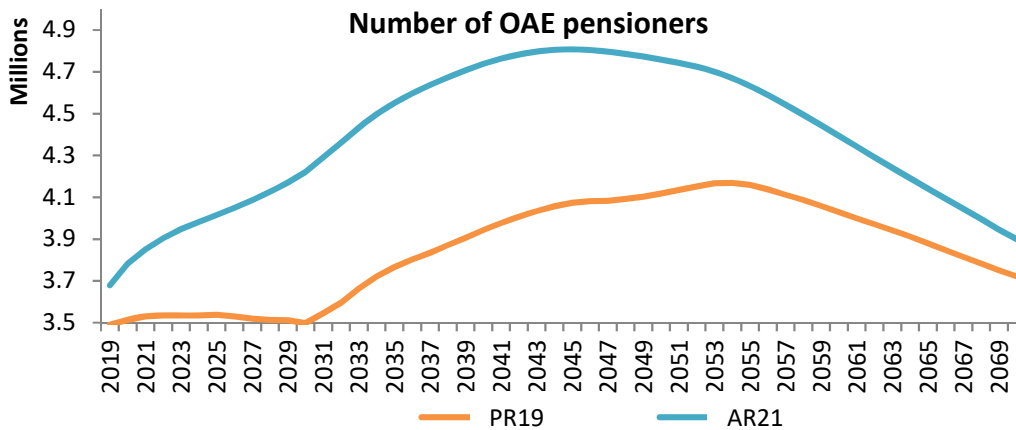
If there are not big changes regarding the evolution of population 65+ compared with assumption in PR19, when it comes to working age population 20-64, the projections are more pessimistic in AR21:



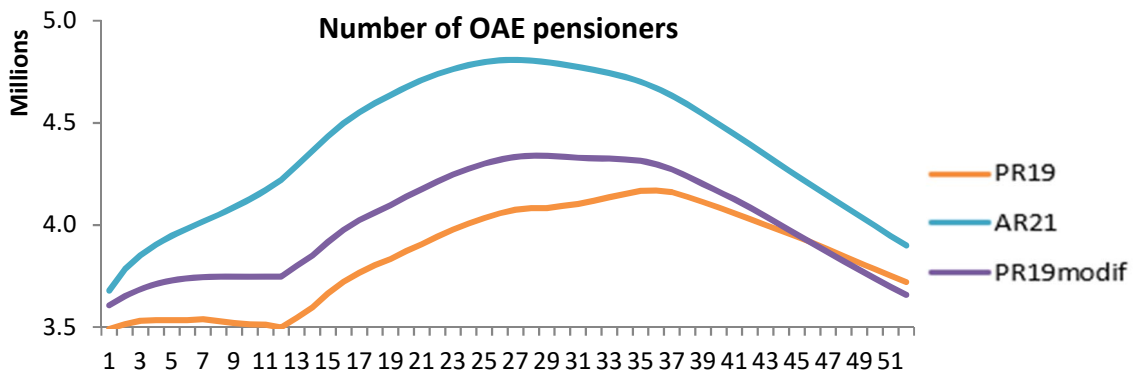
Regarding the evolution of the number of pensioners two aspects are noticeable, first the AR21 curve falls below the PR19 after 2060 and second pensioners numbers are much higher in AR21.

For the first aspect, the explanation consists in the different age/gender structure of the base year contributors (continuing afterwards with constant ratios Contributors vs Employment), who, in time, turn into pensioners.

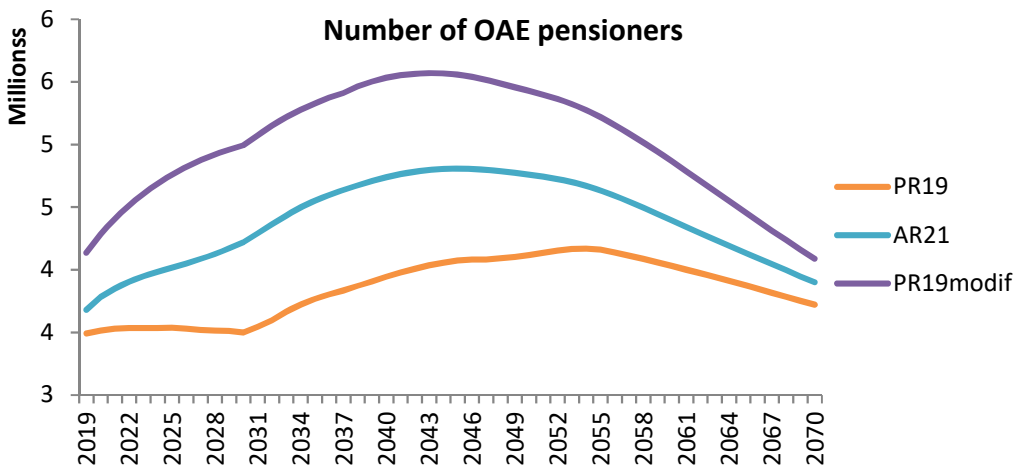
For the second aspect if we must analyse the old age and early pensions:



Part of this important gap results from the manual modelling approach of the increasing statutory retirement age tried at AR18 and PR19. But, as no significant change (was brought about by such punctilious activity, in AR21 we've come back to the simpler automatic approach. In the graph below (old age and early pensioners) the middle line (PR19modif) is the one with PR19 adjusted automatically instead of manually.



Then, if further adjusting PR19 to AR21's age/gender structure of old age and early pensioners (graph below), the PR19modif curve (=adjusted PR19) not only that fills the gap, but drastically exceeds AR21. Hence, the conclusion is that the different age/gender structure of old age and early pensioners produces such modification.



**Table 11a: Pensioners (public schemes) to inactive population ratio by age group (%)**

	2019	2030	2040	2050	2060	2070
Age group -54	7.2	7.4	8.0	8.1	7.8	7.9
Age group 55-59	88.7	89.1	87.6	91.8	97.0	95.3
Age group 60-64	116.7	119.3	110.9	114.6	112.7	107.6
Age group 65-69	112.1	114.4	124.6	120.5	116.2	106.3
Age group 70-74	107.6	107.2	111.8	110.4	105.5	95.8
Age group 75+	90.8	92.3	102.3	105.3	101.3	93.3

**Table 11b: Pensioners (public schemes) to population ratio by age group (%)**

	2019	2030	2040	2050	2060	2070
Age group -54	3.1	3.4	3.5	3.4	3.4	3.4
Age group 55-59	28.9	27.6	28.6	29.0	28.1	27.7
Age group 60-64	77.3	64.2	66.0	64.2	62.1	60.3
Age group 65-69	95.4	97.7	93.3	90.0	86.6	81.4
Age group 70-74	95.5	100.4	97.0	93.3	89.2	84.2
Age group 75+	90.8	102.3	105.3	101.3	97.4	93.3

**Table 12a: Female pensioners (public schemes) to inactive population ratio by age group (%)**

	2019	2030	2040	2050	2060	2070
Age group -54	6.0	6.6	6.5	6.1	6.3	6.3
Age group 55-59	74.1	72.6	72.5	73.5	74.2	73.8
Age group 60-64	115.8	103.8	109.1	107.1	105.9	104.3
Age group 65-69	99.6	107.9	106.7	103.6	101.5	98.5
Age group 70-74	96.9	101.0	100.7	97.9	95.4	92.2
Age group 75+	83.2	95.4	100.1	97.4	94.7	92.3

**Table 12b: Female pensioners (public schemes) to population ratio by age group (%)**

	2019	2030	2040	2050	2060	2070
Age group -54	3.0	3.3	3.3	3.1	3.2	3.2
Age group 55-59	32.4	31.0	31.8	31.8	30.9	30.8
Age group 60-64	90.0	68.5	71.9	70.8	69.0	68.0
Age group 65-69	86.6	89.6	87.3	85.2	83.3	80.3
Age group 70-74	86.3	93.1	90.9	88.8	86.6	83.4
Age group 75+	83.2	95.4	100.1	97.4	94.7	92.3

For the age groups -54 and 55-59, the ratios will not vary significantly over time. But figures at these younger ages look high, reflecting the inclusion of the “other pensions” category in AR21. Some of these pensions (military, judicial staff etc), further to those of workers under special or difficult conditions are called “special” expressly because they involve more intense, hence shorter careers. Furthermore, the number of disability and survivor pensioners close below the statutory retirement age is lower than projected in PR19.

However, there is a noticeable decrease for women in the age group 60-64. This diminution is not related to the total inactive population, but strictly to the number and, hence, the weight of the pensioners within the population in this age group, consequence of the pension reform: the statutory retirement age increases, the eligibility for disability pension is supposed to stricter criteria and the early retirement is discouraged. On the other hand, a lot of recent Romanian emigrants around the world will come back to their home country at retirement, thus receiving the pension benefits only from the country where they worked. The higher coverage ratios from the first year are also due to the fact that the pensioners from these years come from the ex-communist regime, when every individual was obliged to have a job.

On the other hand, some older ages pensions have figures above 100%. It happens around 2040, when the Romanian baby boomers will reach these ages. Noticeable, the projected net migration turns positive only after 2050, so a lot of Romanian workers will migrate until then, and still get a Romanian pension. The slightly higher ratios for men comes from the preponderance of migrating males and also from some migrating women to work as caretakers (mostly informal, in Romania).

