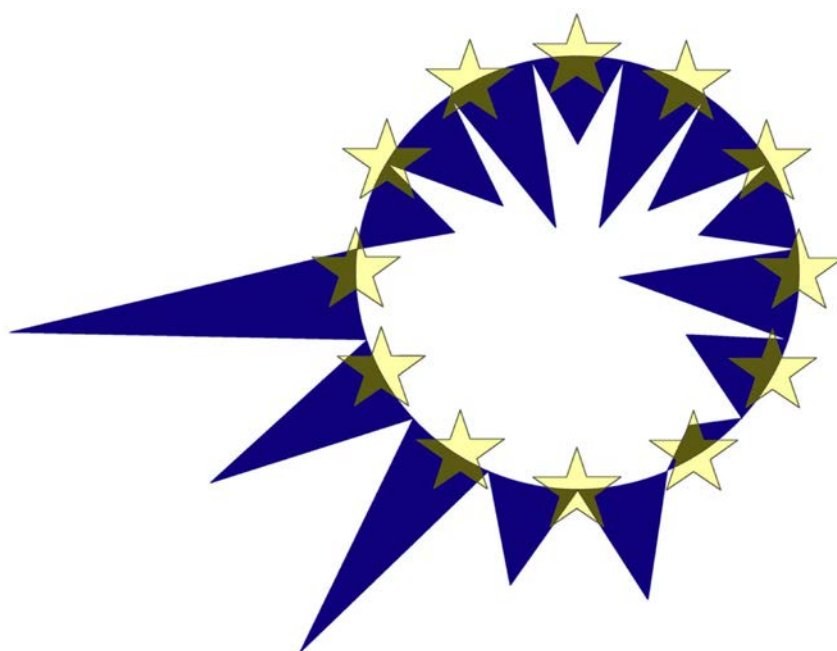


# **EUROMOD**

## **COUNTRY REPORT**



# **ESTONIA (EE)**

## **2007-2012**

**Andres Võrk, Alari Paulus**

**25/01/2013**



EUROMOD is a tax-benefit microsimulation model for the European Union (EU) that enables researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each country and for the EU as a whole.

EUROMOD has been enlarged to cover 27 Member States and is updated to recent policy systems using data from the European Union Statistics on Income and Living Conditions (EU-SILC) as the input database, supported by DG-EMPL of the European Commission.

This report documents the work done in one annual update for Estonia. This work was carried out by the EUROMOD core developer team, based mainly in ISER at the University of Essex, in collaboration with a national team.

EUROMOD coordinator: Holly Sutherland  
EUROMOD coordination assistant: Cara McGenn  
EUROMOD developer responsible for Estonia: Alari Paulus  
National team for Estonia: Andres Võrk

This report accompanies the release of EUROMOD G1.0. There may be minor differences between the results presented here and those obtained with G1.0 due to further improvements since the report was prepared,

For more information, see: <http://www.iser.essex.ac.uk/research/euromod>

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This programme is managed by the Directorate-General for Employment, Social Affairs and Inclusion of the European Commission. It was established to finally support the implementation of the objectives of the European Union in the employment and social affairs area, as set out in the Social Agenda, and thereby contribute to the achievement of the Lisbon Strategy goals in these fields.

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PROGRESS mission is to strengthen the EU contribution in support of Member States' commitment. PROGRESS is instrumental in providing analysis and policy advice on PROGRESS policy areas; monitoring and reporting on the implementation of EU legislation and policies in PROGRESS policy areas; promoting policy transfer, learning and support among Member States on EU objectives and priorities; and relaying the views of the stakeholders and society at large

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## INTRODUCTION

This country report gives an overview of the Estonian country model of EUROMOD. The report presents the basic information on the Estonian tax-benefit system valid in 2007-12 (as of 30<sup>th</sup> June in corresponding year), it explains which taxes and benefits are simulated and how in EUROMOD and how well the model represents actual income distribution and monetary aggregates.

The Estonian country model uses two alternative data sources:

- a) European Union Survey of Income and Living conditions (EU-SILC) 2008
- b) Estonian Social Survey (Eesti Sotsiaaluuring) 2008, which is a more detailed national version of the SILC survey and where the EU-SILC variables are derived from.

The report is an update of four earlier reports:

- i. Lüksik, Paulus and Võrk (2008), for 2005 policies based on the Estonian Household Budget Survey 2005
- ii. Võrk, Paulus and Lüksik (2010), which covered policy years 2005-2008 based on three datasets (besides HBS 2005 also EU-SILC 2006 and ESS 2006),
- iii. Võrk and Paulus (2011), which covered policy years 2006-2009 based on two datasets (EU-SILC 2007 and ESS 2007),
- iv. Võrk and Paulus (2012), which covered policy years 2007-2011 based on two datasets (EU-SILC 2008 and ESS 2008).

The current version of the model uses the same datasets as the previous reports with policies updated further to 2012. This report updates information on policy rules as well as validation results. Some changes have been also made in the structure of the report.

## 1. BASIC INFORMATION

### 1.1 Basic figures

Table 1. Basic figures

	Pop. (m.)	Pop. < 18 (%)	Pop. ≥ 65 (%) <sup>[1]</sup>	Life expect. (years)	Fertility rate	Unemp. rate	GDP per head (PPP) <sup>[a]</sup>	Currency	
								Name	Exch. rate
2003	1.356	21.3	15.9	71.59	1.37	10.0	55	Kroon	15.6466
2004	1.351	20.8	16.2	72.02	1.47	9.7	57	Kroon	15.6466
2005	1.348	20.3	16.5	72.82	1.50	7.9	62	Kroon	15.6466
2006	1.345	19.8	16.7	73.02	1.55	5.9	66	Kroon	15.6466
2007	1.342	19.3	17.1	73.01	1.64	4.7	70	Kroon	15.6466
2008	1.341	18.8	17.2	74.06	1.66	5.5	69	Kroon	15.6466
2009	1.340	18.6	17.1	75.04	1.63	13.8	64	Kroon	15.6466
2010	1.340	18.4	17.1	75.84	1.64	16.9	64	Kroon	15.6466
2011	1.340	18.4	17.0	76.28	1.52	12.5	67	Euro	1
2012	1.340	18.4	17.2	n/a	n/a	n/a	n/a	Euro	1

Source: Statistics Estonia, on-line database, last accessed 4 December, 2012;

<sup>[a]</sup> Eurostat, on-line database, last accessed November 8, 2012.



Notes: Population figures on 1<sup>st</sup> January; Unemployment rate for age group 15-74; GDP per head in Purchasing Power Standards (EU-27=100); Exchange rate between Euro and Estonian Kroon was fixed 1 EUR= 15.6466 EEK until 2010.

## 1.2 The tax-benefit system

Table 2. Tax-benefit system and government budget

	<b>Total general government revenue<sup>[a]</sup> % of GDP</b>	<b>Total tax receipts<sup>[a]</sup> % of GDP</b>	<b>Total general government expenditure<sup>[a]</sup> % of GDP</b>	<b>Social protection expenditure<sup>[b]</sup> % of GDP (ESSPROS methodology)</b>
2003	36.5	30.8	34.8	12.5
2004	35.6	30.6	34.0	13.0
2005	35.2	30.7	33.6	12.6
2006	36.1	30.8	33.6	12.1
2007	36.4	31.5	34.0	12.1
2008	36.7	32.0	39.7	14.9
2009	43.5	36.1	45.5	19.3
2010	40.8	34.3	40.7	18.1
2011 <sup>1</sup>	39.4	33.0	38.3	NA

Source: <sup>[a]</sup> Eurostat, on-line database, last accessed 13 December 2012, Eurostat tables: Government revenue, expenditure and main aggregates - Total general government expenditure, Total general government revenue; Main national accounts tax aggregates - Total receipts from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed but unlikely to be collected;

<sup>[b]</sup> Statistics Estonia, Total expenditure on social protection, Current prices (% of GDP)

Table 3. Social protection expenditure by function (as % of total social protection expenditure)

	Sickness /health care	Disability	Old age	Survivors	Family/ Children	Unemployment	Housing	Social exclusion
2003	31.8%	9.3%	44.0%	0.8%	10.0%	1.8%	0.6%	1.6%
2004	31.5%	9.1%	42.9%	0.8%	12.7%	1.6%	0.4%	1.1%
2005	31.9%	9.4%	43.1%	0.9%	12.2%	1.3%	0.2%	1.0%
2006	31.2%	9.5%	44.4%	0.9%	12.1%	0.9%	0.3%	0.7%
2007	33.4%	9.3%	43.0%	0.8%	11.6%	1.2%	0.2%	0.6%
2008	32.4%	9.9%	42.3%	0.7%	12.0%	2.1%	0.2%	0.5%
2009	28.4%	9.9%	41.9%	0.6%	11.9%	6.4%	0.2%	0.6%
2010	26.8%	10.9%	43.6%	0.6%	12.7%	4.2%	0.3%	0.8%

Source: Statistics Estonia, Total expenditure on social protection (% of GDP)



Table 4. Taxation (as % of total tax receipts)

	Personal income tax	Corporate income tax	Social security contributions		Indirect taxes	Other taxes
			Employees	Employers		
2003	21.0	5.1	0.9	33.0	39.3	0.7
2004	20.6	5.5	0.9	32.7	39.6	0.7
2005	18.3	4.7	0.9	32.4	43.0	0.7
2006	18.3	4.9	0.5	32.3	43.3	0.7
2007	18.7	5.2	0.6	32.6	42.2	0.7
2008	19.7	5.2	0.6	35.7	37.9	0.9
2009	16.0	5.2	1.5	35.0	41.3	0.9
2010	15.9	4.0	2.4	35.8	41.0	0.9
2011	16.2	3.9	2.4	32.5	42.3	2.6

