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1. Overview of the pension system

1.1. Description of the system

The Croatian pension system is a mixed public-private system based on three pillars:

- Mandatory pension insurance based on intergenerational solidarity (I pillar)
- Mandatory pension insurance based on individual capitalized savings (II pillar)
- Voluntary pension insurance based on individual capitalized savings (III pillar)

The current system is the result of comprehensive structural reform enacted in 1998. The reform started with thorough changes within the existing public PAYG system in 1999 and continued by introduction of mandatory and voluntary private schemes in 2002.

1.1.1. The first pillar: public PAYG scheme

The first pillar is a public pension scheme. It is mandatory for all employees and the self-employed, based on PAYG principle, of defined benefit type. This scheme applies point system for calculation of earnings-related pension benefits. The scheme covers the risks of old age, disability (including work-related injury and diseases) and also provides for survivor's rights upon the insured person's or pensioner's death. It is administrated by the Croatian Pension Insurance Institute and financed by contributions and state budget transfers.

1.1.2. The second pillar: mandatory private funded scheme

The second pillar is a fully-funded defined contribution scheme that is privately managed. It covers predominantly the risk of old age, but also the risks of disability and death under specified circumstances (if the fund member is older than 55 and the membership is longer than 10 years and if the amount of disability or survivors pension from two pillars would be higher than the amount from the first pillar only). Within the second pillar, the accumulation phase (managed by pension companies that run pension funds) is institutionally separated from the pension payment phase (managed by pension insurance companies) and is regulated by separate legislation. At the moment of retirement, the savings are transferred to a pension insurance company. There are four mandatory pension funds currently established in Croatia, but only one pension insurance company which is also responsible for paying of pensions from the third pillar.

Participation in the second pillar is mandatory for all employees and the self-employed under the age of 40 in 2002 (time of introduction of this scheme) i.e. those born before 1962. The employed aged between 40 and 50 in 2002, i.e. those born between 1952 and 1962, were given an option to choose between staying in the public PAYG scheme only and entering the two-pillar regime (participation in both public PAYG scheme and the private second pillar scheme). Persons older than 50 in 2002 i.e. those born before 1952, had to remain insured only in the first pillar.

Calculation of pension benefits in the first pillar (the public PAYG scheme) differs between mono-pillar and two-pillar participants (see below). This difference caused, that the combined (two-pillar) pensions were lower than the mono-pillar pensions. At least, that was the case for the first combined

pensions paid in early 2010s. Therefore, in 2011 the pension legislation is amended to provide the possibility for persons who were aged between 40 and 50 in 2002 to opt out of the second pillar at the moment of retirement. In the case of opting out, they would receive pensions only from the public PAYG scheme based on the rules for those insured in the first pillar only, while their savings accumulated in the second pillar are transferred to the public scheme. At the end of 2013, less than 1% of the retired two-pillar participants decided to receive combined pension, from the first and the second pillar. Those aged under 40 in 2002 have no option to choose between mono-pillar and combined pension benefit; they will receive combined old-age pension once retired. Increase in the number of the combined pensions can be expected around 2026-7 when that group reaches the statutory retirement age. As a result, the projections indicate low pension expenditures from the second pillar up to that point (see table 6). Transfers of savings of the opt-outs from the second to the first pillar are not counted as contribution revenue of the first pillar in the pension projections.

1.1.3. The third pillar: voluntary private funded scheme

The third pillar is voluntary private pension scheme that started operating in 2002. This is a fully-funded, defined contribution, privately managed pension scheme, divided into personal scheme (so called open-end funds) and occupational scheme (so called close-end funds). Its coverage is relatively low. At the end of 2013, there were around 205 thousand members of open-ended funds and 23 thousand of closed-ended funds. With the total of 228 thousand it covers around 15% of employees, but these numbers include also those who stop paying contributions on regular basis, but remain members. There were some 13 thousand pensions paid out of the third pillar insurance at the end of 2013. However, in this scheme, payment of pensions is possible starting from the age of 50 without other qualifying conditions. Overall, the third pillar will provide for rather small portion of overall retirement incomes and, therefore, it is not modeled in the current projections.

1.1.4. Pension benefits determined by special legislation

Pension system in Croatia is under sizable influence of the number of specific laws that stipulate retirement conditions for specific categories of population and/or define the pension benefits and its supplements under various conditions. Pension entitlement conditions are in most cases more lax and benefits calculated under special regulation are higher than those determined under general conditions. Members of Parliament, government officials, Constitutional Court judges, Homeland War Veterans (HWV), academics, police and military personnel, veterans from the World War II, and former political prisoners receive benefits that are determined by special laws and paid by the public PAYG scheme.¹ Total amount of such benefits reached around 18% of all pension expenditures in 2013. A significant part of these benefits is “covered” by previous contributions to the public insurance scheme, but a part cannot be considered as covered by general pension insurance. Transfers from the state budget to the Croatian Pension Insurance Institute aim to cover additional pension expenditures due to special regulations which provide more favourable pension rights.

The most important special law is the Law on the Rights of Croatian Defenders from the Homeland War and the Members of their Families (Official Gazette no. 174/2004 and its amendments), according to which disability and survivor pensions for around 71 thousands pensioners are defined,

¹ New pensions for members of the parliament, government officials and constitutional court judges are not provided any more under special regulation, although the acquired rights remain in force.

mostly for veterans from 1990-1996 war. These pensioners are relatively young, and their benefits are higher than the average pension. Around HRK 5 billion were paid for pensions based on this law in 2013, which is around 14% of the total pension expenditures. Although no new disability pensions will be granted according to this law, there is one more benefit left for war veterans that will influence future pension expenditures. According to this law, war veterans that served in combat units for more than 100 days are entitled to the minimum pension at the level of 45% of the average net wage in Croatia. War veterans are also entitled to the minimum pension after reaching the statutory retirement age, provided that they do not qualify for the old age pension due to insufficient contribution period.

The Law on the Supplement on Pension Acquired According to the Pension Insurance Act (OG no. 79/2007 and its amendments) stipulates an increase that affects the pensions acquired from 1999 to 2010, which are increased from 4% to 27%, whereas the post-2010 new pensions paid from the first pillar are increased by 27%, on top of the benefit determined by point formula defined by the Pension Insurance Law (OG no. 157/2013). Importantly, this pension supplement is not applied in the calculation of pension benefits for those insured in both mandatory pillars. It is added only to pension benefits of those who are insured in the first pillar only. The pension supplement is neither applied in the calculation of the minimum pension, nor in the calculation of the maximum pension. The purpose of the supplement was to balance the benefits between older and younger cohorts, as the benefits of post-reform pensioners (retired 1999 and later) were significantly lower than of those who retired earlier, under previous legislation. Regulation of the supplement has become an integral part of the PAYG system legislation.

1.2. Statutory retirement age, early retirement and qualifying conditions for retirement

Statutory retirement age is set to be 65 years until 2030. For women, however, old age retirement is possible at the age of 61 in 2014. The pensionable age for women has been increased by 3 months every year since 2010 upon reaching the age of 65 in 2030. As of 2038, the pensionable age (for both women and men) will be 67 after completion of the transitional period starting from 2031, when the retirement age gradually rises by 3 months per calendar year. Minimum contributory period² for both genders will remain 15 years.

Persons working in arduous or hazardous occupations are granted special treatment and can retire earlier without reductions of pension benefit. In such cases the insurance periods are calculated in extended duration (each 12 months of work, the insurance period is taken as 14, 15, 16 or 18 months) and the age prescribed for the entitlement to the old-age pension is decreased, depending on the degree of increment of the insurance periods. Pension contribution rate for such occupations is higher than the standard rate and is paid by the employer.

Early retirement is possible 5 years prior to the statutory retirement age, under condition of minimum contributory period of 35 years. In 2014, the earliest retirement is possible at the age of 60 for men and 56 for women. In case of early retirement, the pension benefit is reduced permanently,

² In Croatia, the coverage requirement for the old-age pension is the qualifying period of 15 years, which comprises contributory periods and credited non-contributory periods.

with the reduction ranging from 0.10% to 0.34% for each month of anticipation depending upon the contribution period (see below). Table 1 illustrates options for regular and early retirement in Croatia for contribution period of 20 and 40 years.

Table 1 - Statutory retirement age, earliest retirement age and penalties for early retirement

		2013	2020	2030	2040	2050	2060
Men - with 20 contribution years	statutory retirement age	65	65	65	67	67	67
	earliest retirement age	-	-	-	-	-	-
	penalty in case of earliest retirement age	-	-	-	-	-	-
Men - with 40 contribution years	statutory retirement age	65	65	65	67	67	67
	earliest retirement age	60	60	60	62	62	62
	penalty in case of earliest retirement age	6%	6%	6%	6%	6%	6%
Women - with 20 contribution years	statutory retirement age	60y9m	62y6m	65	67	67	67
	earliest retirement age	-	-	-	-	-	-
	penalty in case of earliest retirement age	-	-	-	-	-	-
Women - with 40 contribution years	statutory retirement age	60y9m	62y6m	65	67	67	67
	earliest retirement age	55y9m	57y6m	60	62	62	62
	penalty in case of earliest retirement age	6%	6%	6%	6%	6%	6%

Source: Member State

Disability pensions are paid from the first pillar on condition that insurance period is equal to one third of working life. Working life is the full number of years between the age of 20 (23 for persons with post-secondary qualifications and 26 for persons with university qualifications) and the day of the occurrence of disability. Persons under 30 years of age are entitled to disability pension, provided they have 1 year of insurance at least; whereas those between 30 to 35 years are entitled to disability pension with at least 2 years of insurance (1 year, if graduated from university). There is no minimum insurance period if disability is the result of a work injury or an occupational disease. To qualify for disability pension, changes in health must occur before the age of 65. In the case of partial incapacity, the benefit is lower than in the case of total incapacity, and partial incapacity pensioner can be employed while simultaneously receiving a reduced disability pension.

