Romania

Country fiche on pension projections prepared for the Economic Policy Committee

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PART I. OVERVIEW OF THE PENSION SYSTEM

1.1. Description of the Romanian pension system

The Romanian Pension System, governed by Law no. 263/2010, which entered into force on January 1st, 2011, 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 solidarity. This scheme includes old age pension, early retirement pension, partial early retirement pension, disability pension and survivor pension based on intergenerational solidarity.

Pillar II, the **mandatory private pension scheme,** 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); The access has begun in 2007; the scheme is compulsory for all eligible persons aged up to 35 and voluntary for age group 35-45. Portfolio size by December 2016: 6.80 million participants, total assets equivalent of 7000 million euros.

The second pillar contribution quota in 2017 is 5.1%, from the total employee's social contribution quota of 10.5%. The second pillar contribution rate is expected to increase to 6% in 2018, according to the current legislation.

Pillar III, the **voluntary private pension scheme,** 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 funds, 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, the age of 60 and a minimum cumulated amount. 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 December 2016: 410.2 thousand participants, total assets equivalent of 330 million euros

➢**The social allowance for pensioners** addresses the public system pensioners, resident in Romania, regardless of the retirement application date, if their monthly pension quantum is below the ceiling set by the law (2017 - 520 RON, the equivalent of approx. 117 euro). This social allowance was introduced by the pension Law no. 263/2010 and completes the old age and early retirement pensions, as well as the disability ones. Before this measure, there was no supplement for the pension benefits. Those who don't comply with the 15 year contribution period requirement get the minimum income guarantee (of 32 euro per month in 2017), to be replaced as of April 1st 2018 by the minimum inclusion income (up to the ceiling of 300 RON,

equivalent of 65 euro per month). As most of the present pensioners worked part of their career during the communism, almost all completed at least the minimum contribution period. These social pension entitlements have evolved as follows:

Year	2010	2011	2012	2013	2014	2015	2016
Number of beneficiaries (thou)	419.1	413.5	421.5	391.3	370.6	478.2	459.4
Average level of monthly allowance (euro)	21.54	21.52	20.67	21.32	23.20	28.80	31.18

➢ **Eligibility requirements**

The old age pension is granted to the insured that cumulatively fulfill 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 increasing). The full contribution period gradually increases up to 35 years (same intervals of increasing). December 2016: standard retirement age: 60 years /6 months (F), minimum contributory period 15 years (F), full contributory period 30 years/6 months (F).

For active military police corps and special public servants within national defense, 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 can be granted up to 5 years before the insured person reaches the standard retirement age, 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 quantum is calculated by diminishing the old-age pension benefit by 0.75% for each month of anticipation before complying with the old-age pension requirements. At the time when the old age pension requirements are fulfilled, the early pension is transformed into old age pension.

When the accumulated contribution period is calculated in order to register for early retirement, the following are not taken into account:

- the period when the insured benefited of a disability pension;

- the years spent full time on higher education courses, at the end of which the individual graduated with a diploma;

- the time served in the military, or while having been called under arms or taken prisoner;

- the time spent studying in a military / police school institution, as a pupil or student.

Numeric example (table 1 below): As one can see, the early retirement pension can be granted only upon completing full contributory period plus at least 8 years. Someone in this situation can retire not sooner than 5 years before the statutory retirement age, without being penalized. The penalty is associated with the **partial** 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 before the statutory retirement age (no matter how many years he contributed, between T and T+8, with T being the full contributory period). The quantum of the penalty would be 5 years x 12 months per year x 0.75% = 45%, until the person reaches the statutory retirement age.

Table 1: Qualifying condition for retiring

		2016	2020	2030	2040	2050	2060	2070
Qualifying conditions for retiring with a full pension (statutory old age)	Contributory period- men	15	15	15	15	15	15	15
	Contributory period- women	15	15	15	15	15	15	15
	Retirement age - men	65	65	65	65	65	65	65
	Retirement age – women	60.3	61.3	63	63	63	63	63
Qualifying conditions for retiring with a full pension (early retirement)	Contributory period- men	43	43	43	43	43	43	43
	Contributory period- women	43	43	43	43	43	43	43
	Retirement age - men	60	60	60	60	60	60	60
	Retirement age – women	55.3	56.3	58	58	58	58	58
Qualifying conditions for retiring **without** a full pension (partial early retirement)	Statutory retirement age - men	65	65	65	65	65	65	65
	Statutory retirement age - women	60.3	61.3	63	63	63	63	63
	Early retirement age - men	60	60	60	60	60	60	60
	Early retirement age - women	55.3	56.3	58	58	58	58	58
	Penalty in case of earliest retirement age	45%	45%	45%	45%	45%	45%	45%
	Bonus in case of late retirement	-	-	-	-	-	-	-
	Minimum contributory period - men	36	36	36	36	36	36	36
	Minimum contributory period - women	31.4	32.4	36	36	36	36	36
	Minimum residence period - men	-	-	-	-	-	-	-
	Minimum residence period - women	-	-	-	-	-	-	-

The **survivor pension** is paid to children up to the age of 16 (or until they complete their studies) and to the surviving spouse (when they reach the standard retirement age). If the surviving spouse is also entitled to their own pension, they can choose the more advantageous of the two. The quantum 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 **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 quantum of the disability pension is the result of the 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 between the full contribution period and the stage already achieved. The monthly number of potential points equals to 0.70 / 0.55 / 0.35 of the old-age point value, depending on the degree of disability.

➤ The **Social security contribution quotas** are: 10.5% for the employee (including also the quota corresponding to private pensions funds - 5.1% in 2017) and 15.8% for the employer;

➤ **Employees can cumulate wages with pension benefits.** Note that, for public sector employees, before October 1st, 2014, cumulating pension with wage was allowed only if the level of the pension benefits did not exceed the economy-wide average wage.

➤ **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. For **2017**, the value of the pension point was set at **917.5 RON in January 2017,** followed by a 9% increase to **1000 RON (222.68 euro) in July 2017.** The value of the correction index, to be applied only once, at retirement, was set to 1.14, for persons who apply for retirement as of January 1st, 2017.

➤ **Point value indexation**
- According to Law 263/2010, beginning with the 1st 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 is negative, only the positive value will be considered.

Note: The 9% increase of the point value from July 1st, 2017 was adopted by Government's Emergency Ordinance and is supplementary to the development according to Law 263/2010.

Starting with 2021, the pension point value will be annually indexed with 100% inflation rate plus 45% of the real average gross wage growth of the previous year. The weight of the real average gross wage growth will be gradually reduced by 5% each year; Hence, starting with 2030, the pension point value will be indexed annually only by 100% inflation rate.

Note: In the Government's Program, one of the measures taken into consideration for the forthcoming years is the increase of the pension point value, as follows:

➤As from July 1st, 2018 the point value will reach 1,100 RON (245 eur) - decision entered into force on November 16th, 2017, by Government's Emergency Ordinance no. 82/2017.
The increase of the point value according to the Government's Program in 2018 is 10%, while the increase according to Law 263/2010 is 8.7% in 2018.

➤As from April 1st, 2019 the point value to reach 1,265 RON (282 eur),
➤As from April 1st, 2020 the point value to reach 1,400 RON (312 eur) and
➤As from October 1st, 2020 the point value to reach 1,775 RON (395 eur).
These three increases represent targets of the social policy, are not legislated and therefore not included in the present baseline scenario.

The comparative effects of such increases on the gross public pension expenditure as % of GDP are shown in the following table and graph as three different scenarios: 1. A scenario based on the point values increasing according to the July 2017 legislated formula; 2. The baseline scenario of the Ageing Report 2018 projections, taking into account the already legislated ad-hoc 2018 value increase and 3. A scenario considering all the additional ad-hoc increases envisaged until 2020, not yet legislated.

	2016	2020	2030	2040	2050	2060	2070
1. Point value = 985.6 RON (July 2017, before GOE 82/2017)	7.99	6.98	6.51	7.68	8.67	8.93	8.69
2. Baseline AR 2018 projections - Point value July 2018 = 1100 RON	7.99	7.28	6.65	7.72	8.68	8.93	8.69
3. Multiple point value increases (July 2018 = 1100 RON .. Oct 2020= 1775 RON)	7.99	8.91	7.43	7.99	8.72	8.93	8.69

Ad-hoc increases of the pension point value influences only the cohorts who retired in years before the revision's one (Graph below). This is because of the new pension stream formula, which links the new pension only with the previous year's economy-wide average. The connecting element is the correction index applied to the total number of points accrued by new pensioners. In this manner, any increase in the point value is counterbalanced by the decrease of the correction index (and, thus, of the number of average pension points the pensioner goes on with, all along his retirement period). Hence, the impact of an ad-hoc increase of the point value in a given year is maximal in that year; afterwards it phases out, with the gradual extinction of the generations of pensioners who retired prior to that given year.

The European Commission underlines the necessity to mention that such ad-hoc increases in the point value, above the levels resulted from the legislated formula, lead to more significant increases than in the present set of projections.
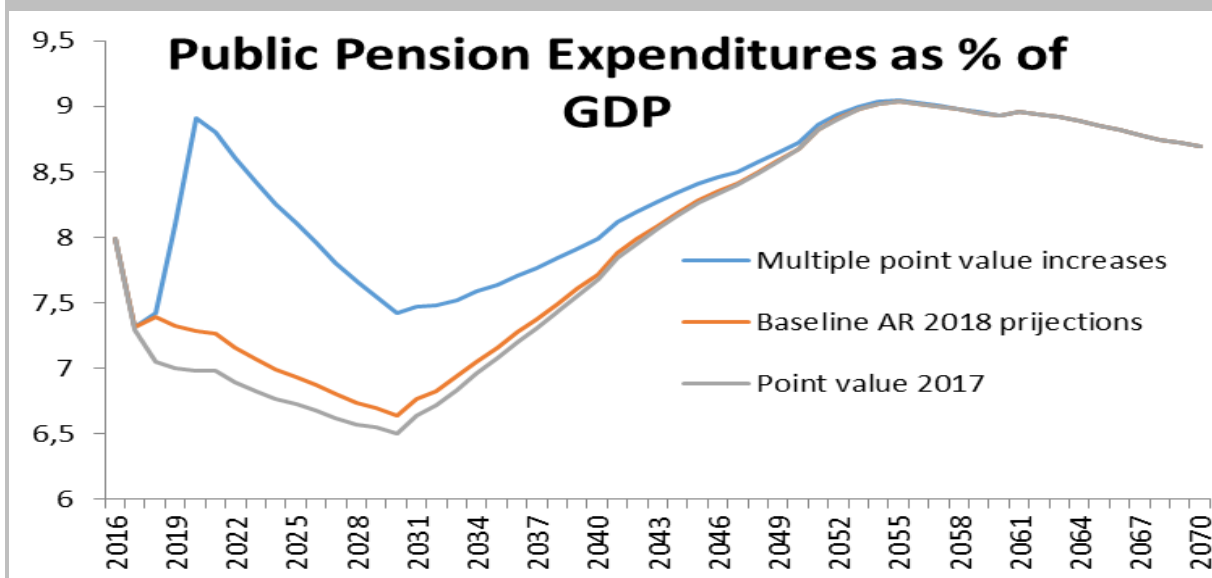
Regarding the history of the ad-hoc increases of the pension point in Romania, here is how the average pension evolved in the recent past:

	2012	2013	2014	2015	2016	2017
Social Insurance Pension	774	806	847	893	949	1089
- percentage change compared to previous period-	2.8	4.1	5.1	5.4	6.3	14.8
calculated according to Law 263/2010's formula	4.68	4.99	3.75	4.37	4.31	4.63
of which:						
- State's Social Insurance Pension		809	845	886	931	1065

- percentage change compared to previous period-		4.0	4.4	4.9	5.1	14.4
Point value	732.8	762.1	790.7	830.2	871.7	958.75

Thus, in 2012 the point value was still frozen to its 2010 level (below the value calculated according to the formula); afterwards, the ad-hoc increases haven't been significant, until the 9% increase from July 2017.