Source: Statistics Estonia, own computations

### 1.2.1 Basic information about the tax-benefit system

- The tax system is largely a unified, national system consisting of income tax, value added tax, excise taxes, social tax and social insurance contributions. There are a few taxes set by local governments, such as land tax, motor vehicle tax, sales tax, but the share of these taxes in overall taxation is negligible.
- The benefit system is also a unified, national system. Municipalities provide a few local benefits, such as additional family and child benefits, and additional social assistance benefits, but the share in overall social expenditures is small. Social benefits and pensions are usually assessed and delivered on a monthly basis. Amounts are referred to in monthly terms.
- The fiscal year is 1<sup>st</sup> January – 31<sup>st</sup> December. The tax system generally changes in 1<sup>st</sup> January each year. Indirect taxes may change also within a year. Main benefit changes happen at the same time, but may also be implemented in April (indexation of state pensions takes place in 1<sup>st</sup> April each year), or other times in year, e.g. family benefits have been changed in July and September.
- In 2012 the statutory pension age was 63 for men and 61.5 for women. For women it was meant to increase to 63 by 2016. On 7 April 2010 the parliament approved an increase of the statutory pension age. The amendment of the law raises pension age further to 65 by 2026 for both sexes by 3-months-steps. For those younger than 50 in 2010, the retirement age will be 65; those who are between 50 and 56 the retirement age will depend on birth year and month; the retirement age will remain 63 for those currently older than 57.
- Children are subject to the obligation to attend school from age 7 and until they acquire basic education or attain 17 years of age.
  - Dependent children for family benefits are defined as aged under 16, or under 19 and enrolled in basic school, upper secondary school or vocational school in daytime study or another form of study for medical reasons.



- In the case of subsistence benefit, dependent children are defined as aged under 18.
- For taxation purposes, dependent children are aged up to 17. One of the parents may deduct additional basic allowances from his or her income in the period of taxation depending on the number of children. The number of additional allowances has varied over the years.
- For family benefit purposes single parents are the parents of resident dependent children whose birth registration certificate does not have an entry concerning the father or an entry has been made on the basis of a statement by the mother or whose parent has been declared to be a fugitive. For social assistance purposes single adult
- The income tax system is an individual system, but a married couple may also file a joint tax report if they wish (beneficial if one has unused tax allowances which the other one could claim for). There are some income sources on which income tax is immediately withheld when they are paid out; final tax liability is based on the tax report after the tax year has ended (taking into account tax already withheld).
- Liability of income tax is based on annual income and allowances are referred to in annual terms, although 1/12 of the annual basic, pension and sickness allowance can be applied monthly to calculate withholding income tax. In order to make use of the other allowances and deductions these have to be declared in the following year (by 31<sup>st</sup> March) when filing the tax report. Overall, there are a few allowances and deductions in the system. Different income sources are taxed uniformly.
- The means-tested benefit system assesses entitlement according to household income. Household consists of persons living together and share their income and expenditures. Income is assessed on monthly basis. Total income, with a few exceptions, of the previous month is taken into account.
- Taxes and benefits are not indexed, with the exception of old-age pensions, which are indexed to weighted average of inflation and social tax revenues, but ad hoc changes are common. Usually taxes and benefits are changed in ad hoc manner. Some thresholds of benefits (i.e. minimum or maximum levels) are linked to past minimum wage or average contribution base.
- Social tax is a payroll tax and is paid by employers, although all tax payments are linked to individuals when calculating pensions, sickness benefits or maternity benefits. There are a few additional social contributions paid by employees: unemployment insurance benefits and contributions to the mandatory pension scheme.





## 1.3 Social Benefits<sup>1</sup>

### 1.3.1 Pensions

The Estonian pension system is based on three pillars:

- state pension insurance (the 1<sup>st</sup> pillar) – pay-as-you-go scheme;
- mandatory funded pension scheme (the 2<sup>nd</sup> pillar) – introduced in 2002;
- supplementary (voluntary) funded pension scheme (the 3<sup>rd</sup> pillar) – introduced in 1998.

As the funded pension components were introduced relatively recently, only pensions from the state pension insurance scheme were paid out in 2006-2008. In 2009 pensions from the mandatory funded pension scheme started, but their role was initially negligible.

The first pillar – the state pension insurance – provides protection against the risks of old age, disability and survivorship, and in fact comprises two separate tiers:

- residence-based national pensions and
- employment-based old-age, work incapacity and survivors' pensions.

All economically active persons are compulsorily covered by the state pension insurance through the payment of an earmarked social tax (by employers). The state pays social tax on behalf of some economically non-active persons, e.g. persons on parental leave, conscripts, carers of disabled persons etc.

Entitled to old age pension are residents of Estonia who have attained a pension age and have at least 15 years of pensionable service obtained in Estonia. In 2007, the statutory pension age was 63 years for men and 60 years for women. The pension age of women is being increased and gradually equalised with the pension age of men, reaching the target level of 63 by 2016. (See table 5). After that the pension age increases gradually to 65 for both sexes by 2026.

Since 1999 the acquisition of new pension rights is linked to the social tax paid on behalf of the person. That introduced an insurance element in the pension formula and counting of pension insurance periods on the basis of registered social tax payments.

**The old-age pension (*vanaduspension*)** from the state pension system (the 1<sup>st</sup> pillar) is calculated according to a formula, which consists of three additive elements:

- a flat-rate element;
- a length-of-service element (applies only to pensionable service until 31<sup>st</sup> December 1998);
- an insurance element applying to periods after 1<sup>st</sup> January 1999.

The pension components are indexed annually by an arithmetic weighted average of annual increases of consumer prices and social tax revenues. In 2005-2007 the weights were equal, they were changed in 2008, the new weights are 20% for CPI increases and 80% for social tax revenue increases). However, additional ad hoc top ups have been common. In 2009, the

<sup>1</sup> The following description of social benefits cites and uses excerpts from the following sources.

- Ministry of Social Affairs. Social sector in figures 2005. Tallinn 2006.
- Ministry of Social Affairs. Social sector in figures 2006. Tallinn 2007.
- Lüpsik, S., Paulus, A., Võrk, A. (2006) "I-CUE Feasibility Study. Estonia (2005 tax-benefit system)" EUROMOD Feasibility Study.
- Leetmaa, R., Võrk, A. (2006) "Social Insurance and Social Assistance in Estonia", report to World Bank.
- Leppik, L. (2004) "The Estonian pension system: challenges of adequacy and sustainability". PRAXIS Center for Policy Studies. Unpublished.



pension indexation rules were changed to allow smoothing the value of nominal pensions during an economic downturn (adding to the previous rule according to which the nominal level cannot be reduced even if implied by the raw index). This resulted in a smaller increase of pensions in 2009 (and predictably smaller increases again in 2012-2015).

Table 5. Changes in the pension age in 2005-2027

Women			Men
Birth year	State pension age	Year reached	State pension age
1946	59 and 6 months	2005, 2006	63
1947	60	2007	63
1948	60 and 6 months	2008, 2009	63
1949	61	2010	63
1950	61 and 6 months	2011, 2012	63
1951	62	2013	63
1952	62 and 6 months	2014, 2015	63
1953	63	2016	63
Both women and men			
1954	63 and 3 months	2017-2018	
1955	63 and 6 months	2018-2019	
1956	63 and 9 months	2019-2020	
1957	64	2021	
1958	64 and 3 months	2022-2023	
1959	64 and 6 months	2023-2024	
1960	64 and 9 months	2024-2025	
1961	65	2026	
1962	65	2027	

A flat-rate guaranteed minimum pension – national pension – is granted to all residents at the age of 63 provided they have resided in Estonia at least five years prior to claiming a pension. Both early retirement and postponement of pensions are possible (see below). Working is allowed while receiving pensions. If the person acquires additional pension insurance coefficients, the pension is recalculated each year.

The 2<sup>nd</sup> pillar is based on defined-contribution principle, meaning that the benefit depends on the total contributions paid into individual pension accounts and investment returns of the pension fund. As a rule, benefits are paid in the form of life-long annuities, while unisex life tables are used for calculation of annuities. The pension age in the second pillar is the same as in the first pillar. The first benefits were paid out in 2009. By the end of 2011, the scheme covers about 73% of the population aged 18 to 63. At the end of 2011 61% of the participants contributed.

Supplementary funded pension scheme (the 3<sup>rd</sup> pillar) is a voluntary scheme, which plays a minor role in Estonia so far. It had about 50,000 participants (6% of people aged 18–62) with assets about EUR 85 million (about 0.5% of GDP) on 3 January 2012. There were additionally about 70,000 contracts in the form of life insurance at the end of the 2<sup>nd</sup> quarter of 2011.<sup>2</sup>

**Early retirement pension (*ennetähtaegne vanaduspension*):** Available up to three years before the legal pension age. The amount of pension calculated on the basis of pension formula is permanently reduced by 0.4% for every month of earlier retirement. Pensions are suspended when the person returns to work before pension age. Working while receiving early retirement pensions is allowed after the person has reached statutory pension age. Pension is recalculated

<sup>2</sup> Source: Pensionikeskus, statistical data, retrieved on 4 January 2012 at <http://www.pensionikeskus.ee/?id=600>.



when the person has acquired additional pension insurance periods (but still applying the reduction factor). Eligibility: 15 years of pension insurance period.

**Old age pension under favourable conditions (*soodustingimustel vanaduspension*):** There are two possibilities:

- Under the *State Pension Insurance Act (Riikliku pensionikindlustuse seadus)*, one of the parents who has raised three or more children or a disabled child has the right to retire up to five years earlier before the legal pension age and there is no reduction in pension amount.
- *Old-age Pensions Under Favourable Conditions Act (Soodustingimustel vanaduspensionide seadus)* states that persons who have worked with hazardous or hard working conditions (defined categories of professions) for a certain period of time have the right to retire up to ten years before the legal pension age. Also the value of a year of pensionable service is increased, the size depending on the profession. There is accumulation with earnings if the person does not work at the same profession that gave eligibility to the pension before the statutory pension age.