**Table 13a: Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) – Total**

New pension	2019	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	294.8	1048.4	1644.6	1907.8	1978.9	2603.4
II. Number of new pensions ('000)	195.6	222.3	224.4	180.7	136.3	131.9
Average annual pension	3.0	9.4	14.7	21.1	29.0	39.5
III. Contributory period*	32.8	25.0	25.0	25.0	25.0	25.0
IV. Point value (EUR)	243.4	595.1	887.8	1277.4	1809.6	2524.4
V. Total average pension points at retirement	28.2	33.0	34.4	34.4	33.4	32.6
VI. Average number of months paid the first year	6	6	6	6	6	6
VII. Correction index	1.2	1.0	1.0	1.0	1.0	1.0
VIII. $II \cdot IV \cdot V \cdot VI \cdot VII / III$	294.8	1048.4	1644.6	1907.8	1978.9	2603.4
Additional information						
IX. Average contributory period	32.0	34.4	34.3	34.4	34.5	34.4
X. Average new annual pension (1000 EUR) (Projected new pension expenditure /I/ VI*12)	3.0	9.4	14.7	21.1	29.0	39.5
XI. Average new pension over economy wide average wage	28%	43%	40%	36%	32%	29%

\*Line 'III. Contributory period' is a fix value of 25 years, used in the pension formula as of 1 Sept 2021. Conversely, line 'Average contributory period (effective)' represents the number of years beneficiaries effectively contribute, on average, to their pension. The latter figure is reflected in line 'IV. Total average pension points at retirement', since the longer is a person's effective contributory period, the more points he/she accumulates at retirement.

**Table 13b: Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) – Male**

New pension	2019	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	157.9	599.4	938.8	1110.8	1160.0	1489.5
II. Number of new pensions ('000)	107.5	113.9	115.4	94.5	71.8	67.7
Average annual pension	2.9	10.5	16.3	23.5	32.3	44.0
III. Contributory period*	35.0	25.0	25.0	25.0	25.0	25.0
IV. Point value (EUR)	243.4	595.1	887.8	1277.4	1809.6	2524.4
V. Total average pension points at	29.3	36.9	38.2	38.3	37.2	36.3
VI. Average number of months paid the first year	6	6	6	6	6	6
VII. Correction index	1.2	1.0	1.0	1.0	1.0	1.0
VIII. $II*IV*V*VI*VII/III$	157.9	599.4	938.8	1110.8	1160.0	1489.5
Additional information:						
IX. Average contributory period	33.9	36.9	36.7	36.8	36.7	36.7
X Average new annual pension (1000 EUR) (Projected new pension expenditure /I/ VI*12)	2.9	10.5	16.3	23.5	32.3	44.0
XI. Average new pension over economy wide average wage	27%	48%	44%	39%	35%	31%

\*Line 'III. Contributory period' is a fix value of 25 years, used in the pension formula as of 1 Sept 2021. Conversely, line 'Average contributory period (effective)' represents the number of years beneficiaries effectively contribute, on average, to their pension. The latter figure is reflected in line 'IV. Total average pension points at retirement', since the longer is a person's effective contributory period, the more points he/she accumulates at retirement.

**Table 13c: Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) – Female**

New pension	2019	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	136.9	449.0	705.8	797.0	818.9	1113.9
II. Number of new pensions ('000)	88.0	108.5	108.9	86.2	64.5	64.1
Average annual pension	3.1	8.3	13.0	18.5	25.4	34.7
III. Contributory period*	31.1	25.0	25.0	25.0	25.0	25.0
IV. Point value (EUR)	243.4	595.1	887.8	1277.4	1809.6	2524.4
V. Total average pension points at retirement	27.6	29.0	30.4	30.2	29.2	28.7
VI. Average number of months paid the first year	6	6	6	6	6	6
VII. Correction index	1.2	1.0	1.0	1.0	1.0	1.0
VIII. $II \cdot IV \cdot V \cdot VI \cdot VII / III$	136.9	449.0	705.8	797.0	818.9	1113.9
Additional information:						
IX. Average contributory period	29.6	31.9	31.9	31.8	31.9	31.9
X. Average new annual pension (1000 EUR) (Projected new pension expenditure /I/ VI*12)	3.1	8.3	13.0	18.5	25.4	34.70
XI. Average new pension over economy wide average wage	29%	39%	36%	32%	28%	26%

\*Line 'III. Contributory period' is a fix value of 25 years, used in the pension formula as of 1 Sept 2021. Conversely, line 'Average contributory period (effective)' represents the number of years beneficiaries effectively contribute, on average, to their pension. The latter figure is reflected in line 'IV. Total average pension points at retirement', since the longer is a person's effective contributory period, the more points he/she accumulates at retirement.

### III.4 Financing of the pension system

**Table 14 – Financing of the system**

	Public employees	Private employees	Self-employed
Contribution base	Wage	Wage	Declared income
Contribution rate/contribution			
<i>Employer</i>	Between 0% and 8%, according to the working conditions, as follows: 0% (normal working conditions) 4% (difficult working conditions) 8% (special working conditions)	Between 0% and 8%, according to the working conditions, as follows: 0% (normal working conditions) 4% (difficult working conditions) 8% (special working conditions)	
<i>Employee</i>	25%	25%	25%
<i>State</i>			
<i>Other revenues</i>	State provides funds from the national budget to cover the public pension system deficit	State provides funds from the national budget to cover the public pension system deficit	State provides funds from the national budget to cover the public pension system deficit
Maximum contribution	No threshold	No threshold	No threshold
Minimum contribution	Minimum wage	Minimum wage	Minimum wage <sup>4</sup>

The total amount of contributions collected is registered as such, but it also includes payments delayed from previous years, hence it is hard to separate precisely the part coming from employees and the (much smaller) one, equivalent of 4% (difficult conditions) or 8% (special conditions), coming from employers. On PR19 we included all under the employee's category. For the projections of AR 21 we improved the model to have more granular results and managed to include these estimates in the model. Revenues that come from difficult and special working conditions that have to be paid by the employer are around 0.03% of GDP.

Revenue from contributions (table 15): the shrinking number of contributors (circa 2/3 in 2070 as compared with 2019) is compensated by the 3/2 evolution of average contribution (as %GDP): GDP level increases with real GDP growth and inflation; contributions, hence wages, hence labour productivity increase with real wage growth and inflation. For 2019-2070 the overall real growth of GDP is 2.26 while the one of wages is 3.58.  $3.58/2.26 = 1.58$  = roughly 3/2. So, the weight of contributions in GDP is quite constant in time.

<sup>4</sup>If the declared income is below the minimum wage, the self-employed are not obliged to pay health and pension social contributions.

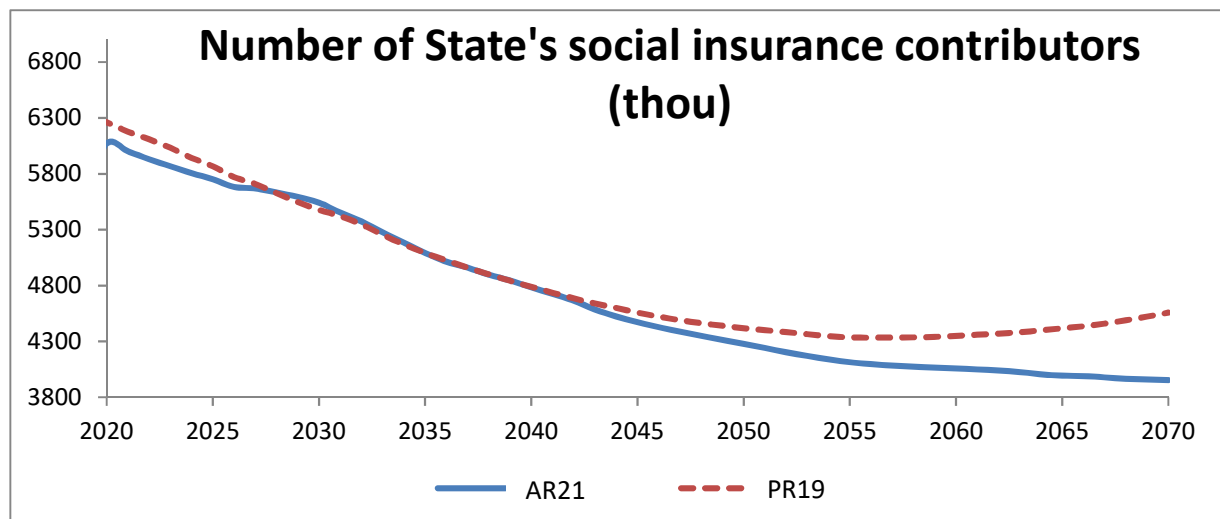


**Table 15: Revenue from contribution (% of GDP), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)**

	2019	2030	2040	2050	2060	2070	Change 2019-2070 (pps)
Public contribution	6.8	6.8	6.5	6.5	6.5	6.5	-0.3
<i>Employer contribution</i>	0.03	0.03	0.02	0.02	0.02	0.02	-0.01
<i>Employee contribution</i>	6.7	6.8	6.55	6.5	6.5	6.5	-0.2
<i>State contribution</i>							
Number of contributors (I)	5632.3	5726.9	4968.4	4363.7	4050.2	3849.4	-32%
Employment (II)	8639.5	7792.0	6938.8	6148.3	5670.4	5370.2	-38%
Ratio of I/II	0.7	0.7	0.7	0.7	0.7	0.7	0.0

One significant change is that in AR21 we let aside, for the moment, the assumption used in the previous exercises, that progresses in the elimination of the significant black and grey economy would bring additional contributors (see graph below). For the time being this progress is rather slow, so we eliminated this assumption.

**Chart 10: Number of State's social insurance contributors (thou)**



Differences between the number of contributors and the volume of employees come from the different methodologies applied in calculation. The employment is calculated according to the international labour office methodology, so it can also include day-workers or part-time workers. These categories are considerable in Romania, and they are not included as

contributors. On the other hand, the indemnified unemployed are also contributors, so can be other categories not included in employment, as well. Moreover, the demographic projections indicate a progressive inversion of the migration flows, which from 2052 on are estimated to turn positive; this means young working age people coming from abroad.