Table 2a: Number of new pensioners by age group – administrative data (year 2015) M

Age Group	All	Old age	Disability	Survivor	Other
0-49	13857	1034	12823	M+F = 37687 (not available by age brackets)	
50-54	7415	1953	5462		
55-59	22986	13146	9840		
60-64	52208	46797	5411		
65-69	46938	46912	26		
70-74	607	607			

Source: Commission services

Table 2b: Number of new pensioners by age group – administrative data (year 2015) F

Age Group	All	Old age	Disability	Survivor	Other
0-49	11599	41	11558	M+F=37687 (not available by age brackets)	
50-54	7455	1466	5989		
55-59	35705	28217	7488		
60-64	69827	69727	100		
65-69	2562	2562	0		
70-74	173	173			

Source: Commission services

Table 2c: Number of new pensioners by age group – administrative data (year 2015) TOTAL

Age Group	All	Old age	Disability	Survivor	Other
0-49	25456	1075	24381	37687 (not available by age brackets)	
50-54	14870	3419	11451		
55-59	58691	41363	17328		
60-64	122035	116524	5511		

| 65-69 | 49500 | 49474 | 26 |
| 70-74 | 780 | 780 | |

PART II. Overview of the Demographic and labour forces projections

2.1 Demographic development

Similarly with the evolutions in other European Union member states, the pace of the ageing expenditure growth is influenced in Romania by a pronounced inversion of the age pyramid.

Table 3 – Main demographic variables evolution

Demography	2016	2020	2030	2040	2050	2060	2070	Peak year
Population (thousand)	19,672	19,199	17,965	17,029	16,301	15,664	14,985	2016
Population growth rate (%)	-0.7	-0.6	-0.7	-0.5	-0.4	-0.4	-0.4	2053
Old-aged dependency ratio (pop65/pop15-64)	26.3	29.6	34.7	45.7	54.2	56.7	52.8	2055
Ageing of the aged (pop80+/pop65+)	24.4	24.9	26.8	31.2	33.2	41.2	46.2	2070
Men - Life expectancy at birth	71.8	72.9	75.4	77.8	79.9	81.8	83.6	2070
Men - Life expectancy at 65	14.8	15.4	16.8	18.2	19.5	20.8	22.0	2070
Women - Life expectancy at birth	78.9	79.9	81.8	83.6	85.3	86.9	88.3	2070
Women - Life expectancy at 65	18.2	18.8	20.2	21.5	22.8	24.0	25.1	2070
Men - Survivor rate at 65+	72.1	74.4	79.1	82.9	86.1	88.7	90.8	2070
Men - Survivor rate at 80+	35.3	38.8	46.7	54.1	60.9	66.9	72.2	2070
Women - Survivor rate at 65+	87.1	88.2	90.3	92.0	93.4	94.5	95.5	2070
Women - Survivor rate at 80+	58.7	61.6	67.7	73.1	77.7	81.5	84.8	2070
Net migration (thousand. of pers.)	-63.8	-65.1	-51.1	-8.9	7.7	1.6	2.6	2052
Net migration over population change	0.5	0.5	0.4	0.1	-0.1	0.0	0.0	2018

In Romania, the life expectancy at birth for men is estimated to grow by approximately 11.8 years over the projection horizon, from 71.8 in 2016 to 83.6 in 2070. For women, the life expectancy at birth is estimated to grow by 9.4 years, from 78.9 in 2016 to 88.3 in 2070, these trends reflecting a slight convergence of life expectancy between men and women.
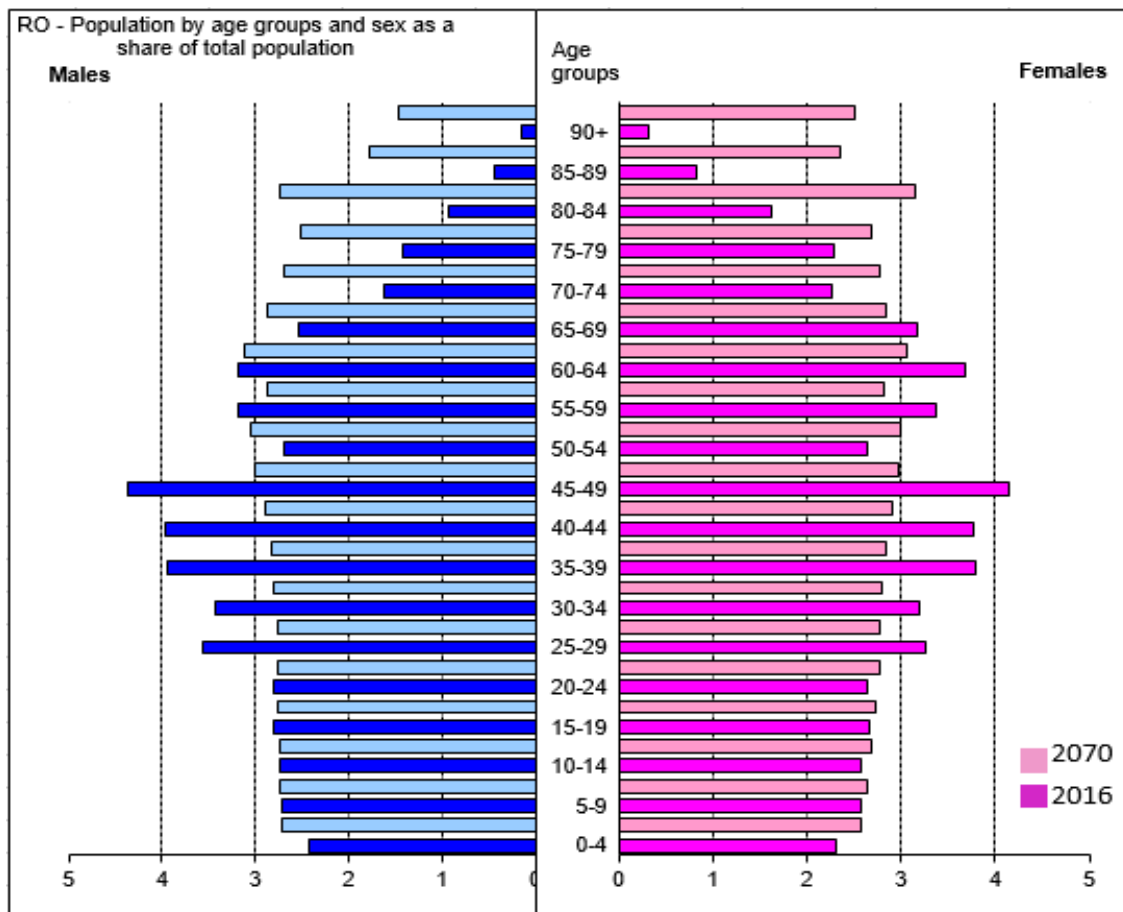
In the case of women, the increase in life expectancy for the period 2016-2070 is the largest in the EU28 + NO, according to graph 1 hereafter, and in the case of men RO has the third largest growth.

Graph 1 – Increase in life expectancy at birth for men and women: 2016 vs 2070
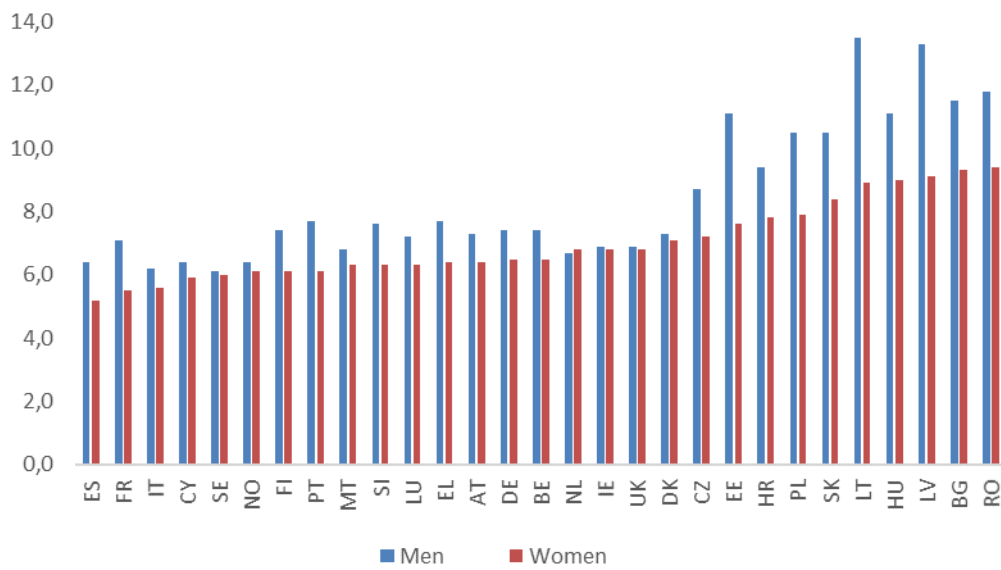
Source: Eurostat

## Graph 2 - Structure of population: 2016–2070

Source: Eurostat

The demographic changes will alter the structure of population in Romania. The extent and the pace of the ageing of population depend on the future trends in life expectancy, fertility and migration.

