Latvian Country Fiche on Pension Projections

1. OVERVIEW OF THE PENSION SYSTEM

Pension System in Latvia

The Notional defined-contribution (NDC) pension scheme is functioning already since 1996, the state mandatory funded defined contribution pension scheme was launched in July 2001, and private pension funds are operating from July 1998. Social insurance contributions rate for the state old-age pensions (NDC + FDC) is 20 per cent of wage.

1.1.   Public pensions

Old age pensions

The first pillar pension scheme implemented in January 1996 is based on insurance principles, as the social insurance contributions, earmarked for old-age pensions, are recorded in the notional individual accounts, are given a rate of return until retirement and accumulate (notional) pension capital, while real contributions are used for financing current pension expenditures. Pensions are calculated by dividing the amount accumulated in the notional account by projected cohort unisex life expectancy at retirement.

Benefit can be claimed at any time starting from the minimum retirement age and it is possible to receive full pension while continuing work after the retirement. Working pensioners continue to contribute and accumulate additional notional pension capital. This newly accrued pension capital also yields a rate of return, and the benefit is recalculated upon final retirement to include this new capital. The principle behind this is that it provides an opportunity and support for gradual withdrawal from the labour force.

Minimum insurance record for rights to state old-age pension until 31 December 2013 was 10 years, from 1st January 2014 – 15 years, from 1st January 2025 – 20 years.

Person who has insurance period less than minimum insurance record and has exceeded the qualifying age for old-age pension by 5 years shall be granted the state social security benefit, paid by the state budget. The amount of the state security benefit is 64.03 EUR. These state social security benefits are included in the pension projections.

Legislation provides an opportunity to retire 2 years before the normal retirement age, if person's insurance record is 30 years or more. The amount of early retirement pension is 50% of pension amount. The full pension is restored after reaching normal retirement age.

The normal retirement age for men and women is 62 years and, starting from 2014, increases gradually every year by 3 months until reaching 65 years in 2025.

The average benefit is directly dependent on the actual pensioner's age, number of years worked until 1996, contributions paid from 1996 and dynamics of the contribution wage base (growth of the contribution wage sum in Latvia), which determines the rate of return for the NDC pension capital.

Contribution wage sum consists of the total amount (employed and self-employed income, transfers from the state basic budget and the state special budget) from which contributions are made.

Transition regulations as part of the Law on State Pensions are the most important implementation tool of the pension system. It covers all insured persons, retiring after 1996,

who have made contributions prior 1996. An important task for transition regulations is to determine how to evaluate an individual contribution of a person in accumulation of the pension capital before 1996, when there were no personified registrations of social insurance contributions. According to Latvian design of the NDC scheme's transition provisions, insurance period until the year 1995 (inclusive) is credited with an initial capital, calculated using an average contribution wage[1] of individual in 1996-1999. For retired people, whose insurance record is not shorter than 30 years, but whose income has been below state average income level are also supported financially, e.g. for starting capital calculation in relevant years (1996–1999) the average wage in the state is taken into account and not the individual insurance contributions wage.

Pensions granted before 1996 were not revised according to the rules of the NDC scheme.

Nevertheless the same rules for indexation are applied for both the old-law and new-law pensioners.

Within framework of pension reform it was intended to introduce 4th pension tier from the state basic budget in order to reduce the impact of transition period for those pension recipients whose work life until 1996 was the major one or the greatest one. Relatively the 4th pension tier was introduced in 2006 from the state special insurance budget resources. Since January 2006 the supplementary payment for each length of period of insurance year up to 31 December 1995, have been paid to old age pensioners. As of January 1, 2009 this supplement is defined to all old-age and disability pensions in amount of 1.00 EUR for each year worked. From 2014 this supplement will be financed from the state basic budget.

Supplements to the old-age and disability pensions for newly granted pensions are suspended as of January 1, 2012.

Disability pensions

Those persons whose insurance record is not less than three years and they have been recognised as disabled can receive disability pension; excluded persons whose disability has been caused by an accident at work or an occupational disease.

Persons with disability resulting from an accident at work or an occupational disease shall be granted and paid indemnity (compensation) for the loss of the capacity of work.

Disabled persons are divided into three categories. The Health and Working Capacity Medical Expert Commission determines the category of disability as well as the cause and anticipated duration of the disability.

Disabled persons who have reached retirement age shall be granted the old-age pension instead of disability pension (disability pensioners, who reached retirement age before 1996 continue to receive disability pension – until the end of transition period). If amount of old-age pension is smaller than disability pension's amount, person continues to receive bigger amount.

To provide support for people with the disabilities the state social security benefit is granted to a person who is not entitled to receive the state disability pension.

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[1] The average contribution wage is the average wage on which contributions are actually based. It takes into account evasion as well as ceilings and also social transfers (for the non-contributory periods), and is usually lower than the economy-wide average wage.

In 2014 the amount of the state social security benefit in general case is 64.03 euro per month, for disabled persons since childhood - 106.72 euro per month.

Starting from July 2014 the amount of the state social security benefit to disabled persons (including disabled persons since childhood) older than 18 years of age and not entitled to state pension:

- *in the case of disability group I – 83.24 euro per month (for disabled persons since childhood - 138.73 euro per month);*

- *in the case of disability group II – 76.84 euro per month (for disabled persons since childhood - 128.06 euro per month).*

These state social security benefits are included in the pension projections.

Survivor's pensions

If the breadwinner has been an insured person, his/her family members shall be entitled to a survivor's pension irrespective of the cause of death of the breadwinner.

Family members (under the age of 18) incapable of work who have been dependent on the deceased breadwinner are entitled to the survivor's pension.

Persons shall be also considered incapable of work, if at the time of the death of the breadwinner or later they are day department (full-time) students at secondary, vocational or higher educational establishment and are under the age of 24.

Widows, who have pensions according to the old pension system, continue to receive those during the transition period. Widows' pensions shall be paid out from the state pension special budget.

To provide support for children who have lost their supporter the state social security benefit is granted to a person who is not entitled to receive the state survivor pension.

The state social security benefit is granted to these persons and cannot be less than 50% from the amount of statutory state social security benefit per each child in case when benefit is granted to 3 and more children. In this case the state social security benefit is granted until 18 years of age.

The benefit is paid afterwards if they attend general educational establishment or vocational school and are not older than 20 years or study full time in high-school and are not older than 24 years.