The projected evolution takes into account the specific features of employment in Romania, respectively the significant weight of the self-employed. The weight of the self-employed among total employment in Romania is still far from the EU28's average, which is 15.3%. The same ratio for Romania reached 25.2% in 2018, according to AMECO national accounts statistics. Out of these self-employed, almost half are farmers. This category contributes voluntarily to the pension system. Romania's long-term development and the rural modernization, also including the consistent European aid, will reduce the percentage of these people compared to the wage earners. Consequently, the number of contributors from this category will increase, even on the background of the ageing of population. Important, in Romania the above-mentioned trend is validated by the recent years' reality, when the ratio between the number of contributors and the employment has improved from 57% in 2010 to approximately 67% in 2016.

Still, the progresses expected on this side (under our previous rounds of projections) were lower than our expectations, so under AR21 we eliminate, for the moment, this assumption.

As for the existence of a buffer fund, to smooth the financing gaps that occur due to the cyclicity of employment, this is not expressly stipulated. However, at the budgetary revisions, the necessary amounts can be transferred from the State's Budget to the Social Insurance Budget. The extent to which the State has an obligation to cover any remaining financing gaps is related to people's right to benefit of social insurance. This right is guaranteed by the State, in accordance with the fundamental law.

**Table 16 – Pension assets and reserves (% GDP) and return on assets (%)**

	average 2009- 2018	2019	2030	2040	2050	2060	2070	AVERAGE 2019-2070
Private individual mandatory schemes								
-assets and reserves	4308.9	12221.1	60698.9	152460.8	271541.4	411968.9	593708.8	234132.7
-average return	173.1	626.5	3303.7	7538.7	11656.6	17835.9	25792.4	10455.7
Private individual non-mandatory schemes								
-assets and reserves	215.2	492.2	2386.6	5602.3	9718.1	15388.0	24098.9	8835.1
-average return	8.3	19.7	130.8	278.6	417.0	661.7	1037.5	393.1

### III.5 Sensitivity analysis

The sensitivity analysis of the public pension expenditure, as a percentage of GDP, is undertaken through a series of alternative scenarios, based on specific deviations from the baseline scenario. The deviations in assumptions apply to only one parameter for each alternative scenario, while the other parameters considered remain unchanged, according with the agreed AWG methodology.

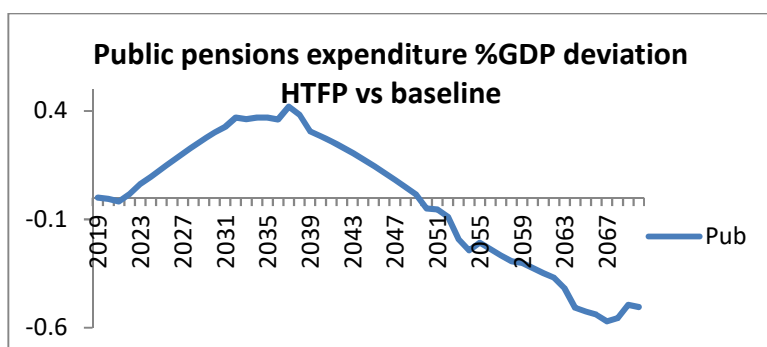
Note: The projected evolution of the Benefit Ratio do not diminish so seriously over the projection horizon, so that a 10% diminution compared to base year occurs. Hence, there is no scenario to offset an eventual decline. More specific, the major increase in the level of pensions occurs in 2020, just after the base year, so there is a lot of room left afterwards, for a decline of more than 10% compared to 2019.

**Table 17: Total and public pension expenditures under different scenarios (deviation from baseline scenario)**

Public Pension Expenditure	2019	2030	2040	2050	2060	2070	Change 2019 -2070 (pps)
Baseline (% GDP)	8.1	12.9	14.2	14.8	13.6	11.9	3.8
Higher life expectancy at birth (+2y)	0.0	0.1	0.2	0.4	0.6	0.7	0.7
Higher migration (+33%)	0.0	0.2	0.4	0.5	0.5	0.4	0.4
Lower migration (-33%)	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.3
Lower fertility (-20%)	0.0	0.0	0.0	0.6	1.3	1.9	1.9
Higher employment rate of older workers (+10 pps.)	0.0	-0.5	-0.8	-1.0	-0.6	-0.4	-0.4
Higher TFP growth (convergence to 1.2%)	0.0	0.3	0.3	0.0	-0.3	-0.5	-0.5
TFP risk scenario (convergence to 0.8%)	0.0	0.3	0.7	0.8	0.8	0.8	0.8
Policy scenario: linking retirement age to change in life expectancy	0.0	-0.3	-0.9	-1.1	-1.1	-1.1	-1.1
Policy scenario: unchanged retirement age	0.0	0.3	0.3	0.2	0.1	0.1	0.1
Policy scenario: offset declining pension benefit ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lagged recovery scenario	0.0	0.3	0.3	0.2	0.0	-0.1	-0.1
Adverse structural scenario	0.0	0.7	0.9	1.3	1.4	1.5	1.5

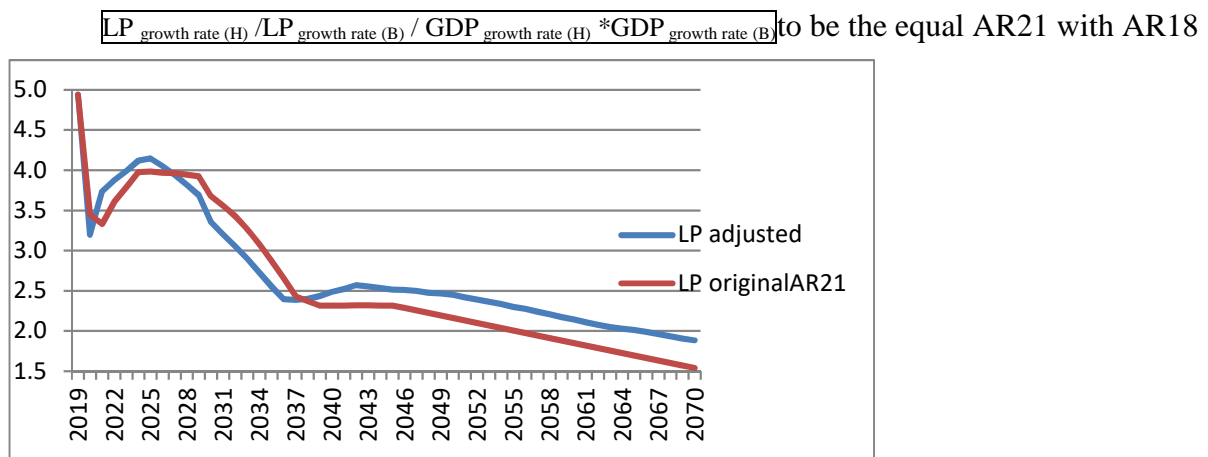
Total Pension Expenditure	2019	2030	2040	2050	2060	2070	Change 2019 -2070 (pps)
Baseline (% GDP)	8.1	12.9	14.6	15.6	14.7	13.1	4.9
Higher life expectancy at birth (+2y)	0.0	0.1	0.2	0.4	0.6	0.8	0.8
Higher migration (+33%)	0.0	0.2	0.4	0.5	0.5	0.4	0.4
Lower migration (-33%)	0.0	-0.2	-0.3	-0.5	-0.5	-0.4	-0.4
Lower fertility (-20%)	0.0	0.0	0.0	0.6	1.4	2.1	2.1
Higher employment rate of older workers (+10 pps.)	0.0	-0.5	-0.8	-1.0	-0.6	-0.4	-0.4
Higher TFP growth (convergence to 1.2%)	0.0	0.3	0.3	-0.1	-0.4	-0.6	-0.6
TFP risk scenario (convergence to 0.8%)	0.0	0.3	0.7	0.9	0.9	0.9	0.9
Policy scenario: linking retirement age to change in life expectancy	0.0	-0.3	-0.9	-1.2	-1.1	-1.1	-1.1
Policy scenario: unchanged retirement age	0.0	0.3	0.3	0.2	0.1	0.1	0.1
Policy scenario: offset declining pension benefit ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lagged recovery scenario	0.0	0.3	0.3	0.2	0.0	-0.1	-0.1
Adverse structural scenario	0.0	0.7	0.9	1.3	1.5	1.6	1.6

For the higher total factor productivity assumption, there is a 0.5/0.6 percentage point decrease of the total pension expenditures, at the end of the projection horizon, compared to the baseline. The main reason for this decrease is the quick impact of productivity on the GDP and the delayed impact on the pension benefits; the latter are a reflection of the pensioner's earnings throughout his entire career. There is an abnormal positive deviation during the first part of the projection horizon (until 2037), reflecting a noticeable difference stemming from the different way the baseline and the higher TFP scenario are constructed. The baseline follows the t+10 projection until 2029, thereafter converging to the target TFP growth value 2037/2045. The higher TFP scenario assumes a linear convergence between 2019 and 2037/2045 to the target TFP growth value.



We consider that the distortion comes from the labour productivity alternative scenario's projected time series. Notably, our model doesn't use TFP, but only Labour productivity growth rates. Nevertheless, TFP and Labour productivity (LP) evolve in line, so LP is a good proxy. Another important mention is that no problem or distortion in respect of lower or higher TFP alternative scenarios occurred in our previous projection exercises.