The magnitude and speed of aging population will change the ratio between retirement age and the working age population, so that the labour market will undergo significant changes in its age structure, with an overall negative impact. 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 thereof. This trend, of constant growth in the pension expenditures, will reverse after 2040, when the volume of new pension system entries will become 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 entry the pension system around 2030 and will begin to exit as from 2040.

Graph 3 - Development of population
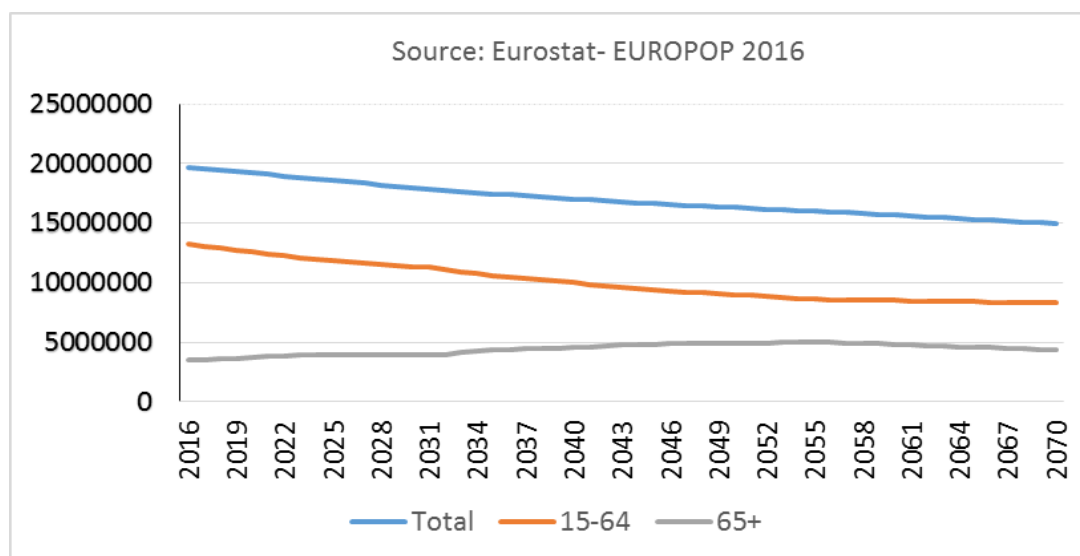
Source: Eurostat

The results of the demographic projections made by Eurostat for Romania (EUROPOP 2016), reflect a significant drop in the volume of population, by 4.7 million persons, in 2070, as compared to 2016 (a 23.8% decrease).

By 2070 RO will drop a position in the rank of population share within the total population in EU28 + NO in the favor of NL, according to chart 4 hereafter. The main drivers for this change are the ageing population, the fertility rates and the levels of migration.
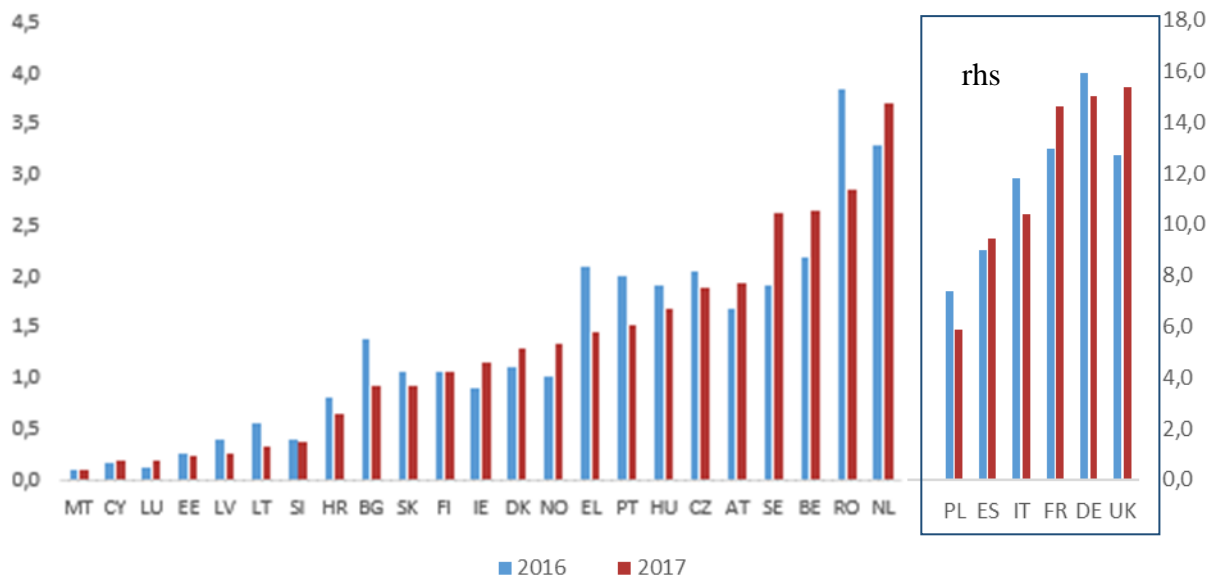
Source: Eurostat

The population of the European Union is estimated to increase until 2070 by about 12 million people. Among the countries with a significant positive fluctuation are United Kingdom with an increase of about 15.6 million (3% of the total population) and France with an increase of about 10 million (2% of the total population). Among the negative trends, Poland stands out with a decrease of about 7 million (-1.5% of the total population) and Italy with a 5.8 million drop (-1.3% of the total population).

The highest positive fluctuations are estimated for Sweden +40.5% 2070 vs 2016 (increase of 4 million people) and Norway +34.3% 2070 vs 2016 (an increase of 1.8 million people). The highest decreases are estimated for Lithuania -40.3% (a decrease of 1.2 million people), Bulgaria and Latvia – 31.8% (BG -2.3 million people, LV -0.6 million people).

The ageing of the population in Romania is also a consequence of the low fertility. In 2015 the fertility rate was 1.58 children per woman, below the optimal replacement level. The level estimated by Eurostat for the Romanian fertility rate in 2070 is 1.89.

Although the young population decreases as result of the constant reduction in the number of women at the fertile age, there are still some positive signs, coming from the augmentation of the fertility rate.

Graph 5 - Fertility rate
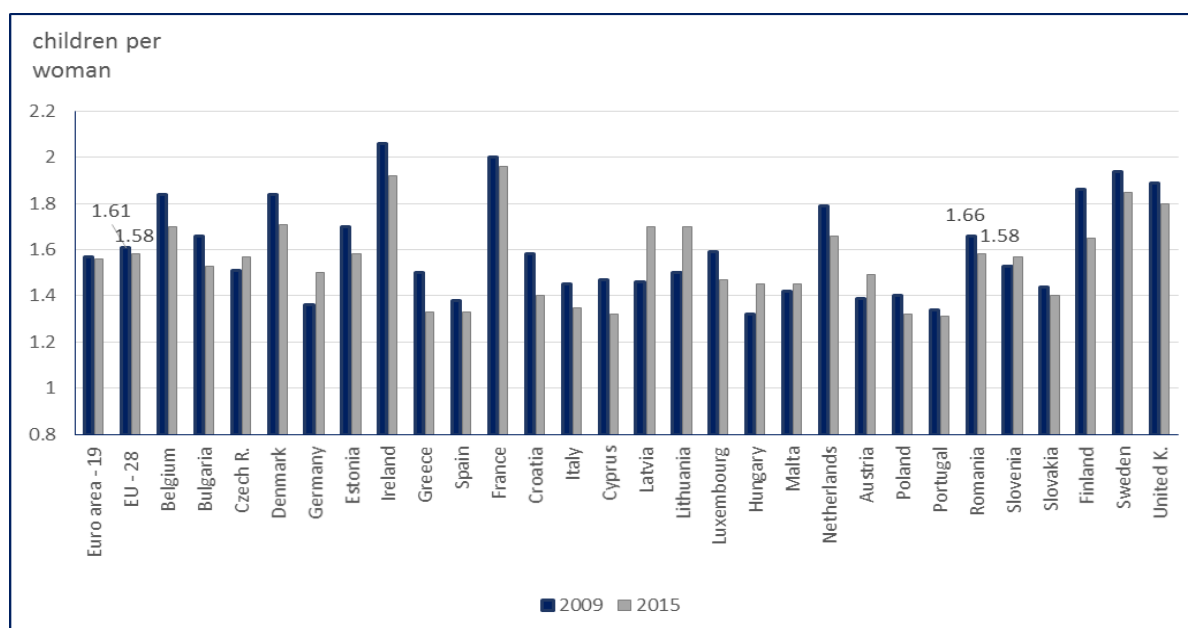
Source: Eurostat

2.2 Labour forces

Table 4 – Participation rate, employment rate and share of workers for the age groups 55-64 and 65-74

	2016	2020	2030	2040	2050	2060	2070	Peak year
Labour force participation rate 55-64	44.0	47.5	51.5	49.9	49.7	51.4	50.7	2026
Employment rate for workers aged 55-64	42.6	46.3	49.9	48.4	48.3	49.8	49.2	2026
Share of workers aged 55-64 on the total labour force	96.8	97.4	96.8	96.9	97.0	96.9	97.0	2021
Labour force participation rate 65-74	15.1	12.8	14.7	16.4	15.4	15.3	16.1	2036
Employment rate for workers aged 65-74	15.1	12.8	14.7	16.4	15.4	15.3	16.1	2036
Share of workers aged 65-74 on the total labour force	100.0	100.0	100.0	100.0	100.0	100.0	100.0	2016
Median age of the labour force	40.0	41.0	43.0	43.0	42.0	41.0	41.0	2034

Table 4 reflects an increase in the employment rate and labour force participation rate for persons aged 55-64 until 2020-2030 and for persons aged 65-74 until 2030-2040. Afterwards,

the weight begins to drop, toward the end of the projection horizon, as result of the cycle ending for the so-called baby-boom phenomenon.

Table 5a - Labour market effective exit age and expected duration of life spent at retirement

MEN	2017	2020	2030	2040	2050	2060	2070	Peak year
Average effective exit age (CSM)	64.0	64.0	64.0	64.0	64.0	64.0	64.0	2016
(Average) Contributory period	32.9	33.4	34.2	33.9	34.7	35.2	35.1	2062
Duration of retirement *	15.6	16.1	17.5	18.9	20.3	21.6	22.8	2060
Duration of retirement / contributory period	0.5	0.5	0.5	0.6	0.6	0.6	0.6	
Percentage of adult life spent at retirement **	25.3	25.9	27.6	29.1	30.6	32.0	33.1	2060
Early / late exit ***	1.6	1.4	1.4	1.0	0.9	0.8	0.9	2016

Calculated as the difference between the life expectancy at average effective exit age and the average effective exit age itself.