Service pensions (during the transition period)

Starting with 1 January 1999 the determination of insurance record entitling to service pensions shall be terminated. Only for persons, who by 1 January 1999 have worked in special qualifying occupations for not less than three fourths of the insurance period required for allocation of the service pension in accordance with special regulations shall retain their entitlement to the service pension. The service pension shall be paid out from the state pension special budget.

For persons who have been granted the service pension in accordance to the special regulations and who have reached the retirement age shall be granted the old-age pension

instead of the service pension. It must not be smaller in amount than the service pension received prior to the allocation of the old-age pension.

1.2. The state mandatory funded pension scheme

The FDC pension scheme in Latvia was started in July 2001. It is a fully funded statutory pension scheme, where part of the social insurance contributions within the 20% contribution rate for old-age pensions are invested in financial assets.

The FDC pension scheme is one of the pillars of the Latvia's pension system. Diversification of future risks into tiers helps to ensure a long term financial sustainability of the state pension system, to decrease a state's liabilities for the future pensioners, to promote a pension adequacy as well as to invest more money in the economy.

Coverage in the FDC pension scheme is mandatory for persons who were under the age of 30 on 1 July 2001, when the State Funded Pension Law came into force. Persons who were at that moment in the age group of 30 – 49 can affiliate to this scheme on a voluntary basis at any time. Participation conditions are simplified to maximum extent and synchronized with the participation in the NDC PAYG pension scheme. This means that the FDC pension scheme gradually will cover almost all persons covered by the state pension insurance. However, persons who were at the age of 50, when the law came into force, have no option to participate. This scheme is expected to be fully mandatory around 2035, when cohorts of voluntary participants will gradually vanish.

The share of contributions dedicated for saving in this scheme is scheduled to increase gradually, proportionally reducing contribution rate for the 1st pillar (NDC PAYG):

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Rate to FDC	2%	2%	2%	2%	2%	2%	4%	8%	2%	2%	2%	2%	4%	4%
Rate to NDC	18%	18%	18%	18%	18%	18%	16%	12%	18%	18%	18%	18%	16%	16%

According to the new policies contribution rate for 2nd tier was decreased from 8% in 2008 to 2% in 2009 until 2012, in 2013 – 4%, in 2014 – 4%; in 2015 – 5%. Starting from 2016 the contribution rate to funded pension scheme according to the Law on State Funded Pensions will be 6%. As the financing of the state mandatory funded pension scheme is in the framework of state pension system, all subsidies for the individual, paid by the state budget or other social insurance budgets (in case of child care, unemployment etc.) are respectively attributed for both schemes.

State funded pension scheme participant's capital, left after the death and prior to retirement, shall be remitted to the state pension budget for financing survivor's benefits for the dependent family members (children) in accordance with the legislation for the 1st pillar. In such case spouses have no rights for survivor's benefits either in the NDC PAYG or in the FDC pension scheme.

There are two options at retirement - at the participant's choice the accumulated state funded pension capital will be:
- added to the 1st pillar pension capital for calculation of the total old-age pension, based on the NDC scheme formula, or
- transferred to the life insurance company, which subsequently will provide a whole life annuity.

1.3. Voluntary private pension scheme, not included in projections

Scheme is operating since 1 July 1998 and the purpose of this scheme is to accumulate and invest the voluntarily made contributions of its participants by means of private pension funds thus ensuring additional pension capital in old age. Pension plan participants may participate directly or with involvement of their employer. The pension plan participant can receive all accumulated pension capital from the age of 55 or continue participating and receive capital in parts.

1.4. Financing of the Social Security system

In 1998 several significant changes were introduced in the area of financing social insurance. Four special social insurance budgets (special budgets) were approved instead of one special insurance budget and expenditures permissible within the given budgetary frame: the state pension special budget; the employment special budget; the occupational accident special budget; the disability, maternity and sickness special budget. Differentiated rate for social insurance contributions was established. Persons were insured and made social insurance contributions against risks which could, in fact, set in.

1.6. Taxation of pensions

Pensions are included in the annual taxable income. Pensions granted prior to 1996 are not subject to income tax.

For pensioners, whose pensions were granted or recalculated since 1/1/1996, the annual non-taxable minimum was 235 EUR per month.

Annual additional tax exemption limits for disability pensions granted or recalculated since 1/1/1996:

Categories I & II: 1 848 EUR per annum

Category III: 1 440 EUR per annum

1.7. Pension indexation

Indexation of pensions was frozen from 2009 till 2012. In 2013 an extra indexation for smaller pensions was realized. In accordance with the last changes in pension legislation an actual consumer price index (CPI) and 25% of contribution wage sum growth are used for the pension indexation from 2014, as well as a ceiling of indexed part of pension's amounts defined. In 2014 the ceiling on indexed part of pension's amount is expected at -285 EUR, but starting from 2015 – the indexed part of the pension amount is expected not higher than 50% of previous year's average contribution wage. However, pensions for persons with I group of disability, for politically repressed persons and for liquidators of the Chernobyl nuclear disaster will be indexed in full amount.

1.8. 2012 reforms of the pension system (were already included in updated projections 2013)

- Normal retirement age for men and women increases gradually, starting from 2014, every year by 3 months and reaching 65 years in 2025.
- Early retirement age for men and women, starting from 2014, increases gradually every year by 3 months and reaching 63 years in 2025.
- Increase in the minimum insurance period up to 15 years starting from 2014, and up to 20 years as of 2025.
- More gradual increase in contribution rate to 2nd tier: 2% in 2012; 4% in 2013 and 2014; 5% in 2015; 6% from 2016.
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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	62	63 and 9 months	65	65	65	65
	earliest retirement age	-	-	-	-	-	-
	penalty in case of earliest retirement age	-	-	-	-	-	-
Men - with 40 contribution years	statutory retirement age	62	63 and 9 months	65	65	65	65
	earliest retirement age	60	61 and 9 months	63	63	63	63
	penalty in case of earliest retirement age	50%	50%	50%	50%	50%	50%
Women - with 20 contribution years	statutory retirement age	62	63 and 9 months	65	65	65	65
	earliest retirement age	-	-	-	-	-	-
	penalty in case of earliest retirement age	-	-	-	-	-	-
Women - with 40 contribution years	statutory retirement age	62	63 and 9 months	65	65	65	65
	earliest retirement age	60	61 and 9 months	63	63	63	63
	penalty in case of earliest retirement age	50%	50%	50%	50%	50%	50%

2. OVERVIEW OF THE DEMOGRAPHIC AND LABOUR FORCES PROJECTIONS

2.1 Demographic development

Table 2 shows development of main demographic indicators in a time period from 2013 to 2060.