Survivors' pensions are paid to the family members when conditions stipulated by law are met. The entitlement conditions concern the deceased person and their survivors. The deceased must have been a pension beneficiary, a beneficiary of occupational rehabilitation or an insured person who had completed five-year insurance period or ten-year qualifying period. After the death of the pension beneficiary, the pension base is the old-age or disability pension that the deceased beneficiary actually received. The survivor pension amounts to 70% - 100% of the pension, depending on the number of beneficiaries eligible for survivors pensions. For example, the surviving partner, who already receives the pension benefit, may apply for the survivor's pension in the amount of 70% of the pension that the deceased beneficiary had received, provided that such benefit is higher than the survivor's own pension. In such case the survivor has to stop receiving her/his own pension benefit. Also, if the deceased beneficiary has children under the age of 15 or under the age of 18 and out of employment or in regular education, but not older than 26, then they are entitled to survivor's pension in the amount of 70% of the pension base for one child, 80% for two children, 90% for three and 100% for four and more beneficiaries.

1.3. Financing of the pension system

The pension system is financed through contributions and state budget. Contribution rate is 20%, levied on the gross earnings and paid by employees. Contributions should be paid on earnings up to maximum of 6 times the average wage (HRK 47,646.00 per month in 2014). For those insured in both mandatory pension pillars, contributions in amount of 15% of gross wage go to the first pillar and 5% goes to the second pillar. Additional contributions should be paid for pension insurance of employees in arduous and hazardous occupations (listed in special legislation). These contributions are paid by employers at rates from 4.86% to 17.58% of the gross wage. If a person is insured in both pillars, these contributions are also divided between two pillars: $\frac{3}{4}$ goes to the first pillar, $\frac{1}{4}$ to the second pillar.

Transfers from the state budget to the public PAYG scheme (i.e. the Croatian Pension Insurance Institute) aim to cover pension expenditures ensuing from special regulations, but also expenditures from the transitional cost of the pension reform due to introduction of the fully funded second pension pillar. The Government is committed to cover any remaining deficit in the public PAYG scheme.

1.4. Pension benefit calculation rules

Pension benefit paid by the public PAYG scheme (first pillar) is determined by the point system. There are certain differences in pension formulas for those insured only in the first pillar compared to those who participated in both mandatory pension pillars.

1.4.1. Pension formulas for those insured in the first pillar only

The new pension benefit (PB) is calculated according to the general pension formula:

$$PB = \text{personal points (PP)} \times \text{pension factor (PF)} \times \text{actual pension value (APV)} \times 1.27$$

Personal points (PP) value earnings and employment record of the insured person by:

$$PP = \text{insurance period (IP)} \times \text{average value points (AVP)} \times \text{initial factor (IF)}$$

Insurance period (IP) is the period in which pension insurance was active and pension contributions are paid. Insurance period is expressed in years.

The average value points (AVP) is one of the key parameters in formula by which the pension benefit is linked to earnings history. It is calculated in the way that annual wage earned by the future pensioner in each year of insurance is divided by the economy-wide average wage in that year. This ratio is averaged over the entire insurance period. For example, a person who received wage in amount of the average national wage in her/his entire career will have the average value point of 1.0.

The initial factor (IF) aims to value timing of retirement. For old-age retirement at statutory retirement age it takes the value of 1. For early retirement, it is lowered by decrement rate, which goes from 0.10% to 0.34% for each month of earlier retirement compared to the statutory age. Decrement rate is 0.10% for early retirement on the basis of 40 years of insurance. 0.15% for 39

years of insurance, 0.25% for 38 years of insurance, 0.30% for 37 years of insurance, 0.32% for 36 years of insurance, and 0.34% per month for 35 years of insurance. Therefore, the initial factor for a man who wants to retire at the age of 60 after 35 years of service will take value of 0.796 ($1 - 0.0034 \times 60$). A person at the age of 60, with at least 41 years of insurance period, is entitled to early retirement without any reduction of the pension benefit. In case of deferred retirement, i.e. at the age exceeding the statutory retirement age and qualifying period of at least 35 years, the initial factor increases by 0.15% per month of deferment, where maximum deferment is set at 5 years. The initial factor for disability pension is 1.

The pension factor (PF) accounts for the type of pension. It takes value of 1 for old-age and early retirement pensions. For disability pensions, the pension factor equals 1 in case of total disability; in case of partial disability it amounts 0.8 if the person is unemployed or 0.5 if employed or self-employed.

Actual pension value (APV) is the monetary value of one personal point. In 2014, the APV was HRK 60.92. The APV is an important parameter as it is the channel for pension valorisation. The APV is regularly adjusted twice a year according to specific rules that take into account the average wage and consumer price developments (see below).

The pension supplement of 27% (factor 1.27 in the formula above) is granted to all new mono-pillar pensions.

Calculation of the pension benefit could be illustrated in an example. For a man with a career of 40 years in which he earned wage equal to the economy-wide average wage, in case of retirement at the age of 65 in 2014, the monthly gross pension benefit is:

$$PB = 40 \times 1 \times 60.92 \times 1.27 = 3,094.74 \text{ kunas (app. 409 euros)}$$

The first factor that takes value 40 is the number of personal points, i.e. product of insurance period (40 years), the average value points (1 because individual wage is equal to the economy-wide average wage over the entire career), and pension factor (1 due to retirement at statutory age).

1.4.2. Pension formulas for those insured in the first and the second pillar

Participants in both mandatory pillars receive their pensions from both the public PAYG scheme and the pension insurance company in the second pillar scheme. The pension benefit paid out from the second pillar is determined according to actuarial rules. The pension benefit paid out from the first pillar for two-pillar participants is called the basic pension and is determined in a similar manner as for mono-pillar participants; however, with a few differences.

For the insurance period before the pension reform (pre-2002 period), pension benefit paid by the PAYG scheme is determined in the same way as for mono-pillar pension, but without the pension supplement of 27%.

For insurance period after the reform (post-2002 period), the pension benefit paid by the PAYG scheme is calculated by applying the standard point formula provided above ($PB = PP \times PF \times APV$), but personal points (PP) include an additional factor, the basic pension factor.

The *basic pension factor* is calculated as an average share of the first pillar contribution rate in the total (first and second pillar) contribution rate, in the period from 2002 until the current year. Currently, this factor equals 0.75 (15%/20%). It should be noted that the basic pension is also calculated without the 27% supplement.

1.4.3. Minimum pension

The minimum pension in Croatia depends on the contribution period and the actual minimum pension value. It is an integral part of the insurance in the public PAYG scheme financed by its regular revenue. Minimum pension (MP) is calculated as follows:

MP = insurance period (IP) x initial factor (IF) x pension factor (PF) x actual minimum pension value (AMPV)

The formula resembles the general pension formula, but previous earnings are not taken into account here and the pension supplement is missing. Actual minimum pension value (AMPV) was HRK 59.05 in 2014. For illustration, the minimum monthly pension for a man with 40 years of service taking old-age retirement with 65 years of age is 2.362 kunas (40x59.05).

To become eligible for the minimum pension, one has to complete the necessary qualifying conditions for retirement and pension benefit calculated according to the general formula should be lower than the minimum pension. Eligibility for the minimum pension is not means-tested. This type of pension is more favourable for persons with low earnings, currently for those whose average career wage has been below or around 75% of the economy-wide average wage. Valorisation and indexation of the minimum pension is equal to that of old-age pensions.

The minimum pension applies also to the pensioners with combined pensions, but only to the basic pension, i.e. pension benefit paid from the public PAYG scheme. It is calculated according to the general minimum pension formula for pre-2002 period, while for post-2002 insurance period, the formula includes the basic pension factor of 0.75. There is no minimum pension for pensions paid out of the second pillar.

A special type of minimum pension is designed for war veterans. The minimum pension in that case is set at 45% of the average net wage in Croatia.

1.4.4. Maximum pension

The maximum pension is the maximum amount at which pension benefits can be determined. It is calculated on the basis of the general pension formula, but limited to the value of 3.8 of the average value points (AVP) in calculation of personal points. Like the minimum pension, the maximum pension is subject of penalty/bonus in case of early/late retirement and refers to all types of pension benefits paid out of the public pension scheme, including the basic pension.

1.5. Valorisation, indexation and taxation of pensions

1.5.1. Valorisation of pensions

Actual pension value (APV) is adjusted twice a year, in January and July, hence influencing valorisation of previous earnings/contributions. In July, the APV is increased by 50% of the average gross wage increase plus 50% of consumer price inflation in the previous six months. In January, the APV increases by a rate that is a combination of wage and price increases in the previous year in one of the following proportions: 70%:30%; 50%:50%; or 30%:70%. If wage and price rises are close, then 50% - 50% adjustment is taken; otherwise, it will be 70 % by the indicator (wage or price rise) with a higher rate of change. However, rate of adjustment in January will be reduced by adjustment already taken in July. A simple interpretation (though not completely accurate) of the APV adjustment mechanism is that it is regularly adjusted with wage and price change in a 70%:30% proportion, where the 70%-weight is given to indicator that has increased at a higher rate. If the above adjustment rule results in a negative value, there will be no change in the APV.