**Table 6. Early retirement and number of children**

Children	How many years allowed to retire earlier?
Disabled child under 18	5 years
5 or more children	5 years
4 children	3 years
3 children	1 year

**Superannuated pension (*väljateenitud aastate pension*):** For narrowly defined categories of professions (e.g. policemen, pilots, seamen, artists etc.) pension is available before normal retirement age, given that they have required length of service. The amount of the pension depends on the profession. Upon attaining the general pensionable age, the person may switch to the general old-age pension.

**Pension for incapacity to work (*töövõimetuspension*, or disability pension):** The percentage of the calculation basis corresponding to the loss of capacity for work. Calculation basis: represented by the higher of the two following amounts: old-age pension calculated on the basis of actual years of pensionable service and the pension insurance coefficient of the applicant, or old-age pension for a person with 30 years of pensionable service. There is no restriction on work, full accumulation with earnings is possible. Pension is granted from the age of 16 years for the period of work incapacity, which could be determined for 6 months, one year, two years, five years or until attaining the pensionable age depending upon claimant's condition. The pension is renewable. Upon attaining the pension age, the person is transferred to old-age pension. Qualification period depends on age at time of granting the pension, ranging from one year of insurance for persons from 21 to 23 years of age to 14 years of insurance for persons from 60 to 62 years of age. No qualification period for persons aged 16-20.

**Survivor's pension (*toitjakaotuspension*):** Upon the death of a provider, family members who were maintained by him or her have the right to receive a survivor's pension. They include:

- 1) a provider's child, brother, sister or grandchild who is under 18 years of age (or who is under 24 years of age and is a student enrolled in daytime or full-time study) or disabled. A brother, sister or grandchild has the right to receive a pension if he or she does not have parents with capacity for work.
- 2) a provider's parent who is of pensionable age or permanently incapacitated for work;



- 3) a provider's non-working widow who is pregnant (from the twelfth week of pregnancy) or who is permanently incapacitated for work or of pensionable age and whose marriage to the provider had a duration of at least one year;
- 4) a provider's divorced spouse who attained pensionable age or was declared permanently incapacitated for work before the divorce, or within three years after the divorce and whose marriage to the provider had a duration of at least twenty-five years,
- 5) a parent or guardian of a provider's child who is not employed and is raising the provider's child who is under 3 years of age in his or her family. Under certain additional conditions the above apply to stepchildren and foster-children, step-parents and foster-parents.

If the provider had a necessary length of service to receive the old-age pension, then the greatest of the following old-age pensions shall be the basis for calculation of a survivor's pension:

- 1) the old-age pension earned by the provider until the date of his or her death;
- 2) the old-age pension if the person has completed thirty years of pensionable service.

The amount of survivor's pension depends on the number of family members:

- 1) to one family member, 50% of the basis;
- 2) to two family members, 80% of the basis;
- 3) to three or more family members, 100% of the basis.

**National pension (*Rahvapension*):** It is a minimum guaranteed pension for those persons who do not have necessary length of service to be eligible for old-age pensions or pension for incapacity for work, or in case of survivor's pension a provider did not have necessary length of service. The basis for national pension is the National Pension Rate (*rahvapensioni määr*), which in 2007 was 1,423.31 EEK (see Table 7 for amounts in other years).

**Table 7. Minimum amount of national pension by pension type**

Pension type	Minimum amount	
Old-age pension	100% of the National Pension Rate (NPR, <i>rahvapensioni määr</i> )	
Pension for incapacity for work	Percentage of loss of capacity applied to the National Pension Rate (in case of total incapacity 100% of NPR)	
Survivor's pension	<ol style="list-style-type: none"> <li>1) to one family member, 50% of the NPR;</li> <li>2) to two family members, 80% of the NPR in total;</li> <li>3) to three or more family members, 100% of the NPR in total.</li> </ol>	
National pension rate (NPR)	Date	NPR
	1/4/2007	1,423.31 EEK
	1/7/2007	1,573.31 EEK
	1/4/2008	1,913.14 EEK
	1/4/2009	2,008.80 EEK
	1/4/2010	2,008.80 EEK
	1/1/2011	128.45 EUR
1/1/2012	134.10 EUR	

Source: Sotsiaalkindlustusamet [http://www.ensib.ee/public/statistika\\_ja\\_eelarve/penkoefitsendid2010.xls](http://www.ensib.ee/public/statistika_ja_eelarve/penkoefitsendid2010.xls)

Pensions are subject to income tax. Both basic income tax allowance (1,700 EEK per month in 2005; 2,000 EEK in 2006 and 2007; 2,250 EEK in 2008-2010 and 144 EUR since 2011) and a special tax allowance for pensions (3,000 EEK per month until 2010 and 192 EUR since 2011) can be applied. That is for non-working pensioner the pension is non-taxable to the amount of 5,000 EEK in 2006 and 5,250 EEK in 2008-2010 and 336 EUR since 2011. Average old-age



pension was 3,129 EEK in January 2007 and 305 EUR in 2011. It means that the majority of the pensioners effectively do not pay income tax if they do not have taxable income from other sources.

### 1.3.2 Benefits for families with children

There are various types of benefits for families with children.

- 1) State family benefits that mainly depend on the age and number of children.
- 2) Benefits that compensate periods when a parent is out of the labour market and which depend on the parent's previous earnings – maternity benefit (*sünnitushüvitis*), parental benefit (*vanemahüvitis*), care benefit for nursing a child under 12 years of age who is ill (*hooldushüvitis*), etc.
- 3) Tax allowances and deductions depending on the number of children or expenditures on children. This is described in detail below where we discuss income taxation.
- 4) Free or subsidised services for children (e.g. subsidised school meals; free health care, including dental care; subsidised childcare in kindergarten, etc) – these in-kind services are not discussed in detail.
- 5) Benefits and services provided by local municipalities – additional birth grants, social assistance benefits, child's school allowance (at the beginning of the school year), etc.
- 6) Special benefits for disabled children.

#### State family benefits

The types and extent of state family benefits and the conditions under which they are granted are regulated by the *State Family Benefits Act (Riiklike peretoetuste seadus)*. Family benefits are paid to permanent residents of Estonia and foreigners living in Estonia, who have a fixed-term residence permit or who are staying in Estonia on grounds set forth in the *Aliens Act (Välismaalaste seadus)*. Depending on the type of benefit, family benefits are paid either as a lump sum, once a month, once a quarter or once a year (see table 7) and they are financed from the state budget. If a person is entitled to several types of family benefits, these benefits are determined and disbursed simultaneously. Child benefits are calculated on the basis of the Child Allowance Rate (CAR, *lapsetoetuse määr*). Childcare allowances and allowances for families with seven or more children are calculated on the basis of Childcare Allowance Rate (CCR, *lapsehooldustasu määr*). Both rates are established with the state budget for every budget year and the new rate cannot be lower than the existing rate. The family benefits are coefficients of those rates. The child allowance rate was 150 EEK in 2007-2010 and 9.59 EUR since 2011, and the childcare allowance rate was 1,200 EEK in 2007-2010 and 76.7 EUR since 2011.

Dependent children for family benefits are defined as aged under 16, or under 19 and enrolled in basic school, upper secondary school or vocational school in daytime study or another form of study for medical reasons.

All benefits paid under the State Family Benefits Act are non-taxable with income tax.



Table 8. Overview of state family benefits, in 2006-2012

Benefit (legal term in English)	Frequency	Unit	Basic formula in 30 <sup>th</sup> of June 2007	Changes in 2007-2012
Childbirth allowance	Lump sum	Family	5,000 EEK	Since 2011: 320 EUR
Adoption benefit	Lump sum	Family	5,000 EEK	Since 2011: 320 EUR
Child allowance	Monthly	Per child	2 x CAR until 30 June 2007	Since 1 July 2007: 1 <sup>st</sup> and 2 <sup>nd</sup> child 2 x CAR, 3 <sup>rd</sup> and more 6 x CAR
Childcare allowance	Monthly	Per child	Under 3 years old: 1/2 x CCR 3-8 years old: 1/4 x CCR  Additional 100 EEK (6.40 EUR since 2011) for each child under 1 year old, if the parent receives childcare allowance	Since 2009 - none if a parent receives parental benefit for any child
Allowance for families with 3 or more children/ with triplets	Quarterly	Per child	1/1/2006-31/6/2007 3 children: 2 x CAR 4 or more: 3 x CAR	Abolished since 1 July 2007
Allowance for families with triplets	Quarterly	Family	9 x CAR	Abolished since 1 July 2007
Allowance for one parent of a family with 7 and more children	Monthly	Family	2 x CCR	Since 2007: 2.2 x CCR
Single parent child allowance	Monthly	Per child	2 x CAR	
Child's school allowance	Annual	Per child	3 x CAR	Abolished in 2009
Allowance for a child in guardianship or in foster care	Monthly	Per child	10 x CAR	
Conscript's child allowance	Monthly	Per child	5 x CAR	
Start in independent life allowance	Lump sum	Per child	40 x CAR	

Note: CAR – Child allowance rate, 150 EEK in 2007-2010 and 9.59 EUR since 2011; CCR – Childcare allowance rate, 1,200 EEK in 2005-2010 and 76.7 EUR since 2011.

**Child allowance (*lapsetoetus*):** 300 EEK (= 2 x CAR) per child per month. Non-taxable. Since 1<sup>st</sup> July 2007 quarterly allowances for families with 3 or more children (see below) were merged with monthly child allowances and the former were abolished. Since 1<sup>st</sup> July 2007 the third and any consequent child receives 6 x CAR per month. (See also **Allowance for families with 3 or more children** below).