Table 2 Main demographic variables evolution

	2013	2020	2030	2040	2050	2060	Peak year*
Population (thousand)	2014	1868	1624	1510	1451	1396	2013
Population growth rate	-1.0	-1.2	-1.3	-0.4	-0.4	-0.4	2060
Old-age dependency ratio (pop65/pop15-64)	28.3	32.5	42.2	47.8	50.7	50.3	2056
Ageing of the aged (pop80+/pop65+)	24.9	28.6	27.8	33.1	37.4	39.1	2060
Men - Life expectancy at birth	69.1	71.1	73.8	76.4	78.7	80.9	2060
Men - Life expectancy at 65	13.8	14.8	16.3	17.7	19.1	20.4	2060

Women - Life expectancy at birth	78.9	80.3	82.2	83.9	85.5	87.0	2060
Women - Life expectancy at 65	18.4	19.4	20.6	21.9	23.1	24.2	2060
Men - Survivor rate at 65+	66.0	70.4	75.8	80.3	84.1	87.2	2060
Men - Survivor rate at 80+	28.7	34.5	42.7	50.6	58.0	64.6	2060
Women - Survivor rate at 65+	86.3	88.0	90.1	91.8	93.3	94.4	2060
Women - Survivor rate at 80+	59.1	63.6	69.3	74.3	78.6	82.2	2060
Net migration	-10.1	-14.3	-9.9	0.9	0.7	0.0	2036
Net migration over population change	0.5	0.6	0.5	-0.1	-0.1	0.0	2021

* 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

In accordance with the Population and Housing Census 2011 results at the beginning of 2011 Latvia was resided by 2 074,6 thousand persons. In comparison with the number of population published prior (based on the Population Register data), the number of Latvia population has reduced by 155 thousand. Most notable reduction in the population number was recorded in 23-31 year age group (more than 14%). The decrease may be explained with difficulties to find employment in Latvia after school, forcing young people to leave the country with an aim to find work abroad. Population and Housing Census approves that economic migration and low fertility has led to population ageing. On 1 January 2011 the average age was 41.6 years - 6 moths more than the average age published earlier.

In accordance with the projections the number of people will continue to decline and in 2060 will reach 69% of number of people were in 2013. The total population is projected less in comparison with EUROPOP 2010, where population in 2060 was projected 1 665 thousand or by 269 thousand people more.

The sharp increase in projected life expectancy (for men at birth by 11.8 years; for women at birth by 8.1 years) promotes rapid increase in old age dependency rate in long run – from 28.3% in 2013 to 50.3% in 2060 or by 22 p.p.

Graph 1   Age pyramid comparison: 2013 vs 2060
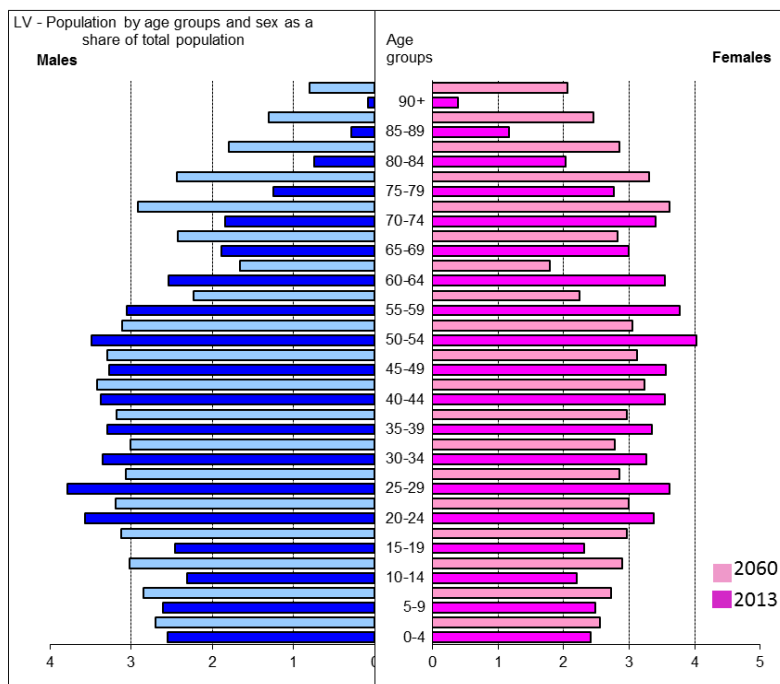
2.2. *Labour force*

Table 3 shows development of main labour market indicators connected with the older workers in the long run until 2060. The table shows increase in a labour force participation rates, employment rates as well as in shares of workers on the total labour force for both older age groups of workers aged 55-64 and aged 65- 74.

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	61.5	63.9	70.7	71.4	69.8	73.1	2060
Employment rate for workers aged 55-64	55.0	57.1	64.6	67.0	65.5	68.5	2060
Share of workers aged 55-64 on the total labour force	89.5	89.4	91.4	93.9	93.9	93.7	2055
Labour force participation rate 65-74	14.1	18.0	18.3	20.2	20.5	19.0	2053
Employment rate for workers aged 65-74	13.6	17.3	17.8	19.8	20.1	18.6	2053
Share of workers aged 65-74 on the total labour force	96.4	96.4	97.2	98.0	97.9	97.9	2039
Median age of the labour force	41.0	42.0	44.0	44.0	40.0	41.0	2029

Tables 4a and 4b show labour market entry ages, exit ages, expected durations of life spent at retirement divided by sex. Tables show the labour market effective entry age less for men, but exit age equal for both of sex in the long run. The average effective working career is higher for men, but contributory period is higher for women. The projected increase in life expectancy for both of sexes gives increase in duration of retirement – for men by 5.5 years, but for women by 5.8 years.