**Calculated as the ratio between the duration of retirement and the life expectancy diminished by 18 years.

***Is the ratio of those who retired and aged less than the statutory retirement age and those who retired and are aged more than the statutory retirement age.

Table 5b – Labour market effective exit age and expected duration of life spent at retirement

WOMEN	2017	2020	2030	2040	2050	2060	2070	Peak year
Average effective exit age (CSM)	62.4	62.4	62.6	62.6	62.6	62.6	62.6	2016
(Average) Contributory period	28.3	28.8	28.9	29	29.5	30	30	2066
Duration of retirement *	20.8	21.3	21.9	23.2	24.5	25.8	26.9	2070
Duration of retirement / contributory period	0.7	0.7	0.8	0.8	0.8	0.9	0.9	
Percentage of adult life spent at retirement **	31.9	32.4	32.9	34.2	35.5	36.6	37.6	2070
Early / late exit ***	0.7	0.5	0.9	0.7	0.6	0.7	0.8	2027

Calculated as the difference between the life expectancy at average effective exit age and the average effective exit age itself.

**Calculated as the ratio between the duration of retirement and the life expectancy diminished by 18 years.

***Is the ratio of those who retired and aged less than the statutory retirement age and those who retired and are aged more than thestatutory retirement age.

Increasing life expectancy for females and males leads to a longer period of life spent at retirement (+6,1 years for females and +7,2 for males), so that further pressure is added 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 the necessary financial 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 2.2 years for males and 1.7 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).

PART III - PROJECTION RESULTS

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

The table below shows the pension expenditure in % of GDP between 2006 and 2014, according to Eurostat's ESSPROS database and the data provided by Romania to the Ageing Working Group.

Table 6: Eurostat (ESSPROS) vs. Ageing Working Group (definition of pension expenditure - % of GDP)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1. Eurostat total pension expenditure	6.0	6.4	7.5	9.2	9.3	9.1	8.7	8.3	8.2	
2. Eurostat public pension expenditure	6.0	6.4	7.5	9.2	9.3	9.1	8.7	8.3	8.2	
3. Public pension expenditure AWG	6.0	6.3	7.5	9.2	9.2	9.0	8.6	8.2	8.2	8.1
4. Difference (2)-(3)	0	0.1	0	0	0.1	0.1	0.1	0.1	0.0	
5. Expenditure categories not considered in the AWG definition										

III.2 Overview of the projection results

Following the imbalances due to the economic crisis (the fall of GDP, resulting in the raise of the pension expenditures' weight; the pension benefits having been reduced by 15% as a measure of austerity and later reinstated, on the background of recovery), the long run trend seems to be the return to a constant level. Furthermore, the development of the second pillar and the beginning of the pension payments thereof will gradually relieve the stress that would have accumulated on the public pension pillar under the former circumstances.

Table 7: Projected gross and net pension spending and contributions (% of GDP)

Expenditure	2016	2020	2030	2040	2050	2060	2070	Peak year
Gross public pension expenditures	8.0	7.3	6.6	7.7	8.7	8.9	8.7	2055
Occupational pensions	:	:	:	:	:	:	:	
Private pensions	0.0	0.0	0.2	0.5	0.8	1.0	1.1	2070
Mandatory private	0.0	0.0	0.2	0.5	0.8	1.0	1.1	2070
Non-mandatory private	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2017
Gross total pension expenditure	8.0	7.3	6.8	8.2	9.5	10.0	9.8	2055
Net public pension expenditure	7.7	7.2	6.6	7.6	8.6	8.8	8.6	2055
Net total pension expenditure	7.7	7.2	6.7	8.1	9.4	9.9	9.7	2055
Contributions	**2016**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**Peak year**
Public pensions contributions	5.6	5.8	5.4	5.2	5.3	5.5	5.9	2017
Total pension contributions	6.4	7.3	7.3	7.5	7.8	8.1	8.8	2070

After the considerable increase of the gross public pension total expenditure during the first decade of this century, an increase due to the necessary convergence toward a European life standard, these expenditures have reached a significant weight in GDP. Therefore, a pension reform became necessary in order to stabilize this increase. As of 2010, the principle behind the pension indexation has changed, so that the growth has become smaller than the nominal GDP growth.

The macro assumptions indicate a correlation between the average wage' and the GDP's developments. This contradicts the 2012 projection exercise that forecasted that the average wage would double between 2040 and 2060, while the GDP would increase by only 76%. In this context, a limitation of the pension expenditures, as percentage of GDP, is also estimated. As we expect an improvement in the collection of contributions, it is expected that contributions will increase, both as regards the number and the amounts. Hopefully, as from 2030 on, the black or grey parts of the economy will become negligible.

Table 8: Projected gross public pension spending: by scheme (as % of GDP)

Pension scheme	2016	2020	2030	2040	2050	2060	2070	Peak year
Total public pensions of which	8.0	7.3	6.6	7.7	8.7	8.9	8.7	2055
Old age and early pensions	5.9	5.4	4.9	5.9	6.7	6.9	6.7	2055
Flat component	:	:	:	:	:	:	:	
Earning related	5.9	5.4	4.9	5.8	6.7	6.9	6.7	2055
Minimum pensions (non-contributory)	0.03	0.03	0.02	0.03	0.03	0.04	0.04	2061
Disability pensions	0.61	0.63	0.72	0.74	0.68	0.63	0.65	2031
Survivor pensions	0.42	0.38	0.38	0.46	0.55	0.59	0.57	2061
Other pensions	1.03	0.85	0.64	0.65	0.72	0.76	0.80	2016

The application of the pension reform has already begun to produce improvements, as the weight of the old age pensions in GDP has decreased. Furthermore, the strict criteria imposed for the disability pension eligibility have led to a considerable reduction of the afferent expenditures. On the long-run, the disability and survivor pension expenditures are forecasted to become stabilized, while the old age pension expenditures will gradually diminish, as percentage of GDP, due to the indexation formula. A peak of the old-age pension expenditures is anticipated as the baby-boomers retire. Noticeable, the disability pensions transform into old age pensions, once the standard retirement age is reached. The social pensions will grow faster than the old-age ones, due to the agreed methodology of correlating them to the wage growth, every ten years.

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.

$$\frac{\text{Pension Exp}}{\text{GDP}} = \overbrace{\frac{\text{Population } 65+}{\text{Population } 20-64}}^{\text{Dependency Ratio}} \times \overbrace{\frac{\text{Number of Pensioners (Pensions)}}{\text{Population } 65+}}^{\text{Coverage Ratio}}$$

$$\times \overbrace{\frac{\dfrac{\text{Average income from pensions (Average Pension)}}{\text{GDP}}}{\text{Hours Worked } 20-74}}^{\text{Benefit Ratio}} \times \overbrace{\frac{\text{Population } 20-64}{\text{Hours Worked } 20-74}}^{\text{Labour Market / Labour Intensity}}$$

[1]

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

Two further sub-decompositions have been added in the 2015 exercise:

$$\overbrace{\frac{\text{Number of Pensioners}}{\text{Population } 65+}}^{\text{Coverage Ratio}} =$$

$$= \overbrace{\frac{\text{Number of Pensioners } 65+}{\text{Population } 65+}}^{\text{Coverage Ratio Old-Age}} + \left(\overbrace{\frac{\text{Number of Pensioners} \leq 65}{\text{Population } 50-64}}^{\text{Coverage Ratio Early-Age}} \times \overbrace{\frac{\text{Population } 50-64}{\text{Population } 65+}}^{\text{Cohort effect}} \right) \quad [2]$$

$$\overbrace{\frac{\text{Population } 20-64}{\text{Hours Worked } 20-74}}^{\text{Labour Market / Labour Intensity}} =$$

$$\overbrace{\frac{\text{Population } 20-64}{\text{Working People } 20-64}}^{1/\text{Employment Rate}} \times \overbrace{\frac{\text{Working People } 20-64}{\text{Hours Worked } 20-64}}^{1/\text{Labour intensity}} \times \overbrace{\frac{\text{Hours Worked } 20-64}{\text{Hours Worked } 20-74}}^{1/\text{Career shift}} \quad [3]$$

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 0.7 percentage points.

Obviously, the main pressure related to the increase of the pension expenditures comes from the dependency ratio, as result of the 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.

Moreover, the coverage ratio will also decrease over time. The growth in the number of pensioners will be exceeded by the augmentation of the volume of people aged 65+. The main determination comes from the heightening of the statutory retirement age. This will diminish the number of pensioners below the age of 65, relative to the population 50-64. Moreover, an additional decline of the coverage ratio takes place in the last years of the projection horizon, when the total population will drop as well. The decreasing population also impacts on the number of disability pensions, which also goes down, as well as on the number of survivor pensions, which stagnates.

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 9a: Factors behind the change in public pension expenditures between 2016 and 2070 (in percentage points of GDP) – pensions

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70	Average annual change
Public pensions to GDP	**-0.7**	**-0.6**	**1.1**	**1.0**	**0.3**	**-0.2**	**0.7**	**0.011**
Dependency ratio effect	**1.0**	**1.2**	**2.1**	**1.4**	**0.4**	**-0.6**	**5.6**	**0.102**
Coverage ratio effect	**-0.5**	**-0.4**	**-0.5**	**-0.4**	**-0.1**	**0.2**	**-1.7**	**-0.038**
Coverage ratio – old age*	-0.3	-0.5	-0.3	0.0	0.1	0.1	-0.8	-0.010
Coverage ratio – early age*	-0.6	-0.5	0.8	0.9	0.0	0.1	0.6	-0.008
Cohort effect*	-0.3	0.2	-1.7	-2.1	-0.8	0.6	-4.0	-0.088
Benefit ratio effect	**-0.9**	**-1.4**	**-0.3**	**0.0**	**0.0**	**0.1**	**-2.6**	**-0.046**
Labour market / Labour intensity effect	**-0.2**	**0.2**	**-0.1**	**-0.1**	**-0.1**	**0.1**	**-0.1**	**-0.004**
Employment ratio effect	-0.2	0.2	0.1	-0.1	-0.1	0.0	-0.1	-0.002
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000
Career shift effect	0.0	0.0	-0.2	0.0	0.1	0.0	-0.1	-0.001
Residual	**-0.1**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.0**	**-0.5**	**-0.002**

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

Table 9b: Factors behind the change in public pension expenditures between 2016 and 2070 (in percentage points of GDP) – pensioners

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70	Average annual change
Public pensions to GDP	**-0.7**	**-0.6**	**1.1**	**1.0**	**0.3**	**-0.2**	**0.7**	**0.011**
Dependency ratio effect	**1.0**	**1.2**	**2.1**	**1.4**	**0.4**	**-0.6**	**5.6**	**0.102**
Coverage ratio effect	**-0.5**	**-0.5**	**-0.5**	**-0.4**	**-0.1**	**0.2**	**-1.7**	**-0.039**
Coverage ratio – old age*	-0.3	-0.5	-0.3	0.0	0.2	0.1	-0.8	-0.009
Coverage ratio – early age*	-0.6	-0.6	0.7	0.7	-0.2	0.1	0.1	-0.019
Cohort effect*	-0.3	0.2	-1.7	-2.1	-0.8	0.6	-4.0	-0.088
Benefit ratio effect	**-0.9**	**-1.4**	**-0.3**	**0.0**	**0.0**	**0.1**	**-2.6**	**-0.046**
Labour market / Labour intensity effect	**-0.2**	**0.2**	**-0.1**	**-0.1**	**-0.1**	**0.1**	**-0.1**	**-0.004**
Employment ratio effect	-0.2	0.2	0.1	-0.1	-0.1	0.0	-0.1	-0.002
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000
Career shift effect	0.0	0.0	-0.2	0.0	0.1	0.0	-0.1	-0.001
Residual	**-0.1**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.0**	**-0.5**	**-0.002**

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

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, even after the stabilization of the point value indexation formula. 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, as well as the correction index applied when the quantum of the first pension is calculated, compensate the diminution resulted from the formula.

