Pension fiche
Estonia
2014

1. OVERVIEW OF THE PENSION SYSTEM

1.1. Description

Estonian pension system is based on the **three-pillar approach**, where the first pillar is the state pension fund and which is included to general government accounts. Second pillar is mandatory to newcomers to the labour market (and to all the persons born 1983 and later), and third pillar is voluntary pension scheme. Second and third pillar pension funds are not included in general government accounts but second pillar funds are included in context of EPC AWG projection exercise because of it having significant impact on future pensions.

A multi-pillar pension scheme rests on the assumption that income in retirement age is to be formed from several different sources, each with its different legal, organisational and financial principles. Current legal principles of the state pension insurance are effective since 1999-2000. It was then established that the right and the amount of the future old age pension is tied to the amounts of social tax paid by or on behalf of the person over the full career. Mandatory funded pension scheme was launched in 2002. Possibilities for supplementary funded pension were created in 1998.

The first pillar of the Estonian pension scheme is state pension insurance based on pay-as-you-go financing and covers three social risks: old age, permanent incapacity for work and loss of a provider.

Protection ensured by state pension insurance includes two levels:
1) National pensions ensured for all residents of Estonia;
2) Old-age, incapacity-for-work and survivor's pensions based on former work input.

A right to national pension (**minimum pension**) on the basis of age starts from the age of 63, on the condition that the pension applicant has lived in Estonia for at least 5 years. Minimum pension is paid in the fixed rate, in the so-called national pension rate, which is 148,98 euros per month (from 1.04.2014).

In 2014, the retirement age for men is 63 and for women 62 years and 6 months. The age limit for women will be equalized with that of the men by 2016. After that the retirement age will continue to be increased for both sexes to 65 years by 2026.

The qualification period for old age pension is 15 years of pensionable service in Estonia.

Early retirement is possible 3 years before the official retirement age but the benefit received (pension) will be reduced by 0,4% per each month of early retirement. One can also postpone the retirement, after reaching the official retirement age, and is entitled to receive the 0,9% higher pension benefit per each month of postponement. If a person keeps on working during the retirement, he/she will receive the full pension in addition to wage.

Old age pension consists of three parts: base amount, length-of-service component and insurance component. The base amount is a flat-rate element. The length-of-service component applies to periods of pensionable service through the end of 1998 and depends on the length of service (in years). The insurance component applies to pensionable service from 1999 and depends on social tax paid by the person (in case of self-employment) or on behalf of the person by the employer or by the state.

Since 1999, old age pension rights are acquired only on basis of social tax paid. Until 1999, pension rights were determined on the basis of the length of service. The pension formula includes a gradual transition from the old rules to the new rules. For persons who withdraw from work before 1999, the state pension depends only on the flat rate base amount and the length of service. For persons who entered the labour market in 1999 or later, the state pension also consists of two parts: base amount and insurance component. In essence, the three-part pension formula applies only to those generations who have acquired pensionable service both before and after 1999.

The pension formula used since 2000 can be described as follows:

$$P = B + V \cdot s + V \cdot \sum A$$

where:
P – amount of pension (in EEK);
B – base amount (in EEK);
s – pensionable length of service (up to 1999, in years)
$\sum A$ – sum of annual pension insurance coefficients;
V – cash value of one year of pensionable length of service and the pension insurance coefficient 1.0 (in EUR).

To calculate the annual pension insurance coefficient for a given individual, the amounts of state pension insurance part of social tax paid or calculated for the person in the specific calendar year are divided by the Estonian annual average amount of the pension insurance part of social tax. Hence, annual pension insurance coefficient reflects the ratio of social tax calculated on the earnings of the person to the Estonian average.

Real values of pensions are influenced by the values of the base amount (B) and the cash value of the annual score (V), which are subject to regular indexation (see below). From 01.04.2014, the base amount (*B*) is €134.91, which is ca 37% of the average old age pension and the cash value of annual score *(V)* is €4.96.

State pension insurance is financed mainly from the state pension insurance part of social tax. The rate of state pension insurance part of social tax is 16% for persons having joined the II pension pillar and 20% for those who have not joined. The expenses of national pensions and pension supplements are covered from other revenues of the state budget. If necessary, the state budget shall also cover any current deficit of the pension insurance budget, i.e. any difference between social tax revenues and expenditures on pensions.

Increasing of actual pension payments is performed through regular indexation. Pension index was changed in 2008 in order to guarantee the stable increase of pensions, to ensure the higher benefit rates to older generations and to diminish the need for one-off and ad hoc increases, which used to be policy for many government coalitions before.

The indexation system is based on social tax and inflation. Pension index is a sum of 80% of social tax increase and 20% of the annual increase in consumer price index. In addition, when applying the index to the parts of the pension, different co-efficient are used – 0,9 for the cash value of annual score and 1,1 to base amount of pension, in order to further increase the solidarity in the system.

So the index is calculated as follows:

$$i_{YearN} = 0{,}8 \cdot (\frac{SocialTax_{Year(N-1)}}{SocialTax_{Tear(N-2)}} - 1) + 0{,}2 \cdot CPI_{Year(N-1)}$$

and is applied to pension formula in following way:

$$P = (1 + 1{,}1 \cdot i) \cdot B + V \cdot s + (1 + 0{,}9 \cdot i) \cdot (V \cdot \sum A)$$

According to Pension Insurance Act, the Government of Estonia has to analyse the impact of the increase in pensions to financial and social sustainability and suggest to the parliament the changes in indexation in every 5 years.

Besides the general state pension insurance, the Estonian pension system also includes some special schemes – old age pensions at favourable conditions and superannuated pensions, enabling representatives of specific professions or persons with specific social status to retire before the general retirement age. Also, some categories of civil servants (for example judges, prosecutors, officials of the State Audit Office, police officers, members of the Defence Forces, Chancellor of Justice) have a right to favourable special pensions. Amount of special pensions, although increasing, has remained limited (close to 0,1% of GDP). Government has been committed to reducing the special rights and for example the pension addition paid to the public sector workers based on the length of service was abolished from 2013.