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)	21.8	21.7	21.7	21.7	21.7	21.7	2013
Average effective exit age (CSM) (II)	63.2	65.0	65.3	65.3	65.3	65.3	2035
Average effective working career (CSM) (II)- (I)	41.4	43.2	43.6	43.6	43.6	43.6	2035
Contributory period	33.8	35.5	36.6	37.3	37.3	37.3	2040
Contributory period/Average working career	1.2	1.2	1.2	1.2	1.2	1.2	2042
Duration of retirement **	14.9	14.8	16.3	17.7	19.1	20.4	2060
Duration of retirement/average working career	36.0	34.2	37.4	40.6	43.8	46.8	2060
Percentage of adult life spent at retirement***	24.8	24.0	25.6	27.2	28.8	30.1	2060
Early/late exit****	1.3	1.6	1.3	1.1	1.2	0.7	2013

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	23.5	23.5	23.5	23.5	23.5	2013
Average effective exit age (CSM) (II)	64.6	64.7	65.3	65.3	65.3	65.3	2026
Average effective working career (CSM) (II)- (I)	40.8	41.2	41.8	41.8	41.8	41.8	2026
Contributory period	35.2	37.0	38.1	38.8	38.8	38.8	2040
Contributory period/Average working career	1.2	1.1	1.1	1.1	1.1	1.1	2013
Duration of retirement **	18.4	19.4	20.6	21.9	23.1	24.2	2060
Duration of retirement/average working career	45.1	47.1	49.3	52.4	55.3	57.9	2060
Percentage of adult life spent at retirement***	28.3	29.3	30.3	31.6	32.8	33.8	2060

| Early/late exit**** | 1.3 | 1.3 | 0.9 | 0.8 | 0.9 | 0.5 | 2013 |

* 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[2]

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

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

	2005	2006	2007	2008	2009	2010	2011	2012
1 Eurostat total pension expenditure	6.4	6.2	5.3	6.0	8.4	10.0	8.6	8.2
2 Eurostat public pension expenditure	6.4	6.2	5.3	6.0	8.4	10.0	8.6	8.2
3 Public pension expenditure (AWG)	6.1	5.9	5.1	5.8	8.3	9.8	8.4	7.8
4 Difference (2) - (3)	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.4
5 Expenditure categories not considered in the AWG definition, please specify: 5.1 … 5.2 … 5.3 …								

Main factors explaining the difference between ESSPROSS and AWG data of pension expenditures are that the only State pension system - Social security and private mandatory (funded) pension schemes as well as minimum (guarantee) pensions are used for projections, but ESSPROSS data of pension expenditures includes also indemnities of insurance against work injury, specific public sector service pensions and other minor pensions.

3.2. Overview of projection results

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	7.7	5.9	5.5	5.4	5.1	4.6	2013
Private occupational pensions	:	:	:	:	:	:	:
Private individual pensions	:	0.0	0.3	0.7	1.5	2.2	2060
Mandatory private	:	0.0	0.3	0.7	1.5	2.2	2060
Non-mandatory private	:	:	:	:	:	:	:
Gross total pension expenditure	7.7	6.0	5.8	6.2	6.6	6.8	2013
Net public pension expenditure	:	:	:	:	:	:	:
Net total pension expenditure	:	:	:	:	:	:	:
Contributions	2013	2020	2030	2040	2050	2060	Peak year*
Public pension contributions	7.0	6.3	6.2	6.3	6.2	6.2	2014
Total pension contributions	7.8	7.9	7.9	7.9	7.9	7.9	2014

[2] The European System of National Accounts (ESA) 2010 was introduced from September 2014. As decided by the AWG, Member States do not need to be updated their pension country fiches to reflect the new national accounts.
The Commission services will incorporate the ESA2010 revision by updating the GDP series for the base year (2013), and by applying the previous growth rates of both GDP and the pension projections from 2013 onwards throughout the projection horizon.

Table 6 shows dynamics of gross pension expenditures and contributions. Decrease of gross public pension expenditures in % of GDP during all the period of projections is mainly connected with the redistribution of pension contribution rate between NDC and FDC. Impact also comes from increase in retirement age, indexation rules and suspending of supplements. Mandatory private pension expenditures as % of GDP increase by 2.2 p.p. during the period of projections.

Data about public pension contributions includes contributions to the state special pension budget (includes: old-age pensions, survival pensions, service pensions, funeral benefits, benefit in case of dead spouse), the contribution rate to the state pension budget in general case every year have been changed – depends from proportions of expenditures between social insurance special budgets. The contribution rate to the state pension budget, fixed for the year 2014 further used in projections.

The contribution rate to disability insurance, fixed for the year 2014 further used in projections.

Net pensions are not included in LV model wherewith not included in projections.

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

Pension scheme	2013	2020	2030	2040	2050	2060	Peak year *
Total public pensions	7.7	5.9	5.5	5.4	5.1	4.6	2013
of which earnings related:							
Old age and early pensions	6.9	5.2	4.9	4.9	4.7	4.1	2013
Disability pensions	0.6	0.5	0.4	0.4	0.3	0.3	2013
Survivors' pensions	0.1	0.1	0.1	0.1	0.1	0.1	2013
Other pensions	:	:	:	:	:	:	:
of which non-earnings related (including minimum pension and minimum income guarantee):							
Old age and early pensions	0.00	0.00	0.00	0.00	0.00	0.00	2013
Disability pensions	0.08	0.07	0.05	0.04	0.03	0.03	2014
Other pensions	0.00	0.00	0.00	0.00	0.00	0.00	2014
of which							
country-specific scheme 1	:	:	:	:	:	:	:
country-specific scheme 2	:	:	:	:	:	:	:
country-specific scheme 3	:	:	:	:	:	:	:

The ratio of old-age and early pensions spending is mainly connected with the redistribution of pension contribution rate between NDC and FDC. The ratio of disability and survivors pensions spending mostly connected with demographic.