1.5.2. Indexation of pensions

Indexation of pensions, i.e. adjustment of pensions in payments is subject to the same rules and the same rates as the valorisation of pensions. Pension payments from the second pillar should also be adjusted (indexed) by the same rule.

Pensions or portions of pensions that are determined by special regulation are indexed by the rate determined by the Government and such rate cannot exceed the general rate of valorisation/indexation. Moreover, there will be no adjustments of such pensions if GDP increases by less than 2% in each of three previous quarters and if the state budget deficit is higher than 3%.

During regular economic conditions, the current rules for valorisation and indexation of pension will lead to adjustments that are below average wage growth. Provided there are no other changes, the adjustments will lead to declining benefit ratios and replacement rates.

1.5.3. Taxation

Pension benefits are subject to income taxation, but pensioners have a more favourable treatment and large majority of pensions go untaxed in practice. Pensioners with benefits higher than the economy-wide average net wage pay health insurance contribution of 3% of gross pensions. Remaining pensions are taxed according to general income tax rules. However, the personal tax allowance for pensioners is higher than in the general case and in 2014 it amounts to HRK 3.400 per month (compared to HRK 2.200 in the case of general taxation). Disabled persons, persons who support family members and those living in underdeveloped regions are entitled to a higher tax allowance. In most cases, the personal tax allowance is higher than the pension benefit and no tax is paid. Therefore, the average gross and the average net pensions are similar.

1.6. Recent reforms of the pension system included in the projections

The projections include important changes brought to the system by a set of laws enacted at the end of 2013 and in application from the beginning of 2014. These are the Pension Insurance Law (OG no.

157/2013), in force from 1 January 2014, Act on Mandatory Pension Funds (OG no. 19/2014), in force from 20 February 2014, Act on Voluntary Pension Funds (OG no 19/2014), in force from 20 February 2014 and Act on Pension Insurance Companies (OG no 22/2014), in force from 27 February 2014.

The most important changes brought about and included in the projections are the following:

- revised valorisation and indexation of pensions in the public PAYG scheme; from the previous 50% : 50% with wages and prices to variable adjustment at 70%:30%; 50%:50%; or 30%:70% with wages and prices;
- indexation of pensions determined under special regulations at government discretion; the rate cannot be higher than that of old-age pensions in the public PAYG scheme;
- indexation of second-pillar pensions in payment in the same manner as in the first pillar; 70%:30%; 50%:50%; or 30%:70%, previously it was 100% price indexation;
- new formula for the basic pensions paid from the first pillar for two-pillar participants;
- revised pension decrement factors for early retirement;
- decrease of pensions determined under special regulations and higher than HRK 5.000 per month by 10% as of January 1, 2014, which is a temporary measure that will be abolished upon meeting certain economic and fiscal conditions;
- conversion of total disability pensions to old-age pension upon reaching the age required for old-age pension; the conversion will be effective from January 2015; previously, disability pensions were treated as such during the entire retirement period; although this is a kind of a technical operation (there will be no change in the pension benefit), it will cause abrupt changes in the number of disability pensions and in the average pension benefit for old-age and disability pensioners in 2015;
- new definitions of occupational disability and new procedures for disability assessment;
- old-age pensioners can combine their pensions with part-time employment.

1.7. “Constant policy” assumptions used in the projection

It is assumed that the current legislation (as of September 2014) will remain in force over the entire projection period. In particular, the valorisation and indexation rules set in the laws defining the first and the second pillar pensions are assumed to be in application by 2060. Indexation of pensions, that are determined according to special regulations, is a matter of government’s discretion. In the pension projections, it is assumed that there will be no indexation of such pensions up until 2017, because necessary preconditions for indexation (defined by the Pension Insurance Law) in terms of GDP growth and fiscal deficit will not be met. It is then assumed that up until 2030 indexation will be 100% with prices, and between 2030 and 2060 indexation will be equal to general pension rules. It is also assumed that the share of taxes in pension expenditures remains constant in the projection horizon.

2. Demographic and labour force projections

2.1. Demographic projections

Croatian population is declining and aging. In the period 2013 - 2060, the population is projected to decline by around 13%, from 4.3 to 3.7 million. In parallel, life expectancy should increase significantly. At the age of 65, life expectancy is projected to increase by 5.8 years for men and 5.5 years for women between 2013 and 2060. Survivor rates at 65+ and 80+ are also expected to increase notably. The old-age dependency ratio (15-64) will be almost doubled by 2060 and reach 52.3%, whereas the ratio of older old-age population (80+) to total old-age population (65+) is expected to reach 37.5%. Net migration is expected to remain positive in the entire period 2013 - 2060. However, it will have a negligible impact on the overall demographic developments.

The projected demographic trends will cause strong pressure on the pension system sustainability, in particular on the public PAYG scheme. Although there is no automatic adjustment mechanism in pension formulas, the enacted increases of statutory retirement age for women from 61 in 2014 to 65 by 2030, and for both men and women from 65 to 67 between 2030 and 2038, should release the pressure.

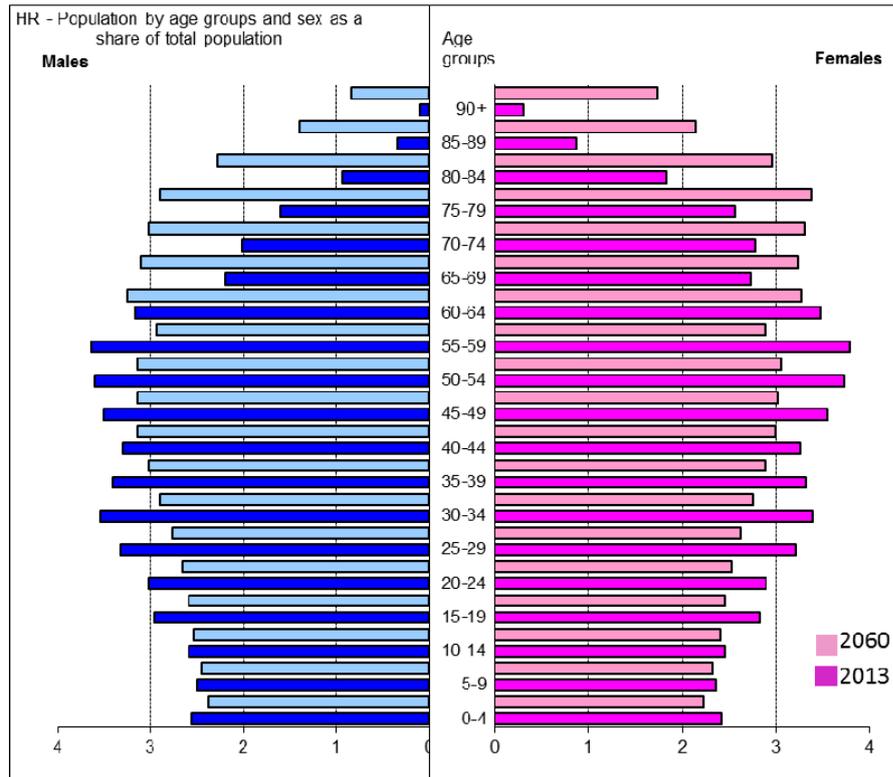
Table 2 - Main demographic variables evolution

	2013	2020	2030	2040	2050	2060	Peak year*
Population (thousand)	4257	4194	4081	3951	3822	3699	2013
Population growth rate	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	2015
Old-age dependency ratio (pop65/pop15-)	27.3	32.1	39.5	43.9	49.3	52.3	2060
Ageing of the aged (pop80+/pop65+)	23.9	25.8	25.5	32.9	34.8	37.5	2060
Men - Life expectancy at birth	74.0	75.4	77.4	79.3	81.0	82.7	2060
Men - Life expectancy at 65	15.0	15.9	17.2	18.5	19.7	20.8	2060
Women - Life expectancy at birth	80.7	81.8	83.4	84.8	86.2	87.6	2060
Women - Life expectancy at 65	18.7	19.6	20.8	22.0	23.1	24.2	2060
Men - Survivor rate at 65+	78.5	81.1	84.2	86.9	89.1	90.9	2060
Men - Survivor rate at 80+	40.2	45.4	52.4	58.9	64.8	70.0	2060
Women - Survivor rate at 65+	90.7	91.7	93.0	94.0	94.9	95.7	2060
Women - Survivor rate at 80+	64.4	68.2	73.1	77.3	81.0	84.1	2060
Net migration	2.3	2.4	3.5	4.6	5.7	4.8	2049
Net migration over population change	-0.2	-0.2	-0.3	-0.3	-0.5	-0.4	2049

Source: EUROSTAT and Commission Services

Explanatory note: *This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2013 to 2060.

Graph 1 - Age pyramid comparison: 2013 vs 2060



Source: Commission Services

2.2. Labour force projections

Croatia is characterized by rather low participation and employment rates in general, and that can also be said for participation and employment rates of older cohorts (55-64 and 65-74 years), as shown in Table 3.

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

	2013	2020	2030	2040	2050	2060	Peak year*
Labour force participation rate 55-64	41.4	44.5	45.8	52.5	51.0	50.9	2041
Employment rate for workers aged 55-64	37.1	41.2	43.2	50.3	48.9	48.8	2041
Share of workers aged 55-64 on the total labour force	89.6	92.5	94.3	95.9	95.9	95.9	2048
Labour force participation rate 65-74	5.9	8.6	10.3	11.8	14.5	13.8	2048
Employment rate for workers aged 65-74	5.8	8.5	10.2	11.7	14.4	13.7	2048
Share of workers aged 65-74 on the total labour force	98.9	98.8	99.3	99.5	99.5	99.5	2056
Median age of the labour force	39.0	40.0	41.0	41.0	41.0	41.0	2026

Source: Commission Services

Explanatory note: *This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2013 to 2060.