The second pillar of the Estonian pension system is a mandatory funded pension based on full pre-financing and covering only the risk of old age. Private asset management companies administer the II pillar pension funds. In essence, the II pillar is an individual savings scheme, where the size of pension depends on the total contributions over the career and rate of return of the pension fund.

Participation in the II pillar is mandatory for persons born in 1983 or later. People born prior 1983 and participating at the labour market can join the II pillar on voluntary basis. The rate of the II pillar contribution is 6% of wages – the employee pays 2% from gross wages, which is supplemented by the state with 4% of gross wage on the account of social tax paid by the employer.

The retirement age in the II pillar is the same as in I pillar. An additional requirement to receive a funded pension is the fulfilment of a qualification period of 5 years, which has to be passed from the date of commencing the payment of contributions. II pillar was launched in July 2002. Thus the payment of first benefits were done in 2009 (benefits on the basis of inheritance started from 2007). According to the law the main payment modality is a compulsory lifetime annuity. Insurers are allowed to offer only base (insurance) products for

policy holders. Joint products are also allowed but they have to meet the requirements of the base product. A guaranteed period may be stipulated so that the beneficiary or beneficiaries specified in a contract are entitled to payments made pursuant to the contract if the insured dies during the guaranteed period.

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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	63	63y9m	65	65	65	65
	earliest retirement age	60	60y9m	62	62	62	62
	penalty in case of earliest retirement age	14,4%	14,4%	14,4%	14,4%	14,4%	14,4%
	bonus in case of late retirement	10,8%	10,8%	10,8%	10,8%	10,8%	10,8%
Men - with 40 contribution years	statutory retirement age	63	63y9m	65	65	65	65
	earliest retirement age	60	60y9m	62	62	62	62
	penalty in case of earliest retirement age	14,4%	14,4%	14,4%	14,4%	14,4%	14,4%
	bonus in case of late retirement	10,8%	10,8%	10,8%	10,8%	10,8%	10,8%
Women - with 20 contribution years	statutory retirement age	62	63y9m	65	65	65	65
	earliest retirement age	59	60y9m	62	62	62	62
	penalty in case of earliest retirement age	14,4%	14,4%	14,4%	14,4%	14,4%	14,4%
	bonus in case of late retirement	10,8%	10,8%	10,8%	10,8%	10,8%	10,8%
Women - with 40 contribution years	statutory retirement age	62	63y9m	65	65	65	65
	earliest retirement age	59	60y9m	62	62	62	62
	penalty in case of earliest retirement age	14,4%	14,4%	14,4%	14,4%	14,4%	14,4%
	bonus in case of late retirement	10,8%	10,8%	10,8%	10,8%	10,8%	10,8%

Source: Member States

2. OVERVIEW OF THE DEMOGRAPHIC AND LABOUR FORCES PROJECTIONS

2.1 DEMOGRAPHIC DEVELOPMENT

Table 2 – Main demographic variables evolution

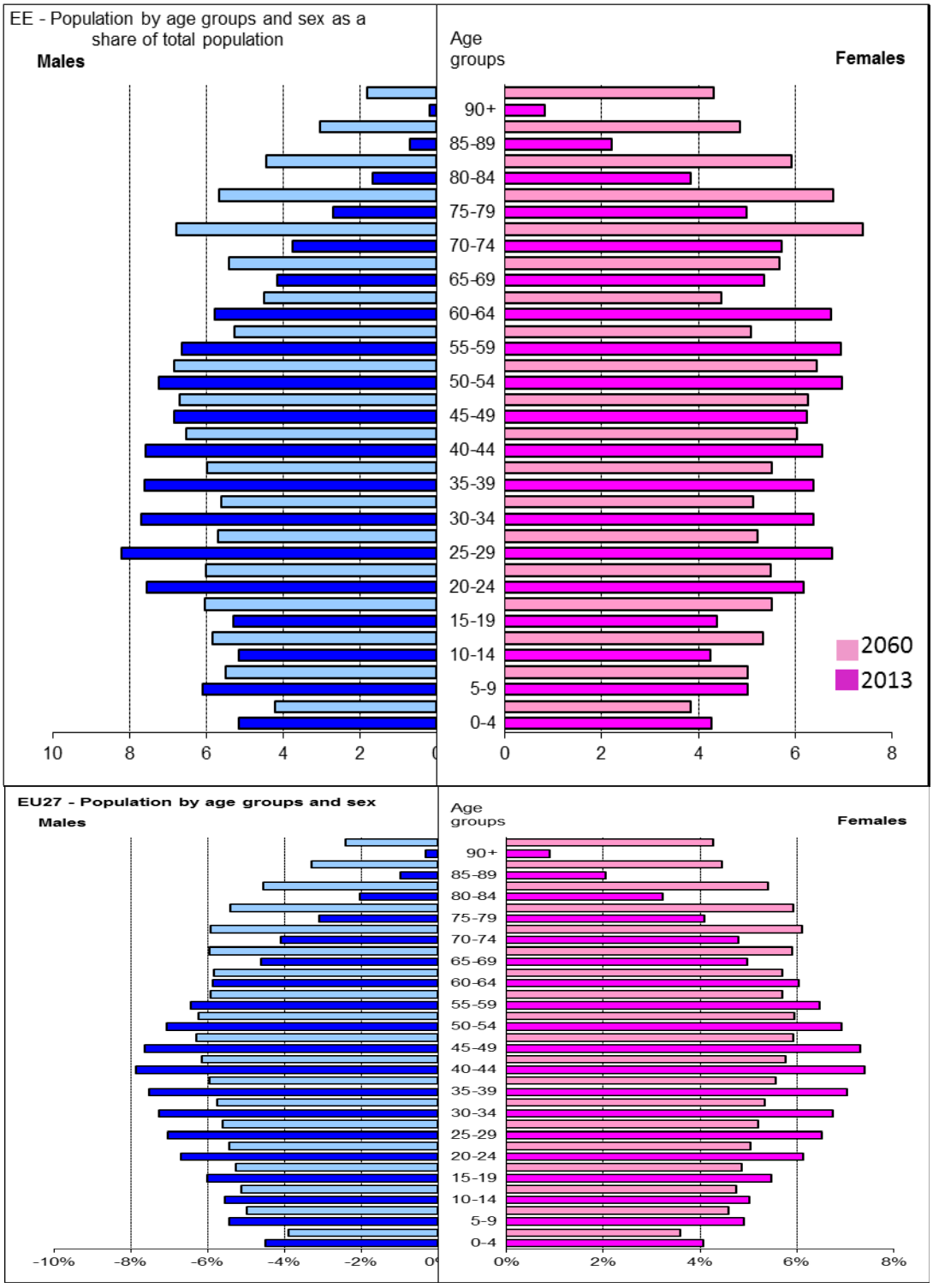
	2013	2020	2030	2040	2050	2060	Peak year
Population (thousand)	1318	1281	1205	1161	1129	1091	2013
Population growth rate	-0,4	-0,5	-0,6	-0,3	-0,3	-0,4	2042
Old-age dependency ratio (pop65/pop15-64)	27,5	32,8	39,8	45,5	51,7	54,5	2057
Ageing of the aged (pop80+/pop65+)	26,4	29,4	29,5	34,7	36,2	39,4	2060
Men - Life expectancy at birth	71,6	73,3	75,7	77,9	80,0	81,9	2060
Men - Life expectancy at 65	14,9	15,9	17,2	18,5	19,8	21,0	2060
Women - Life expectancy at birth	81,3	82,5	84,1	85,6	87,0	88,3	2060
Women - Life expectancy at 65	20,1	20,9	22,0	23,1	24,1	25,1	2060
Men - Survivor rate at 65+	80,6	82,8	85,6	87,9	89,9	91,5	2060
Men - Survivor rate at 80+	44,1	49,0	55,5	61,5	66,9	71,7	2060
Women - Survivor rate at 65+	90,7	91,8	93,0	94,1	95,0	95,7	2060
Women - Survivor rate at 80+	65,7	69,3	74,0	78,0	81,5	84,5	2060
Net migration	-2,7	-3,7	-2,2	0,6	0,6	0,0	2041
Net migration over population change	0,6	0,6	0,3	-0,2	-0,2	0,0	2015