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 using pension data (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	-1.8	-0.4	-0.1	-0.3	-0.6	-3.1	-0.067
Dependency ratio effect	1.0	1.7	0.7	0.3	0.1	3.8	0.077
Coverage ratio effect	-0.7	-0.5	-0.1	0.0	0.0	-1.3	-0.027
*Coverage ratio old-age**	:	:	:	:	:	:	:

Coverage ratio early-age*	:	:	:	:	:	:	:
Cohort effect*	*-0.5*	*-1.3*	*-0.5*	*-1.3*	*-0.6*	*-4.1*	*-0.089*
Benefit ratio effect	-1.8	-1.2	-0.4	-0.5	-0.5	-4.5	-0.095
Labour Market/Labour intensity effect	-0.2	-0.3	-0.2	0.0	-0.1	-0.8	-0.021
Employment ratio effect	*-0.1*	*-0.2*	*-0.2*	*0.0*	*-0.1*	*-0.6*	*-0.017*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.000*
Career shift effect	*-0.1*	*-0.1*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.004*
Residual	-0.1	-0.2	0.0	0.0	0.0	-0.3	-0.002

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

Table 8b   Factors behind the change in public pension expenditures between 2013 and 2060 using pensioners data (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	-1.8	-0.4	-0.1	-0.3	-0.6	-3.1	-0.067
Dependency ratio effect	1.0	1.7	0.7	0.3	0.1	3.8	0.077
Coverage ratio effect	-0.7	-0.5	-0.1	0.0	0.0	-1.3	-0.027
Coverage ratio old-age*	*-0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.004*
Coverage ratio early-age*	*-1.4*	*-0.7*	*-0.2*	*1.0*	*0.5*	*-0.9*	*-0.025*
Cohort effect*	*-0.5*	*-1.3*	*-0.5*	*-1.3*	*-0.6*	*-4.1*	*-0.089*
Benefit ratio effect	-1.8	-1.2	-0.4	-0.5	-0.5	-4.5	-0.095
Labour Market/Labour intensity effect	-0.2	-0.3	-0.2	0.0	-0.1	-0.8	-0.021
Employment ratio effect	*-0.1*	*-0.2*	*-0.2*	*0.0*	*-0.1*	*-0.6*	*-0.017*
Labour intensity effect	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.000*
Career shift effect	*-0.1*	*-0.1*	*0.0*	*0.0*	*0.0*	*-0.1*	*-0.004*
Residual	-0.1	-0.2	0.0	0.0	0.0	-0.3	-0.002

The main driving force of decrease of public pension expenditures to GDP is benefit ratio. Decrease of the benefit ratio during the all period of projections is explained mainly by switching part of the public old-age scheme into private funded schemes - so public provision decrease while the private mandatory part increase. As well as the decrease of the benefit ratio reflects indexation rules and suspension of supplements to newly granted pensions.

The dependency rate is effect of current demographic situation, assumed rapid increase in life expectancy, what makes dependency rate to rise over the all projections period. The life expectancy for men in age 65 increases from 13.8 in 2013 to 20.4 in 2060, for women – from 18.4 years to 24.2 years.

The high decrease of coverage ratio in first period of projection is the result of the increase in retirement age and early retirement age.

According to the demographic projections decrease of number of population in age 15-64 is expected during all period of projections. Effect of employment ratio on the public pension expenditure to GDP reflects changes in employment rates.

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)	27.7	21.5	17.4	16.1	14.6	13.2
Public scheme (RR)	33.4	29.0	24.3	20.6	18.0	18.1
Coverage	100.0	100.0	100.0	100.0	100.0	100.0
Public scheme old-age earnings related (BR)	30.3	23.7	19.0	17.4	15.6	14.0
Public scheme old-age earnings related (RR)	38.1	31.4	25.8	21.2	18.3	19.1
Coverage	82.5	80.3	81.9	83.7	85.1	85.0
Private occupational scheme (BR)	:	:	:	:	:	:
Private occupational scheme (RR)	:	:	:	:	:	:

Coverage	:	:	:	:	:	:
Private individual scheme (BR)	:	:	:	:	:	:
Private individual scheme (RR)	:	2.2	4.2	7.3	9.9	12.2
Coverage	:	:	:	:	:	:
Total (BR)	27.7	21.6	18.3	18.3	18.9	19.5
Total (RR)	33.4	30.3	26.9	26.3	26.1	26.0

Both benefit rates and replacement rates declines significantly in the projection period.

Switching the part of the public old-age scheme into private funded schemes works as a main driving factor on decrease in the replacement ratio of the social security scheme and increase replacement ratio of the private mandatory scheme.

Old age pension capital is indexed by early contribution wage sum growth indexes. The negative growth of employment/socially insurance persons mostly through the all projection period gives a negative impact to the future replacement ratio of the social security pension scheme – wages increase faster as the contribution wage sum increase.

Old age pension at retirement is calculated as accumulated pension capital divided by the life expectancy at retirement age. Rapid grow in life expectancy gives a negative effect to pension amount and to replacement ratio at retirement. The life expectancy for men in age 65 increases from 13.8 in 2013 to 20.4 in 2060, for women – from 18.4 years to 24.2 years.

Decline of benefit ratio is influenced by not only factors mentioned before (influence to RR), but also with factor that for pension indexation CPI +25% of wage sum growth is used as well as GDP assumptions, which stronger growth is projected in first years of projection period.

Social security scheme is mandatory and coverage rate is 100% over the all projection period. Coverage rate of private pension scheme as it started to operate in 2001 grows through all the projection period.

Table 10   System dependency ratio and old-age dependency ratio

	2013	2020	2030	2040	2050	2060
Number of pensioners (thousand) (I)	585.0	541.6	531.3	528.8	510.6	483.1
Employment (thousand) (II)	902.9	819.7	697.6	650.7	598.7	573.7
Pension System Dependency Ratio (SDR) (I)/(II)	64.8	66.1	76.2	81.3	85.3	84.2
Number of people aged 65+ (thousand) (III)	379.9	386.9	414.2	420.7	410.1	391.2
Working age population 15 - 64 (thousand) (IV)	1340.6	1191.2	980.3	879.5	808.8	777.6
Old-age Dependency Ratio (ODR) (III)/(IV)	28.3	32.5	42.2	47.8	50.7	50.3
System efficiency (SDR/ODR)	2.3	2.0	1.8	1.7	1.7	1.7

As the largest part of all pension recipients are old age pensioners, the large decrease in the total number of pensioners from 2013 to 2020-2030 is mainly influenced by the increase in retirement age, starting from 2014 and reaching 65 years in 2025, which cause the decrease in the newly granted pensions.

Ageing in Latvia is the driving force of the future evolvement of expenditures in relation to GDP. Number of people aged 65+ increases about half of the all projection period and starts to decrease from 2040.

The number of working age population as well as employment goes down over the all projection period.