Both the labour force participation rate and employment rate for workers aged 55-64 is projected to increase by 2040 (with a peak in 2041), and then to slightly fall again. However, even with an increase of the participation rate by almost 10 percentage points and employment rate by more than 11 points in the period 2013-2060, the participation rate for this age group will be around 51% in 2060, while the employment rate is projected to be around 49%. The 65-74 years age group is projected to more than double both the participation and employment rate in 2060 in comparison to 2013; from 5.9% (5.8%) in 2013 to 13.8% (13.7%) in 2060 with its peak in 2048. Such projected increase is in line with legislated increase in the statutory retirement and expected recovery of the economy. Median age of the labour force should rise by 2026 and stay constant thereafter at around 41 years.

According to the CSM model, average effective entry age in Croatia should remain constant in the entire projection period in the case of men (22.5 years), whereas in the case of women it should increase from 24.3 years in 2013 to 24.7 in 2020 and remain constant afterwards (Tables 4a and 4b). Average effective exit age is projected to increase for both men and women. For men, it starts at 61.7 years in 2013 and should reach its peak in 2038 and stay constant thereafter at 64 years. For women, it starts at 61.2 years in 2013 and should reach its peak in 2046 and then stay constant at 63.7 years. These projected developments (CSM model) imply an increase in the average effective working career by 2.3 years for men and 2.1 years for women. In period 2013-2060, the average contributory period is projected to increase from 36.3 to 39.2 years for men and from 34 to 38.9 years for women. At the same time, the expected duration of retirement and the projected share adult life spent at retirement are increasing for both men and women. The duration of retirement for men is projected to increase by 4.6 years, from 17.1 years in 2013 to 21.7 years in 2060. For women it is expected to increase by 3 years, from 22.1 years in 2013 to 25.1 years in 2060 for women. In the projection horizon, the expected duration of retirement increased by less than the projected life expectancy at the age of 65 years, and by less than the expected contributory period for men. For women, contributory period is expected to increase by 4.9 years between 2013 and 2060, while duration of retirement would increase by 3 years. It is also projected that early retirement will be less and less practiced in comparison with late retirement and in 2050 and later, early retirement will be less frequently used than late retirement.

Table 4a - Labour market entry age, exit age and expected duration of life spent at retirement - MEN

	2013	2020	2030	2040	2050	2060	Peak year*
Average effective entry age (CSM) (I)	22.5	22.5	22.5	22.5	22.5	22.5	2013
Average effective exit age (CSM) (II)	61.7	62.6	62.9	64.0	64.0	64.0	2038
Average effective working career (CSM) (II)-(I)	39.2	40.1	40.4	41.5	41.5	41.5	2038
Contributory period	36.3	36.5	36.8	38.4	38.9	39.2	2060
Contributory period/Average working career	0.9	0.9	0.9	0.9	0.9	0.9	2060
Duration of retirement **	17.1	17.3	18.7	19.2	20.5	21.7	2060
Duration of retirement/average working career	43.6	43.1	46.2	46.2	49.3	52.2	2060
Percentage of adult life spent at retirement***	28.1	28.0	29.4	29.4	30.8	32.0	2060
Early/late exit****	3.3	2.3	1.6	1.2	0.9	0.9	2014

Table 4b - Labour market entry age, exit age and expected duration of life spent at retirement - WOMEN

	2013	2020	2030	2040	2050	2060	Peak year*
Average effective entry age (CSM) (I)	24.3	24.7	24.7	24.7	24.7	24.7	2017
Average effective exit age (CSM) (II)	61.2	61.9	62.9	63.7	63.7	63.7	2046
Average effective working career (CSM) (II)-(I)	36.9	37.2	38.1	39.0	39.0	39.0	2046
Contributory period	34.0	34.9	36.6	38.1	38.6	38.9	2060
Contributory period/Average working career	0.9	0.9	1.0	1.0	1.0	1.0	2060
Duration of retirement **	22.1	22.2	22.5	22.8	24.0	25.1	2060
Duration of retirement/average working career	59.9	59.7	59.0	58.5	61.5	64.4	2060
Percentage of adult life spent at retirement***	33.9	33.6	33.4	33.3	34.4	35.4	2060
Early/late exit****	1.2	1.8	1.6	1.2	0.8	0.8	2020

Source: Commission Services

Explanatory note: *This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2013 to 2060. ** Duration of retirement is calculated as the difference between the life expectancy at average effective exit age and the average effective exit age itself. *** The percentage of adult life spent at retirement is calculated as the ratio between the duration of retirement and the life expectancy diminished by 18 years. **** Early/late exit, in the specific year, 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.

3. Pension projection results

3.1. Extent of the coverage of the pension schemes in the projections

The projections cover all pensions from the public pension scheme, as well as pensions from mandatory private second pillar. The voluntary third pillar is not included in projections due to its relatively low significance for future retirement incomes and limitations of projection model.

Up until 2012 (Table 5), all the pension expenditures were entirely within the public pension scheme because payment phase of the second pillar has been of marginal importance at that time.

The AWG projection covers almost all pension expenditures included in the Eurostat (ESSPROS) official figures. The marginal difference between AWG and Eurostat figures of about 0.2% of GDP (Table 5) is due to the fact that the Eurostat includes some categories of pension expenditures not covered by the AWG definition, such as: health contributions for pensioners paid by the state budget, compensation allowance for a physical injury, costs of a professional rehabilitation program, as well as Christmas bonus and some other benefits paid according to discretionary Government decisions.

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

	2005	2006	2007	2008	2009	2010	2011	2012
1 Eurostat total pension expenditure	:	:	:	9.5	10.4	10.7	10.6	10.7
2 Eurostat public pension expenditure	:	:	:	9.5	10.4	10.7	10.6	10.7
3 Public pension expenditure (AWG)	:	:	:	9.3	10.2	10.5	10.4	10.5
4 Difference (2) - (3)	#	#	#	0.2	0.2	0.2	0.2	0.2
5 Expenditure categories not considered in the AWG definition, please specify:	:	:	:	:	:	:	:	:
5.1 ...	:	:	:	:	:	:	:	:
5.2 ...	:	:	:	:	:	:	:	:
5.3 ...	:	:	:	:	:	:	:	:

Source: EUROSTAT

Non-contributory means-tested social benefits are neither covered by our projections nor treated as pensions by Eurostat. For example, the Support Allowance (renamed to the Guaranteed Minimum Benefit in 2014) is a kind of minimum income guarantee aimed to support households with rather low resources. It covers general population and pensioners (i.e. those receiving a contributory pension) rarely qualify for this type of social assistance, because the minimum pension is higher than the income threshold condition. However, it is possible for pensioners to receive this allowance if living in households with other dependent members and/or having short working career consisting of part-time jobs. In 2013 there were around 10 thousand beneficiaries aged 65 years and more (around 9% of total beneficiaries; 1.3% of the population of the same age). The Assistance and Care Allowance is a non-contributory periodic cash benefit aimed for persons who cannot perform basic everyday activities or satisfy specific needs without the help of others. It is income tested while the

threshold is somewhat higher than in the Support Allowance program. Therefore, it is more often the case that pensioners with low pension benefits qualify for this kind of social assistance. There were around 43 thousand beneficiaries aged 65 years and more (almost 60% of total beneficiaries; 5.5% of the population of the same age). Above mentioned social assistance programs are of low generosity; total expenditures are of around 0.3% of GDP on both programs.

3.2. Overview of the projection results

In the baseline scenario, gross public pension expenditures measured as a proportion of the GDP are projected to decline continuously, from 10.9% in 2013 to 7.0% in 2060 (Table 6). Although demographic trends, foremost increase in life expectancy and increased share of elderly in total population, tend to push up future pension expenditures in Croatia, there are other important factors working in the opposite direction:

1. A significant share of population is already in retirement, due to insufficiently strict incentives for postponing early retirement in the past, loose conditions for achieving disability pension rights and relatively large number of War veterans arising from Croatian Homeland War, meaning that population cohorts which represent the base for future retirement are reduced. Currently, 28.6% of the total population in Croatia is in retirement.
2. Due to introduction of two-pillar mandatory private pension system, since 2027 majority of new pension beneficiaries will receive the basic pension from the first pillar plus the pension from the second pillar. This fact will cause that the average pension paid out from the first pillar will gradually decline and hence public pension expenditures will decline. Also, two-pillar participants are not entitled to the pension supplement of 27% on their first-pillar pensions, leading to lower expenditures of the public scheme.
3. Statutory retirement age for women will gradually rise by three months per year to 67 by the year 2038 and also for men by three months per year in the period from 2031 to 2038 so that from 2038 the retirement age for both sexes will be 67. This measure will slow down inflow of new beneficiaries in the pension system.
4. Disability pension beneficiaries are projected to continually decrease as a result of the new system for achieving disability pensions which has been established alongside with the introduction of compulsory medical assessment every 3 years for disability pensioners, improved occupational rehabilitation system and also considering the fact that the number of disability pensioners-war veterans reached its peak and will gradually decline in the future.
5. Survivors' pension beneficiaries are also projected to decrease due to demographic trends and increased employment rate of women.
6. Projected rate of valorisation and indexation of pensions is lower than the projected rate of growth of wages, as well as that of GDP.