Source: EUROSTAT and Commission Services

** 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*

Estonian population is in decline due to various reasons since regaining of the independence at the beginning of 90es and according to Eurostat projections this trend is expected to continue. Ageing of the population is more rapid in comparison with other European countries as the starting levels of life expectancy are currently relatively low but are expected to converge with EU average levels by 2060. Old age dependency ratio is set to increase rapidly, adding pressure to state's pension system.

Graph 1: Age pyramid comparison: 2013 vs 2060



Source: EUROSTAT and Commission Services

2.2 Labour forces

Labour forces are projected by the Commission Services, on the bases of the expected demographic evolution described in the paragraph above.

Key variables that influence the evolution of pension expenditure are shown in Table 3 and Table 4.

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	66,6	67,4	73,5	74,2	72,6	74,8	2060
Employment rate for workers aged 55-64	62,6	63,8	69,4	70,4	69,0	71,0	2060
Share of workers aged 55-64 on the total labour force	94,0	94,6	94,5	94,9	95,0	94,9	2053
Labour force participation rate 65-74	20,9	18,0	17,4	19,4	19,5	17,6	2015
Employment rate for workers aged 65-74	20,2	17,4	16,8	18,8	18,8	17,1	2015
Share of workers aged 65-74 on the total labour force	97,0	96,7	96,9	96,9	96,8	97,3	2060
Median age of the labour force	41,0	42,0	44,0	44,0	41,0	42,0	2036

Source: Commission Services

**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.*

Table 3 shows the expected development of those age groups (55 - 64 and 65 – 74) that are more influenced by the effects of pension reforms that shift retirement age (both early and statutory) or by active labour market policies that are targeted to prolong working life.

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)	23,1	21,7	21,7	21,7	21,7	21,7	2013
Average effective exit age (CSM) (II)	68,6	64,7	65,4	65,4	65,4	65,4	2013
Average effective working career (CSM) (II)- (I)	45,5	43,1	43,7	43,7	43,7	43,7	2013
Contributory period	40,6	38,5	38,8	42,4	41,7	42,4	2060
Contributory period/Average working career	0.9	0.9	0.9	1.0	1.0	1.0	2060
Duration of retirement **	12,6	15,9	17,2	18,5	19,8	21,0	2060
Duration of retirement/average working career	27,7	36,9	39,3	42,3	45,3	48,0	2060
Percentage of adult life spent at retirement***	19,9	25,4	26,6	28,1	29,5	30,7	2060
Ealy/late exit****	2,0	2,1	2,2	1,9	1,5	3,5	2059

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)	23,8	23,1	23,1	23,1	23,1	23,1	2013
Average effective exit age (CSM) (II)	67,9	64,6	65,0	65,0	65,0	65,0	2013
Average effective working career (CSM) (II)- (I)	44,0	41,5	41,9	41,9	41,9	41,9	2013
Contributory period	54,9	52,6	47,3	40,9	39,8	40	2013
Contributory period/Average working career	1.2	1.3	1.1	1.0	0.9	1.0	2020:
Duration of retirement **	17,6	20,9	22,0	23,1	24,1	25,1	2060
Duration of retirement/average working career	40,0	50,3	52,5	55,1	57,5	59,8	2060
Percentage of adult life spent at retirement***	26,1	31,0	31,9	32,9	33,9	34,8	2060
Early/late exit****	1,5	1,9	2,7	2,0	1,5	3,2	2059

Source: Commission Services

** 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.*

Contributory periods are not projected as the pension system is based on the insurance points accrued – thus the model focuses on that.