**Single parent child allowance (*üksikvanema lapse toetus*):** 300 EEK until 2010 and 19.18 EUR since 2011 (2 x CAR) per child per month, paid as a supplement to the child allowance. Non-taxable. Single parents are the parents of resident dependent children whose birth registration certificate does not have an entry concerning the father or an entry has been made on the basis of a statement by the mother or whose parent has been declared to be a fugitive.

**Allowance for families with 3 or more children / triplets (*kolme- ja enamalapselise pere ning kolmikuid kasvatava pere toetus*):** Until 30<sup>th</sup> June 2007 for families with 3 children, 300 EEK (= 2 x CAR) per child was paid once a quarter as a supplement to other child benefits; for families with 4 or more children, 450 EEK (= 3 x CAR) per child. For families with triples it was 300 EEK (3 x CAR) per child. A large family applicable to these benefits could only receive a benefit from one of these categories. It was non-taxable. The benefits were abolished since 1<sup>st</sup> July 2007. Monthly child benefits were increased for families with more than three children (see also **Child allowance** above).

**Childcare allowance (*lapsehooldustasu*):** 600 EEK (= 1/2 x CCR) per month for every child up to 3 years old, 300 EEK (= 1/4 x CCR) per month for each eligible child from 3 to 8 years of age. Additionally 100 EEK per month for every child up to one year old. Paid to one of the parents in respect of children under 3 years of age and in respect of children from 3 to 8 years of age if there are 3 or more children or children under 3 years of age in the family. It is non-taxable and there is full accumulation with labour earnings, and other benefits, except maternity benefit and parental benefit.

The additional element for children less than 1 year old is effectively redundant (about 20 families receive it in a year) as most of the families receive parental benefits in that case.

Since 1<sup>st</sup> January 2009 if a parent receives parental benefits then the parent cannot receive the child care allowance also for any other children.

**School Allowance (*koolitoetus*):** 450 EEK (= 3 x CAR) for each child receiving child allowance and enrolled in daytime studies, paid once a year at the beginning of the school year. It is also non-taxable. Note that in 2009 it was abolished.

**Allowance for a parent raising 7 or more children (*7 ja enamalapselise pere vanema toetus*):** Since 2005 the state offers a special non-taxable allowance for the parent of seven or more children. It was 2640 EEK in 2007-2010 and 168.74 EUR since 2011 (2.2 x CCR).

**Conscript's child benefit (*ajateenija lapse toetus*)** is applicable to the child whose parent serves in the Estonian Defence Forces in case the child receives child allowance. In 2007-2010 it was 750 EEK and since 2011 it is 47.95 EUR (= 5 x CAR) per month. It is non-taxable.

**Foster care allowance (*eestkostel või perekonnas hooldamisel oleva lapse toetus*)** is paid for a child who is deprived of parental care, if guardianship has been established for him or her or a foster care contract has been entered into with respect to him or her, and who receives child allowance payments. Upon termination of guardianship or foster care when a child attains 18 years of age, the payment of an allowance continues until the end of the school year when the child attains 19 years of age. Foster care allowance is 1500 EEK (=10 x CAR) in 2007; 3,000 EEK (=20 x CAR) in 2008-2010 and 191.80 EUR since 2010. It is non-taxable.

**Childbirth allowance (*sünnitoetus*).** One of the parents has the right to receive childbirth allowance that was 5,000 EEK for all children in 2006-2010 and 320 EUR since 2011. An adoptive parent, guardian or caregiver has the right to receive childbirth allowance, if childbirth allowance has not been paid for the same child earlier. It is non-taxable.



**Adoption allowance (*lapsendamistoetus*).** An adoptive parent residing in Estonia permanently or on the basis of a temporary residence permit from who an adopted child does not descend and who is not a step-parent of the child has the right to receive adoption allowance, if childbirth allowance has not been paid to the family for the same child earlier. The amount is equal to birth allowance (see above).

**Start in independent life allowance (*elluastumistoetus*)** is a benefit paid to the person without parental care who has been raised in a social welfare institution or a school for children with special needs in case the person starts living independently in a new residence. The amount was 6,000 EEK (= 40 x CAR) in 2005-2010 and 383.60 EUR since 2011. It is non-taxable.

### Benefits compensating the periods out of the labour market

**Maternity benefit (*sünnitushüvitis*)** is one of the benefits for temporary incapacity for work, regulated by the *Health Insurance Act (Ravikindlustuse seadus)*. It is paid to insured person in the event of pregnancy and maternity leave. A pregnant woman has the right to receive maternity benefit for 140 calendar days or, in the case of a multiple birth or delivery with complications, for 154 calendar days if the pregnancy and maternity leave of the woman commences at least 30 calendar days before the estimated date of delivery as determined by a doctor. The size of the benefit is her average gross income taxed with social tax (i.e. earnings) per calendar day in the previous calendar year. It is taxable with income tax.

**Parental benefit (*vanemahüvitis*):** From 1<sup>st</sup> January 2004, the *Parental Benefit Act (Vanemahüvitise seadus)* entered into force, with the aim to compensate for income not received by stay-at-home parents in the first year of the child's life. The right to the parental benefit is granted to the parent, adoptive or foster parent, guardian or caregiver, who is a permanent resident in Estonia or a foreigner living in Estonia on terms of a temporary residence permit. In 2004 and 2005, parental benefit was paid until the end of a 365-day period from the beginning of the pregnancy and maternity leave, i.e. it includes the period of receiving maternity benefit. The duration was increased to 455 days in 2006 and to 575 days in 2008 (see Table 9).

Table 9. Overview of parental benefit, in 2005-2012

	2007	2008	2009	2010	2011	2012
Maximum days (together with pregnancy and maternity leave benefits)	455	575	575	575	575	575
... for parent who did not receive maternity benefits (months)	14	18	18	18	18	18
... for parent who received maternity benefits (days)	315	435	435	435	435	435
Parental benefit rate (minimum rate) (EEK)	2,690	3,600	4,350	4,350	€78.02	€78.02
Parental benefit at the rate of minimum wage (EEK)	3,600	4,350	4,350	4,350	€78.02	€90
Maximum parental benefit	21,624	25,209	30,730	35,316	€157.03	€259.1

Source: Ministry of Social Affairs; Estonian National Social Insurance Board





The size of the benefit is calculated according to the applicant's average monthly gross income taxed with social tax (i.e. earnings) in the previous calendar year (generally 100%). Persons who did not receive any earnings (e.g. non-working students) are paid the parental benefit at the parental benefit rate (2,690 EEK 2007; 3,600 EEK in 2008; 4,350 EEK in 2009-2010; 278.02 EUR in 2011 and 2012). Persons whose average monthly income in the previous year was less than or equal to the minimum wages are paid the parental benefit in the amount of the minimum monthly wages (3,600 EEK in 2007; 4,350 EEK in 2008-2010; 278.02 EUR in 2011; 290 EUR in 2012). The maximum amount of the monthly benefit is three times the average monthly income taxed with social tax in the calendar year before. The parental benefit is subject to income tax.

**Additional childcare leave and breaks:** Under the Holidays Act and the Working and Rest Time Act the following are financed from the state budget: the additional childcare leave of a parent raising a disabled child, the additional childcare leave of one parent (three or six days, depending on the number of children) and the additional childcare leave for fathers (10 workdays). The father is entitled to additional childcare leave either during the mother's pregnancy and maternal leave or within two months from the child's birth. The daily rate for the additional childcare leave was 66 EEK in 2007-2010 and 4.25 EUR in 2011 and 2012, and it is taxable with income tax. In 2008 the daily rate of additional childcare leave for fathers was made dependent on fathers' previous earnings, but in 2009 the compensation was abolished altogether.

A working person raising a child under 1.5 years of age is entitled to additional breaks for feeding the child – the minimum of 30 minutes after every three hours. The additional breaks may be added up and used to shorten the workday. The employees are paid average wages for the additional breaks from the state budget.

### Other family benefits

Families are also paid a lump sum **benefit for holding funerals** (*matuseoetus*) on the territory of Estonia under the *State Funeral Benefit Act (Riikliku matuseoetuse seadus)*. Non-taxable.

**Compensation of study loans** (*õppelaenu kustutamine*). Pursuant to the *Study Allowances and Study Loans Act (Õppetoetuste ja õppelaenu seadus)*, the state started partially writing off the parents' study loans since 2004, writing off 50% of the study loan balance of a parent of one child, 75% of the study loan balance of a parent of twins and 100% of the study loan balance of a parent of triplets. 50% of the loan balance is written off upon the birth of every new child. (Ministry of Social Affairs "Social sector in figures 2006", pp 86-87). The compensation scheme was abolished since 1<sup>st</sup> July 2009 as a result of fiscal constraints of the central government.

### 1.3.3 Unemployment benefits and social assistance benefits

In 1991-2002 the unemployment compensation system consisted only of flat rate unemployment allowances. In 2002 unemployment insurance system was introduced and the payment of unemployment insurance benefits started in 2003. The unemployment compensation in Estonia includes now two tiers:

- a) unemployment insurance (UI) benefits, which depend on previous earnings and are financed from statutory unemployment insurance contributions. Unemployment insurance system is administered by the Estonian Unemployment Insurance Fund (*Eesti Töötukassa*);
- b) unemployment assistance (UA) benefits or unemployment allowance, which are flat rate and are financed from the state budget. National Labour Market Board



(*Tööturuamet*) was responsible for administering the unemployment assistance system until 2009, when it was merged with the Unemployment Insurance Fund.

In addition to that there are severance payments.