Mandatory private scheme is projected to have growing importance as it matures. In years up to 2027, most of potential new pensioners of this scheme have an option to return to the public scheme for payment of pensions and we assume they will use this option as public pensions are projected to be somewhat higher than combined ones. But after 2027, the most of new retirees (those born after 1962) will not have the option of receiving mono-pillar pension and therefore the number of private

pensions will start to increase. The net pension expenditures are following the trends of gross pension expenditures as it is assumed that share of taxes in pension expenditures remains constant.

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

Expenditure	2013	2020	2030	2040	2050	2060	Peak year*
Gross public pension expenditure	10.9	10.3	9.6	7.9	7.2	7.0	2014
Private occupational pensions	:	:	:	:	:	:	:
Private individual pensions	0.0	0.0	0.3	0.8	1.3	1.6	2060
<i>Mandatory private</i>	0.0	0.0	0.3	0.8	1.3	1.6	2060
<i>Non-mandatory private</i>	:	:	:	:	:	:	:
Gross total pension expenditure	10.9	10.4	9.9	8.6	8.5	8.6	2014
Net public pension expenditure	10.8	10.2	9.4	7.8	7.1	6.9	2014
Net total pension expenditure	10.8	10.2	9.8	8.5	8.4	8.5	2014
Contributions	2013	2020	2030	2040	2050	2060	Peak year*
Public pension contributions	5.9	5.9	5.6	5.6	5.6	5.6	2016
Total pension contributions	7.5	7.5	7.5	7.5	7.5	7.5	2017

Source: Commission Services

Explanatory note: * This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2010 to 2060.

Contribution revenues of the public PAYG scheme were 5.9% of GDP in 2013 and will decline towards 5.6% by 2030 due to increasing proportion of employees insured in both mandatory pillars (they pay 15% of contributions to the public scheme and 5% to the private scheme) and declining proportion of employees insured only in the public scheme (they pay 20% of contributions to the public scheme). After the two-pillar system reaches its maturity, around 2030, and the most of employees will pay combined insurance, contribution revenues of the public scheme will stabilize at 5.6% of GDP. The gap between public pension expenditures and public pension contributions is financed from the state budget, which was 4% of GDP in 2013, is projected to decline to around 1.4% of GDP in 2060.

Table 7 reveals peculiar composition of gross public pension spending in Croatia. In 2013, disability pensions accounted for rather high 2.5% of GDP, while old age and early pensions accounted for 5.1% of GDP. High share of disability pensions is due to loose conditions for achieving disability pension rights and relatively large number of war veterans, but also due to the practice that disability pensions are not converted to old-age pensions when pensioner reaches statutory retirement age. Such conversion will be practiced in Croatia as of 2015, which explains sudden decline in spending on disability pensions between 2013 and 2020, as reported in Table 7. Declining trend in disability pensions thereafter is due to stricter conditions for disability pension and declining number of war veterans' pensions.

Table 7 - Projected gross public pension spending by scheme (% of GDP)

Pension scheme	2013	2020	2030	2040	2050	2060	Peak year *
Total public pensions	10.9	10.3	9.6	7.9	7.2	7.0	2014
<i>of which earnings related:</i>							
<i>Old age and early pensions</i>	5.1	5.8	5.6	4.3	3.8	3.7	2024
<i>Disability pensions</i>	2.5	1.3	0.7	0.6	0.5	0.5	2013
<i>Survivors' pensions</i>	1.6	1.3	1.1	1.0	1.0	0.9	2013
<i>Other pensions</i>	1.7	1.9	2.2	2.0	1.9	1.9	2030
<i>of which non-earnings related (including minimum pension and minimum income guarantee):</i>							
<i>Old age and early pensions</i>	:	:	:	:	:	:	:
<i>Disability pensions</i>	:	:	:	:	:	:	:
<i>Other pensions</i>	:	:	:	:	:	:	:
<i>of which</i>							
<i>country-specific scheme 1</i>	:	:	:	:	:	:	:

Source: Commission Services

Explanatory note: Table 7 provides an example of how public expenditure could be decomposed. Countries should adapt this table with regards to their specific situation, i.e. farmer, self-employed, etc.* This column represents a peak year, i.e. the year in which the particular variable reaches its maximum over the projection period 2010 to 2060.

One can also note rather high expenditures on “other pensions”, 1.7% of GDP in 2013. These are, in fact, minimum pensions granted mostly under general pension rules or, in much lower proportion, according to special legislation (minimum of 45% of the average net wage for war veterans under certain conditions). Due to specificities of minimum pensions in Croatia, it is agreed that they will not be reported under non-earnings related pensions, but as other pensions. Expenditures on these pensions are projected to increase up to 2030 mostly due to expected rise in the number of war veterans’ minimum pensions, but thereafter they will decline due to rising share of the two-pillar pensions where in the first pillar they will acquire the basic minimum pension which is lower than the minimum pension of those who retired only in the first pillar. Public expenditures for old age and early pensions are projected to rise up to 2024, after which they will decrease to 3.7% of GDP in 2060, predominately as a consequence of maturation of two-pillar insurance system.

3.3. Main driving forces behind the projection results

According to the decomposition results reported in Table 8³, demographic trends will exert a strong upward pressure on public pension expenditures. Other things being constant, the dependency ratio (elderly/working age population) would alone lead to an increase in the pension expenditures/GDP ratio by 6.4 percentage points between 2013 and 2060, with the most of the effect cumulated up until 2030. However, other factors related to the pension system reforms and labour market

³ The decomposition of public pension expenditures on the basis of the number of pensioners gives exactly the same results as that based on the number of pensions and reported in Table 8 and therefore those results are not reported here.

developments will more than compensate for the demographic changes effect and drive public pension expenditures in the opposite direction.

The benefit ratio has a strong downward effect on public pension expenditures, 5.0 percentage points between 2013 and 2060. Benefit ratio for public scheme old-age earnings-related pensions declines from 34.9% in 2013 to 20.5% in 2060 (Table 9). There are three main reasons for that: i) valorisation and indexation of pensions at a rate lower than wage growth, ii) growing importance of two-pillar pension regime that results in lower expenditure of the public scheme, and iii) declining number of pensions based on special regulations and their less generous indexation.

Table 8 - Factors behind the change in public pension expenditures between 2013 and 2060 (in percentage points of GDP) - pensions

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60	Average annual change
Public pensions to GDP	-0.6	-0.8	-1.7	-0.6	-0.3	-3.9	0.145
Dependency ratio effect	1.7	2.3	1.0	0.9	0.5	6.4	0.130
Coverage ratio effect	-1.0	-1.1	-0.9	-0.3	-0.1	-3.3	-0.070
<i>Coverage ratio old-age*</i>	-0.1	-0.2	-0.5	-0.1	0.0	-0.9	-0.018
<i>Coverage ratio early-age*</i>	-1.5	-1.9	-2.0	0.0	0.1	-5.2	-0.113
<i>Cohort effect*</i>	-1.5	-2.0	-0.6	-1.0	-0.7	-5.8	-0.125
Benefit ratio effect	-0.5	-1.3	-1.4	-1.1	-0.6	-5.0	-0.107
Labour Market/Labour intensity effect	-0.7	-0.5	-0.4	-0.1	0.0	-1.7	-0.034
<i>Employment ratio effect</i>	-0.6	-0.4	-0.3	0.0	0.0	-1.4	-0.028
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.000
<i>Career shift effect</i>	-0.1	-0.1	0.0	-0.1	0.0	-0.3	-0.006
Residual	-0.1	-0.2	0.0	-0.1	0.0	-0.4	0.226

Source: Commission Services

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

Coverage ratio effect (pensioners/elderly population) is estimated to decrease pension expenditure-to-GDP ratio by 3.3 percentage points in the period 2013 to 2060. This is the result of pension system reforms, foremost the rising statutory and early retirement age that are projected to increase average exit age, but also stricter rules for disability pensions. This effect is particularly strong because retirement age for women will increase by 6 years between 2014 and 2038, which will reduce their retirement before the age of 65, explaining thereby a high effect of coverage ratio for early-age retirement.

Due to rising employment rate, particularly in the first half of the projection horizon and for older workers (career shift), the labour market effect is estimated to contribute to lowering of the expenditure-to-GDP ratio by 1.7 percentage points.

Table 9 - Replacement rate at retirement (RR), benefit ratio (BR), and coverage by pension scheme (in %)

	2013	2020	2030	2040	2050	2060
Public scheme (BR)	30.8	29.9	26.3	22.4	19.3	17.6
Public scheme (RR)	27.9	27.6	21.3	18.8	17.4	16.5
Coverage	100.0	100.0	100.0	100.0	100.0	100.0
Public scheme old-age earnings related (BR)	34.9	35.2	32.1	26.7	22.5	20.5
Public scheme old-age earnings related (RR)	35.3	35.0	22.9	20.6	19.4	18.7
Coverage	41.5	48.0	48.1	45.9	45.5	45.2
Private occupational scheme (BR)	:	:	:	:	:	:
Private occupational scheme (RR)	:	:	:	:	:	:
Coverage	:	:	:	:	:	:
Private individual scheme (BR)	2.5	3.4	5.2	6.3	7.2	7.5
Private individual scheme (RR)	2.2	3.8	5.9	7.9	7.9	7.9
Coverage	0.0	0.5	17.0	35.1	48.9	55.2
Total (BR)	30.8	29.9	27.2	24.7	22.9	21.8
Total (RR)	27.9	27.8	24.7	22.9	21.6	20.7

Source: Commission Services

Explanatory note: Coverage of each pension scheme is calculated as a ratio of the number of pensioners within the scheme and the total number of pensioners in the country. When data on pensioners are not available calculation based on number of pensions is allowed.