Contributory period is affected by the increase in length of service part of the pension by 2 years for every child raised until the age of 8 (can be used for one parent, usually a mother). Also the years spent raising the children up to the age of 3 are counted as the years of service together with, for example, years spent in deportation (during the occupation).

As the add-on on children is being phased out (replaced by the higher contributions by the state to the second pillar on every child raised), the initially high number of the insurance points for women is rapidly falling due to the move of contribution based system.

Fast increase of life expectancy (convergence with the best performers in EU) will result in larger share of life spent at retirement, thus adding the pressure on pension system. The fully funded scheme is implemented to reduce the pressure and in order to provide adequate income for the elderly.

3. PENSION PROJECTION RESULTS

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

Difference between ESSPROS and AWG numbers is marginal and represents the special pension supplements paid directly from the state budget.

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	5,9	5,9	5,8	7,1	9,0	8,9	8,0	7,8
2 Eurostat public pension expenditure	5,9	5,9	5,8	7,1	9,0	8,9	8,0	7,8
3 Public pension expenditure (AWG)	5,7	5,7	5,6	6,9	8,8	8,7	7,8	7,6
4 Difference (2) - (3)	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
5 Expenditure categories not considered in the AWG definition, please specify:								
5.1 Specific pension supplements paid directly from state budget	*0,2*	*0,2*	*0,2*	*0,2*	*0,2*	*0,2*	*0,2*	*0,2*

Source: EUROSTAT and Member States

3.2. Overview of projection results

Social security pension spending will fall mainly due to implementation of mandatory private II pillar. Part of the social tax, together with pension rights, is switched to the funded private pension funds for the people who have joined the second pension pillar. Total pension expenditure (two pillars combined) is set to increase after 2040 due to increased coverage of II pillar and higher pensions received from there.

Taxes on pensions are not included in model neither in projections. The reason behind this is the high level of tax-exempted income for retired and the political commitment to keep at least the average pension tax free. The monthly threshold of pensions exempted from income tax €210 is applied together with income tax free overall threshold of €144 in 2014. The average pension in 2014 of €350 remains lower than the taxable level of pensions, thus the collected amount of tax revenue on pension is low. Considering the policy of the governments to increase the tax threshold together with increasing wage levels seems to support the assumptions, that the tax on pensions will remain negligible.

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	7,8	7,8	7,2	7,0	6,8	6,4	2018
Private occupational pensions	:	:	:	:	:	:	:
Private individual pensions	0,0	0,1	0,4	0,9	1,7	2,2	2059
Mandatory private	0,0	0,1	0,4	0,9	1,7	2,2	2059

Non-mandatory private	:	:	:	:	:	:	:
Gross total pension expenditure	7,8	7,8	7,6	7,9	8,5	8,6	2056
Net public pension expenditure	:	:	:	:	:	:	:
Net total pension expenditure	:	:	:	:	:	:	:
Contributions	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**Peak year***
Public pension contributions	6,0	5,6	5,2	5,1	5,1	5,1	2013
Total pension contributions	7,4	7,5	7,3	7,4	7,6	7,7	2014

Source: Commission Services

**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*

The main driving force behind the ratio of public spending between 2010 and 2060 are the demographic one and the full implementation of II pillar together with its out-payments. As the first payments from the funded pillar started on 2009, the impact on the benefit ratio will magnify with time (resulting in more and more of the retired persons receiving pension from both I and II pillar). Disability pensions are paid up to the statutory retirement age.

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

Pension scheme	**2013**	**2020**	**2030**	**2040**	**2050**	**2060**	**Peak year ***
Total public pensions	7,8	7,8	7,2	7,0	6,8	6,4	2018
of which earnings related:							
Old age and early pensions	4,0	3,8	3,2	3,0	2,8	2,5	2018
Disability pensions	0,5	0,5	0,5	0,5	0,4	0,3	2018
Survivors' pensions	0,0	0,0	0,0	0,0	0,0	0,0	2026
Other pensions	0,1	0,1	0,00	0,00	0,00	0,00	2013

Source: Commission Services

** 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.*

3.3. Description of main driving forces behind the projection results and their implications for main items from a pension questionnaire

Table 8a - 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	0,0	-0,6	-0,2	-0,2	-0,4	-1,4	0,133
Dependency ratio effect	1,5	1,7	0,9	0,9	0,5	5,5	0,110
Coverage ratio effect	-0,7	-0,7	-0,2	-0,2	-0,2	-2,0	-0,044
*Coverage ratio old-age**	*0,0*	*-0,2*	*0,0*	*0,0*	*0,0*	*-0,1*	*-0,003*
*Coverage ratio early-age**	*-0,9*	*-0,5*	*-0,4*	*1,1*	*0,0*	*-0,7*	*-0,017*

*Cohort effect**	*-1,0*	*-1,1*	*-0,3*	*-1,8*	*-0,7*	*-5,0*	*-0,110*
Benefit ratio effect	-0,4	-1,3	-0,7	-0,8	-0,7	-3,9	-0,085
Labour Market/Labour intensity effect	-0,2	-0,1	-0,1	0,0	0,0	-0,5	-0,011
Employment ratio effect	*-0,2*	*-0,1*	*0,0*	*0,0*	*-0,1*	*-0,4*	*-0,009*
Labour intensity effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,000*
Career shift effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*-0,1*	*-0,002*
Residual	-0,1	-0,2	0,0	-0,1	0,0	-0,4	0,162

Source: Commission Services

The main driving force behind the ratio of public spending between 2013 and 2060 are the demographic one and the full implementation of II pillar together with its out-payments. As the first payments from the funded pillar started on 2009, the impact on the benefit ratio will magnify with time (resulting in more and more of the retired persons receiving pension from both I and II pillar).