The following table extracted from the model shows the reformed PAYG pillar formulae. As one can see, both the basic replacement rate and the incremental replacement rate (which is the accrual rate) are different between switchers and non-switchers, with switchers having lower rates for both from the reformed PAYG. In the monopillar table, the incremental replacement rate (given by the wage growth, the full length of service and the pension correction index) multiplied by the minimum statutory length of service gives the basic replacement rate. In the multi-pillar table, shown here, the incremental replacement rate for the switchers diminishes proportionally to the ratio between the quota of contribution remained for the first pillar and the total quota of contribution (also including the contribution to 2nd pillar).

The shift takes into account that the switch implies the separation of the total contribution rate 26.3% (employers 15.8% plus employee 10.5%) into 20.3 % for the public pillar and 6% for the second pillar.

Benefit Formula Parameters for Old age										
	Switchers						Non-switchers			
	2017	2020	2030	2040	2060	2070	2017	2020	2030	2070
Men										
Required Years of Service for Basic RR	15	15	15	15	15	15	15	15	15	15
Basic RR	17.5%	17.5%	17.6%	17.8%	17.9%	17.9%	17.5%	17.5%	17.6%	17.6%
Incremental RR	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	1.2%	1.2%	1.2%	1.2%
Maximum RR	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Women										
Required Years of Service for Basic RR	15	15	15	15	15	15	15	15	15	15
Basic RR	20.2%	19.8%	17.9%	17.8%	17.9%	17.9%	20.2%	19.8%	17.9%	17.9%
Incremental RR	1.0%	1.0%	0.9%	0.9%	0.9%	0.9%	1.3%	1.3%	1.2%	1.2%
Maximum RR	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Men										
Years in Final Average Wage	33	33	33	33	33	33	33	33	33	33
Wages are Valorized to Inflation										
Wages are Valorized to Nominal Wage Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Women										
Years in Final Average Wage	28	28	28	28	28	28	28	28	28	28
Wages are Valorized to Inflation										
Wages are Valorized to Nominal Wage Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

According to the point value indexation formula, the average wage growth will be taken into account less and less and, as from 2030 on, will not be considered at all. Thus, on the overall pensions, the average value will be 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.

Table 10: Replacement rate at retirement and coverage by pension scheme (in %)-

	2016	2020	2030	2040	2050	2060	2070
Public scheme(BR)	35%	32%	27%	26%	26%	26%	26%
Public scheme(RR)	43%	45%	38%	31%	32%	32%	32%
Coverage	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Public scheme– old-age earnings related (BR)	39%	35%	29%	27%	27%	27%	27%
Public scheme– old-age earnings related (RR)	30%	32%	32%	30%	30%	30%	29%
Coverage	66,9	67,8	68,2	71,4	73,2	73,7	72,9
Private individual scheme (BR)	8%	28%	7%	4%	4%	4%	4%
Private individual scheme (RR)	16%	34%	10%	7%	7%	7%	6%
Coverage	0,2	0,8	8,9	39,0	61,6	73,4	75,9
Total (BR)	36%	32%	27%	27%	28%	29%	29%
Total (RR)	44%	49%	45%	37%	39%	40%	39%

The number of pensioners is expected to steadily augment, on the background of the pronounced ageing of the population. The peak value is expected to be reached in 2053 (5640.7 thou); afterwards it will begin to diminish, as the total volume of population will decrease (as from nearly 20 million in 2013 to 17.0 million in 2040 and 15.0 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 currently, 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 11: System Dependency Ratio and Old-age Dependency Ratio

	2016	2020	2030	2040	2050	2060	2070
Number of pensioners (I)	5151.6	5185.9	5130.5	5526.6	5627.3	5466.6	5103.8
Employment (II)	8407.5	8225.9	7268.1	6412.6	5810.0	5497.7	5313.3
Pension System Dependency Ratio (SDR) (I)/(II)	61.3	63.0	70.6	86.2	96.9	99.8	96.1
Number of people aged 65+ (III)	3463.2	3716.1	3941.3	4567.1	4880.3	4804.7	4379.3
Working age Population 15-64 (IV)	13192.9	12563.5	11355.6	9983.4	9002.7	8480.3	8287.2
Old-age Dependency Ratio ODR (III/IV)	26.3	29.6	34.7	45.7	54.2	56.7	52.8
System efficiency SDR / ODR	2.3	2.1	2.0	1.9	1.8	1.7	1.8

As the labor 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 increase over time, as the "grey" economy will be combated and gradually eliminated.

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

	2016	2020	2030	2040	2050	2060	2070
Age group -54	6.5	7.3	8.1	8.0	7.3	7.5	7.4
Age group 55-59	70.6	81.7	79.1	83.2	86.6	86.6	88.1
Age group 60-64	89.3	96.8	86.8	96.2	98.7	105.3	102.4
Age group 65-69	101.5	97.0	105.6	102.9	103.3	106.9	103.9
Age group 70-74	113.4	101.3	100.2	96.1	98.1	99.8	100.0
Age group 75+	116.3	114.1	94.8	93.0	91.1	91.7	93.3

Table 12b: Pensioners (public schemes) to population ratio by age group (%)

	2016	2020	2030	2040	2050	2060	2070
Age group -54	2.9	3.3	3.8	3.9	3.6	3.7	3.7
Age group 55-59	29.0	31.4	30.4	32.7	33.4	33.4	34.1
Age group 60-64	62.7	61.9	50.7	57.3	58.5	62.0	60.4
Age group 65-69	85.0	81.7	84.1	81.5	82.1	84.6	82.2
Age group 70-74	98.2	92.3	90.3	84.7	87.5	89.0	89.0
Age group 75+	116.3	114.1	94.8	93.0	91.1	91.7	93.3

Table 13a: Female pensioners (public schemes) to inactive population ratio by age group (%)

	2016	2020	2030	2040	2050	2060	2070
Age group -54	5.3	6.0	6.6	6.4	5.7	5.9	5.9
Age group 55-59	55.0	64.6	63.5	64.5	64.5	64.3	65.5
Age group 60-64	90.7	89.2	73.2	84.1	83.7	84.8	86.2
Age group 65-69	85.7	84.5	90.9	90.9	92.9	94.4	95.6
Age group 70-74	92.2	84.5	87.1	84.8	88.9	90.5	91.5
Age group 75+	94.5	93.7	83.4	84.5	84.3	86.2	88.0

Table 13b: Female pensioners (public schemes) to population ratio by age group (%)

	2016	2020	2030	2040	2050	2060	2070
Age group -54	2.8	3.1	3.6	3.6	3.2	3.3	3.3
Age group 55-59	28.5	31.6	31.4	33.6	33.5	33.3	33.9
Age group 60-64	71.2	67.4	50.1	59.4	60.0	60.3	61.3
Age group 65-69	73.3	73.0	76.8	76.3	78.8	80.1	81.0
Age group 70-74	81.1	77.8	80.8	77.1	81.8	83.5	84.2
Age group 75+	94.5	93.7	83.4	84.5	84.3	86.2	88.0

For the age groups -54 and 55-59, the ratios will not vary significantly over time. 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.

With regard to the new pension decomposition, the table below illustrates the evolution of the new public pension expenditures in relation to the average number of new retirees, the point value and the number of pension points.

Table 14a: Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) – Total

New pension	2016	2020	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	255.5	296.8	413.6	876.1	1203.0	1298.1	1789.4
II. Number of new pensions ('000)	215.7	187.4	143.7	199.0	176.5	131.7	129.9
Average annual pension	2.4	3.2	5.8	8.8	13.6	19.7	27.5
III. Standard contributory period	32.3	33.0	35.0	35.0	35.0	35.0	35.0
IV. Point value (EUR)	194.1	254.5	346.5	422.3	514.8	627.6	765.0
V. Total average pension points at retirement	30.2	27.1	29.1	27.8	28.2	27.7	26.9
VI. Average number of months paid the first year	6	6	6	6	6	6	6

	2016	2020	2030	2040	2050	2060	2070
VII. Correction index	1.1	1.3	1.7	2.2	2.7	3.3	3.9
VIII. II*IV*V*VI*VII/III	255.5	296.8	413.6	876.1	1203.0	1298.1	1789.4
IX. Average contributory period	31.0	31.2	32.1	31.5	32.3	32.8	32.5
X. Average pension points accrued per year (V/IX)	0.97	0.87	0.91	0.88	0.87	0.84	0.83
Monthly average pensionable earnings / Monthly economy-wide	1.06	1.07	1.10	1.13	1.14	1.12	1.11
Average new pension over economy wide average wage	32%	34%	35%	34%	35%	34%	33%

Table 14b: Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) – Male

New pension	2016	2020	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	147.9	158.8	271.2	483.1	693.7	732.9	942.3
II. Number of new pensions ('000)	114.8	102.2	91.1	103.6	94.8	69.3	63.9
Average annual pension	2.6	3.1	6.0	9.3	14.6	21.1	29.5
III. Standard contributory period	35.0	35.0	35.0	35.0	35.0	35.0	35.0
IV. Point value (EUR)	194.1	254.5	346.5	422.3	514.8	627.6	765.0
V. Total average pension points at	35.5	28.2	30.1	29.4	30.3	29.7	28.8
VI. Average number of months paid the first year	6	6	6	6	6	6	6
VII. Correction index	1.1	1.3	1.7	2.2	2.7	3.3	3.9
VIII. II*IV*V*VI*VII/III	147.9	158.8	271.2	483.1	693.7	732.9	942.3
IX. Average contributory period	33.0	33.3	34.0	33.7	34.6	35.2	35.1
X. Average pension points accrued per year (V/IX)	1.08	0.85	0.89	0.87	0.87	0.84	0.82
Monthly average pensionable earnings / Monthly economy-wide	1.12	1.14	1.13	1.17	1.17	1.15	1.14
Average new pension over economy wide average wage	35%	33%	36%	36%	37%	36%	35%