Pensioners (public scheme) to inactive population ratio by age group (%)

TABLE 11a

	2013	2020	2030	2040	2050	2060
Age group -54	15.2	17.9	18.8	17.7	14.8	14.8
Age group 55-59	92.7	69.9	89.9	100.8	103.7	112.2
Age group 60-64	125.3	73.5	53.7	58.0	62.6	67.8
Age group 65-69	126.1	134.6	137.1	142.2	143.9	143.5
Age group 70-74	111.7	112.6	113.2	116.4	117.0	117.0
Age group 75+	105.7	103.1	102.1	102.6	103.2	103.5

Pensioners (public schemes) to total population ratio by age group (%)

TABLE 11b

	2013	2020	2030	2040	2050	2060
Age group -54	5.5	6.3	6.7	6.4	5.6	6.0
Age group 55-59	18.9	16.2	16.8	17.5	18.4	19.0
Age group 60-64	73.8	36.4	21.7	23.6	25.1	26.9
Age group 65-69	103.6	100.4	102.2	102.8	103.1	103.8
Age group 70-74	99.8	102.3	101.4	102.3	103.2	102.9
Age group 75+	105.7	103.1	102.1	102.6	103.2	103.5

Female pensioners (public scheme) to inactive population ratio by age group (%)

TABLE 12a

	2013	2020	2030	2040	2050	2060
Age group -54	14.1	16.9	17.7	16.6	13.7	14.0
Age group 55-59	89.0	54.6	69.4	82.7	92.5	104.8
Age group 60-64	122.2	74.5	52.5	56.1	61.9	67.9
Age group 65-69	124.0	136.9	138.1	143.2	145.4	145.8
Age group 70-74	108.3	111.5	113.0	116.2	116.9	117.1
Age group 75+	105.7	103.2	102.3	102.6	103.1	103.4

Female pensioners (public scheme) to total population ratio by age group (%)

TABLE 12b

	2013	2020	2030	2040	2050	2060
Age group -54	5.3	6.1	6.4	6.2	5.4	6.0
Age group 55-59	17.5	13.7	14.8	16.3	18.1	19.9
Age group 60-64	74.0	37.0	21.8	23.6	25.5	27.6
Age group 65-69	103.4	100.4	102.8	103.6	104.0	105.1
Age group 70-74	99.4	102.5	101.6	102.8	103.9	103.8
Age group 75+	105.7	103.2	102.3	102.6	103.1	103.4

The ratio to inactive population in age group 55-59 is higher than in age group 60-64 for differences in participation rates. The participation rates in age group 60-64 are lower than in age group 55-59 group.

The number of pensioners includes also pensioners living abroad as a result are ratios above 100% in older age groups.

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

TABLE 13a

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	39.2	46.0	54.3	59.9	79.6	53.2
II. Number of new pensioners ('000)	26.7	25.2	21.6	19.4	20.3	9.0
Average new pension ('000)	1.5	1.8	2.5	3.1	3.9	5.9
III. Average contributory period (in years)	34.5	36.3	37.4	38.1	38.1	38.1
IV. Average accrual rate (=c/A)	0.011	0.010	0.010	0.008	0.007	0.006
Notional-accounts contribution rate (c)	0.2	0.2	0.2	0.2	0.1	0.1
Annuity factor (A)	18.4	18.5	18.5	19.8	21.1	22.3
V. Monthly average pensionable earning	604.0	743.5	1025.0	1547.4	2271.6	3780.7
VI. Sustainability/adjustment factors	0.0	0.0	0.0	0.0	0.0	0.0

VII. Average number of months of pension paid the first year	6.5	6.5	6.5	6.5	6.5	6.5
Monthly average pensionable earnings / Monthly economy-wide average wage	1.0	0.8	0.7	0.7	0.7	0.8

TABLE 13b   *Disaggregated new public pension expenditure (old-age and early earnings-related pensions) - MEN*

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	17.9	21.6	26.0	29.9	40.5	28.3
II. Number of new pensioners ('000)	11.9	11.1	9.4	8.8	9.4	4.3
Average new pension ('000)	1.5	1.9	2.8	3.4	4.3	6.5
III. Average contributory period (in years)	33.8	35.5	36.6	37.3	37.3	37.3
IV. Average accrual rate (=c/A)	0.011	0.010	0.010	0.008	0.007	0.006
Notional-accounts contribution rate (c)	0.2	0.2	0.2	0.2	0.1	0.1
Annuity factor (A)	18.4	18.5	18.5	19.8	21.1	22.3
V. Monthly average pensionable earning	628.1	811.4	1145.9	1742.4	2559.4	4252.2
VI. Sustainability/adjustment factors	0.0	0.0	0.0	0.0	0.0	0.0
VII. Average number of months of pension paid the first year	6.5	6.5	6.5	6.5	6.5	6.5
Monthly average pensionable earnings / Monthly economy-wide average wage	1.1	0.9	0.8	0.8	0.8	0.9

TABLE 13c   *Disaggregated new public pension expenditure (old-age and early earnings-related pensions) - WOMEN*

New pension	2013	2020	2030	2040	2050	2060
I Projected new pension expenditure (millions EUR)	21.4	24.3	28.3	30.0	39.0	25.0
II. Number of new pensioners ('000)	14.8	14.1	12.1	10.6	10.9	4.7
Average new pension ('000)	1.4	1.7	2.3	2.8	3.6	5.4
III. Average contributory period (in years)	35.2	37.0	38.1	38.8	38.8	38.8
IV. Average accrual rate (=c/A)	0.011	0.010	0.010	0.008	0.007	0.006
Notional-accounts contribution rate (c)	0.2	0.2	0.2	0.2	0.1	0.1
Annuity factor (A)	18.4	18.5	18.5	19.8	21.1	22.3
V. Monthly average pensionable earning	584.5	690.6	932.4	1390.9	2033.3	3363.1
VI. Sustainability/adjustment factors	0.0	0.0	0.0	0.0	0.0	0.0
VII. Average number of months of pension paid the first year	6.5	6.5	6.5	6.5	6.5	6.5
Monthly average pensionable earnings / Monthly economy-wide average wage	1.0	0.8	0.6	0.6	0.6	0.7

The average contributory period for women is projected higher as for men, while the average pensionable earnings are higher for men.

The average accrual rate for both men and women is the same.

Number of new pensioners declines in accordance with increasing in retirement age as well as in accordance with demography.