The replacement rate at retirement (the first pension of those who retire over the average wage at retirement) in the public scheme is projected to decline steadily over the projection horizon (Table 9). Two main reasons behind that are i) the already mentioned valorisation and indexation of pensions at rates below the wage growth, and ii) increasing number of two-pillar pensioners in the regime of combined pensions, where the 27 % pension supplement is only provided to mono-pillar pensioners and as their proportion in total number of pensioners declines with time, the average pension benefits of new pensioners will also decline. The replacement rate in the mandatory private scheme will gradually increase up until 2040 when this scheme should reach its maturity, and when it is projected to stabilize at around 7.9%. The replacement rate measured for combined pensions from public and mandatory private schemes will gradually decline from 27.9% in 2013 to 20.7% in 2060. The longer expected contribution period due to rising statutory retirement age is projected to be relatively weak in driving the replacement rate up compared to other factors that drive it down. The similar trend is projected for the benefit ratio.

The low replacement rate and its significant decline despite the increase in the average contributory period (see below Table 13a) raise serious concerns about pension adequacy in Croatia. Although the replacement rate expressed in net term points is much higher than in gross terms, due to a much lower tax burden on pensions than on wages, the falling trend remains in both terms.⁴ Even after transition period to the two-pillar system is over, the current valorisation/indexation rule implies declining replacement rate of public pensions, while private pensions will provide for more-or-less

⁴ The difference between gross and net terms is considerable, which can be illustrated with the benefit ratio. For example, in 2013 benefit ratio in the public scheme in gross terms was 30.8 percent, while in net terms it is estimated at 43.8 percent.

stable replacement rate. Such situation is likely to lead to increasing pressures to change certain parameters of the pension system, which is a challenge for our no policy change assumptions.

Public PAYG scheme is mandatory and its coverage is 100% over the entire projection period. Coverage rate of private pension scheme increases from virtually 0% in 2013 to 55.2% in 2060. Less than full coverage of the private scheme is because in 2060 there will still be old-age pensioners that accrued their pension rights in mono-pillar system, but also because all disability and majority of survivors pensions should be paid out from the public scheme just as pensions of military and police personnel as well as pensions granted under special regulations.

The number of pensioners is expected to increase modestly until 2030, then to decline between 2030 and 2040, and to rise again thereafter (Table 10). As employment is expected to decline ever since 2018, the pension system dependency ratio will increase in post-2018 period to reach 91.6% in 2060. However, rising pace of pension system dependency ratio will be slower than the pace of old-age dependency ratio mostly thanks to pension system reforms. Rising statutory retirement age, especially in period 2030-2038 will slow down inflow of new pensioners. Modest increase in the number of pensioners in years up to 2030 is due to rising retirement age for women, but also due to relatively large share of population that is already retired before the statutory retirement age (reflected in currently large share of disability and early age pensions) reducing thereby inflow of new pensioners in the future in the situation where conditions for new disability pensions are made stricter. System efficiency seems to be improving in the sense that the ratio of system dependency ratio and old-age dependency ratio is decreasing up to 2040. In 2040 to 2060, the system efficiency ratio should stay constant at 1.8%.

Table 10 - System dependency ratio and old-age dependency ratio

	2013	2020	2030	2040	2050	2060
Number of pensioners (thousand) (I)	1217.8	1241.4	1266.2	1204.6	1216.3	1212.7
Employment (thousand) (II)	1511.9	1549.5	1505.9	1484.1	1403.1	1324.0
Pension System Dependency Ratio (SDR) (I)/(II)	80.6	80.1	84.1	81.2	86.7	91.6
Number of people aged 65+ (thousand) (III)	777.3	868.0	989.1	1040.2	1087.3	1093.1
Working age population 15 - 64 (thousand) (IV)	2846.6	2700.3	2506.9	2368.6	2204.4	2089.7
Old-age Dependency Ratio (ODR) (III)/(IV)	27.3	32.1	39.5	43.9	49.3	52.3
System efficiency (SDR/ODR)	2.9	2.5	2.1	1.8	1.8	1.8

Source: Commission Services

Age distribution of pensioners in the public PAYG scheme is shown in Tables 11a and 11b, while the age distribution of female pensioners is shown in Tables 12a and 12b. One can observe relatively large share of younger cohorts (up to the age of 60) of pensioners in both inactive and overall population. This is mostly due to disability pensions, particularly those of war veterans. The shares of these younger cohorts should decline in the future as the average retirement age will increase and inflow of new disability pensions will be reduced. It is interesting to note that the pensioner-to-population ratio for 65-69 and 75+ age groups in 2013 is above 100%. The difference is particularly important in the age group 65-69 and it remains thus, evolving by cohort over time. This is the reflection of the recent past in Croatia, where a number of pensioners receives pensions from the

Croatian pension system, but lives in other countries, particularly countries of former Yugoslavia. Workers' flows were intensive in former Yugoslavia and Croatia was one of the most developed states attracting thereby workers from other states. Also, there were very intensive migration flows in early 1990s. As a consequence, in 2013, around 11% of pension beneficiaries are living abroad (8% in countries of former Yugoslavia). Demographic projections indicate that migration flows will be rather moderate in the future and pension projections show that the initial imbalance will gradually disappear, i.e. toward the end of the projection horizon the number of pensioners and the population of older age tend to be aligned. Possible future non-resident pension claimers are not specifically modeled, but the model implicitly takes account of them as one of the key parameters of the model, the rate of retirement in the initial period, already contains certain number of non-resident claimers.

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

	2013	2020	2030	2040	2050	2060
Age group -54	9.2	8.0	6.7	6.7	6.4	6.0
Age group 55-59	67.9	56.5	42.1	41.3	40.6	41.0
Age group 60-64	92.3	86.1	78.0	60.5	60.5	61.1
Age group 65-69	119.5	113.1	105.4	90.3	95.1	93.6
Age group 70-74	103.2	119.2	109.7	103.8	107.1	106.2
Age group 75+	104.1	101.3	107.6	104.9	101.4	101.2

Source: Commission Services

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

	2013	2020	2030	2040	2050	2060
Age group -54	4.1	3.5	2.9	2.9	2.8	2.6
Age group 55-59	30.9	24.8	17.9	16.0	16.6	16.6
Age group 60-64	67.7	57.6	51.5	34.2	34.4	34.6
Age group 65-69	110.4	99.8	91.2	73.8	74.9	74.3
Age group 70-74	98.9	113.8	102.1	98.5	99.4	98.8
Age group 75+	104.1	101.3	107.6	104.9	101.4	101.2

Source: Commission Services

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

	2013	2020	2030	2040	2050	2060
Age group -54	5.4	6.1	6.7	7.0	6.4	6.0
Age group 55-59	64.6	50.7	37.3	42.8	41.0	41.2
Age group 60-64	93.9	87.2	73.7	67.6	68.1	68.9
Age group 65-69	110.4	103.5	90.5	83.1	88.7	88.8
Age group 70-74	92.8	111.1	101.3	95.1	98.2	99.7
Age group 75+	96.8	95.1	103.3	100.5	97.9	98.3

Source: Commission Services

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

	2013	2020	2030	2040	2050	2060
Age group -54	2.5	2.8	3.0	3.1	2.9	2.8
Age group 55-59	35.6	24.7	16.2	16.4	17.0	17.0
Age group 60-64	75.7	62.1	50.2	38.5	39.0	39.5
Age group 65-69	103.5	93.4	78.9	68.2	69.8	70.7
Age group 70-74	90.3	107.0	94.5	90.4	91.2	92.8
Age group 75+	96.8	95.1	103.3	100.5	97.9	98.3

Source: Commission Services

New public pension expenditure can be disaggregated on the number of new pensions and the average pension, which in turn can be disaggregated, within the Croatian point system, to the number of pension points at retirement and the point value. The results are shown in Table 13a for all new old-age and early earnings-related pensions, in Table 13b for such pension for males and in Table 13c for females. **Minimum pensions are not included in the new pension decomposition as they are labeled as “other pensions - earnings related”; minimum pensions will be added to this block for the next projection exercise.** Increasing number of new pensioners in 2013-2020 is the result of the ageing population. However, between 2020 and 2030 and ever further up to 2038, the rising statutory retirement age dominates over ageing and lead to lower number of new pensions. Once transitional period is over, in 2038, inflow into retirement is projected to increase and then to stabilize somewhat between 2040 and 2050. In the last decade of the projection horizon, the reduced population will result in lower number of new pensions. This pattern is somewhat more pronounced for women than for men.

Accumulation of total pension points is projected to increase in the period up to 2022 driven by longer contributory period. However, as more and more new pensions will be combined pensions of the first and the second pillar, then first pillar pensions (the basic pensions) will be determined on the basis of pension points that are calculated using the basic pension factor of 0.75.

Total contributory period is projected to increase by 4.9 years for women and 2.9 years for men (3.8 years in total) between 2013 and 2060 as a reflection of rising statutory retirement age. Rising contributory period is related to projected increase in the average retirement age which is, in situation of rising statutory age, assumed to be driven also by rather low replacement rates meaning that workers have strong income incentive to stay longer in employment.⁵

Due to valorisation rules that increase the point value by lower rate than wage growth, average new pension expressed as a proportion of economy-wide average wage will decline continuously. The only exception is the period up to 2020 when majority of new pensions will be only from first pillar, where accumulation of pension points due to longer contributory period will dominate the impact of valorisation rules.

⁵ The strong link between increases in the actual retirement age and increases in statutory retirement age in situation of relatively low replacement rates was observed in the period 1999-2008 when statutory retirement age increased by 5 years for both men and women.