New pension	2016	2020	2030	2040	2050	2060	2070
I. Projected new pension expenditure old age and early retirement (millions EUR)	107.5	138.0	142.4	393.0	509.2	565.2	847.1
II. Number of new pensions ('000)	100.9	85.1	52.6	95.4	81.6	62.4	66.0
Average annual pension	2.1	3.2	5.4	8.2	12.5	18.1	25.7
III. Standard contributory period	30.3	31.3	35.0	35.0	35.0	35.0	35.0
IV. Point value (EUR)	194.1	254.5	346.5	422.3	514.8	627.6	765.0
V. Total average pension points at retirement	25.4	26.3	27.4	26.0	25.8	25.4	25.1
VI. Average number of months paid the first year	6	6	6	6	6	6	6
VII. Correction index	1.1	1.3	1.7	2.2	2.7	3.3	3.9
VIII. II*IV*V*VI*VII/III	107.5	138.0	142.4	393.0	509.2	565.2	847.1
IX. Average contributory period	28.7	28.7	28.8	29.1	29.6	30.1	30.1
X. Average pension points accrued per year (V/IX)	0.89	0.92	0.95	0.89	0.87	0.85	0.83
Monthly average pensionable earnings / Monthly economy-wide	1.03	1.02	1.03	1.05	1.05	1.05	1.04
Average new pension over economy wide average wage	29%	35%	33%	32%	32%	31%	31%

This table has been built using an alternative approach. The quantum of the pension benefits of an individual is thus calculated using a point-based formula, by multiplying the average annual number of points accrued by the insured, by the point value. For each career month, gross earnings are divided by the gross economy-wide average wage for that month. The annual number of points is obtained as the average of the 12 monthly numbers of points. The total number of points accrued in an individual's career is the sum of the annual numbers of points. The average annual number of points is the ratio of the total number of points accrued by the individual along his career versus the statutory contributory period corresponding to the individual's cohort. Hence, the effective contributory period of the person is not taken into consideration for the pension benefits calculation. The statutory

contributory period is set by the Labour Ministry, according to the retirement age set for the cohort in case and to the evolution of the life expectancy.

Row VII shows the correction index which is applied every year, and only for the persons who retire during that specific year. This correction index represents a multiplying factor, for the average number of pension points of that generation, and is computed by dividing 43.3 of the economy-wide gross average wage from the previous year by the value of the pension point for that specific year. The retiree than continues with this new number of points throughout all the years afterwards. Noticeable, the economy-wide average series used differs from the one employed by the European Commission services. The series we used here follows the same trend, but the basic level is lower, as represented in the graph below.

Chart 6 – Economy-wide average wage – in thou. Euros per year
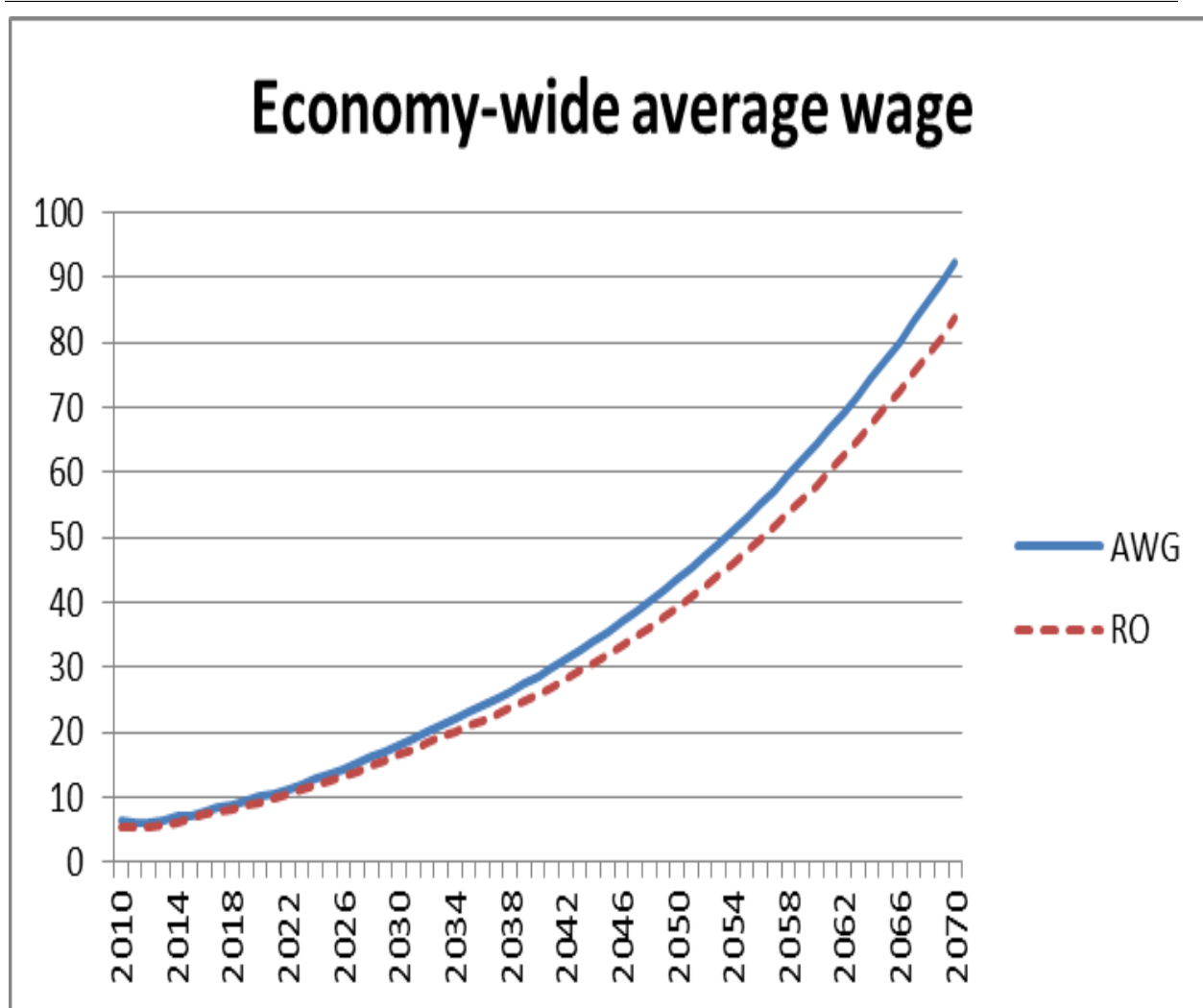
Source: Eurostat

III.4 Financing of the pension system

Table 15 – Financing of the system[1]

		Public employees	Private employees	Self-employed
Contribution base		0	0	0
Contribution rate/contribution				
	Employer	Between 15.8% and 25.8%, according to the working conditions, as follows: 15.8% (normal working conditions) 20.8% (extraordinary working conditions) 25.8% (special working conditions)	Between 15.8% and 25.8%, according to the working conditions, as follows: 15.8% (normal working conditions) 20.8% (extraordinary working conditions) 25.8% (special working conditions)	10.5% or 26.3%
	Employee	10.5%	10.5%	
	State			
	Other revenues	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		0	0	0
Minimum contribution		0	0	0

Source: Commission Services

Table 16: Revenue from contribution (million), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)

	2016	2020	2030	2040	2050	2060	2070
Public contribution	9512.2	12381.1	18199.0	24881.3	34782.9	50290.6	75787.7
Employer contribution	6677.7	9038.6	13924.7	19137.1	26721.9	38642.1	58293.8
Employee contribution	2834.5	3342.6	4274.3	5744.2	8061.0	11648.5	17494.0
State contribution							
Number of contributors (I)	5591.3	6249.1	5429.2	4728.0	4363.9	4295.1	4505.5
Employment (II)	8407.5	8225.9	7268.1	6412.6	5810.0	5497.7	5313.3
Ratio of I/II	0.67	0.76	0.75	0.74	0.75	0.78	0.85

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[1] Recent changes referred to on the last page of the fiche

The 2014 legislative measure of decreasing the social contribution rate due by the employers, by 5 p.p. (i.e. as from 20.8 to 15.8 of the employee's gross wage, for normal working conditions) has begun to be offset, within the total volume of contributions, by the enlargement of the contribution basis. The employment is estimated to follow a continuously decreasing trend, down to 63% of the current number of employees, at the end of the projection horizon. Nevertheless, the estimates related to the number of contributors are positive, as the grey and black areas of the economy will gradually disappear. Thus, the weight of the contributors among the employees will constantly improve.

The 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 2035 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 reaches 25,2% in 2016, 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. In figures, the ratio of contributors among working age population keeps the trend from AR2015 (from 0.42 vs 0.46 in 2016 to 0.50 vs 0.52 in 2060) while contributors as compared to employment keep the same percentage points progression (67% to 77% versus 74% to 84% in AR 2015).

The existence of a buffer fund, to smooth the financing gaps that occur due to the cyclicality of employment, 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.

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.