3.4. Financing of the pension system

TABLE 14   *Revenue from contribution (Millions), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)*

	2013	2020	2030	2040	2050	2060
Public contribution	1629.8	2052.2	2919.8	4102.9	5563.4	7600.8
Employer contribution	*1622.8*	*2044.1*	*2911.7*	*4090.6*	*5546.1*	*7579.8*
Employee contribution						
State contribution	*7.0*	*8.0*	*8.2*	*12.3*	*17.3*	*21.0*
Number of contributors (I)	936.6	845.9	713.4	666.6	617.0	591.5

Employment (II)	902.9	819.7	697.6	650.7	598.7	573.7
Ratio of (I)/(II)	1.0	1.0	1.0	1.0	1.0	1.0

In 2014 the total social insurance contribution rate in Latvia is 34.09% of individual gross contribution wage, where employer pays 23.59% and employee - 10.5%. The largest part of the total social insurance contributions goes to pension insurance and these contributions are not divided by employer and employee contributions.

The number of contributors is higher as number of employment for the reason that the contributions are paid also for unemployment persons, disability persons, state budget transfers, etc.

3.5 Sensitivity analysis

TABLE15

Public and total pension expenditure under different scenarios (p.p. deviation from the baseline)

	2010	2020	2030	2040	2050	2060
Public Pension Expenditure						
Baseline	7.7	5.9	5.5	5.4	5.1	4.6
Higher life expectancy (2 extra years)	0.0	0.0	0.0	0.0	0.1	0.1
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	-0.1	0.0	0.0
Higher emp. of older workers (+10 pp.)	0.0	-0.1	-0.2	-0.1	-0.1	0.0
Lower migration (-20%)	0.0	0.0	-0.1	0.0	0.0	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	-0.3	-0.4	-0.2
Total Pension Expenditure						
Baseline	7.7	5.9	5.5	5.4	5.1	4.6
Higher life expectancy (2 extra years)	0.0	0.0	0.0	0.0	0.1	0.1
Higher lab. productivity (+0.25 pp.)	0.0	0.0	-0.1	-0.2	-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	-0.1	-0.1	-0.1	-0.1	-0.1
Higher emp. of older workers (+10 pp.)	0.0	-0.1	-0.2	-0.1	-0.1	-0.1
Lower migration (-20%)	0.0	0.0	-0.1	-0.1	0.0	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	-0.5	-0.6	-0.4

Amount of new granted pension at retirement are calculated by dividing the amount of contributions accumulated in the notional account by projected life expectancy at retirement for the individual's birth cohort. *Higher life expectancy scenario* increase the number of pensioners, but that is partly covered by smaller average pension amount.

In the *higher/ lower labour productivity scenarios* due to the CPI + 25% of real wage sum growth is used for indexation of pensions and wage sum growth is used for indexation of NDC pension capital, the ratio of total pension expenditures to GDP is smaller/higher in comparison to the baseline scenario.

Higher employment rate scenario not only leads to higher GDP but also make larger accumulated pension capital and higher average pension.

Higher employment of older workers scenario not only leads to higher GDP but also make larger accumulated pension capital and higher average pension.

Lower migration scenario increases number of contributors as well as number of pensioners.

Linking the retirement age to the increase in life expectancy scenario increase the number of contributors, decrease the number of pensioners and make larger accumulated pension capital and higher average pension.

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

TABLE 16 — *Overall change in public pension expenditure to GDP under the 2006, 2009, 2012 and 2015 projection exercises*

	Public pensions to GDP	Dependency ratio	Coverage ratio	Employment effect	Benefit ratio	Labour intensity	Residual (incl. Interaction effect)
2006 *	-0.86	3.42	-1.27	-0.67	-2.35	:	0.01
2009 **	-0.35	5.73	-1.57	-0.16	-3.92	:	-0.43
2012 ***	-3.73	6.75	-2.13	-1.35	-6.15	-0.01	-0.84
2015****	-3.08	3.83	-1.35	-0.61	-4.46	-0.01	-0.48

* 2004-2050; ** 2007-2060; *** 2010-2060; **** 2013-2060

There are some changes in comparison with the previous AWG projections.

Macroeconomic assumptions, assumptions of life expectancy as well as pension indexation rules affect the difference *in benefit ratio*.
Changes in demographical situation and demographic projection affect the difference *in dependency ratio.*
Changes in population age structures affect difference *in coverage ratio*.
Difference in *employment effect* reflects changes in demography and employment rates.

TABLE 17 — *Decomposition of the difference between 2012 and the new public pension projection (% of GDP)*

	2013	2020	2030	2040	2050	2060
Pier review 2013	8.2	6.8	6.0	6.1	6.2	6.0
Change in assumptions	-0.6	-1.3	-0.9	-1.1	-1.5	-1.7
Improvement in the coverage or in the modelling	0.1	0.1	0.0	0.0	0.0	0.0
Change in the interpretation of constant policy	:	:	:	:	:	:
Policy related changes	0.0	0.3	0.4	0.4	0.4	0.3
New projection	7.7	5.9	5.5	5.4	5.1	4.6

3. DESCRIPTION OF THE PENSION PROJECTION MODEL AND ITS BASE DATA

The Ministry of Welfare is responsible for pension projections in Latvia. The Latvian Social Insurance Budget/Pension Model was built by World Bank consultants and ministry's experts.

The model is a micro simulation model and generates long-term projections of expenditures and revenues of the total social insurance budget. The model rests on five pillars:
- A Demographic Model
- A Population Status and Labour-force Participation Model
- An Income Model
- Pension Model

- Benefit Models

The model is presently designed to produce projections for old age, disability, short-term sickness, work injury, unemployment, maternity, survivor, funeral benefits and other important outlays. The most elaborate modules are those that generate disability and old-age pension projections.

For a specified set of rules for the calculation of benefits, the user steers the projections by choosing parameters that determine scenarios for the development of the population, participation in the labour force, the unemployment rate, the average wage and the degree of participation in the formal economy.

Most of the key assumptions needed to run the model can be varied over the projection period. For example, birth, mortality, migration, unemployment, disability, average wage, and interest rates can develop in various ways specified by the user. Some scenarios are specified by a vector, such as the rate of growth or rate(s). Others are specified as changing age-gender distributions, e.g. survival rates, the distribution of income, unemployment risks. This is done by specifying a set of possible scenarios in the Data Module and then choosing the desired development of parameters and the desired combination of scenarios in the Control panel that steers a run.