Hence, we tried the following simulation: we adjusted the LP (High TFP scenario =H) in order to keep the ratios LP growth rate over GDP growth rate (H versus B=baseline) identical to AR18 ones:



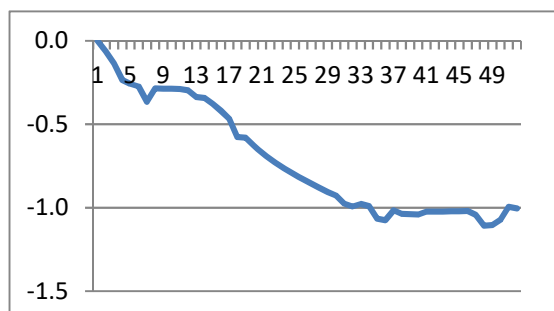
The two series look as in the above graph.

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
LP adjusted	4.9	3.2	3.7	3.9	4.0	4.1	4.1	4.1	3.9	3.8	3.7	3.4
LP originalAR21	4.9	3.4	3.3	3.6	3.8	4.0	4.0	4.0	4.0	3.9	3.9	3.7

Now the deviations would be as follows:

	2019	2030	2040	2050	2060	2070
Pub	0.0	-0.3	-0.7	-1.0	-1.0	-1.0
Tot	0.0	-0.3	-0.7	-1.0	-1.1	-1.1

With the graph looking as below, steady increasing negative deviation – plausible, expected trend. So the conclusion is that a small adjustment of labour productivity figures in the problematic period would fix the issue.



For the higher employment rate of old workers, the GDP grows even more and such growth is more significant than the increase of the pension expenditures. The results of this sensitivity test follow the same trend as in our previous projection exercise, with a peak, then coming back down to 2030's level.

The permanent shock of this year's crises leads to 1.5 / 1.6 pp increase in expenditures, while the assumption of a temporary shock gives hopes to a late return to the positive area.

Linking the retirement age with the increase in life expectancy seems to be more stable than in PR19, when the 2070 projected value deviations reached 1.8 / 1.9 pp, as compared to 1.1 now.

The same is valid for the TFP risks scenario, now growing up to 0.8/0.9 pp deviations, as compared to 1.5/1.6 in PR19.

The newly introduced unchanged retirement age scenario doesn't develop significant deviations, with a peak in 2030, then going down on long run.

In the case of higher/lower migration, the deviations are not considerable, as the negative estimates of the migration flows are followed by positive trends. Nevertheless, the differences induced in the volume of population are more significant for the working-age category than for the population over 65. Therefore, a lower migration scenario would lead to a gain of 300,000 persons at working age, hence improving the results.

By far, the worst possible scenario is the one involving the 20% reduction of the fertility rate. Taking into consideration the already problematic development of the demography from the baseline scenario, there is no surprise that such worsen fertility rates would lead to an increase in expenditure of around 1.9 / 2.1.pp.

The higher life expectancy determines an increase in expenditures of around 0.7/0.8 p.p. from the baseline scenario. The GDP would not increase significantly, but a longer life leads to more people receiving pension benefits and, thus, results in higher pension expenditures.

### III.6 Description of the changes in comparison with the previous projections

**Table 18: Overall change in public pension expenditure to GDP under the 2009, 2012, 2015, 2018, 2019 and 2021 projection exercises - pensioners**

	Public pensions to GDP	Dependency ratio effect	Coverage ratio effect	Benefit ratio effect	Labour market effect	Residual (incl. Interaction effect)
2009	9.24	13.61	-4.91	1.73	0.28	-1.46
2012	3.70	12.93	-4.69	-3.70	0.36	-1.20
2015	-0.15	6.80	-2.34	-0.05	-0.56	-0.62
2018	0.70	5.60	-1.74	-2.56	-0.15	-0.45
2019	4.56	8.51	-2.57	-0.79	0.02	-0.61
2021	3.78	9.44	-2.98	-1.67	-0.58	-0.43

Tables 18 and 19 refer to the differences between the results of the present projections and those from the previous exercises.

The public pensions, as percentage of GDP, are forecasted more stable in time, with every round of projections. The evolution of the dependency ratio also improves. The coverage ratio is presumed to decline softer, but an eventual further increase of the retirement ages would bring the figures closer to the older assumptions.

**Table 19a: Breakdown of the difference between AR2018, 2019 projections and actual outcome figures (% of GDP)**

	2016	2017	2018	2019
<b>Ageing report 2018</b>	8.0	7.3	7.4	7.3
<i>Change in assumptions 2019 peer review</i>	0.0	0.0	0.0	0.0
<i>Policy related changes 2019 peer review</i>	0.0	0.0	0.1	0.5
<b>Peer review 2019</b>	8.0	7.3	7.5	7.8
<i>Change in assumptions AR21</i>	0.0	0.0	0.0	-0.1
<i>Improvement in the coverage or in the modelling AR21</i>	0.3	1.0	0.7	0.4
<i>Change in the interpretation of constant policy AR21</i>				
<i>Policy related changes AR21</i>				
Actual public pension expenditure	8.3	8.3	8.2	8.1

**Table 19b: Breakdown of the difference between 2018, 2019 and the new public pension projection (% of GDP)**

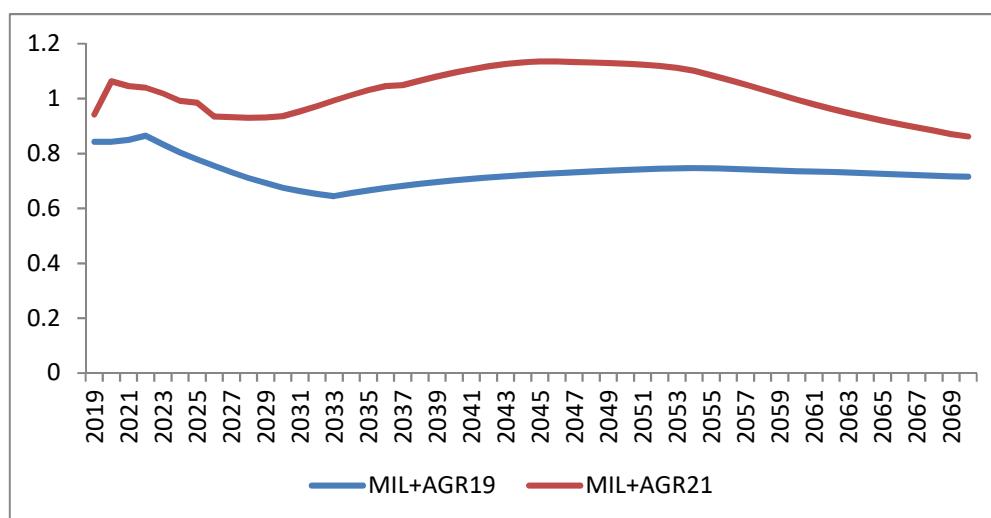
	2019	2030	2040	2050	2060	2070
<b>Ageing report 2018</b>	7.3	6.6	7.7	8.7	8.9	8.7
<i>Change in assumptions 2019 peer review</i>	0.0	-0.1	-0.2	-0.2	-0.2	-0.2
<i>Policy related changes 2019 peer review</i>	0.5	5.0	5.8	5.7	5.1	4.0
<b>Peer review 2019</b>	7.8	11.5	13.3	14.2	13.8	12.5
<i>Change in assumptions AR21</i>	-0.1	1.2	0.7	0.4	-0.4	-0.8
<i>Improvement in the coverage or in the modelling AR21</i>	0.4	0.2	0.2	0.2	0.2	0.2
<i>Change in the interpretation of constant policy AR21</i>						
<i>Policy related changes AR21*</i>						
<b>New projection Ageing report 2021</b>	8.1	12.9	14.2	14.8	13.6	11.9

\*Policy related changes occur, but only between 2020-2022 (due to changed point value), as follows:  
 2020: 0.7% of GDP, 2021: 1.3% of GDP, 2022: 0.01% of GDP – more details in Box 2 at page 18.

The change in modelling comes from the exclusion, as compared to AR18 and PR19, of the contributors (then, turned into pensioners) from the black economy (presently inactive). The coverage change comes from the new categories (special pensions, special indemnities) included in AR21, and from the more refined way we try now to model the minimum pensions.

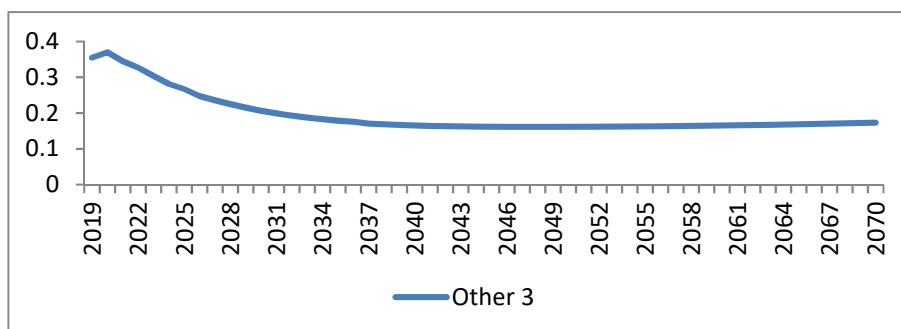
In our previous exercise, the categories included under “Other pensions” were only the military and the farmers. The chart below shows how military + farmer pension expenditures develop under the two sets of projections (% of GDP). Obviously, the difference comes from the starting point, 2019, when our 2018 forecast was underestimating. One source of this underestimation was the number of military pensioners. We used to keep this figure constant as from the base year (150.8 thou in 2016), but in 2019 we already had 173.2 thou (and in AR21 we estimate their number to evolve in line with the number of social insurance pensioners).

**Military + farmer (agriculture) pension expenditures (% of GDP) in PR19 and AR21**





Further to this change, AR21 also included other three categories: the farmers' social pensions, the civil special pensions (6 professional categories) and the special indemnity.



The total expenditure of these “Other 3” (as % of GDP) is expected to go down in time, as the farmers will disappear and the special pensions, despite being high at retirement, are indexed only by the inflation rate.