Table 8b - 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	Average annual change
Public pensions to GDP	0,0	-0,6	-0,2	-0,2	-0,4	-1,4	0,133
Dependency ratio effect	1,5	1,7	0,9	0,9	0,5	5,5	0,110
Coverage ratio effect	-0,7	-0,7	-0,2	-0,2	-0,2	-2,0	-0,044
*Coverage ratio old-age**	*0,0*	*-0,2*	*0,0*	*0,0*	*0,0*	*-0,1*	*-0,003*
*Coverage ratio early-age**	*-0,9*	*-0,5*	*-0,4*	*1,1*	*0,0*	*-0,7*	*-0,017*
*Cohort effect**	*-1,0*	*-1,1*	*-0,3*	*-1,8*	*-0,7*	*-5,0*	*-0,110*
Benefit ratio effect	-0,4	-1,3	-0,7	-0,8	-0,7	-3,9	-0,085
Labour Market/Labour intensity effect	-0,2	-0,1	-0,1	0,0	0,0	-0,5	-0,011
Employment ratio effect	*-0,2*	*-0,1*	*0,0*	*0,0*	*-0,1*	*-0,4*	*-0,009*
Labour intensity effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,000*
Career shift effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*-0,1*	*-0,002*
Residual	-0,1	-0,2	0,0	-0,1	0,0	-0,4	0,162

Source: Commission Services

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

	2013	2020	2030	2040	2050	2060
Public scheme (BR)	30,4	30,9	25,9	23,3	20,7	18,8
Public scheme (RR)	40,1	40,6	34,5	31,2	27,3	25,2
Coverage	100,0	100,0	100,0	100,0	100,0	100,0
Public scheme old-age earnings related (BR)	34,6	34,9	28,9	25,5	22,4	20,2
Public scheme old-age earnings related (RR)	40,1	40,6	34,5	31,2	27,3	25,2
Coverage	72,6	72,4	73,3	75,6	78,4	80,0
Private occupational scheme (BR)	:	:	:	:	:	:

Private occupational scheme (RR)	:	:	:	:	:	:
Coverage	:	:	:	:	:	:
Private individual scheme (BR)	1,4	2,5	4,2	5,9	7,8	8,8
Private individual scheme (RR)	2,9	5,4	9,5	13,9	17,5	18,9
Coverage	4,3	10,8	31,0	49,3	65,2	74,4
Total (BR)	30,5	31,1	27,2	26,2	25,8	25,4
Total (RR)	40,4	43,1	43,2	43,3	44,6	44,1

Source: Commission Services

Table 9 illustrates the switch of the part of pension spending from the first pillar to the second. Replacement rates from the pay-as-you-go scheme will fall and payments from the II pillar will increase. More and more people over time start to receive part of their pension benefit from the II pillar, thus reducing their benefits from the state pillar.

The coverage of old age pension is very good today (near 100%) and there are expected to be no changes in future. The coverage of II pillar depends on how big was the switching activity to II pillar in voluntary age cohorts. In mandatory age cohorts the coverage should be almost the identical to the state pension). The number of old age pensioners will gradually increase mainly to do the increasing life expectancy.

Table 10 – System Dependency Ratio and Old-age Dependency Ratio

	2013	2020	2030	2040	2050	2060
Number of pensioners (thousand) (I)	413,0	412,8	419,0	431,7	435,2	425,2
Employment (thousand) (II)	622,4	589,6	539,2	510,6	471,1	446,0
Pension System Dependency Ratio (SDR) (I)/(II)	66,4	70,0	77,7	84,5	92,4	95,3
Number of people aged 65+ (thousand) (III)	239,8	264,2	293,0	310,9	324,8	326,2
Working age population 15 - 64 (thousand) (IV)	870,3	804,8	735,2	683,8	628,5	598,7
Old-age Dependency Ratio (ODR) (III)/(IV)	27,5	32,8	39,8	45,5	51,7	54,5
System efficiency (SDR/ODR)	2,4	2,1	2,0	1,9	1,8	1,7

Source: Commission Services

The ratio of the number of social security pensioners and the number of people at the age of 65 and higher should remain more or less the same, since the number of pensioners will increase due to the increase in life expectancy and the number of employed (and not getting pensions) is also increasing (higher participation rates in older ages). The coverage of pensioners should also remain the same. The ratio of the number of social security contributors and the total employment should remain the same since all contributors are employed. The support ratio is decreasing substantially due to the reasons stated above.

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

	2013	2020	2030	2040	2050	2060
Age group -54	22,4	22,3	24,1	24,4	21,9	21,8
Age group 55-59	171,6	158,7	187,8	192,4	199,4	210,1
Age group 60-64	168,7	127,0	132,6	141,0	139,7	153,4

Age group 65-69	141,8	138,8	127,3	131,1	131,2	131,4
Age group 70-74	116,6	110,8	109,9	111,4	111,4	111,6
Age group 75+	101,0	100,9	100,7	100,6	100,5	100,5

Source: Commission Services

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

	2013	2020	2030	2040	2050	2060
Age group -54	8,1	8,1	8,6	8,5	7,9	8,4
Age group 55-59	35,4	34,3	33,5	33,8	35,9	36,4
Age group 60-64	79,6	55,6	47,9	48,7	48,2	52,6
Age group 65-69	101,8	103,3	94,4	94,2	94,0	95,4
Age group 70-74	100,8	100,8	100,7	100,7	100,6	100,5
Age group 75+	101,0	100,9	100,7	100,6	100,5	100,5

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	20,9	21,1	23,0	22,8	20,3	20,3
Age group 55-59	165,1	162,1	194,0	199,1	209,6	222,4
Age group 60-64	159,2	109,3	116,3	118,6	118,1	131,7
Age group 65-69	142,6	132,2	123,4	125,4	125,4	126,3
Age group 70-74	114,2	108,1	107,0	107,9	107,6	107,7
Age group 75+	100,7	100,7	100,6	100,5	100,5	100,5