**Unemployment insurance benefit (*töötuskindlustushüvitis*).** The unemployment insurance operates as a compulsory insurance and is financed by the contributions of employees and employers. In order to receive an unemployment insurance benefit, three main requirements have to be met. One must meet the eligibility requirements, be involuntarily unemployed, and be registered as unemployed. Unemployment insurance covers all employees (aged 16 to the legal pension age), except self-employed, members of management and controlling bodies of legal persons and some categories of civil servants. To be eligible for UI benefit a person should register as unemployed in the public employment service and needs to have worked and made contributions for at least 12 months during the previous 36 months (until 2006 it was 24 months). Unemployment insurance benefits are not paid to those who leave their job or service voluntarily or who lose their job because they do not perform as agreed, lost confidence of their employer or behaved in an indecent manner. These persons may still receive unemployment allowances. The UI benefit may be stopped if the person refuses an offer of suitable work or does not show up at the public employment at a fixed date.

As persons receiving old-age pension or are older than legal pension age are not allowed to be registered as unemployed in PES, they are also not eligible for unemployment insurance benefits or unemployment allowances.

The level of the UI benefit depends on the previous average gross earnings. During the first 100 calendar days of unemployment the replacement rate is 50% of the previous gross earnings and afterwards it falls to 40%. The daily amount received is calculated on the bases of the wages the person has received during the last twelve months of the insurance period. Of those twelve months, only the first nine are taken into account. The latest three months are disregarded. There is an upper ceiling 3-times average taxable wages in the previous calendar year.

There was no lower limit for the benefit in 2005 and 2006; from 1<sup>st</sup> January 2007 to 31<sup>st</sup> June 2009 it was 1,000 EEK; since 1<sup>st</sup> July 2009 it is 50% of the minimum wage of the previous year. UI benefits are subject to income tax and this is withheld when the benefits are paid out by the UI fund.

To discourage entry into unemployment, UI system involves a waiting period of 7 days before the benefit payment starts. The duration of the unemployment insurance benefit ranges from 180 days up to 360 days depending on the length of contribution payments. Until 2006, the insurance benefits are paid up to 180 days since the contribution period could not exceed necessary five years as it was counted only from January 2002. Since 2007 it can be 270 days and since 2010 it can be 360 days.

After expiry of the insurance benefit, the unemployed can apply for unemployment allowances for the remaining days and for social assistance thereafter.



Table 10. Overview of unemployment benefits; in 2007-2012

	2005	2006	2007	2008	2009	2010	2011	2012
<b>Unemployment insurance benefits</b>								
Maximum duration (days)	180	180	270	270	270	360	360	360
Minimum contribution period for eligibility	12 months during last 24 months		12 months during last 36 months					
Required contribution period for benefits								
180 days	-5 years		- 55 months					
270 days	5-10 years		56-110 month					
360 days	10 or more years		110 or more months					
Base income for benefit	Last 12 months' average wage		Average wage of the last 9 months earlier than 3 months before the unemployment					
Amount of the benefit	50% of the base amount during first 100 days, 40% during the remaining period							
Maximum daily benefit basis (3 times the average of the taxable earnings previous year), EEK	562	630	748	885	1,015	894	60.46 EUR	63.99 EUR
Maximum monthly benefit (replacement rate (here using 50%) times maximum daily basis during 31 days), EEK	8,704	9,764	11,598	13,718	15,725	13,857	937 EUR	992 EUR
Minimum benefit	None		UA benefit			50% MW of previous year		
<b>Unemployment allowance</b>								
Maximum duration (days)	270	270	270	270	270	270	270	270
Amount daily benefit (EEK)	14.3	14.3	32.9	32.9	32.9	32.9	2.11 EUR	2.11 EUR
Required contribution period (days)	180	180	180	180	180	180	180	180
Eligible period for contribution (months)	12	12	12	12	12	12	12	12

Source: Unemployment Insurance Fund; various legal acts

**Unemployment allowance (töötutoetus)**, until 2005 this was named unemployment assistance benefit (UAB) (*töötutu abiraha*). Eligible for the unemployment allowance are persons, aged 16 to the legal pension age, who do not fulfil the eligibility criteria (e.g. students, persons who terminated their previous employment voluntarily) for UI or who have exhausted their UI benefits. The person must have been employed or engaged in activity equal to work (e.g. studying) for at least 180 days during the 12 months prior to filing an application with an employment office. Benefit is suspended for 10 days if the person refuses an offer of suitable work or does not show up at the PES at a fixed date for the first time. Benefit is stopped if the person refuses an offer of suitable work or does not show up at the PES at a fixed date for the second time.



The level of UA benefit is fixed by the Government and its daily rate was 32.90 EEK per day in 2007-2010 (2.11 EUR in 2011 and 2012). The UA benefits are not subject to income tax. UA benefit is formally income tested: only the unemployed whose income is below the unemployment assistance are entitled to the benefits. It is not known in practice if and how this income test is followed.

Duration is generally 270 days. If the reason for termination of the previous employment was violation of the duties of employment, loss of confidence or indecent act, the UA is paid up to 210 days. If a person has less than 180 days until the retirement age after the receipt of 270 days of UA, the payment of UA will be extended until the person reaches the retirement age. The unemployed people who have received UI benefits for a shorter period than 270 days receive UA benefits until the end of the period of 270 days.

**Severance payments (*koondamishüvitised*):** According to the *Employment Contract Act (Töölepingu seadus)* the employees are entitled to severance payments if the reason for dismissal was liquidation of enterprise, bankruptcy of the employer, lay-off or age. The amount of the severance payments depends on previous work record and ranges from 2-4 months' salary. If the contract was terminated because the employee was not suitable due to professional skills or health, the severance payment is 1 month's salary. In public sector the amounts of the severance payments can be much higher as compared to the private sector. The amount of the severance payment in public sector depends also on the length of previous employment and ranges from 2 month's salary up to 12 month's salary. In 2009 changes took place reducing severance payments.

Table 11. Severance benefits

	Job tenure	Extent of benefit (months of previous average salary)	Financier of the benefit
Before 1 July 2009	Up to 5 years	2 months	Employer
	5-10 years	3 months	Employer
	10 and more years	4 months	Employer
Since 1 July 2009	Up to 5 years	1 month	Employer
	5-10 years	2 months	Employer (1 month) + UIF (1 month)
	10 and more years*	3 months	Employer (1 month) + UIF (2 months)

\* Note: In case of people who have employment tenure more than 20 years, a five-year transition time is implemented, during which they will retain the existing level of redundancy benefits – that is, four months' earnings. After that, their benefit will be lowered to 3 months salary. Before 1<sup>st</sup> July 2009, the redundancy benefits were complemented by additional benefits by the UIF in case of collective redundancies.

Source: Employment Contracts Act, Unemployment Insurance Act

There are also **training allowances (*stipendium*) and transport and accommodation allowances (*sõidu- ja majutustoetus*) for the unemployed** which are meant to cover actual costs of participation in active labour market measures (training, work practice). Until 2006 the maximum amount was 1,200 EEK per month. The duration of the allowances depends on the duration of the respective active labour market measure. The amount of training allowance was 1.5 times the unemployment assistance benefit until 2005. Since 2006 the training allowance



and transport allowance are fixed every year with the state budget. For example, in 2010 the training allowance was 60 EEK per day and the amount of transport allowance is 1.5 EEK per km. The allowances are non-taxable.

**Subsistence benefit (*toimetulekutoetus*)** is a means-tested benefit guaranteeing a minimum income to all residents. Households whose income after payment for housing expenses, calculated according to certain general criteria and specific rules set by municipalities, is below the subsistence level are entitled to these benefits. The details are given in section 2.3.9.

In 2005 and 2006, subsistence level was 750 EEK for the first member and 80% (500 EEK in 2005) for the each subsequent member of the household. The level is changed in an ad hoc manner as cost of living increases. In 2007 the level was increased to 900 EEK for the first member, in 2008 it was increased further to 1,000 EEK and in 2011 to 76.70 EUR (or 1,200 EEK). Duration is unlimited, but granted and renewed on monthly basis. Municipalities have the right to refuse the payment of benefits to people in working age and capable for work, but who do not study or work, and who have repeatedly refused to accept suitable work. Means-test is based on current disposable income (i.e. net of withholding income tax). Certain types of income are not counted as an household income, for example, family allowance for families with three or more children, social benefits for disabled persons, one-off benefits (e.g. birth grant, funeral grant), training stipends. The benefit is non-taxable. Local authorities may pay additional social assistance benefits.

#### 1.3.4 Social benefits for the disabled

**Social benefits for the disabled (*puuetega inimeste sotsiaaltoetus*)** are regulated by the *Social Benefits for Disabled Persons Act (Puuetega inimeste sotsiaaltoetuste seadus)*. Disabled people are paid special benefits to support the independent coping and social integration and equal opportunities of disabled people. Social benefits for disabled persons are granted and paid to permanent residents in Estonia or persons living in Estonia on the basis of a temporary residence permit in case of moderate, severe or profound disabilities for compensating additional expenses arising out of the disability and for activities established in the rehabilitation plan. The types of social benefits to disabled persons are the disabled child allowance, disabled adult allowance (since 2008 it is distinguished between working age adult and pension age adult), care-giver's allowance, disabled parent's allowance, education allowance, rehabilitation allowance and in-service training allowance. The benefits are calculated on the basis of the rate of social benefits for disabled persons, which is established by the Parliament for every year in the state budget.

Disability is determined regardless of a person's age and the main criteria in determining the degree of severity are the extent of outside assistance and the amount of additional expenses arising out of the disability.

The benefits are monthly benefits and the size of the benefit depends on the degree of disability and additional costs caused by the disability.



Table 12. Amounts of social benefits for disabled persons

Type of benefit	Severity of disability	Amount (EEK per month) 2007	Changes in 2008-2012
Disabled child allowance	Moderate	1,080	Since 2011: 69.04 EUR
	Severe and profound	1,260	Since 2011: 80.55 EUR
Disabled working-age adult allowance	Moderate	200	Since 1 <sup>st</sup> October 2008 depends on actual additional costs and is between 260-840 EEK (or 16.62-53.70 EUR in 2011)
	Severe	420	
	Profound	640	
Disabled pension-age adult allowance	Moderate	200	
	Severe	420	
	Profound	640	
	Profound	400	
Disabled parent's allowance (per child)		300	Since 2011: 19.18 EUR

Benefits are non-taxable. Benefit is granted from the age of 16 years for the period of disability (which for persons under 65 years of age could be from six months to five years). The period is renewable. It often accumulates with pension for incapacity to work (*töövõimetuspension*) and old-age pension (*vanaduspension*).