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

Public Pension Expenditure	2016	2020	2030	2040	2050	2060	2070
Baseline	8.0	7.3	6.6	7.7	8.7	8.9	8.7
Higher employment rate (+ 2 pp)	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.1
Higher life expectancy (+2 years)	0.0	0.0	0.1	0.1	0.2	0.3	0.4
Higher migration (+33%)	0.0	0.1	0.2	0.3	0.3	0.2	0.1
Higher TFP (+0.4 pp)	0.0	0.0	-0.1	-0.5	-0.7	-0.8	-0.9
Lower fertility (-20%)	0.0	0.0	0.0	0.1	0.6	1.2	1.9
Lower employment rate (-2 pp)	0.0	0.0	0.2	0.2	0.2	0.2	0.1
Lower migration (-33%)	0.0	-0.1	-0.2	-0.2	-0.3	-0.2	-0.1
Lower TFP (-0.4 pp)	0.0	0.0	0.0	0.0	0.5	0.8	0.9
Higher emp. of older workers (+10 pp.)	0.0	-0.1	-0.4	-0.6	-0.6	-0.6	-0.5
Risk scenario	0.0	0.0	0.2	0.4	0.4	0.5	0.5
Policy scenario: linking retirement age to increase in life expectancy	0.0	0.0	-0.1	-0.6	-0.8	-1.0	-1.3

Total Pension Expenditure	2016	2020	2030	2040	2050	2060	2070
Baseline	8.0	7.3	6.8	8.2	9.5	10.0	9.8
Higher employment rate (+ 2 pp)	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.1
Higher life expectancy (+2 years)	0.0	0.0	0.0	0.1	0.2	0.3	0.4
Higher migration (+33%)	0.0	0.1	0.2	0.3	0.3	0.2	0.1
Higher TFP (+0.4 pp)	0.0	0.0	-0.1	-0.5	-0.7	-0.9	-1.1
Lower fertility (-20%)	0.0	0.0	0.0	0.1	0.6	1.3	2.1
Lower employment rate (-2 pp)	0.0	0.0	0.2	0.2	0.2	0.2	0.1
Lower migration (-33%)	0.0	-0.1	-0.2	-0.2	-0.3	-0.2	-0.1
Lower TFP (-0.4 pp)	0.0	0.0	0.0	0.0	0.5	0.9	1.1
Higher emp. of older workers (+10 pp.)	0.0	-0.1	-0.4	-0.6	-0.7	-0.6	-0.5
Risk scenario	0.0	0.0	0.2	0.4	0.5	0.6	0.6
Policy scenario: linking retirement age to increase in life expectancy	0.0	0.0	-0.2	-0.7	-0.9	-1.0	-1.3

The higher employment rate results in higher GDP, so the weight of the relatively equal pension expenditures within GDP diminishes. 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.

For the higher total factor productivity assumption, there is a 0.9/1.1 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. The same explanation, in the mirror, applies to the lower productivity.

The higher life expectancy determines a 0.4 p.p. deviation 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.

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

The alternative scenarios pertinent to the dynamic retirement age, yearly adjusted in accordance with the life expectancy evolution, would lead to significant gains, of 1.3 p.p., at the end of the projection horizon.

The risks associated with a worse development of TFP can lead to a 0.5 p.p. (for public pensions) and 0.6 p.p. (for total pension expenditures) deviation of the pension expenditures, as percentage of GDP. So a worse development of TFP would produce significant deviations from the baseline.

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 1.9 / 2.1 p.p. negative deviations.

III.6 Description of the changes in comparison with the 2009, 2012 and 2015 projections

Table 18a: Average annual change in public pension expenditure to GDP under the 2009, 2012, 2015 and 2018 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2009	0.185	0.272	-0.098	0.006	0.034	0.000	-0.029
2012	0.074	0.249	-0.098	0.007	-0.076	0.000	-0.100
2015	-0.003	0.141	-0.054	0.000	-0.086	0.000	-0.005
2018	0.011	0.102	-0.038	0.002	-0.046	0.000	-0.002

Table 18b: Overall change in public pension expenditure to GDP under the 2009, 2012, 2015 and 2018 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2009	9.24	13.61	-4.91	0.28	1.73	:	-1.46
2012	3.70	12.93	-4.69	0.36	-3.70	-0.01	-1.20
2015	-0.15	6.80	-2.45	0.02	-3.90	-0.01	-0.62
2018	0.70	5.60	-1.68	-0.07	-2.61	0.00	-0.54

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 19: Decomposition of the difference between 2015 and the new public pension projection (% of GDP)

	2016	2020	2030	2040	2050	2060	2070
Ageing report 2015	8.1	8.1	8.1	8.4	8.4	8.1	
Change in assumptions	-0.1	-0.8	-1.5	-0.7	0.3	0.8	
Improvement in the coverage or in the modeling							
Change in the interpretation of constant policy							
Policy related changes							
New projection	8.0	7.3	6.6	7.7	8.7	8.9	8.7

The main drivers of difference between the 2015 and 2018 projection results are the different evolutions of the macroeconomic assumption:

Chart 7 - Evolution of total population	**Chart 8 - Evolution of nominal GDP billion euro**
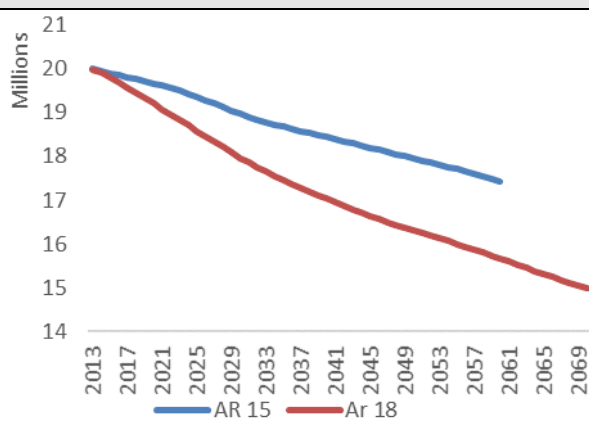
Chart 9 - GDP per capita (growth rate yoy)
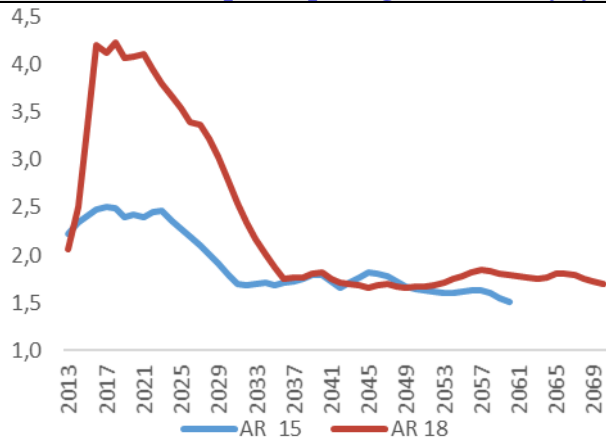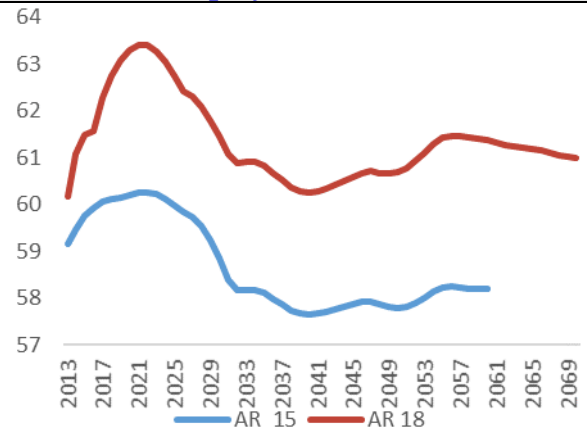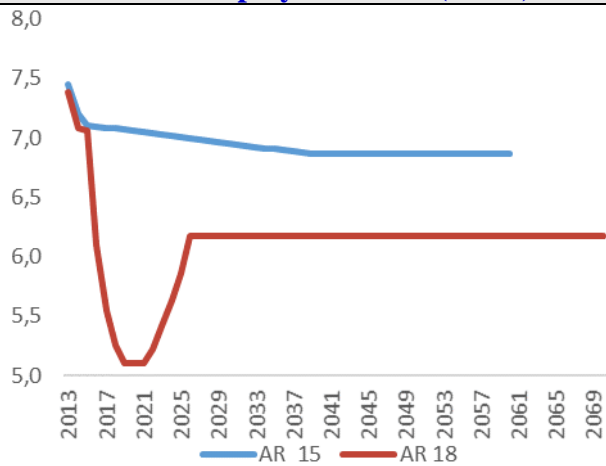

Chart 10 - Employment rate (15-64)

Chart 11 - Unemployment rate (15-64)

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 2018.

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. Labor 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.
- Labor 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
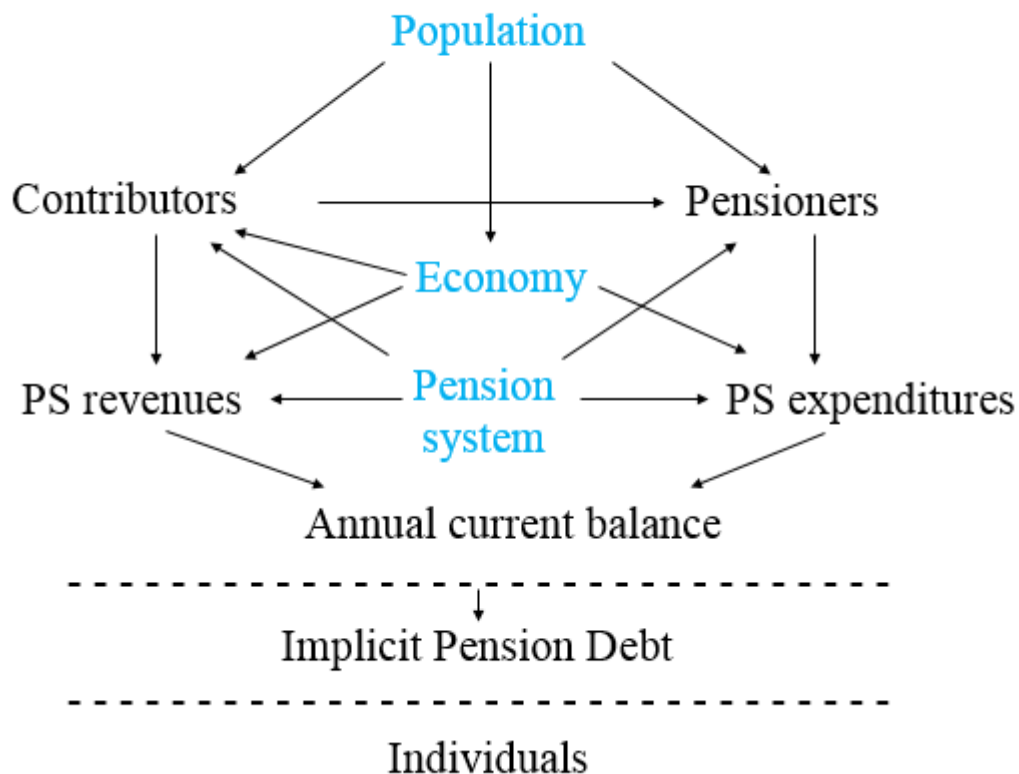
IV.4. Reforms incorporated in the model

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:

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

Labor supply:

$$LF(a,t,g) = P(a,t,g) \cdot lfp\%(a,t,g),$$

where lfp(a,t,g) is the labor supply's participation rate.

Employed:

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

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

Number of existing pensioners:

$$EP(a,t,g) = P(a,t,g) \cdot rr\%(a,t,g),$$

where rr(a,t,g) is the retirement (exit) rate.