Source: Commission Services

Table 12b – female pensioners (public schemes) to population ratio by age group (%)

	2013	2020	2030	2040	2050	2060
Age group -54	8,0	7,9	8,5	8,4	7,7	8,3
Age group 55-59	33,4	33,1	33,0	33,3	35,4	36,0
Age group 60-64	75,9	45,7	40,5	41,0	40,5	44,9
Age group 65-69	102,0	103,6	92,3	92,0	91,6	93,4
Age group 70-74	100,7	100,7	100,6	100,6	100,6	100,5
Age group 75+	100,7	100,7	100,6	100,5	100,5	100,5

Source: Commission Services

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**

Number of new pensions (in 1000)	13,0	12,7	15,0	15,3	15,6	10,0
Total pension points at retirement	40,6	37,9	35,1	33,8	32,5	32,7
Average pension points accumulated per year or average contributory period	0,9	0,8	0,8	0,8	0,8	0,8
Average accrual rate (=V/K)	0,56	0,55	0,48	0,44	0,38	0,34
Point value (V)	4,7	6,5	8,6	11,4	14,7	18,9
Point cost (K)	836,9	1175,9	1773,8	2597,6	3854,1	5529,0
Sustainability/adjustment factors	:	:	:	:	:	:
Average number of months paid the first year	12	12	12	12	12	12

Source: Commission Services

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

New pension	2010	2020	2030	2040	2050	2060
Number of new pensions (in 1000)	7,0	5,3	6,9	7,3	7,6	4,8
Total pension points at retirement	39,9	37,0	36,2	39,0	37,8	38,1
Average pension points accumulated per year or average contributory period	1,0	1,0	0,9	0,9	0,9	0,9
Average accrual rate (=V/K)	0,56	0,55	0,48	0,44	0,38	0,34
Point value (V)	4,7	6,5	8,6	11,4	14,7	18,9
Point cost (K)	836,9	1175,9	1773,8	2597,6	3854,1	5529,0
Sustainability/adjustment factors	:	:	:	:	:	:
Average number of months paid the first year	12	12	12	12	12	12

Source: Commission Services

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

New pension	2010	2020	2030	2040	2050	2060
Number of new pensions (in 1000)	6,0	7,4	8,1	8,0	8,2	5,3
Total pension points at retirement	41,3	38,5	34,2	29,0	27,6	27,8
Average pension points accumulated per year or average contributory period	0,8	0,7	0,7	0,7	0,7	0,7
Average accrual rate (=V/K)	0,56	0,55	0,48	0,44	0,38	0,34
Point value (V)	4,7	6,5	8,6	11,4	14,7	18,9
Point cost (K)	836,9	1175,9	1773,8	2597,6	3854,1	5529,0
Sustainability/adjustment factors	:	:	:	:	:	:
Average number of months paid the first year	12	12	12	12	12	12

Source: Commission Services

Number of new pensions shows the number of new receivers of pension benefit in particular year. For the purpose of AWG/EPC exercise it is assumed that the pension will be paid for 12 months during the first year of receiving the benefit.
Accrual rate is decreasing due to the fact that the pension insurance coefficient value is indexed with regular pension index, value of which is lower than the increase in wages. Low value stems from a fact that basic pension is not included in the calculation of accrual rates and that a share of pension rights in first pillar is decreasing due to the implementation of funded pillar.

The difference in terms of wages of men and women is over time transferred to pension system and will result in lower pensions for females.

3.3.1. Financing of the pension system

There is no explicit rule for covering the difference of the pension contributions and payments but as government has an obligation to fulfil the pension commitments of the PAYG-scheme, implicitly the financing gap is covered by other revenue sources. The deficit is expected to remain around 1% of GDP annually during next 50 years.

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	1100,8	1427,4	1924,1	2627,5	3549,5	4806,5
Employer contribution	*1054,3*	*1367,1*	*1842,9*	*2516,5*	*3399,5*	*4603,4*
Employee contribution	*:*	*:*	*:*	*:*	*:*	*:*
State contribution	*46,5*	*60,3*	*81,3*	*111,0*	*149,9*	*203,0*
Number of contributors (I)	622,4	589,6	539,2	510,6	471,1	446,0
Employment (II)	622,4	589,6	539,2	510,6	471,1	446,0
Ratio of (I)/(II)	1,0	1,0	1,0	1,0	1,0	1,0

Source: Commission Services

3.3.2. Sensitivity analysis

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

	2010	**2020**	**2030**	**2040**	**2050**	**2060**
Public Pension Expenditure						
Baseline	7,8	7,8	7,2	7,0	6,8	6,4
Higher life expectancy (2 extra years)	0,0	0,0	0,1	0,2	0,3	0,4
Higher lab. productivity (+0.25 pp.)	0,0	0,0	-0,1	-0,1	-0,1	-0,1
Lower lab. productivity (-0.25 pp.)	0,0	0,0	0,1	0,1	0,1	0,1
Higher emp. rate (+2 pp.)	0,0	-0,1	-0,1	0,0	0,0	0,0

Higher emp. of older workers (+10 pp.)	0,0	-0,1	-0,1	0,0	0,0	0,0
Lower migration (-20%)	0,0	0,0	0,0	0,0	0,1	0,1
Risk scenario	0,0	0,0	0,0	0,0	0,1	0,1
Policy scenario: linking retirement age to increases in life expectancy	0,0	0,0	-0,2	-0,6	-1,0	-1,0
Total Pension Expenditure						
Baseline	7,8	7,8	7,6	7,9	8,5	8,6
Higher life expectancy	0,0	0,0	0,1	0,2	0,3	0,4
Higher lab. productivity (+0.1pp.)	0,0	0,0	-0,1	-0,1	-0,2	-0,3
Lower lab. productivity (-0.1pp.)	0,0	0,0	0,1	0,1	0,2	0,3
Higher emp. rate (+1 p.p.)	0,0	-0,1	-0,1	-0,1	-0,1	-0,1
Higher emp. of older workers (+5 pp.)	0,0	-0,1	-0,1	-0,1	-0,1	-0,1
Lower migration (-10%)	0,0	0,0	0,0	0,0	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	0,0	-0,2	-0,7	-1,3	-1,2

Source: Commission Services

Higher life expectancy will increase the part of life spent in retirement, thus resulting in higher spending.