There are also allowances for education, rehabilitation, in-service training. The state also compensates a part of the cost of the device to disabled people, the elderly and children, who need prostheses, orthopaedic and other aids. Local municipalities may pay additional allowances for caregivers.

### 1.3.5 Health insurance benefits

*Health insurance benefits (ravikindlustushüvitis)* are regulated by the *Health Insurance Act (Ravikindlustuse seadus)*.

In Estonia, health care is financed from funds designated for health insurance in the state budget via the Health Insurance Fund (*Eesti Haigekassa*), as well as with direct allocations from the state budget, municipal budgets, by patients and from other sources (e.g. foreign aid, enterprises). The health insurance system is designed for compensating the insured persons for the cost of disease prevention and treatment, the cost of medicines and medical appliances and for paying benefits for temporary incapacity for work and other benefits.

The compulsory health insurance applies in Estonia since 1<sup>st</sup> January 1992. Employers are obligated to pay social tax for employees, which includes 13% of gross wages for health insurance. People in business for themselves (sole proprietors) are obligated to pay the social tax on their business income themselves.

Insured persons are permanent residents of Estonia or persons living in Estonia under a temporary residence permit, the social tax for whom is paid by the employer or the state or by themselves (this is discussed in detail in section 1.4), as well as equivalent persons under the Health Insurance Act for whom social tax is not paid:

- 1) pregnant women starting from the 12th week of pregnancy;
- 2) children up to 19 years of age;
- 3) recipients of state pension in Estonia;





- 4) an insured person's dependent spouse with less than five years until retirement age;
- 5) students of up to 21 years of age acquiring basic education, students of up to 24 years of age acquiring general secondary education or vocational secondary education after basic education, students acquiring vocational secondary education after secondary education and permanent residents of Estonia acquiring university education in Estonian educational institutions established and operating under legal acts or in equivalent educational institutions abroad. (Ministry of Social Affairs "Social sector in figures 2006", pp 67-68).

Health insurance benefit is either in kind (health service, necessary medicinal products or medical device), or in cash (a sum of money which the health insurance fund is required to pay to an insured person under for the health care expenses incurred by the person or upon his or her temporary incapacity for work). The Health Insurance Fund finances outpatient and inpatient services provided to insured persons, and in certain cases also rehabilitation and nursing care and dental care services. Uninsured persons have the right to emergency care.

Health insurance benefits in cash are the following:

- 1) benefit for temporary incapacity for work;
- 2) adult dental care benefit;
- 3) supplementary benefit for pharmaceuticals.

**1. Benefits for temporary incapacity for work (*ajutise töövõimetuse hüvitis*)** provide an earnings-related benefit for periods of absence from work for illness or for caring for another person. The types of benefit for temporary incapacity for work are:

- 1) sickness benefit;
- 2) maternity benefit;
- 3) adoption benefit;
- 4) care benefit.

The benefits for incapacity for work are calculated on the basis of the insured person's income calculated on the basis of the social tax paid during the previous year. There is no upper ceiling. The percentage of the benefit paid of the average income per calendar day is:

- 80% in the event of receiving in-patient health services; (since 1<sup>st</sup> July 2009 it is 70%);
- 80% in the event of nursing a child under 12 years of age in a hospital;
- 80% in the event of caring for a child under 3 years of age or for a disabled child under 16 years of age when the person caring for the child is himself or herself ill or is receiving obstetrical care;
- 80% in the event of receiving out-patient health services, nursing a family member who is ill at home, temporary release from the performance of his or her duties, or quarantine; (since 1<sup>st</sup> July 2009 it is 70%);
- 100% in the event of nursing a child under 12 years of age at home; (since 1<sup>st</sup> July 2009 it is 80%);
- 100 % in the event of pregnancy and maternity leave; or in the event of adoptive parents leave;
- 100 % in the event of an illness or injury caused as a result of an occupational disease or an accident at work;
- 100 % in the event of preventing a criminal offence, protecting national or public interests or saving a human life.



Benefits are paid for various periods – for up to seven successive days in case of caring for a sick family member and quarantine, for up to 14 days in case of caring for a sick child, and generally for up to 182 days in case of illness and occupational accident (in case of tuberculosis 240 days). In case of certificates for sick leave, benefits are paid starting from the second day of the leave and in case of certificates for maternity leave and care leave, starting from the first day. In total the sick may be 250 calendar days per calendar year. Insured persons receiving a pension for incapacity for work or insured persons who are at least 65 years of age have the right to receive sickness benefit up to 60 consecutive calendar days for one illness but not for more than a total of 90 calendar days per calendar year.

Since July 2009 there were changes concerning the employee's and employer's responsibility. In case of sickness benefit, employee's responsibility is first three days, employers have to pay benefits from the fourth until eighth day of the leave, and Estonian Health Insurance Fund starts paying from the ninth day. Also since July 2009 some of the replacement rates were reduced.

## **2. Adult dental care benefit (*täiskasvanute hambaraviteenuse hüvitis*)**

The adults pay for their dental treatment and dentures themselves and the Health Insurance Fund compensates for these payments up to the rate fixed by the Minister of Social Affairs. In 2007-2010 it was 300 EEK per year, in 2011 19.18 EUR per year. Since 1<sup>st</sup> January 2009 it was abolished for those aged 19-62 (except when the person receives work incapacity pension or old-age pension).

Higher compensation rates are established for pregnant women and mothers of children up to 1 year of age and those having greater need for dental treatment because of sickness (in 2007-2010 450 EEK per year, in 2011 28.77 EUR). In case of dentures the Fund compensates once every three years for the amount paid for dentures by insured persons, who are at least 63 years old. In 2007-2010 the amount was 4,000 EEK per three years, in 2011 255.65 EUR.

## **3. Supplementary benefit for pharmaceuticals (*täiendav ravimihüvitis*)**

The Health Insurance Fund additionally compensates for amounts paid by the insured for medicinal products during the calendar year, where such amounts fall between 6,000 and 20,000 EEK (between 384 and 1300 EUR since 2011). If the insured person has made an own contribution between 6,000 and 10,000 EEK during a calendar year (between 384 and 640 EUR since 2011), the Health Insurance Fund compensates 50% of the amount exceeding 6,000 EEK. If this own contribution is between 10,000 and 20,000 EEK, the Health Insurance Fund additionally compensates 75% of the amount exceeding 10,000 EEK. The fund does not compensate amounts beyond 20,000 EEK.

### **1.3.6 Local benefits**

According to the *Local Government Organisation Act (Kohaliku omavalitsuse korralduse seadus)* the Council of any city or rural municipality is empowered to provide local benefits to people who are living and are registered in the Population Registry for the respective region. The variation of local benefits given in municipalities is large. Benefits differ on type, amounts, application conditions etc.

A study conducted by Ainsaar *et al* (2004) showed that the majority of the municipalities give family and child support related local benefits. The most common is benefit for birth support, however also such benefits as benefit for crisis, large family benefits etc are present in many regions. As to the importance of such benefits, from the table it can be also seen that the family





and child related local benefits in 2003 accounted approximately 77 million EEK in 2003, which was approximately 0.5% of the total social expenditures according to ESSPROS statistics in 2003 (Table 13). During the economic boom years 2006-2008 municipalities increased the benefits (see Ainsaar, Soo 2009).

Table 13. Local benefits for families in 2003

Benefit	Share of municipalities giving the benefit, %	Average amount of benefit per recipient per year, EEK	Total expenditures in all municipalities, EEK	Number of recipients
Birth benefit	94	1,710	33,201,279	13,350
School food	84	181	7,693,081	36,347
Support for buying spectacles	78	517	883,526	1,813
Crisis support	72	685	6,642,147	11,957
Christmas support	60	172	3,249,816	42,406
Medicine support	59	491	655,877	1,975
Schooling equipment benefit	56	378	2,707,234	8,727
Primary school graduate benefit	51	412	1,085,199	2,562
Disabled child benefit	49	3,790	1,679,651	799
Transport cost reimbursement	47	1,169	1,453,238	3,807
Secondary school graduate benefit	46	543	951,751	1,782
Large family support	42	936	3,228,356	4,869
Start school support	42	456	1,985,022	3,783
Reimbursement of social service	37	947	1,183,619	1,985
Reimbursement of clothing/ footwear	37	518	273,436	2,654
Support for excellent pupils	32	677	808,998	1,980
Beginning of school benefit	23	482	1,458,378	3,568
Baby-package	21	429	2,900,968	4,404
Student housing benefit	18	4,155	1,971,204	1,278
Additional school food support	7	1,049	1,789,423	2,427
Baby support	4	962	1,104,601	1,038

Source: Aidarov, A. Kohalikud laste- ja peretoetused Eestis 2003. aastal. Sotsiaaltöö nr 5/2005, pp 39-44, quoted from Ainsaar, M. Soo, K. Aidarov, A. Omavalitsuste toetus lastega peredele 2003-2004, TÜ sotsioloogia ja sotsiaalpoliitika osakond

### 1.3.7 Scope and scale of social benefits

The following tables provide an indication of the relative scale and coverage of each benefit by showing the number of recipients and the expenditure on each benefit. Table 14 presents the share of recipients as percentage of population. Note that for some benefits only total annual number of new cases is available and not the number of different recipients (see notes below the table). This means we may overestimate the actual share of recipients as some people may receive benefits several times a year. Still it gives an overview which benefits are most frequent.