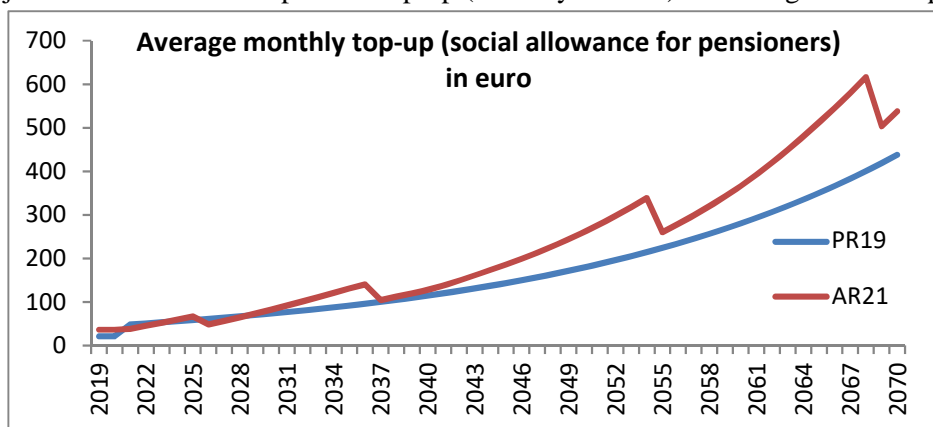
Another source of difference between AR21 and 2019's update of AR18 comes from our efforts to refine the projection of the social (minimum) pensions. Now we've refined the number of pension income brackets to fall under the projected threshold level and also follow them year by year. In 2019 exercise we went to the 2070 (probably overestimated) values, and then used the interpolation (that is why the PR19 curve looks more fluid).

The number of social allowance pensioners was strongly underestimated (216.6 thou estimated for 2019 in our previous exercise, versus 402.5 thou actual data). Still, on long run, also bearing in mind the depopulation, hence the decrease of the total number of pensioners, those earning on the basis of their contributions less than the minimum pension threshold would rather not increase so drastically in number.

Number of social allowance pensioners (to become Minimum pension beneficiaries from 2021 on) as ratio of Total number of pensioners:

	2019		2070
AR 18	4%	....	5%
PR 19	4%	....	16%
AR 21	8%	....	14%

The projected evolution of this pension top-up (monthly amount) is still higher on our present exercise:



## PART IV –DESCRIPTION OF THE MODEL AND THE DATABASE

### IV. 1 Institutional context in which the projections are made

The projections are made strictly for the Ageing Report 2021.

### IV.2. Assumptions and methodologies applied

The model applied relies on informed assumptions of future patterns including:

- Wage growth
- Real returns on pensions assets
- Economic growth
- Growth in coverage of a contributory pension scheme

One of the main assumptions of the model is that, once retired, the individuals continue to receive the pension benefits until the end of their life. At the same age, both the pensioners and the individuals still active have the same probability of dying.

### IV.3. Data used to run the model

The main data necessary in order to forecast the expenditure for the pension system are:

*Entry Indicators:*

A. GENERAL:

1. Base year data
2. Wage and pension brackets and cumulative distributions
3. Demographic trends (sex ratio at birth, mortality rate multiplier for disabled, mortality rate multiplier for Old Age pensioners)
4. Macroeconomic trends (actual figures until 2016, EC projections afterwards)
  - a) real GDP growth
  - b) productivity growth of minimum wage workers
  - c) inflation rate
5. Interest rate
6. Benefit eligibility
7. Percentage of people willing, but not allowed for normal retirement, after reform
8. Replacement rate
9. Revenue sources
10. Costs and other expenditure
11. Indexation
  - a) pension indexation to inflation
  - b) pension indexation to normal wage growth
12. Benefit formula parameters for old age

B. POPULATION:

1. Population volume
2. Fertility rates
3. Mortality rates
4. Immigration

C. LABOR

1. Labour participation rate
2. Unemployment rate
3. Earning profile in terms of minimum wage
4. Pension profile in terms of minimum pension

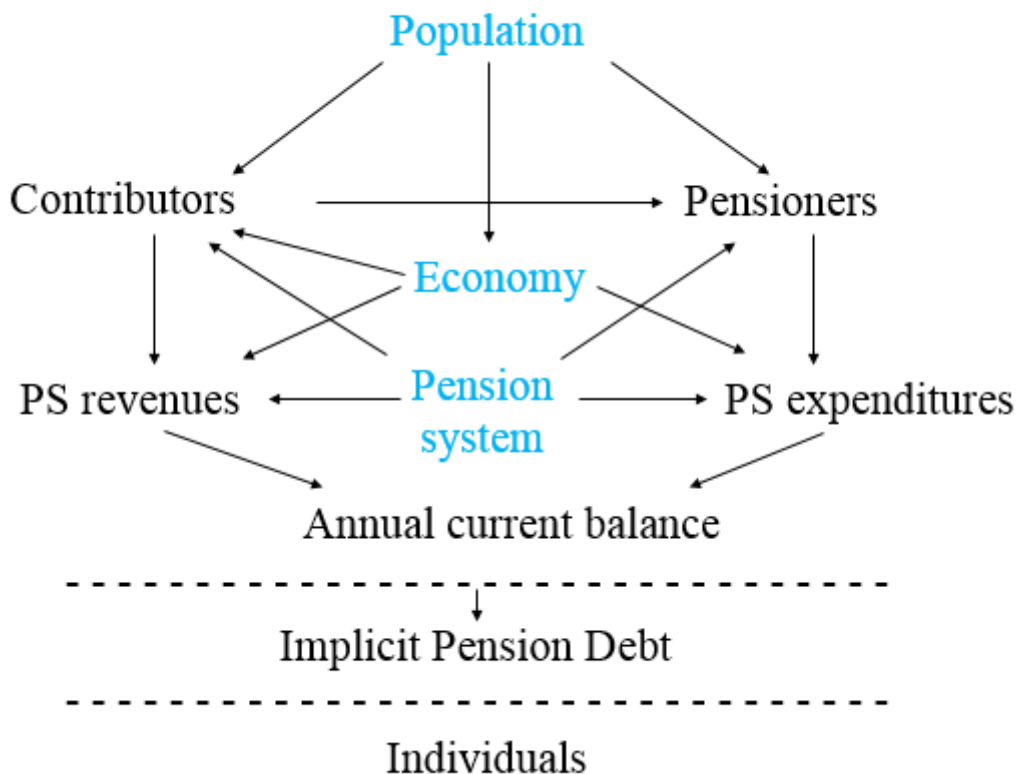
D. PENSION

1. Pension system in base year and reform
2. Length of service at retirement
3. Contributors as percentage of population
4. Old age – stock of population
5. Disabled as percentage of population
6. Survivors as percentage of population
7. Exemption rate

The model is data intensive in order to support the robustness of the results. The key required data are:

- Population fertility and mortality rates by age and gender.
- Labour force participation rates and unemployment rates by age and gender.
- Numbers of contributors and beneficiaries, their contribution and retirement patterns by age and gender.
- Wages and pensions by age and gender, income distribution for contributors and pensioners.

### General Calculation Scheme



#### IV.4. Reforms incorporated in the model

The model can assess anything from ‘parametric’ reforms of initial pay-as-you-go systems changing pensionable ages, contribution rates, benefits, indexation etc.—to structural reforms, such as the introduction of individual, funded retirement savings accounts or notional accounts. PROST model can handle provident fund schemes as well as pay-as-you-go systems as the starting point, before reform.

#### IV.5. General description of the model

The core model is the World Bank’s **pension reform options simulation toolkit (PROST)**. It comprises a set of instruments which can model pension contributions, entitlements, system revenues and system expenditures over a long timeframe into the future. The model is designed to promote evidence-based policy-making, bridging the gap between quantitative and qualitative analysis of pension regimes. Additionally, two models, one for the repartition on sex and age groups and the other for the second pillar, have been included.

The model utilizes country-specific data, provided by the European Commission, and generates population projections. These projections, combined with economic assumptions, are used to forecast future numbers of contributors and beneficiaries. In turn, this approach generates flows of revenues and expenditures. The model then projects fiscal balances, taking into account any partial pre-funding of liabilities. The model can use either a ‘stock’ or a ‘flow’ approach. In the stock concept, parameters such as retirement are expressed as total retirees as a percentage of population rather than as probabilities of retirement, since the stocks can be more stable predictors of the future.

There are three indices (dimensions) for each variable: a=age, t= time (year), g=gender.

Main equations:

**Total population:**

$$P(a, t, g) = [1 - m\%(a - 1, t - 1, g)]P(a - 1, t - 1, g) + im(a, t, g),$$

where  $im(a, t, g)$  is the net migration, and  $m(a, t, g)$  is the probability of dying.

The equation can be used for any age group, other than the new-born ( $a > 0$ ). For the latter, the following formula applies:

$$NEWBORN(t) = \sum_a f\%(a, t - 1)P(a, t - 1, 2),$$

where  $f(a, t)$  is the fertility rate.

The PROST model groups the total population in 3 age categories: youth (YP), working age (WP) and old (OP). If  $a_r$  represents the retirement age, then:

$$YP(t, g) = \sum_{a=0}^{14} P(a, t, g), \quad WP(t, g) = \sum_{a=15}^{a_r} P(a, t, g), \quad OP(t, g) = \sum_{a=a_r}^{a_{\max}} P(a, t, g)$$

**Labour supply:**

$$LF(a, t, g) = P(a, t, g) \text{ lfp}\%(a, t, g),$$

where  $\text{lfp}(a, t, g)$  is the labour supply's participation rate.

**Employed:**

$$EM(a, t, g) = LF(a, t, g) [1 - u\%(a, t, g)],$$

where  $u(a, t, g)$  is the unemployment rate.