The model produces projections on an annual basis through the year 2060, although the projection period can be abridged and in some cases elongated. The year 2060 is presently the limit for the old-age pension projections. It is possible to run the demographic and population status sub-models longer.

There are four old-age pension modules. These produce projections of average benefits and costs for:
- The pre-reform defined-benefit system
- The defined-contribution, notional account pay-as-you-go (PAYG) system
- The defined-contribution funded (2nd Tier) funded system
- The defined-contribution funded (2nd Tier) funded system with refunding into the PAYG reserve

The disability model keeps track of the flow of new recipients and the total stock of beneficiaries. The model contains the following features:
- User specified age-gender recovering probabilities specific for the disabled
- User specified age-gender granting probabilities specific for the disabled
- User specified groups with the separate benefit rules
- User specified indexation of benefits

Disabled persons who have reached retirement age shall be granted the old-age pension instead of disability pension (disability pensioners, who reached retirement age before 1996 continue to receive disability pension – until the end of transition period)

The model presently calculates survivor pensioners until age 24, using initial data and factor to specify the average number of survivors per deceased.

Basic data required to run the model(s)

Initial data are prepared by the State Social Insurance Agency and Central Statistical Bureau, like labour force and wage profiles, contributors, contributions, pensioners and pension profiles, etc.

Assumptions and methodology used in the calculation of main variables

Underlying assumptions agreed by the AWG that have been used in the model(s):
- demographical assumptions (fertility, mortality, migration);
- macroeconomic assumptions:
  - wage growth;
  - GDP growth
  - participation rates;
  - unemployment rates;
  - employment rates,
  - interest rates, etc.

Additional assumptions and methodology used to estimate:
- the number of pensioners, including estimates of the average number of newly retired pensioners
  Average age of retirement of a birth cohort, for men and women separately (according to law, considering early retirement) has been used in the projections (all cohort of gender take retirement in the same year, except those who retired earlier)
- pension accrual
  Pension capital for old age pensions (NDC) has been calculated by age and gender in the model. Accumulated capital until year 2013 distributed by age and gender has been put in input data as base. Growth of the social insurance wage base is used for capital indexation until retirement.
- Pension capital for old age pensions (**FDC**) has been calculated by age and gender in the model.
  Accumulated capital until year 2013 distributed by age and gender has been put in input data as base. AWG defined interest rate used for FDC capital indexation.
  An actual data about participation in FDC pension scheme by age and genders as well as projected demographical cohorts by age and genders distributed by mandatory and voluntary cohorts (in accordance with legislation) with assumptions for projected participation rates in FDC are used for projections of FDC contributions, capital and pensions.

  The legislated FDC rates (for all projection period) are used for projection the FDC contributions and AWG defined interest rate is used in accumulation an FDC capital.
  For calculation of FDC pension at retirement the FDC capital at retirement is divided by projected life expectancy at retirement.
  The legislated retirement age is used for FDC and NDC.
  As the financing of the FDC pension scheme is in the framework of public pension scheme, all subsidies for the individual, paid by the state budget or other social insurance budgets (in case of child care, unemployment etc.) are respectively attributed for both schemes.

<u>Total contribution rate to pension capital (NDC + FDC) = 20%.</u>

Contribution rate to the state funded pension scheme:

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
2%	2%	2%	2%	2%	2%	4%	8%	2%	2%	2%

2% in 2012, 4% in 2013 and 2014, 5% in 2015, 6% - from 2016.

FDC pensions in model are indexed by AWG defined interest rate.

- average pensions
  NDC and funded pension amounts depend on accumulated NDC and FDC capital, life expectancy at the retirement age and pension indexation.
  For calculations of different types of pensions model is making calculations according to the law.
- number of years receiving a pension
  Number of years receiving a pension depends on estimation of life expectancy.

Calculation of Old age pensions

Overview

In principle, the model can be used to compute any defined-benefit or defined contribution pension scheme. The model combines demographic and economic scenarios with user defined rule systems to compute benefits. One of the major uses of the model is to examine the financial development and cohort-benefit profiles of old-age pension benefits over time given different user-specified demographic and economic scenarios. The model is presently programmed to produce calculations to the year 2060, but can be modified to produce calculations over longer time spans.

The model population is specified in terms of birth cohorts and gender. Since the model also contains a function specifying the distribution of income for men and women by age, by first specifying an age and gender distribution, it is possible to use the model to compute benefit schemes taking into account typical age-earning income profiles.

Together with survival rates, the pension age is instrumental in determining the size of individual benefits and total costs for the pension system(s). The user specifies the average pension age to be employed in the calculations. Since the average pension age may change by either gender or birth cohort or both, do either to legislative or behavioural reasons, the user is responsible for specifying a desired scenario. The effect of this choice on the outcome can be studied in alternative scenarios.

Benefits are calculated according to benefit formulas specified by the user. They reflect assumptions made about the growth and distribution of individual earnings and contributions and the form of benefit indexation. Where appropriate, the user can make assumptions about what happens with survivor's capital, as well as the development of the real rate of return on funded capital.

The output of the model is summarized in a financial accounting structure. The model keeps track of the development of benefits and the number of recipients by birth cohort and gender. This makes it possible to compare and examine the effects of alternative rule systems by gender and birth cohort. The model aggregates cohort and gender data to aggregate annual

data on revenues and expenditures, stocks and flows of assets and liabilities, and numbers of beneficiaries and contributors. There are predefined tables and charts, but a user familiar with EXCEL can create his own output tables.

The Retirement Age in the Model
Legislation and behaviour determine the retirement age. Within the scope of the model the user determines the average age of retirement of a birth cohort, for men and women separately. With decreasing death risks and the resultant increase longevity for persons reaching a certain (minimum, mandatory etc.) pension age the average age of retirement may increase, either through legislation or behaviour.

The disability model keeps track of the flow of new recipients and the total stock of beneficiaries. The model contains the following features:

- User specified age-gender survival rates specific for the disabled
- User specified groups with separate benefit rules
- User specified indexation of benefits

In addition, account is taken to the fact that different rules apply to persons granted benefits in different years in Latvia (pre-1996, 1996 and post-1996).

The Indexation of Benefits
All calculations in the model are performed in real values. This means that price indexation of benefits is assumed as the default option.

Wage sum indexation involves indexing the real-valued benefits with a real-wage sum index. This can be set equal to varying degrees of full indexation, from zero to full indexation.