



MINISTRY OF FINANCE OF ESTONIA

Estonian pension system

○ *General overview*

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 1984 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 different legal, organisational and financial principles. The current legal principles of state pension insurance are effective since 1999-2000. Then it was 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 started from 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 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. National pension is paid in the fixed rate, in the so-called national pension rate.

In 2005, the retirement age for men is 63 and for women 59 years and 6 months. The age limit for women is rising and will be equalized with that of the men by 2016. The qualification period for old age pension is 15 years of pensionable service in Estonia.

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

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

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 EEK).

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 1 July 2005, the base amount is EEK 858 (ca 28% of the average old age pension) and the cash value of annual score is EEK 42.83.

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. The index depends with equal weights (50%-50%) on the increase of social tax revenues and the increase of consumer price index. However, different government coalitions have, in addition to indexation, also applied supplementary ad hoc pension increases.

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.

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 shall commence from 2009 (benefits on the basis of inheritance starting from 2007).

In the beginning of October 2005, there were more than 460 thousand switchers in mandatory funded pension scheme. More than 50% of employees and more than 50% of eligible persons have joined the II pillar (around 2/3 of switchers are currently employed).

The model

- *Name and organisation responsible*

Long-term pension budget model that includes all types of pensions (incl. II pillar pensions), other social benefits are excluded. Finance Policy Department of the Ministry of Finance of Estonia is responsible for managing the model.

- *Type of model*

The model is a simulation and forecasting model of social expenditures and revenues under alternative economic, demographic and legislative assumptions. The model is a macro-level numerical partial equilibrium top-down model based on historical relationships and identities constructed as a set of Excel files.

- *General purpose and use of the model*

The model was created in the context of pension reform. The main purpose of the model is to simulate different policy options, understand what will happen in future, make different scenarios etc.

Basic data required to run the model

○ *Sources of data*

For population and labour force there are used AWG projections (there is also possibility to use national assumptions). Data for I pillar pensioners comes from Estonian Social Insurance Agency; data for mandatory funded pillar pensioners comes from Estonian Central Depository of Securities. Wage statistics comes from Estonian Tax and Customs Board.

○ *Organisation of data*

Most data for age cohorts (from 0 to 110) is available for both men and women. Only data on some special pension scheme is available in aggregated terms, but the number of these pensioners is around 1% of total. Basic units are 1 EEK and 1 person.

○ *Coverage and possible exceptions*

All pension schemes are covered with this model (except III pillar – voluntary pension scheme, which is classified outside of general government).

Assumptions and methodology used in the calculation of main variables

○ *Underlying assumptions agreed with AWG*

Population forecast, mortality rate, migration, unemployment and employment rates, and also macroeconomic assumptions have been used in the estimates. Real wage growth in long-term is assumed to be equal to labour force productivity.

○ *Additional assumptions and methodology*

- Wage structure development by age and gender to calculate contributions and pensions.
- Development for the number and structure of different pensioners by age and gender (according to the changes in law).
- II pillar switchers by age and gender, their wage difference to the total population wages etc.

Incorporation of future effects of enacted reforms

○ *Retirement decisions*

Increasing retirement age of the women is taken into account. Otherwise retirement pattern remain mostly the same, there is only small difference that is resulted from different labour force participation rates in older ages.

○ *Taking up of early retirements*

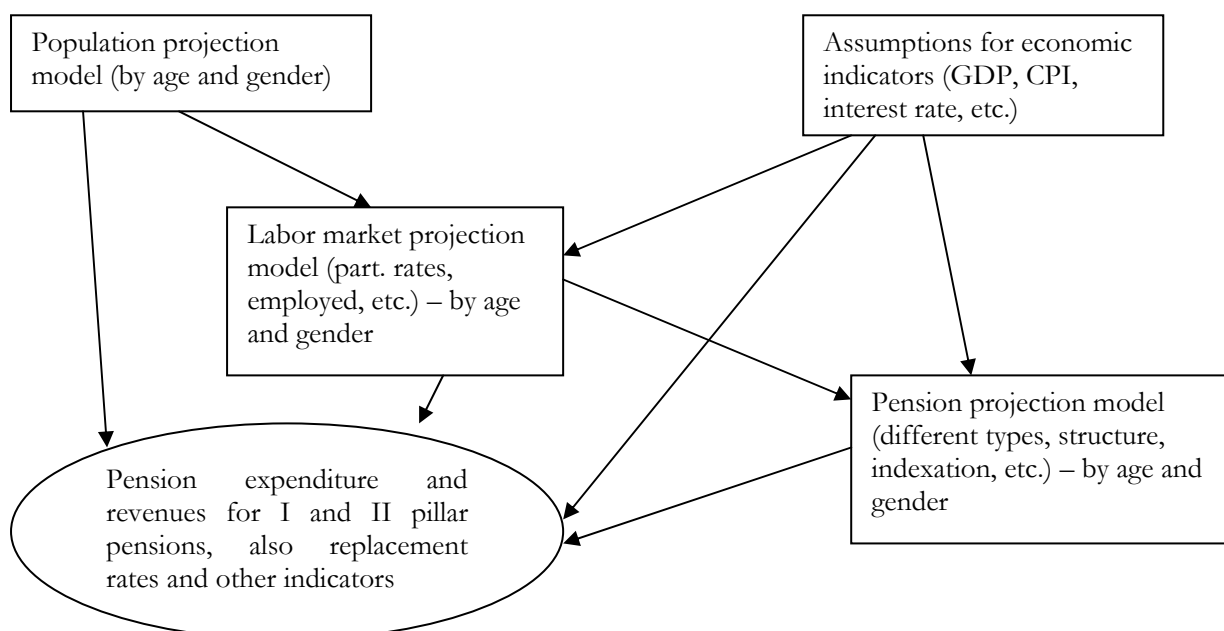
Early retirement is included to the model.

○ *Application of indexation rules and adjustments*

Indexation rules will remain the same as now. Current indexation formula requires that the pensions be annually increased by the sum of half of the social tax increase and half of inflation.

Description of the projection (main equations)

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

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 = $(1 + \text{labour productivity growth}) * (1 + \text{change of employees}) - 1$

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:

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

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.

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. For this projections are imported from other parts of the model and then consolidated to overall level.

Results of the projection

o Readiness of projection results

The national pension expenditure used in AWG-projection is an exactly the same as model outputs. Adjustments were only needed in currency.

o Projection results

Baseline projections show, that the public spending on pensions will decrease by 2,5p to the level of 4,2% of GDP in the timeframe of 2004 to 2050. There are two main reasons for this decrease:

- Indexation of public pensions to the social tax increase and annual CPI increase will reduce the size of pension benefits compared to GDP;
- 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.

On the other hand, total spending (public + private) on pensions will virtually stay on the level of 2004, thus be 6,6% of GDP in 2050. This shows the importance of the funded pillar in providing the pension benefits – more than one third of the total pension spending will be covered by the private sector in 2050. The current indexation rule will also result in build-up of financial assets in the first pillar. The projected amount of assets in public pension system will exceed the 40%, together with funded pillar 100% of the GDP at the end of projection horizon.

The sensitivity tests suggest, that only the higher employment scenario (by 1%) could have some impact in reducing the level of public spending (by 0,2pp by 2050), the other scenarios had no impact on public spending or increased the level marginally.