The largest share of people receive health insurance benefits (about 1/3) and pensions (about 20%). About one fifth of the population receives universal child allowances. About 8-9% of the population receives allowances for disabled persons. The share of people receiving unemployment benefits is relatively low due to low unemployment benefits and relatively strict eligibility criteria. Subsistence benefits are received by 4% of the households.



Table 14. Social benefits: recipients (as % of population)

	2006	2007	2008	2009	2010	2011
<b>Health insurance benefits</b> (paid sick leave, except maternity benefit)	42.5%	46.2%	43.9%	30.9%	24.4%	27.7%
<b>Pensioners</b>						
Old age pension (vanaduspension)	22.0%	21.9%	21.9%	21.9%	22.0%	22.3%
Survivor's pension (toitjakaotuspension)	1.0%	1.0%	0.9%	0.9%	0.8%	0.8%
National pension (rahvapension)	0.7%	0.6%	0.6%	0.5%	0.5%	0.5%
Disability pension (töövõimetuspension)	4.6%	4.9%	5.0%	5.2%	5.7%	6.2%
<b>Allowance for disabled people</b> (disabled child allowance, disabled adult allowance, caregiver's allowance, disabled parent's allowance)	8.6%	8.8%	8.9%	9.3%	9.6%	10.0%
<b>Family and children</b>						
Maternity benefit (sünnitushüvitis)	0.9%	1.0%	1.0%	0.9%	0.8%	0.7%
Parental benefit (vanemahüvitis)	1.0%	1.0%	1.4%	1.5%	1.5%	1.4%
Childcare allowance (lapsehooldustasu)	3.6%	3.7%	3.5%	3.1%	3.0%	3.1%
Child allowance (lapsetoetus)	20.4%	20.1%	19.8%	19.5%	19.3%	19.1%
Single parent child allowance (üksikvanema lapsetoetus)	2.0%	2.0%	1.9%	1.8%	1.7%	1.7%
Large family allowance (3+/triplets) (3 ja enamalapselise pere toetus)	5.2%	4.6%				
Childbirth allowance (sünnitoetus)	1.1%	1.2%	1.2%	1.2%	1.2%	1.1%
School allowance (lapse koolitoetus)	13.4%	12.9%	12.3%			
Conscript's child benefit (ajateenija lapse toetus)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Foster care allowance (ajateenija lapse toetus)	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%
Adoption allowance (lapsendamistoetus)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Unemployment</b>						
Unemployment insurance benefit	0.7%	0.6%	1.1%	4.3%	4.6%	2.4%
Unemployment allowance	1.5%	1.3%	1.8%	3.5%	3.5%	2.3%
<b>Housing</b>						
Subsistence benefit (toimetulekutoetus), households	3.5%	2.4%	2.1%	3.6%	na	na

Notes: Population figures – beginning of the year; pensioners – beginning of the year; family benefit recipients – end of the year; health care benefits – total number of cases within the year; subsistence benefits – total number of households receiving the benefit within the year; unemployment insurance benefits - total persons receiving the benefit within the year; old-age pensions include anticipated old age pensions.

Source: Statistics Estonia, on-line database, last accessed 3 December 2012; own calculations

According to ESSPROS statistics, which includes both in kind and cash social expenditures, majority of expenditures goes to categories of health care (about 32%) and old-age (43%). Expenditures on families and children 12%, disability takes 9.4%. The share of unemployment, housing and social exclusion is 2.5% in total. Benefits in kind are relatively important in health care (health services) and unemployment (active labour market policy measures). In all other categories their share within the category is small.



Table 15. Social benefits in 2007: annual expenditures according to ESSPROS

	Expenditures (mln EEK)	Structure (%)
<b>Health/sickness</b>	<b>10 045.7</b>	<b>33.4%</b>
Cash benefits	1 694.2	5.6%
Paid sick leave	1 297.1	4.3%
Benefits in kind	8 351.5	27.8%
<b>Disability</b>	<b>2 805.9</b>	<b>9.3%</b>
Cash benefits	2 412.0	8.0%
Disability pension	1 720.5	5.7%
Care allowance	585.5	1.9%
Other cash benefits	106.0	0.4%
Benefits in kind	394.0	1.3%
<b>Old age</b>	<b>12 925.0</b>	<b>43.0%</b>
Cash benefits	12 704.6	42.2%
Old age pension	9 960.9	33.1%
Anticipated old age pension ( <i>ennetähtaegne vanaduspension, väljateenitud aastate pension, soodustingimustel vanaduspension</i> )	2 633.9	8.8%
National pension	109.8	0.4%
Benefits in kind	220.4	0.7%
<b>Survivors</b>	<b>240.1</b>	<b>0.8%</b>
Survivors' pension	195.7	0.7%
Death grant	44.5	0.1%
<b>Family and children</b>	<b>3 479.3</b>	<b>11.6%</b>
Cash benefits	3 318.7	11.0%
Maternity benefit ( <i>sünnitushüvitis</i> )	459.5	1.5%
Parental benefit ( <i>vanemahüvitis</i> )	1 113.1	3.7%
Childcare allowance ( <i>lapsehooldustasu</i> )	278.4	0.9%
Child allowance ( <i>lapsetoetus</i> )	1 059.8	3.5%
Single parent child allowance ( <i>üksikvanema lapsetoetus</i> )	96.6	0.3%
Large family allowance (3+/triplets)	46.5	0.2%
Childbirth allowance	78.1	0.3%
School allowance ( <i>lapse koolitoetus</i> )	77.7	0.3%
Other cash lump sum benefits	18.5	0.1%
Other cash periodic benefits	39.9	0.1%
Benefits in kind	160.6	0.5%
<b>Unemployment</b>	<b>347.6</b>	<b>1.2%</b>
Cash benefits	237.6	0.8%
Unemployment insurance benefit	122.9	0.4%
Unemployment allowance	52.3	0.2%
Vocational training allowance	7.4	0.0%
Redundancy compensation ( <i>koondamishüvitis</i> )	31.0	0.1%
Other	24.0	0.1%
Benefits in kind	110.0	0.4%
<b>Housing</b>	<b>53.3</b>	<b>0.2%</b>
Social housing	35.9	0.1%
Part of subsistence benefit, to cover housing costs (imputed)	17.4	0.1%
<b>Social exclusion</b>	<b>183.2</b>	<b>0.6%</b>
Subsistence benefit ( <i>toimetulekutoetus</i> )	119.6	0.4%
Accommodation (in kind)	43.1	0.1%
Other	20.5	0.1%
<b>Total</b>	<b>30,080.1</b>	<b>100%</b>

Notes: Annual expenditures exclude administration costs.

Source: Statistics Estonia, Social protection expenditure and receipts, for ESSPROS.

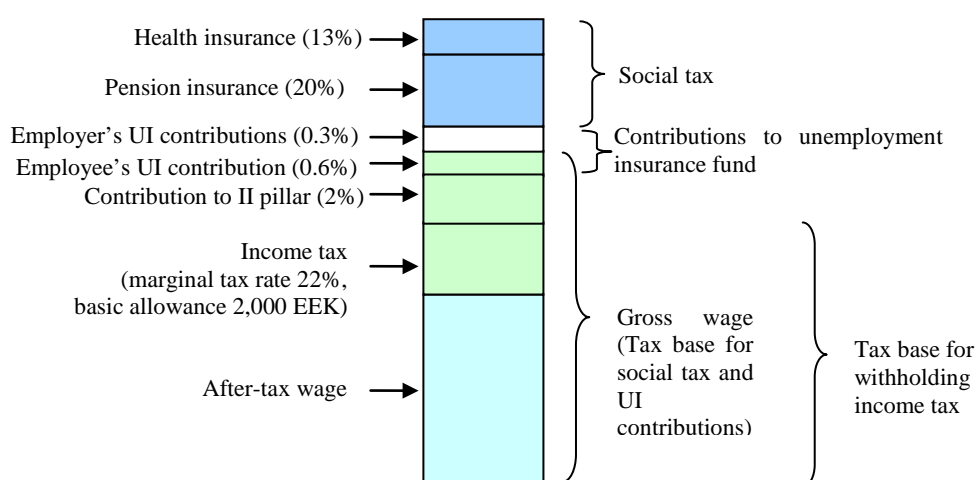


## 1.4 Social contributions

Social insurance contributions finance pensions, health care, and unemployment insurance benefits. Conditions regarding contributions made in the past determine eligibility and amount of contributory benefits (unemployment insurance benefits, maternity benefits, incapacity to work benefits, pensions).

Contributions are either in the form of social tax or unemployment insurance (UI) contributions, all specified as percentage of the gross wage (see Figure 1 below for a schematic definition of the gross wage and other direct taxes on wages). The calculation of social contributions for self-employed are discussed in detail in the Section 2.4.3.

Figure 1. Schematic composition of labour cost, in 2007

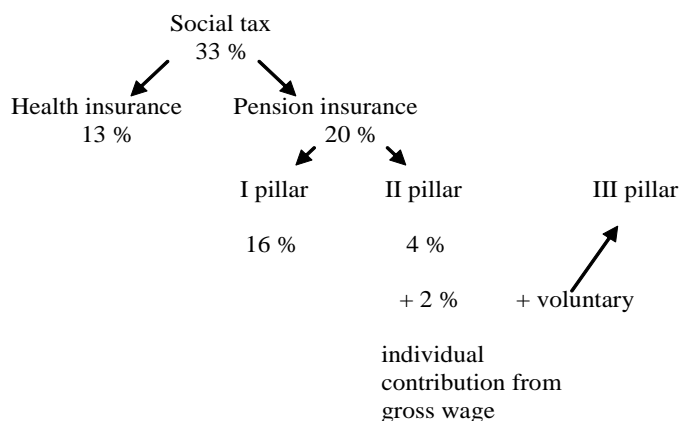


**Social tax** (*sotsiaalmaks*) is a financial obligation imposed on employers and self-employed to obtain revenue required for supplying state pension insurance and health insurance in the country. Tax rate is 33% and the tax base is “gross wage”. The 13% of social tax base is transferred into the Estonian Health Insurance Fund and 20% is transferred into pension insurance schemes. In case the person participates in the funded pension insurance scheme (the so-called 2<sup>nd</sup> pillar of the pension scheme), 4% of the social tax is shifted from the state pension insurance scheme to the private pension scheme and additional 2% contribution of gross wage will be paid by the employee into the pension scheme 2<sup>nd</sup> pillar (see Figure 2 below). Additionally employee may always contribute to the voluntary pension schemes (3<sup>rd</sup> pillar) which are up to certain limit deducted from the income tax base.