**Number of existing pensioners:**

$$EP(a, t, g) = P(a, t, g) \text{ rr}\%(a, t, g),$$

where  $\text{rr}(a, t, g)$  is the retirement (exit) rate.

**Number of existing disabled:**

$$ED(a, t, g) = P(a, t, g) \text{ ds}\%(a, t, g),$$

where  $\text{ds}(a, t, g)$  represents the disability occurrence rate

**Number of effective contributors:**

$$EC(a, t, g) = NC(a, t, g) [1 - ee\%(a, t, g)],$$

where  $ee(a, t, g)$  represents the contributors' exemption rate, and  $NC(a, t, g)$  is the number of nominal contributors.

**Number of nominal contributors:**

$$NC(a, t, g) = P(a, t, g) \text{ cr}\%(a, t, g),$$

where  $\text{cr}(a, t, g)$  is the contribution rate, calculated as percentage of the contributors of age  $a$  and gender  $g$  within total persona of age  $a$  and gender  $g$ .

**Pension fund revenues:**

$$REV(t) = CON\_COLL(t, 3) + PEN\_COLL(t) + TR(t) + O\_REV(t) + INVEST(t),$$

Where CON\_COLL(t,3) represents the contributions from the income tax;

PEN\_COLL(t) represents the contributions from pensions (e.g. pension tax);

TR(t) represents transfers from the state's budget;

O\_REV(t) represents other revenues;

INVEST(t) represents investment revenues.

**Pension funds expenditures:**

$$EXP(t) = PAYM\_T(3,t) + O\_EXP(t) + ADMIN(t) + ASSET\_M(t),$$

where PAYM\_T(3,t) represents expenditures incurred with the pension payments;

O\_EXP(t) represents other expenditures;

ADMIN(t) represents administrative expenditures;

ASSET\_M(t) represents the costs incurred with the administration of the assets.

**Current balance:**

$$BAL(t) = REV(t) - EXP(t)$$

*Model output*

The PROST program produces five output modules, presented as Microsoft Excel tables with graphic summaries. The modules are:

**Population projections**, including life tables, population pyramids, population dependency ratios etc.

**Demographic structure**: labour force and employment, numbers of contributors and beneficiaries, system dependency ratio.

**Financial flows**: projections of wages, benefits, revenues and expenditures of the pension system, pension scheme balance and the implicit pension debt. The financial flows module also calculates the adjustments—to benefit levels or contribution rates—that would 'balance' the system, i.e. would bring revenues and expenditures into line.

**Fundamental systemic reforms**: this module illustrates the effect of a shift to a 'multipillar' regime, incorporating both a pay-as-you-go, defined-benefit pension and a funded, defined contribution scheme or exclusively one or the other. Again, it measures the impact both on the system finances and on individuals' pension entitlements, including measurement of transition costs. The total pension benefit and the value of each of the pillars are provided separately.

## IV.6. Additional features of the projection model

The model can accommodate a distribution of wages per cohort which allows users to determine the effects of changes in floors and ceilings of income, subject to contribution and the effects of changes in the minimum and maximum pension levels.

The model, which can be based either on population or on employment, also allows different transition paths to a new system, including the age cohorts (generations) covered by the new system (such as applying reforms only to younger workers) and the treatment of pension rights accrued before the reform. Accrued rights can be paid in multiple ways, including as recognition bonds and as proportional wages. On-going funded defined contribution schemes and notional accounts can be modelled in PROST as well.

Additionally, the developments of the number of pensioners and pension expenditures, corresponding to the non-earnings related pensions, facultative private pensions and special (sectorial) pensions have also been modelled outside the main model. Starting with 2005, the pensions for farmers are also paid from the State Budget. Their extinction is estimated around the year 2035.

In order to estimate the expenditure for the farmer's scheme we used a simple, linear model, based on data provided by the House of Pensions. The military (including defence, intelligence and police pensioners) have also been included, but estimated outside the main model. The assumptions associated are their constant ratio as active corps among total population, constant ratio of military pensioners among their active corps and constant ratio of their average old-age pension over the regular old-age pension. Beginning with 2016, their pension system has been transferred from the Social Security Budget to the State's Budget.

The social pensions, although being paid from the Social Security Budget, have been modelled separately.

## METHODOLOGICAL ANNEX

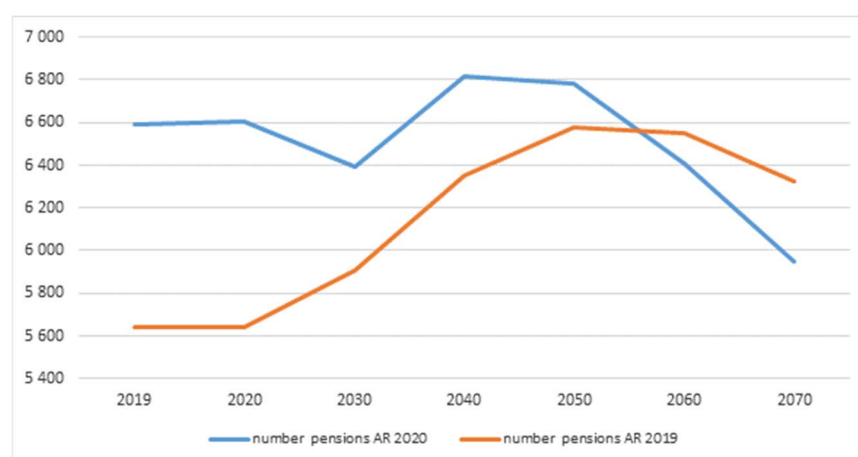
### A. Economy-wide average wage at retirement

**Table A1: Economy-wide average wage at retirement evolution (thousands euro)**

	2019	2030	2040	2050	2060	2070	%Change 2019-2070
Economy-wide average wage	11.1	22.4	37.9	60.7	94.6	143.1	1186.8
Economy-wide average wage at retirement	11.1	22.0	37.3	59.9	93.5	141.5	1180.5

### B. Pensioners vs Pensions

Generally speaking, every pensioner gets a public pension. Some of the public pensioners become switchers; further, a segment of the public pensioners may also enlist in the private facultative pensions. Almost<sup>5</sup> all of the beneficiaries of a social pension receive it additionally to the old-age / disability / survivor pension. This is why we used to count them in the questionnaire only as public pensioners, so the figures for the number of public earning related pensions could be found in the Questionnaire's chapter „Number of pensioners”. In AR21 we still avoid to double count them, yet we count them as pensioners (as compared to the nil values filled in for our previous projection exercises).



<sup>5</sup>There are also people receiving the minimum income guarantee, but as they are not registered separately by category, the elder can't be counted separately, hence not included in the projections



The number of pensions differs from PR19, and the explanation would be that the number of pensions sums up the old age and early, disability, survivor and “other pension”. The first three coincide, as number, with the afferent pensioners. Disabled and survivor are discussed hereafter, while the old age and early are presented among the answers for EC. Thus, the old age and early differ from PR19 due to: different age/gender structure of contributors, different age/gender structure of old age pensioners and a change in modelling the women’s increasing statutory retirement age: we gave up to our PR19 efforts to replace the automatic modelling by the projection model with a time consuming, complex manual one.

The social pensioners are, presumably, still overestimated, despite our projection efforts to bring them closer to plausibility. We have currently 8% of the public pensioners who get a social allowance supplement, in order to reach the threshold. Sure, the changing of the formula (minimum pension instead of social allowance) might possibly increase this level, but 14% in 2070 (or 16% under PR19) seems still high.

The most significant coverage change refers to Other pensions. Here, further to military and farmers (PR19), we added special pensions, special indemnities and social allowance supplement for farmer pensioners. Methodological approach: number of military in line with state’s social insurance old age pensioners (versus constant base year level in PR19), longer period until the extinction of farmers, constant number civil special pension beneficiaries. For the beneficiaries of special indemnity, we just tried to give and continue a trend, from the historical data of each of the 8 categories. As most of these categories include fewer and fewer beneficiaries (588 thou in 2015, 416 thou 2019, hence 55 thou in 2070), they diminish over time.

**Table A3: Factors behind the change in public pension expenditures between 2016 and 2070 (in percentage points of GDP) – pensions**

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
<b>Public pensions to GDP</b>	4.7	1.3	0.6	-1.2	-1.7	3.8
<b>Dependency ratio effect</b>	1.6	3.1	2.9	1.2	-0.6	8.1
<b>Coverage ratio effect</b>	-0.7	-0.5	-0.5	-0.2	0.0	-1.9
Coverage ratio – old age*	-0.2	-0.2	-0.2	-0.2	-0.2	-1.0
Coverage ratio – early age*	-1.7	0.5	0.8	0.0	0.2	-0.2
Cohort effect*	0.1	-1.9	-1.6	-0.4	0.3	-3.6
<b>Benefit ratio effect</b>	3.8	-0.9	-0.8	-1.0	-1.0	0.1
<b>Labour market effect</b>	-0.1	-0.2	-0.1	-0.1	0.1	-0.4
Employment ratio effect	0.0	0.0	-0.1	-0.1	0.0	-0.2
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	-0.1	-0.2	0.0	0.1	0.0	-0.2
<b>Residual</b>	0.1	-0.1	-0.9	-1.0	-0.3	-2.1

\* Subcomponents of the coverage ratio effect do not add up necessarily.