Higher/lower labour productivity is set to decrease/increase the payments from the II pillar more than those from the PAYG scheme, as the II pillar pensions are linked directly to contributions and PAYG pensions have also the flat rate component and the part related to number of years worked.

Higher employment has marginal effect as it increases on the one hand the contributions but at the same time also the pension entitlements.

Higher employment rate of older workers scenario, the relative impacts of the resulting decrease in the number of pensioners (due to the postponement of the retirement age) and the resulting increase in the average pension (due to larger accumulated rights) is not currently calculated. The reason behind this is the system, where people can work and still get pension at the same time, making it difficult to foresee the decisions about the retirement. Thus there is no automatic correction mechanism in the projection model to change the pension coverage in case changes in the employment. Impact of higher employment rate of older workers comes in to picture through contributions and pension levels.

Lower migration reduces the GDP but also the pension index thus spending.

Linking the retirement age to the increase in life expectancy would result in considerable savings in pension system as according to the existing rules, the retirement age is kept at the level of 65 from 2026 onwards.

3.3.3. *Description of the changes in comparison with the 2006, 2009 and 2012 projections*

Changes in comparison with previous AWG projections are not large in terms of the outcome as a share of pensions to GDP as the main parameters of the pension system have not changed. The levels in terms of the starting points between 2012 and 2015 versions do differ as 2012 was projected based on the economy in the middle of crisis. For 2015 edition for example the labour market developments up to 2030 are much more favourable, resulting in reduced levels of public spending.

Table 16 - Average annual change in public pension expenditure to GDP during the projection period under the 2001, 2006, 2009 and 2012 projection exercises

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	-2,96	3,15	-1,50	-0,57	-3,84	:	-0,20
2009 **	-0,70	4,62	-1,65	-0,19	-3,11	:	-0,37
2012 ***	-1,13	6,71	-2,74	-1,12	-3,33	-0,02	-0,63
2015****	-1,36	5,52	-2,04	-0,44	-3,90	-0,01	-0,49

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.)*

Decomposition of the reasons for changes compared to 2012 Ageing Report show that the changes in terms of public spending on pensions are caused by the changes in assumptions, as the pension model and the system have remained the same. The main driver there is the labour market - unemployment (at the age group of 15-64) was assumed at very high level in previous edition, up to 2030 (for example the level of unemployment was assumed to be 14% in 2020, now assumed to be at 7,8%).

Table 17 - Decomposition of the difference between 2012 and the new public pension projection (% of GDP)

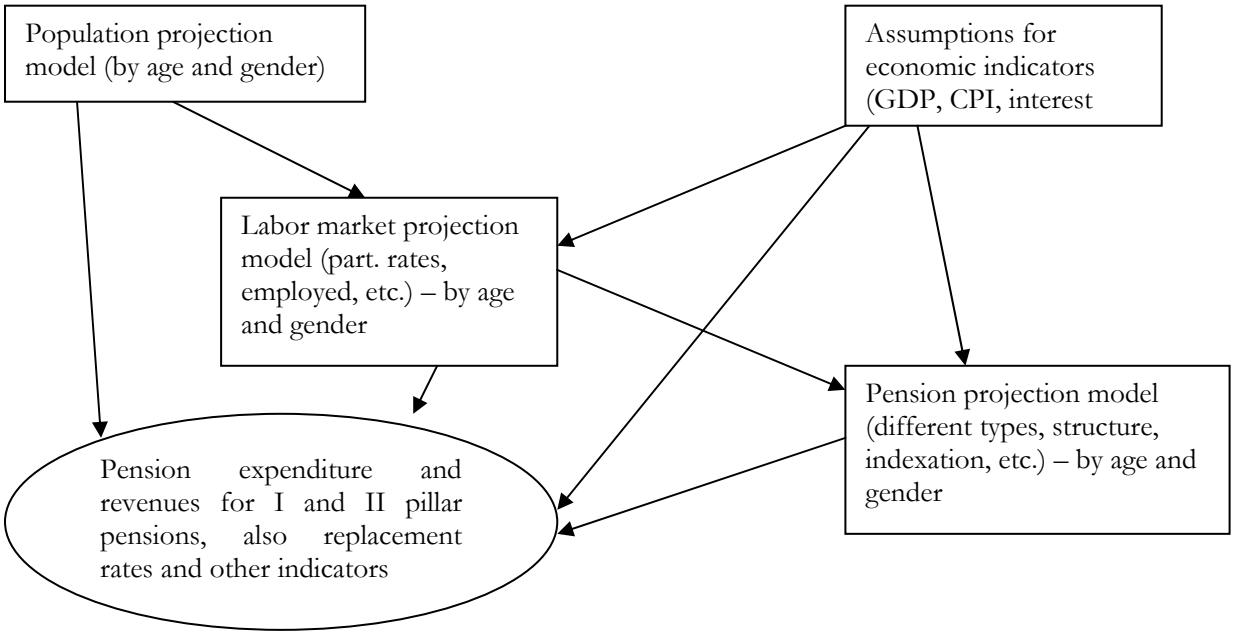
	2013	2020	2030	2040	2050	2060
Ageing report 2012	7,8	7,7	8,2	8,1	8,0	7,7
Change in assumptions	0,0	+0,1	-1,0	-1,1	-1,2	-1,3
Improvement in the coverage or in the modelling	:	:	:	:	:	:
Change in the interpretation of constant policy	:	:	:	:	:	:
Policy related changes	:	:	:	:	:	:
New projection	7,8	7,8	7,2	7,0	6,8	6,4

Source: Member State

3.4. Description of the pension projection model and its base data

The pension projections model is managed by the Insurance Policy Department of the Ministry of Finance of Estonia.