Number of existing disabled:

$$ED(a,t,g) = P(a,t,g) \cdot ds\%(a,t,g),$$

where ds (a,t,g) represents the disability occurrence rate

Number of effective contributors:

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

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:

$$NC(a,t,g) = P(a,t,g) \cdot cr\%(a,t,g),$$

where 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: labor 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 modeled 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 modeled 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 defense, 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 modeled separately.

<h1 style="text-align:center">METHODOLOGICAL ANNEX</h1>

Economy-wide average wage at retirement

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

	2010	2016	2020	2030	2040	2050	2060	2070
Economy-wide average wage	5.42	7.41	9.34	16.55	25.89	39.32	58.06	83.74
Economy-wide average wage at retirement	5.64	7.85	9.79	18.08	29.24	43.77	64.60	92.57

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 all of the beneficiaries of a social pension receive it additionally to the old-age pension. This is why the figures afferent to the <u>number of public earning related pensions</u> can be found in the Questionnaire's chapter „<u>Number of pensioners</u>".

Pension taxation

Beginning with **2011** the pensioners with pension above 740 RON had to pay health insurance (5.5 applied to the difference between the pension quantum and the mentioned ceiling of 740). For the pensioners with pension benefits higher than 1000 RON, pension tax applied to the amount which exceeds this ceiling, after the deduction of the health insurance contribution. The calculation of the tax was as follows: the difference between pension gross benefit (only if greater than 1000 RON), minus the contribution for health insurance (5.5 applied to pension benefit), minus the threshold set up by law (1000 RON according to GPO 87/2000) was subject to personal income tax (by a tax rate of 16%.). The total volume of taxes collected represented about 5% of the total earnings-related public pension expenditures. This system was modified from 2017, so no more health insurance contribution is paid by the pensioners, while the ceiling for tax was raised, for the time being, from 1000 to 2000 RON. An approximation of the taxes collected would be around 1.15% of the total earnings-related public pension expenditures, so the same percentage has been kept for the entire projection horizon.

Disability pension

The beneficiaries of disability pensions are transferred to old age pensions, once they reach the statutory retirement age. The weight of disability pensioners among the total population of the same age and gender is assumed to increase by circa 25 percents until 2040 and remains constant afterwards. This increase is in accordance with the new legal dispositions, stating that

the accumulated contributory period no longer represents an eligibility criterion for the disability pension.

Table A2: Disability rates by age groups (%)

	2010	2016	2020	2030	2040	2050	2060	2070
Age group -54	1.8	1.7	2.0	2.3	2.3	2.1	2.1	2.1
Age group 55-59	22.5	18.4	18.8	19.6	21.5	21.4	21.3	21.7
Age group 60-64	9.8	11.5	13.8	20.1	21.2	21.2	21.2	21.4
Age group 65-69	0.0	0.8	0.8	0.9	1.1	1.0	1.1	1.1
Age group 70-75	0.0	0.0	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	0.0	0.0

Here is an alternative version of this table, which takes into account the age brackets eligible for disability pension in Romania:

Table A2bis: Disability rates by age groups (%)-alternative version

	2010	2016	2020	2030	2040	2050	2060	2070
Age group 18-54 M	2.2	2.2	2.6	3.1	3.2	2.9	3.0	3.0
Age group 55-59 M	20.8	16.1	16.6	17.7	19.5	19.7	19.4	19.8
Age group 60-64 M	21.3	20.2	21.5	22.8	25.2	24.9	25.1	25.4
Age group 18-54 F	2.7	2.3	2.8	3.4	3.4	3.1	3.2	3.2
Age group 55-59 F	24.0	20.5	20.9	21.6	23.5	23.3	23.3	23.6
Age group 60-64 F	0.0	4.0	7.0	17.5	17.2	17.4	17.1	17.3

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.

Non-earnings related minimum pension
The level of this pension is set according to the evolution of the daily basket. The development of the non-earnings related minimum pension beneficiaries is impacted by two opposite trends: on the one hand, there is a diminution of this number, by mean of further integration in the employment; on the other hand, it seems that a slightly higher number of persons who work abroad for the most part of their career will also benefit of this social pension. In such cases, the number of pension points accumulated by them within the country of origin would entitle the beneficiaries to a quantum below the minimum pension.

Contributions
Social Insurance contributions are set as follows:
- 26.3% for normal working conditions (of which 10.5% employee's quota and 15.8% employer's quota);
- 31.3% for hazardous working conditions (of which 10.5% employee's quota and 20.8% employer's quota);
- 36.3% for special working conditions (of which 10.5% employee's quota and 25.8% employer's quota);

The employee's quota is split between the one for the public pension scheme and the one for the private mandatory pension scheme.

The evolution of the quota directed to the private pension fund (Pillar II) was as follows:

2008:	2%	2009:	2.5%
2010:	3%	2011:	3.5%
2012:	4%	2013:	4%
2014:	4.5%	2015:	5%
2016:	5.1%	2017:	5.1%

This rate is set to gradually raise up to 6% (in 2018), remaining constant afterwards.

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

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70
Public pensions to GDP	-0.7	-0.6	1.1	1.0	0.3	-0.2	0.7
Dependency ratio effect	1.0	1.5	3.5	2.6	0.8	-1.2	8.3
Coverage ratio effect	-0.5	-0.4	-0.5	-0.3	-0.1	0.2	-1.7
Coverage ratio – old age*	*-0.3*	*-0.5*	*-0.3*	*0.0*	*0.1*	*0.1*	*-0.9*
Coverage ratio – early age*	*-0.6*	*-0.5*	*0.8*	*0.9*	*0.0*	*0.1*	*0.6*
Cohort effect*	*-0.3*	*0.2*	*-1.8*	*-1.5*	*-0.4*	*0.3*	*-3.6*
Benefit ratio effect	-0.9	-1.4	-0.3	0.0	0.0	0.0	-2.5
Labour market / Labour intensity effect	-0.2	0.2	-0.1	-0.1	-0.1	0.1	-0.2
Employment ratio effect	*-0.2*	*0.3*	*0.1*	*-0.1*	*-0.1*	*0.0*	*0.0*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Career shift effect	*0.0*	*-0.1*	*-0.2*	*0.0*	*0.1*	*0.0*	*-0.1*
Residual	-0.1	-0.6	-1.5	-1.3	-0.4	0.6	-3.3

* Sub components of the coverage ratio effect do not add up necessarily.

Table A4: Factors behind the change in public pension expenditures between 2016 and 2070 using pensioners data (in percentage points of GDP) - pensioners

	2016-20	2020-30	2030-40	2040-50	2050-60	2060-70	2016-70
Public pensions to GDP	-0.7	-0.6	1.1	1.0	0.3	-0.2	0.7
Dependency ratio effect	1.0	1.5	3.5	2.6	0.8	-1.2	8.3
Coverage ratio effect	-0.5	-0.5	-0.5	-0.3	-0.1	0.1	-1.7
Coverage ratio – old age*	*-0.3*	*-0.5*	*-0.3*	*0.0*	*0.1*	*0.0*	*-0.9*
Coverage ratio – early age*	*-0.6*	*-0.6*	*0.8*	*0.7*	*-0.2*	*0.1*	*0.1*
Cohort effect*	*-0.3*	*0.2*	*-1.8*	*-1.5*	*-0.4*	*0.3*	*-3.6*
Benefit ratio effect	-0.9	-1.3	-0.3	0.0	0.0	0.0	-2.5
Labour market / Labour intensity effect	-0.2	0.2	-0.1	-0.1	-0.1	0.1	-0.2
Employment ratio effect	*-0.2*	*0.3*	*0.1*	*-0.1*	*-0.1*	*0.0*	*0.0*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Career shift effect	*0.0*	*-0.1*	*-0.2*	*0.0*	*0.1*	*0.0*	*-0.1*
Residual	-0.1	-0.6	-1.5	-1.3	-0.4	0.7	-3.3

Some methodological assumptions considered in respect of the pension categories projected separately from the model

The structure on gender is equal between men and women for social pensions and social disability pensions (as this is the ratio currently), while for the military we considered a constant 90% weight of men.

As for the pension expenditures of these categories projected outside the model, the assumption used is that the farmers' average pension will follow the same evolution as the old age average pension projected inside the model, the military pensioners' average pension keeps its ratio of circa 2.6:1 as compared to the old age average pension projected in the model, while the social pensions are indexed every ten years (starting with 2021, as no change is anticipated by then), in accordance with the real wage growth along the decade. In the questionnaire attached to the present Country Fiche, the militaries and the farmers are included under "Other pensions".

For 2016 the total pension's expenditures with the special pension's category are as follows:
- Security and defense, 0.7% of GDP
- Disability and survivor, 1% of GDP
- Farmers. 0.3% of GDP
- State employees, 0.08% of GDP
- Revolutionaries and war veteran, 0,06% of GDP
- Atypical 0.01%

Reform measures entered into force later than September 2017 (deadline of the forecast exercise) and therefore not included in the present projections:

➤According to Government's Emergency Ordinance 59/2017, entered into force after the completion of the present set of projections, and thus not included herein, the special pensions (corresponding to pensioners from military, police, intelligence, aeronautic personnel, diplomacy, Parliament members and clerks, Court of Accounts, auxiliary personnel in Courts and Public prosecutors) will be annually indexed only by the previous year's average inflation rate.

➤ Other changes approved in November 2017 on the fiscal side, along with the pension point value set for 2018:
The Government issued an Emergency Ordinance to change the level of social insurance contributions quota starting from 1 January 2018, mainly a reduction by 1.3 pp and a shift of the contribution burden from the employer to employee.
Starting from 1 January 2018 the Social Insurance contributions rates will be:
 - 25% for normal working conditions, to be supported only by the employee.

- 29% for hazardous working conditions (of which 25% employee's quota and 4% employer's quota);
- 33% for special working conditions (of which 25% employee's quota and 8% employer's quota);

➢Further, the Social health insurance quota has been reduced from a total of 10.7% (of which 5.5% employee's quota and 5.2% employer's quota) to a quota of 10% (paid only by the employee). Hence, this shift triggers an increase of the gross average wage, which will offset the negative impact of the 1.3 pp diminution of social insurance contributions.

➢Another change recently approved by the Government is the reduction of the quota transferred to the second pillar. This change comes mostly because the transfer to the second pillar is paid only from the employees' share of the social insurance contributions. The shift equivalent of the 2017 quota for pillar II (5.1%) has been calculated as 3.75% for 2018 and set as such with the purpose of the nominal transfers to the Pillar II to remain constant.

➢The level of the social pension ceiling will be 640 RON (=143 euro) in 2018 (present value 520 RON = 117 euro)