### C. Disability pension

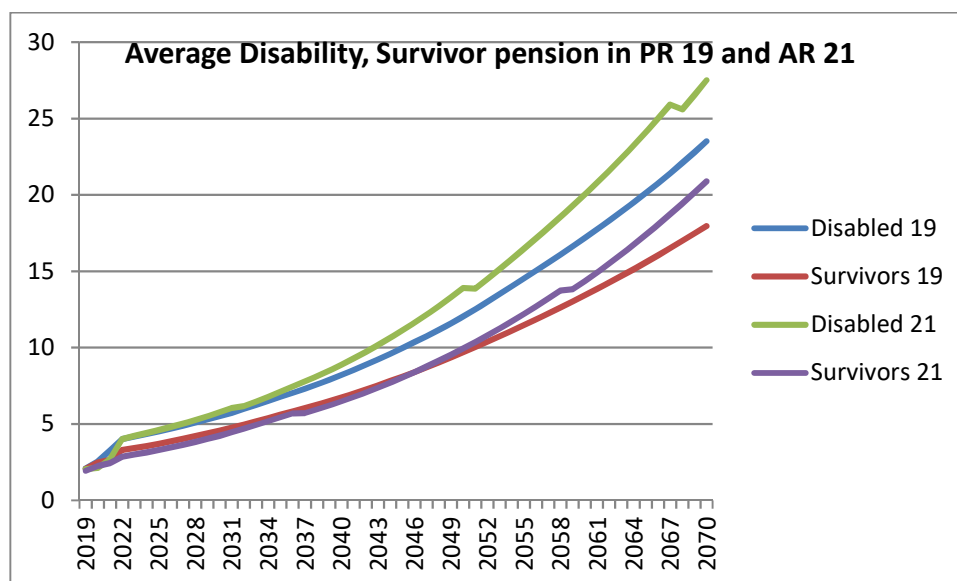
**Table A2: Disability rates by age groups (%)**

	2019	2030	2040	2050	2060	2070
Age group -54	1.5	1.7	1.6	1.5	1.5	1.5
Age group 55-59	14.1	14.0	14.1	14.1	13.9	13.9
Age group 60-64	10.9	11.6	11.4	11.6	11.8	11.9
Age group 65-69	0.7	0.7	0.7	0.7	0.7	0.7
Age group 70-75	0.0	0.0	0.0	0.0	0.0	0.0
Age group 75+	0.0	0.0	0.0	0.0	0.0	0.0

### D. Survivor pensions

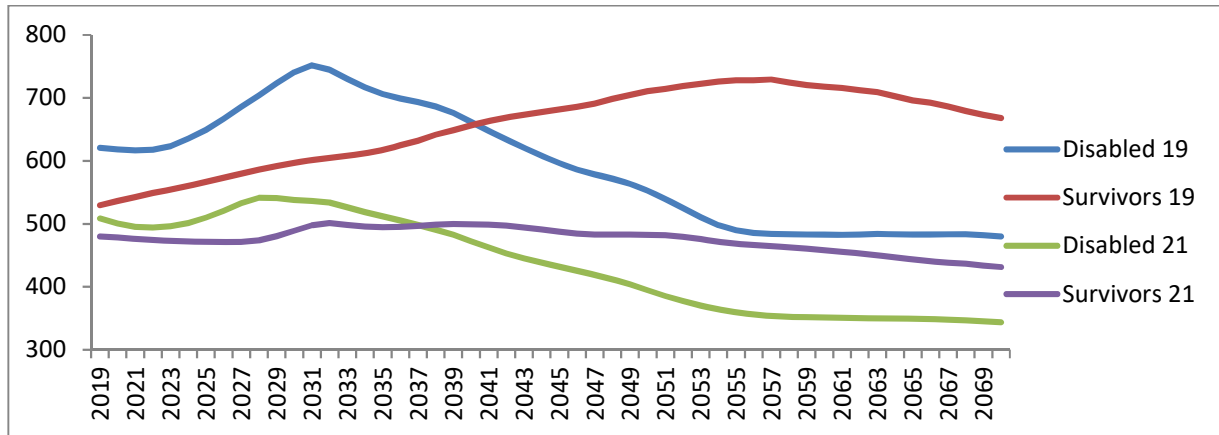
The assumption used is that the percentage of the number of survivors among total population, for each age and gender, is kept constant along the projection horizon.

Disability and survivor pension expenditure, as % of GDP fall in time, hence it worth explaining why.



The average pension doesn't fall, either for disability, or for survivor pensioners. The curves are parallel and above PR19 (due to better macro-assumptions: inflation 2.5% instead of 2%, higher wage growth rates).

Hence, the different expenditure curves are to be searched in the number of pensioners.



Thus:

- a) Disability: AR21 goes parallel with PR19, the distance between them resulting from the number of disability pensioners in the base year 2019: 508.2 thou, fewer than estimated back in AR18 (620.8 thou). Thereafter, the model keeps the disability rates constant, on every age and gender
- b) Survivors: the methodology and the legislation remain the same, it's just the age/gender structure of survivors in the base year that modified – hence, the ratios number of survivors over population all over the projection horizon.

### E. Average contributory period

There is a quite significant difference, as compared to PR19, regarding the average length of service. This is because in all our previous projection exercises no national values were available, so we had to use some adjusted 2008 EU averages. In AR21 the Romanian House of Pension has made these figures available (for 2018 and 2019), so we can prolong the time series accordingly.

### F. Military and farmers

These categories are detailed under the Special Pensions hereinafter. Still, there is a methodological modification, as compared with PR19, to be mentioned: The number of military pensioners used to be projected as constant from the base year on (150.8 thou in AR18), while now we develop it in line with the evolution of the state's social insurance old age pensioners (hence, going from 173.2 thou in 2019, to 183.6 thou in 2070). The farmer pensioners, despite being expected to extinct rather according to PR19 (around year 2030), are projected now with slower extinction pace, in accordance with the recent historical evolution.

### **G. Non-earnings related minimum pension**

The new pension law introduces the minimum pension, as described in page 5 above. The development of the minimum pension number of beneficiaries and volume of expenditures was simulated as follows:

- The present income brackets of the pensioners develop in line with the pension indexation formula.
- The threshold of the minimum pension goes in line with the average economy wide wage, on the assumption that the minimum wage stays at the actual 40% of the average wage level.

### **H. Private pensions**

Some methodological explanations regarding the private pensions:

- a) In the previous exercises we didn't count the private pensioners, since they were already counted as pensioners inside the public scheme. This explains the zeros in PR19.
- b) The projection model approaches the pension system as a monopillar one, reformed to a public + pension one as from base year +1. So, we have to mix outside the model, these future payments with those already made since 2008.
- c) Pillar 3 (facultative private) is projected totally outside the model
- d) The modality of payments is still hieratic in Romania. In the beginning, the private pensions were paid only as lump sum at retirement. Presently, beneficiaries can opt for a lump sum or a number of monthly instalments, but during maximum 5 years.

From the modelling perspective, fact d) created distortions, because private pension lump sums were put together with public pension lifetime annuities. The most significant distortions affected the new streams, as we considered their lump sum as their first pension (which is true, but it is also the last). From AR21 on we split all these lump sums into lifetime annuities, for both mandatory and non-mandatory schemes. So, this marks the higher starting points for PR19 and the different trajectories. Then, the higher CPI and higher real interest rates determines AR21 expenditure curve to exceed PR19's one.

Notably, in PR19 we indexed non mandatory pensions only with inflation. The number of non-mandatory pension (Pillar 3) beneficiaries, we approximate it to evolve with the number of P3 contributors. Under PR19 we kept them rather negligible, around the base year level.

## I. Special pensions

According to the Romanian domestic definition, the category of “special” (or “service”) pensions refer to a group of professions for which the amount of pension computed according to the contribution formula (paid, as a regular one, from the State’s Social Insurance Budget) is supplemented from the State’s Budget. The civil professions (currently about 9.3 thou persons) referred are:

- Members of the diplomatic and consular body (law 216/2015)
- Parliamentary civil servants (law 215/2015)
- Professional personnel from the civil aviation (law 83/2015)
- Lawmakers, judges and prosecutors (law 303/2004)
- Specialized auxiliary personnel of the courts and prosecutors’ offices (law 130/2015)
- Members of the Court of Accounts (law 7/2016).

In average, the non-contributory part represents circa 70-80% of the total pension of these persons.

Number and average amount of the special pensions, in March 2020

Category	Number beneficiaries	Average monthly pension - euro-		
		TOTAL	Average contributory pension (State’s Social Insurance Budget)	Average special pension (Supplement from State’s Budget)
Diplomacy	835	1214	588	696
Parliamentarians	791	1001	594	581
Aeronautic personnel	1,426	2387	800	1633
Magistrates	4,018	3972	671	3705
Auxiliary Court personnel	1,789	980	452	577
Court of Accounts	604	1709	843	877

The laws enforcing the special pension categories are from 2015-2016, except for magistrates, whose special pension benefits are based on a law from 2004. Therefore, the statistics for civil special pensions in Romania begin in 2016.