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

New pension	2013	2020	2030	2040	2050	2060
I. Projected new pension expenditure (millions EUR)	52.8	65.0	54.0	76.8	110.3	140.4
II. Number of new pensions (in 1000)	22.8	24.1	21.5	22.6	22.8	20.9
Monthly average pension	386.1	450.5	419.4	567.2	804.5	1119.3
III. Total pension points at retirement	38.3	38.9	33.1	31.9	31.9	32.2
Average pension points accumulated per year	1.1	1.1	0.9	0.8	0.8	0.8
Actual and virtual contributory period	35.3	35.8	36.7	38.2	38.8	39.1
V. Point value (V)	10.1	11.6	12.7	17.8	25.2	34.8
VI. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VII. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
Average pension over economy wide average wage	0.37	0.36	0.24	0.21	0.20	0.19

Source: Commission Services

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

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	31.5	39.3	33.5	42.0	62.2	76.7
II. Number of new pensions (in 1000)	13.1	14.0	13.1	12.1	12.6	11.2
Monthly average pension	402.1	468.8	426.7	580.9	821.4	1143.7
III. Total pension points at retirement	39.8	40.3	33.7	32.6	32.5	32.8
<i>Average pension points accumulated per year</i>	1.1	1.1	0.9	0.8	0.8	0.8
<i>Actual and virtual contributory period</i>	36.3	36.5	36.8	38.4	38.9	39.2
V. Point value (V)	10.1	11.6	12.7	17.8	25.3	34.9
VI. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VII. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
Average pension over economy wide average wage	0.38	0.38	0.24	0.22	0.21	0.20

Source: Commission Services

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

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	21.3	25.8	20.5	34.8	48.1	63.7
II. Number of new pensions (in 1000)	9.7	10.1	8.4	10.5	10.2	9.7
Monthly average pension	364.7	425.1	407.9	551.6	783.7	1091.4
III. Total pension points at retirement	36.1	37.0	32.3	31.0	31.1	31.4
<i>Average pension points accumulated per year</i>	1.1	1.1	0.9	0.8	0.8	0.8
<i>Actual and virtual contributory period</i>	34.0	34.9	36.6	38.1	38.6	38.9
V. Point value (V)	10.1	11.5	12.6	17.8	25.2	34.7
VI. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VII. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
Average pension over economy wide average wage	0.35	0.34	0.23	0.21	0.20	0.19

Source: Commission Services

Table 13d shows disaggregation of expenditures on new pensions in the private individual scheme. The number of new pensions clearly shows that this scheme will become fully functional at around 2030. Thereafter, number of new pensioners will depend on rising statutory retirement age (until 2038) and on demographic developments. One should note that the number of new pensioners in the private scheme shown in Table 13d is higher than the number of new pensioners from the public scheme. The reason for this is that new pensions in the public scheme do not include minimum pensions, which are counted as “other pensions” and which are projected to account for about one third of the total new old-age and early pensions. The average accrual rate in the entire projection period is relatively stable, it evolves between 0.24 and 0.26 (due to rounded numbers in Table 13d, the variation seems much larger).

Table 13d - Projected and disaggregated new private individual pension expenditure

New pension	2013	2020	2030	2040	2050	2060
I. Projected new pension expenditure (millions EUR)	0.002	0.6	23.0	47.9	73.7	97.0
II. Number of new pensioners ('000)	0.0	2.2	35.6	36.8	37.5	34.3
Monthly average pension	24.0	49.0	107.3	216.9	327.8	471.0
III. Average contributory period	10.3	16.8	25.9	35.0	36.9	37.2
IV. Average accrual rates (%)	0.2	0.3	0.3	0.3	0.2	0.2
V. Monthly average pensionable earnings	976.5	1149.9	1635.0	2458.1	3697.2	5355.0
VI. Sustainability/Adjustment factor	1.0	1.0	1.0	1.0	1.0	1.0
VII. Average number of months paid the first year	6.0	6.0	6.0	6.0	6.0	6.0
Monthly average pensionable earnings / Monthly economy-wide	0.93	0.93	0.93	0.93	0.93	0.93

average wage						
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Source: Commission Services

3.4. Financing of the pension system

Public pension system is primarily financed by contributions paid by employees out of their gross earnings. However, employers are obliged to pay pension contributions for employees working in demanding or hazardous occupations, but that provides limited resources for the public pension fund. Table 14 shows that during the whole projected period (2013-2060) the ratio of employers' and employees' pension contributions is 2.6% : 97.4%. The Government does not pay specific contributions to the public pension scheme, but it has an obligation to cover any remaining financing gap. The Croatian Pension Insurance Institute is integrated into the Government Budget and it operates within the Treasury.

Table 14 - Revenue from contribution (million), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)

	2013	2020	2030	2040	2050	2060
Public contribution	2545.8	3130.8	4136.2	6090.5	8657.9	11832.5
<i>Employer contribution</i>	<i>65.8</i>	<i>80.8</i>	<i>106.3</i>	<i>156.4</i>	<i>222.3</i>	<i>303.8</i>
<i>Employee contribution</i>	<i>2480.0</i>	<i>3050.0</i>	<i>4029.9</i>	<i>5934.1</i>	<i>8435.6</i>	<i>11528.7</i>
<i>State contribution</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
Number of contributors (I)	1452.9	1489.1	1447.1	1426.3	1348.4	1272.4
Employment (II)	1511.9	1549.5	1505.9	1484.1	1403.1	1324.0
Ratio of (I)/(II)	1.0	1.0	1.0	1.0	1.0	1.0

Source: Commission Services

Due to rising proportion of two-pillar participants whose contribution rate for the public scheme is 15%, as compared to mono-pillar participants with contribution rate of 20% for the public scheme, the total contributions to the public scheme rise slower than the total wage bill.

The average number of contributors increases up to 2018 and then declines prospectively. It should be noted that the number of contributors is lower than total employment. It is because the model counts the average number of persons that actually pay contributions in given year. By assumption, the number of contributors rises at the same rate as total employment, so the contributors-to-employment ratio is equal to 0.961 over the projection horizon. This ratio was quite stable over the last decade, which is the reason to assume its stability in the future.

In 2013 contributions revenues represented around 53 percent of the public pension system revenues and remaining 47 percent were covered by the state budget. In the next decades, share of contributions revenues in the total revenues of the public pension system should rise due to declining pension expenditures and reduced number of the pensions under special regulations which are directly financed from the state budget.

3.5. Sensitivity analysis

The baseline projections of pension expenditures presented so far have been challenged by the number of the sensitivity tests in which particular parts of assumptions are changed. The results in term of deviation of expenditure-to-GDP ratio from the baseline projection are presented in Table 15.

Higher life expectancy by two years compared to the baseline is likely to gradually increase pension spending. In 2050, the difference is projected to reach 0.5 percent of GDP, and it will be entirely borne by the public pension scheme, as the private individual scheme will accommodate its pension payment to higher life expectancy. In the public scheme there is no automatic adjustment mechanism and the pension benefits are likely to stay unchanged while increasing pension spending will be the result of longer duration of retirement.

In the higher/lower labour productivity scenarios, the share of pension expenditures in GDP is projected to become a bit smaller/higher compared to the baseline scenario. In the case of higher productivity growth, a higher wage growth is expected. Then, the current valorisation and indexation rules would lead to somewhat lower benefit ratio and hence lower overall pension expenditures (and vice versa in the case of lower productivity growth). The effect is again concentrated in the public pension scheme.

Higher employment rates (overall and of older workers) may have beneficial effects on public spending on pensions foremost by rising GDP, although benefits are slightly higher due to longer contribution period in that case. However, this is in part a matter of distribution of benefits and costs over time; higher employment in present period would be beneficial for sustainability of the public PAYG system, but will cause higher pension expenditures in the future.

Due to relatively low migration flows in Croatia, lower migration scenario would have mild effect on the future pension expenditures, which may be higher by 0.1 percent of GDP in the period 2040-2060 compared to the baseline scenario. The lower net migration tends to reduce employment and GDP, while pension expenditures will remain unchanged in the first years, leading to somewhat higher pension expenditure-to-GDP ratio later on.

Worse-than-expected development of the total factor productivity in the risk scenario is expected to lead to a 0.3 percentage points higher expenditures on public pensions in 2060 in terms of GDP and in comparison with the baseline scenario (0.4 percentage points for total pension expenditures).

Policy scenario of linking retirement age to increases in life expectancy will potentially have the highest impact on lowering of pension expenditures relative to GDP. The projection results show a decline by 0.8 and 0.9 percentage points for public and total pension expenditures in 2060 compared to the baseline scenario. The dynamic retirement age will extend the contribution period, slowdown inflow into retirement and reduce duration of retirement resulting in a lower expenditure-to-GDP ratio. The private scheme with actuarial calculations of pension benefits is expected to partially accommodate for these effects, however the sustainability of the public PAYG scheme will be improved in that scenario.