The models structure is in following graph:



Population projection model:

The model applies initial fertility, mortality and migration rates age specifically to a statistically observed initial population. The model can accommodate alternative assumptions regarding the future development of fertility and mortality rates.

To carry out projections the following data is used:

- Initial population: {L (x, 0,s); for all x, s}
- Mortality rates: {q (x, t, s); for all x, t, s}
- Fertility rates: {F (x, t); for x=15, 49, for all t}
- Sex ratio of the newborn: SR
- Net migration: {N (x, t, s); for all x, t, s}

There x - age, t - time, s – gender.

Assumptions for economic indicators:

The model contains basic macro-economic assumptions as inputs (on GDP, labour productivity and wage growth, future inflation etc). These assumptions have automatic links and also feedback in the model.

Future productivity increases and average unemployment rates (for men and women) are exogenous inputs (assumptions). These two assumptions allow seeing the impacts of less or more to GDP development. Future inflation rates (GDP deflator and CPI) are also exogenous. GDP growth rate for each year results from the change of employees and change of labour productivity.

Real GDP growth = (1+labour productivity growth)*(1+change of employees) - 1

Labour market projection:

Labour force by age and sex is calculated by multiplying population by labour force participation rates for single ages up to the age of 100. In projections it is possible to change the level and the structure of participation rates. Unemployment is calculated by using general trend of unemployment rates and change in unemployment age structure. Employed persons are the difference between the labour force and the unemployment.

Pension projection:

In general the model calculates the number of insured who are actually contributing (for the I and II pillar) by applying compliance rates to the employed, by individual age and sex and also their actual wage, from which they pay taxes (this differs from national average wages). Numbers of pensioners for I and II pillar old age pensioners are calculated by applying retirement rate to the population. Difference between the number of pensioners of age x in year t and the surviving pensioners of age x-1 of year t-1 is taken as the number of new pensioners. Other pensioners (disability, survivor) are calculated by initial data and change vector as follows:

Disability pensioners = population * disability structure base year * disability change

Average pension amounts for all ages for old age pensioners are calculated on the basis of actual pension formula:

$$P = B + V \cdot s + V \cdot \sum A,$$

See description above.

Base and V values are indexed, which results from macroeconomic and labour force projections. S value is real data and this has remained unchanged from 1999. The values are taken from wage statistics. Averages for all age cohorts are used.

To calculate mandatory funded pillar pensions, contribution rate is applied to the wage and these contributions will be accumulated with return rate. Finally it will be turned into annuities, using annuity return rate and unisex life expectancy.

Main assumptions used in the model for projecting II pillar pensions (in addition to the ones agreed by the AWG) are:

- keeping the current rate in terms of contributions (4%+2%);
- real interest rate of 2% on contributions;
- 3% nominal interest rate on annuity;
- profile of switchers to the II pillar.

Output:

Outputs of the projections are the overall expenditure and revenue of the public pension budget, II pillar assets, transfers from I pillar to II pillar, average pensions and replacement rates, different system indicators etc. Indicators for AWG purposes such as new pensions etc are derived from the model implicitly and drawn to overall level.
Annex

Table 1A - Factors behind the change in public pension expenditures between 2013 and 2060 using pension data (in percentage points of GDP) - pensions

	2013-20	2020-30	2030-40	2040-50	2050-60
Public pensions to GDP	0,0	-0,6	-0,2	-0,2	-0,4
Dependency ratio effect	1,6	2,2	1,5	1,8	1,0
Coverage ratio effect	-0,7	-0,6	-0,2	-0,2	-0,2
*Coverage ratio old-age**	*0,0*	*-0,2*	*0,0*	*0,0*	*0,0*
*Coverage ratio early-age**	*-0,9*	*-0,5*	*-0,3*	*1,0*	*0,0*
*Cohort effect**	*-1,0*	*-0,9*	*-0,3*	*-1,3*	*-0,5*
Benefit ratio effect	-0,4	-1,2	-0,6	-0,6	-0,5
Labour Market/Labour intensity effect	-0,2	-0,1	-0,1	0,0	-0,1
Employment ratio effect	*-0,2*	*-0,1*	*0,0*	*0,0*	*-0,1*
Labour intensity effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Career shift effect	*0,0*	*0,0*	*-0,1*	*0,0*	*0,1*
Residual	-0,2	-0,8	-0,8	-1,1	-0,8

Source: Commission Services

TABLE A1	Factors behind the change in public pension expenditures between 2013 and 2060 using pension data (in p GDP) – pensions				
Public pensions to GDP	0,0	-0,6	-0,2	-0,2	-0,4
Dependency ratio effect	1,6	2,2	1,5	1,8	1,0
Coverage ratio effect	-0,7	-0,6	-0,2	-0,2	-0,2
*Coverage ratio old-age**	*0,0*	*-0,2*	*0,0*	*0,0*	*0,0*
*Coverage ratio early-age**	*-0,9*	*-0,5*	*-0,3*	*1,0*	*0,0*
*Cohort effect**	*-1,0*	*-0,9*	*-0,3*	*-1,3*	*-0,5*
Benefit ratio effect	-0,4	-1,2	-0,6	-0,6	-0,5
Labour Market/Labour intensity effect	-0,2	-0,1	-0,1	0,0	-0,1
Employment ratio effect	*-0,2*	*-0,1*	*0,0*	*0,0*	*-0,1*
Labour intensity effect	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Career shift effect	*0,0*	*0,0*	*-0,1*	*0,0*	*0,1*
Residual	-0,2	-0,8	-0,8	-1,1	-0,8