Beginning with AR21, we include the projected civil special pension expenditures in our projections. They constitute, along with special indemnity, farmers and military pensions, the “Other pensions” category in our questionnaire. Here is a split of these four components (statistical data 2016-2019 and projections 2020-2070):

	2016	2017	2018	2019	2025	2030	2040	2050	2060	2070
Expenditures (mil euro), out of which	<b>2303.3</b>	<b>2735.3</b>	<b>2846.3</b>	<b>2896.7</b>	<b>3718.5</b>	<b>4459.1</b>	<b>7454.8</b>	<b>10862.1</b>	<b>14099.8</b>	<b>18008.3</b>
-Civil	140.8	171.4	205.1	222.2	280.8	341.9	518.6	785.1	1178.5	1743.6
-Military	1268.8	1661.2	1738.7	1717.1	2562.3	3400.9	6348.6	9416.0	12054.9	14977.6
-Farmers	452.8	461.7	458.4	450.4	422.2	293.3	147.0	96.4	43.5	20.6
-Special indemnity	440.9	441.0	444.1	507.0	453.2	423.0	440.5	564.6	822.8	1266.5
Number beneficiaries (thou), out of which:	<b>1120.4</b>	<b>1044.9</b>	<b>972.7</b>	<b>897.5</b>	<b>606</b>	<b>474.8</b>	<b>363.9</b>	<b>313.7</b>	<b>277.4</b>	<b>248.6</b>
-Civil	7.4	8.7	9.1	9.3	9.3	9.3	9.3	9.3	9.3	9.3
-Military	152.1	163.6	172.2	173.2	189.1	198.7	223.1	224.0	206.8	183.6
-Farmers	418.6	375.0	335.6	298.5	151.2	85.8	27.6	8.9	2.9	0.9
-Special indemnity	542.3	497.6	455.8	416.5	256.4	181.0	103.9	71.5	58.4	54.8

In the pension projection questionnaire, the civil special pensioners are not counted in the total number of pensioners, because they are already counted with their contribution-computed part of the benefits. The civil special pension methodology keeps constant the number of beneficiaries, at the base year’s level. As for the pension indexation, beginning with 2017 they increase only by the inflation rate. The new streams are considered to increase with the average wage growth. The number of new pensioners is estimated as 5% of the total pensioners.

For farmers, who are paid from the State’s Budget, the system is closed (so there are no new entrants).

Apart from the civil special pensions, the military pensions are also defined in Romania as “special”. They include military, police, intelligence and special public servants from penitentiaries and, beginning with 2015, are paid (in full) from the State’s Budget. Their evolution (past and projected) has been included in our questionnaires since AR09. Military pensioners are modelled as number in line with the number of regular old-age pensioners. Their

pensions are indexed with inflation. The military pension scheme is separated from the regular public scheme. These pensions are not calculated on a point-basis, but as 80% of the person's average earnings during 6 consecutive months out of the last 5 career years. The statutory retirement age is 60, while the full contribution period is 25 years, out of which at least 15 years of military service. In our projection model, the average pension of new streams is estimated as 80% of 1.25 x average economy-wide wage. Beginning with 2018, the active military contribution rate (called "individual contribution to the State's Budget", equivalent of the regular social insurance contribution rate) is 25% as well. The total volume of these military pension contributions in 2019 was RON 3720 mil (circa 750 million euro).

The special indemnity pensioners are some categories of pensioners who receive a certain supplement (under the name of either "indemnity" or "pension") and can be assimilated with "merit and deprived" class from Annex 3. They are called herein "special indemnity" and include as follows (March 2020 – average r.o.e 1 euro= RON 4.8263):

Category	Number of beneficiaries	Average monthly indemnity - euro
1. War veterans, disabled and widows (Laws 49/1991 and 44/1994)	46,510	149
2. Persecuted by the former Communist regime (1945-1989), departed, prisoners (Law Decree 118/1990)	29,899	382
3. Persecuted by the former Communist regime (1945-1989), departed, prisoners (Law 189/2000)	82,940	175
4. Persons who served as military under the General Directorate of Working Service during 1950-1961 (Law 309/2002)	86,334	17
5. Merit: heroes of the Romanian Revolution December 1989 (Law 341/2004)	13,322	378
6. Artists (Law 109/2005)	612	71
7. Art unions (Law 8/2006)	13,005	235
8. Survivor pensioner spouse (Law 578/2004)	118,123	23

For the special indemnity, each category was modelled separately, according to its specific trends (as number and average pension). Noticeable, only the last 3 of these 8 categories are still open, so that new streams of pensioners will come.

In brief:

“Other pensions” included in our Pension Projection Questionnaire are the pensions that coexist with the pillar I, II and III pensions, so they are an equivalent of the AWG-defined “Special pensions”. These “Other”/ “Special” pensions are:

- Civil special pensions
- Military pensions
- Farmer pensions
- Special indemnities

Nevertheless, under the Romanian domestic definition, “Special pensions” are only the first two of these four: civil and military special pensions.

As for the categories specified in Annex:

- Pensioners coming from difficult working conditions are not subject to a special pension; instead, they benefit of an additional 4% (difficult working conditions) / 8% (special working conditions) social insurance contribution, to be supported by their employer. They also benefit of being included in better remunerated official groups of work.
- Judicial civil servants: here we included 2 out of the 6 categories of civil special pensions: magistrates (judges and prosecutors) and auxiliary Court personnel.
- The remaining 4 categories are accounted as „other civil servants – legislative, executive”
- Farmers are included under „Other special pensions – self employed”

## J. Administrative data

**Table A4a: administrative data on new pensioners (2019) - men**

Age Group	All	Old age	Disability	Survivor	Other (including minimum)
15-49	12648	566	7671	4411	0
50-54	7539	1883	5451	64	141
55-59	14926	7901	6389	43	593
60-64	48694	40870	4687	69	3068
65-69	51672	47917	17	141	3597
70-74	854	750	0	48	56



*Source:* Commission services

**Table A4b: administrative data on new pensioners (2019) - women**

Age Group	All	Old age	Disability	Survivor	Other (including minimum)
15-49	12184	51	6836	5297	0
50-54	6536	922	4889	711	14
55-59	30641	24112	5172	991	366
60-64	67558	58202	627	7845	884
65-69	7395	3013	0	4336	46
70-74	4212	383	0	3823	6

*Source:* Commission services

**Table A4c: administrative data on new pensioners (2019) - total**

Age Group	All	Old age	Disability	Survivor	Other (including minimum)
15-49	24832	617	14507	9708	0
50-54	14075	2805	10340	775	155
55-59	45567	32013	11561	1034	959
60-64	116252	99072	5314	7914	3952
65-69	59067	50930	17	4477	3643
70-74	5066	1133	0	3871	62

*Source:* Commission services

### K. Calculation of pensions: numeric example:

Let's consider the case of a pensioner receiving a pension amount of RON 1000 in August 2019.

The point value in August 2019 was RON 1100. Thus, the average number of points of this person is  $1000/1100 = 0.91$ .

Now, it's also important when this person retired. Let's say it's about a woman who retired in 2015. The correction index set for 2015 was 1.07, while the statutory contribution period for women was (in 2015) 30.1 years.

According to the old law, the effective average number of points of this person was adjusted by the correction index (1.07), to get to the "final" average number of points (0.91). Thus, this lady effectively accumulated  $0.91/1.07 = 0.85$  average points throughout her career. While the total accumulated number of points is  $0.85 \times 30.1 = 25.55$ .

Note: this was technically a reverse calculation; in reality, the average number of points (0.85) is known and the pension amount is the result.

Note: The amount of her pension at retirement (back in 2015) was  $\text{Point Value (2015)} \times \text{Total points accumulated} \times \text{Correction index (2015)} / \text{Statutory contributory period (2015)} = 830.2 \times 25.55 / 30.1 \times 1.07 = 830.2 \times 0.85 \times 1.07 = 830.2 \times 0.91 = \text{RON } 755.5$ .

- According to the old law, her pension amount in the future would have equalled to  $0.91 \times \text{PV}$  (each year). According to the old formula of PV indexation, at the beginning of 2022, PV would have been RON 1236.1. Hence, the lady's pension would have been  $0.91 \times 1236.1$  (=PV OLD of 2022) = RON 1124.9.

- According to the new law, her recalculated pension as in January 2022 will be:  $25.55$  (total number of points accumulated)  $\times$  RPV (reference point value of 2022). RPV is defined as the ratio between PV and the average effective level of the contribution periods provided for by the previous legislation, respectively 25. At the date when the new law enters into force,  $\text{RPV} = 1875$  (=PV ad hoc set as from September 1<sup>st</sup>, 2021) / 25 = 75. Hence, this woman's pension will change to  $25.55 \times 75 = 1916.25$  in 2022. Then, this amount will develop in line with the RPV (or, equally, PV) indexation.

- Note: in this numeric example we compared AR18 baseline with the new legislation frame (thus, including the PV assumptions from back in 2016). For comparability reasons, we can start the exercise as from the updated level of PV in 2022, which is 1875. Hence, her pension under the old rules would equal in 2022 with  $0.91 \times 1875 = \text{RON } 1706.25$ . The increase up to the new value (1916.25) is by 12%. As we mentioned, such increase differs according to the year when the person retired. We carried out a simulation over the whole mass of pensioners, and the average resulted rise will be 14%.

Over the entire projection horizon, the ratio between the amount of her pensions (NEW vs OLD law), will be:

$$\text{Pension benefit NEW} = \text{RPV}_Y * N = \text{PV new}_Y / 25 * N$$

$$\text{Pension benefit OLD} = \text{PV old}_Y * N * \text{CI} / T$$

where  $N = 25.5$ ,  $T = 30.1$ ,  $\text{CI} = 1.07$ ,  $Y = \text{current year}$

$$\text{NEW/OLD} = (\text{PV new} / \text{PV old})_Y * T[2015] / \text{CI}[2015] / 25$$

$$\text{NEW/OLD} [(Y+1)/Y] = (\text{PV new}_{Y+1} / \text{PV new}_Y) / (\text{PV old}_{Y+1} / \text{PV old}_Y) =$$

$$= (1 + \text{inflation} + 50\% \times \text{wage growth}_Y) / (1 + \text{inflation} + 50\% \text{ falling to } 0\% \times \text{wage growth}_Y),$$

Hence, as numerator is higher than the denominator, the gap between NEW and OLD augments continuously. If this lady is lucky enough to reach the year 2070, her pension under the new law will be three times the one under the old law, at the end of the projection horizon. The reason is that the new pension law is generous with the existing pensioners (recalculated pension amount formula plus 100% inflation + 50% wage growth indexation of the point value), while, on the other hand, the new streams will not benefit of the correction index (which connected the new pension amount with the wages) anymore.