Table 15 - Public and total pension expenditures under different scenarios (deviation from the baseline)

	2013	2020	2030	2040	2050	2060
Public Pension Expenditure						
Baseline	10.9	10.3	9.6	7.9	7.2	7.0
Higher life expectancy (2 extra years)	0.0	0.0	0.2	0.3	0.4	0.5
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.1	-0.1	-0.2	-0.2
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.1	0.1	0.2	0.2
Higher emp. rate (+2 pp.)	0.0	-0.2	-0.3	-0.2	-0.2	-0.2
Higher emp. of older workers (+10 pp.)	0.0	-0.3	-0.6	-0.5	-0.5	-0.4
Lower migration (-20%)	0.0	0.0	0.0	0.1	0.1	0.1
Risk scenario	0.0	0.0	0.0	0.1	0.2	0.3
Policy scenario: linking retirement age to increases in life expectancy	0.0	-0.1	-0.2	-0.3	-0.6	-0.8
Total Pension Expenditure						
Baseline	10.9	10.4	9.9	8.6	8.5	8.6
Higher life expectancy (2 extra years)	0.0	0.0	0.2	0.3	0.4	0.5
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.1	-0.1	-0.2	-0.3
Lower lab. productivity (-0.25 pp.)	0.0	0.0	0.1	0.2	0.2	0.3
Higher emp. rate (+2 pp.)	0.0	-0.2	-0.3	-0.2	-0.2	-0.2
Higher emp. of older workers (+10 pp.)	0.0	-0.3	-0.6	-0.6	-0.6	-0.5
Lower migration (-20%)	0.0	0.0	0.0	0.1	0.1	0.1
Risk scenario	0.0	0.0	0.1	0.1	0.3	0.4
Policy scenario: linking retirement age to increases in life expectancy	0.0	-0.1	-0.2	-0.4	-0.6	-0.9

Source: Commission Services

3.6. Description of the changes in comparison with earlier projections

The 2015 round of the AWG projections is the first round in which Croatia participates.

Table 16 - Average annual change in public pension expenditure to GDP compared to earlier projections

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	:	:	:	:	:	:	:
2009 **	:	:	:	:	:	:	:
2012 ***	:	:	:	:	:	:	:
2015****	-3.94	6.42	-3.29	-1.37	-4.99	0.00	-0.72

Source: Commission Services

Explanatory note: The Table presents the average annual change of pension expenditure and the contributions of the underlying component to that change, whereas Table shows, for different intervals of time, the decomposition, in percentage points, of the factors behind the change in public pension expenditures. * 2004 - 2050, ** 2007 - 2060, *** 2010 - 2060, **** 2013 – 2060. Please note that the four components do not add up because of a residual component.

4. Description of the pension projection model

4.1. Institutional context in which projections are made

The pension projection model has been recently developed within the Croatian Pension Insurance Institute by a joint working group consisting of experts from the Ministry of Labour and Pension System, Croatian Pension Insurance Institute and Institute of Economics, Zagreb. The model is designed specifically to produce pension projections for AWG purposes. It is expected to give useful insights into outcomes and driving forces of the Croatian pension system as a whole and of its components in the projection period up to 2060.

4.2. Assumptions and methodologies applied

The model is a macro simulation model, i.e. aggregated data are used in calculations. The model and structure of the data are developed in a way to comply with the AWG methodologies and assumptions.

The pension model is based on a cohort approach. The number of public pensions and pensioners is the same reflecting the fact that a person can receive only one pension from the public pension system. As the second pillar is mandatory for younger cohorts, growing number of pensioners in the public system will be entitled also to second pillar pension in the next decades as well, while their first pillar pension will be accordingly smaller than the pension of the older cohorts who acquired only the first pillar pension. In line with that, the total number of pensioners will be the same as the number of public pensions, while the total number of pensions will be the sum of pensions from both mandatory pillars.

The number of pensions in projection year t for a specific cohort (pension type, gender, and age) results from the number of pensions in year $t-1$ minus outflow of pensions plus new pensions in year t .

Outflow of pensions in each projection year is equal to the number of pensions in year $t-1$ multiplied by the mortality rates given the AWG population scenario, plus the outflows due to other reasons like switching from one type of pension to another, outflow of orphan pension due to finishing the school, etc.

New old-age and new disability pensions are calculated with probabilities of pension entry, estimated on the basis of past trends, taking into account the legislated increase of the statutory retirement age. Number of new orphan benefits is calculated on the basis of mortality rates of their parents. Number of new survivors' pensions for spouses is calculated on the basis of past trends.

The public pension benefits of new entrants are calculated by the point formula on a basis of their wages relative to average country wage and the average contribution years for different cohorts, taking into account penalties/bonuses in case of early/deferred retirement.

Minimum pension (service-related) of new entrants is calculated on the basis of contribution years, penalties/rewards for early/deferred retirement and basic pension factor applies to the part of the minimum pension for the years of service completed from 2002. Minimum pension of Homeland War Veterans is calculated at flat rate, corrected by penalties/rewards for early/deferred retirement. Due to their characteristics, all minimum pension provisions are labelled as “other pensions” in the questionnaire. As the minimum pension is more frequently acquired by new pensioners compared to the so-called “old pensioners” (retired before the 1999 reform, which were entitled to two types of minimum provision), the number of minimum pensions relative to the number of all pensions is increasing in the projecting period. The increase is intensified due to the fact that two-pillar pensioners are not entitled to the 27% supplement, and because more of them will qualify to the minimum pension than the mono-pillar pensioners.

New second pillar (fully funded, DC) pension benefits are calculated on the basis of individual account (the value of account depends on contribution years, wage, contribution rate, contribution collection efficiency, and rate of return), retirement age (unisex life expectancies are used) and type of pension (single, joint for spouses, both types can be with or without guaranteed period), and legislated regime of indexation. Administrative charges in both contribution-accumulation and pension-payment phases are also taken into account in the calculation of the second pillar benefits. The pensions from the first and the second pillar have the same indexation regime.

All the commonly agreed AWG assumptions are used in the pension projections.

4.3. Data used to run the model

The model uses the data from year 2013. Most of them come from the Croatian Pension Insurance Institute, which is in charge of disbursing all public pension benefits, and Croatian Registry of Insured People, which administrates second pillar individual accounts. The model requires the following data (by type of pension, gender and age):

- the number of pensions,
- the number of new pensions,
- number of pensioners,
- the number of outflow pensioners,
- the number of new pensioners,
- average pension benefit,
- average newly granted pension benefit.

Projections of the labour market and macroeconomic parameters are from the AWG assumptions.

ANNEX

Economy - wide average wage at retirement

Table A1 – Economy wide average wage at retirement evolution (in thousands euro)

	2013	2020	2030	2040	2050	2060
Economy - wide average wage	12.6	14.8	21.1	31.7	47.6	69.0
Economy - wide average wage at retirement	13.1	15.4	22.0	33.0	49.7	71.9

Source: Member State

Disability pension

Table A2 – Disability rates by age groups (%)

	2013	2020	2030	2040	2050	2060
Age group -54	3.0	1.9	1.2	1.2	1.2	1.2
Age group 55-59	17.5	13.7	9.0	7.3	7.7	7.9
Age group 60-64	21.2	18.4	14.9	10.3	10.7	11.1
Age group 65-69	19.2	22.1	16.9	13.5	12.2	12.7
Age group 70-74	13.2	19.8	18.8	15.5	12.1	12.4
Age group 75+	10.3	11.8	18.1	17.2	14.1	11.8

Source: Member State

Alternative pension spending decomposition

Table A3 - Factors behind the change in public pension expenditures between 2013 and 2060 (in percentage points of GDP) – pensions

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	-0.6	-0.8	-1.7	-0.6	-0.3	-3.9
Dependency ratio effect	1.8	3.0	1.8	2.1	1.3	10.0
Coverage ratio effect	-1.0	-1.0	-0.8	-0.3	-0.1	-3.2
<i>Coverage ratio old-age*</i>	-0.1	-0.2	-0.6	-0.2	0.0	-1.0
<i>Coverage ratio early-age*</i>	-1.4	-1.7	-1.6	0.0	0.1	-4.6
<i>Cohort effect*</i>	-1.5	-1.7	-0.5	-0.9	-0.6	-5.2
Benefit ratio effect	-0.5	-1.3	-1.4	-1.1	-0.6	-4.8
Labour Market/Labour intensity effect	-0.7	-0.5	-0.4	-0.1	0.0	-1.7
<i>Employment ratio effect</i>	-0.6	-0.4	-0.4	0.0	0.0	-1.4
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Career shift effect</i>	-0.1	-0.1	0.0	-0.1	0.0	-0.3
Residual	-0.2	-1.0	-0.9	-1.3	-0.9	-4.2

Source: Commission Services

Table A4 - Factors behind the change in public pension expenditures between 2013 and 2060 (in percentage points of GDP) - pensioners

	2013-20	2020-30	2030-40	2040-50	2050-60	2013-60
Public pensions to GDP	-0.6	-0.8	-1.7	-0.6	-0.3	-3.9
Dependency ratio effect	1.8	3.0	1.8	2.1	1.3	10.0
Coverage ratio effect	-1.0	-1.0	-0.8	-0.3	-0.1	-3.2
<i>Coverage ratio old-age*</i>	-0.1	-0.2	-0.6	-0.2	0.0	-1.0
<i>Coverage ratio early-age*</i>	-1.4	-1.7	-1.6	0.0	0.1	-4.6
<i>Cohort effect*</i>	-1.5	-1.7	-0.5	-0.9	-0.6	-5.2
Benefit ratio effect	-0.5	-1.3	-1.4	-1.1	-0.6	-4.8
Labour Market/Labour intensity effect	-0.7	-0.5	-0.4	-0.1	0.0	-1.7
<i>Employment ratio effect</i>	-0.6	-0.4	-0.4	0.0	0.0	-1.4
<i>Labour intensity effect</i>	0.0	0.0	0.0	0.0	0.0	0.0
<i>Career shift effect</i>	-0.1	-0.1	0.0	-0.1	0.0	-0.3
Residual	-0.2	-1.0	-0.9	-1.3	-0.9	-4.2

Source: Commission Services