Both the individual contribution of 2% and the 4% share transferred from social tax were temporarily suspended from 1<sup>st</sup> June 2009 until 31<sup>st</sup> December 2010 due to the economic crisis. Persons with ten years from retirement (born 1954 or later) could, upon submitting a relevant application, resume individual contributions (2%) from 1<sup>st</sup> January 2010, in which case also state contributions on account of social tax (4%) are transferred. Other age groups may also continue to pay individual contributions (2%) from 1<sup>st</sup> January 2010, but no contributions from social tax are transferred (i.e. the scheme applied is 2+0%). For any other participant of the funded scheme (i.e. persons not opting for voluntary continuation of individual contributions), contributions to the funded scheme are gradually resumed from 2011, when a 1+2% scheme is applied, and from 2012 in full amount of 2+4%.



Figure 2. Social tax and contributions to pension schemes



The minimum monthly base for social tax calculation set by the *State Budget Act (Riigieelarve seadus)* was 700 EEK in 2005, which made the minimum social tax obligation 231 EEK (= 700 x 33%) per month. The minimum base was increased gradually, it was 1,400 EEK in 2006, 2,000 EEK in 2007 and 2,700 EEK in 2008. Since 2009 the minimum base cannot be smaller than the minimum wage (in the previous year) and was 4,350 EEK in 2009-10 and 278.02 EUR in 2011-12.

There is no upper ceiling of social contributions, except for self-employed. After certain deductions relating to enterprise, self-employed are not obliged to pay social tax annually on an amount not more than fifteen times the sum of the legal minimum monthly wages for the taxable period, i.e. 648,000 EEK in 2007 (= 15 x 12 x 3,600), therefore limiting their maximum contributions to 213,840 EEK (= 648,000 x 33%) per year in 2007. In the following years the ceiling increased accordingly.

For certain inactive groups of people (e.g. parents on maternity leave, unemployed, military service, etc.) the state pays the social tax, based on the minimum social tax base in most cases (see Table 16), i.e. credited contributions. In addition, the state pays additional contributions to the funded pension scheme (second pillar) on parental benefits. Some of the categories (recipients of unemployment benefits and family benefits) are also included in EUROMOD.

**Voluntary private pension contributions** (3<sup>rd</sup> pillar) may be in two different forms: a) pension insurance policies offered by licensed private insurance companies; b) units of voluntary pension funds, which are managed by private fund managers. The third pillar pension market is dominated by insurance companies, partly due to more preferential tax treatment compared to voluntary pension funds.



Table 16. Social tax paid by the state (credited contributions)

Group	Basis	Rate	Who pays
Recipients of unemployment insurance benefit	Gross UI benefit	13% (health)	Unemployment Insurance Fund
Recipients of unemployment allowance	Monthly minimum	13% (health)	State budget
Recipient of parental benefit ( <i>vanemahüvitis</i> )	Monthly minimum	33%	State budget
Recipients of childcare allowance ( <i>lapsehooldustasu</i> )	Monthly minimum	33%	State budget
Recipients of benefit for parents of families with seven and more children ( <i>seitsme- ja enamalapselise pere vanema toetus</i> )	Monthly minimum	33%	State budget
Dependent spouses of persons in certain public occupations	Monthly minimum	13% (health)	State budget
Persons who are paid caregiver's allowance pursuant to the <i>Social Benefits for Disabled Persons Act</i> until the persons attain pensionable age	Monthly minimum	33%	State budget
Conscripts in compulsory military service in the Defence Forces	Monthly minimum	33%	State budget
Estonian citizens or persons of Estonian nationality who have settled in Estonia from a foreign country and receive social benefits under the <i>Social Welfare Act (Sotsiaalhoolekande seadus)</i> , and their spouses, children and parents	Monthly minimum	13% (health)	State budget
Employees with loss of capacity for work of 40% or more in certain cases	Monthly minimum	33%	State budget
Non-working accompanying spouses of diplomats and public servants serving in foreign missions of Estonia, until attaining pensionable age	Monthly minimum	33%	State budget
Non-working persons who have participated in the elimination of the effects of a nuclear disaster, nuclear test, or an accident at a nuclear power station, until attaining pensionable age;	Monthly minimum	33%	State budget
<i>To funded pension scheme (II pillar):</i> Parental Benefit ( <i>vanemahüvitis</i> )*	Gross benefit	1% for each related child	State budget

Notes: \* contributions to the funded pension scheme were suspended from 1<sup>st</sup> June 2009 until 31<sup>st</sup> December 2010.

**Unemployment insurance contributions** (*töötuskindlustusmakse*) is a compulsory insurance that covers an employee in case of becoming unemployed, collective closing or insolvency of the employer, and an employer in case of collective redundancies. An unemployment insurance contribution is paid by employees and employers. The unemployment contribution payment base matches the social tax base. Generally the employee's share is withheld from the gross wage and the employer pays the contribution in addition to social tax. Self-employed and the members of the management or controlling bodies of legal persons are not applicable for insurance. Also persons who receive compensation when leaving their position (ministers, parliament members etc) do not hold the unemployment insurance contribution payment obligation. The rate of the unemployment insurance contribution for employees is set annually between 0.5 and 2 per cent, and for employers between 0.25 and 1 per cent. The rates in 2005 were 1% for employees and 0.5% for employers as they have been since the introduction in 2002. In 2006 they were lowered to 0.6% and 0.3%, respectively. On 1<sup>st</sup> June 2009 they increased to 2% and 1% and on 1<sup>st</sup> August 2009 to 2.8% and 1.4%.



As persons receiving old-age pension or older than legal pension age are not allowed to be registered as unemployed in Public Employment Service, they are also not eligible for unemployment insurance benefits or unemployment allowances. Therefore they do not have to pay employee's part of the unemployment insurance contribution.

- *Scope and scale*

The following tables show the number of contributors and the composition of social contributions, as a percentage of overall revenue.

Table 17. Social contributions: contributors (as % of population)

	2006	2007	2008	2009	2010	2011
Unemployment Insurance (employees*)	47.8%	49.4%	48.7%	44.1%	42.3%	43.4%
Social tax (employees*, self-employed, or covered by state)	57.9%	59.4%	58.9%	56.9%	55.7%	55.2%
Participants in the funded pension scheme (II pillar), end of the year	38.7%	41.3%	43.3%	44.3%	45.4%	46.5%
Active contributors to the funded pension scheme (II pillar), end of year	n/a	n/a	27.3%	26.1%	11.3%	28.3%
Contributors to the voluntary pension scheme (III pillar)**	7.4%	10.4%	n/a	10.1%	9.7%*	9.3%

*Notes:* Unemployment Insurance contributors, voluntary pension scheme contributors – whole cumulative; Social tax and contributors to the funded system –whole year cumulative; population – beginning of the year; Social tax figures include only those contributing pension part of the social tax, i.e. excluding the social tax paid on unemployment benefits for health insurance.

\* - paid by them or for them (e.g. employers)

\*\* - as people may have joined several voluntary pension funds and life insurance plans, double counting is possible.

*Sources:* Unemployment insurance contributors – Unemployment Insurance Fund, annual report 2009 and 2010; Social tax – Estonian National Social Insurance Board, data on pension insurance, various press releases;

Voluntary pension scheme – [www.pensionikeskus.ee](http://www.pensionikeskus.ee), various press releases; own imputations

The share of contributors to unemployment insurance funds as a percentage of population reflects the overall share of workers in the population, which was about 46% in 2005 and 48% in 2006. The share of contributors of social tax is larger, because social tax is also paid for some inactive persons by the state. The share of participants to the compulsory funded scheme (II pillar) was about 39% of the population, but almost 80% of the employment in 2006. The share of active contributors is smaller, because of temporary inactivity or unemployment of participants. The share of participants continues to increase as the participation becomes compulsory for a larger share of the population. The share of contributors to the voluntary funded scheme (3<sup>rd</sup> pillar) was about 5.6% of the population in 2005, but almost 12.3% of the employment. It has increased steadily to 10% by 2009. About two thirds of the contributors participate via life insurance funds and the rest invest directly into voluntary pension funds.

The largest contributions come from social tax (94% in 2006), of which most goes to pension (56% of total social contributions). The share of unemployment insurance contributions is 2.3% of total social contributions in 2006. Additional contributions to the compulsory funded pension scheme were 3.3% of total contributions.





Table 18. Social contributions: revenue

	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
<b>Social contributions (mln EEK)</b>	29,184	33,416	30,480	29,820	31,217	100%	100%	100%	100%	100%
Social Tax (employers + state; includes state contributions to the funded pension scheme)	27,500	31,425	28,084	26,562	28,186	94.2%	94.0%	92.1%	89.1%	90.3%
Of which health care	11,000	12,502	11,296	10,795	11,350	37.7%	37.4%	37.1%	36.2%	36.4%
Of which pension	16,500	18,923	16,788	15,767	16,837	56.5%	56.6%	55.1%	52.9%	53.9%
Of which part transferred to the funded pension scheme	2,036	2,481	1,197	123	1,086	7.0%	7.4%	3.9%	0.4%	3.5%
Of which self-employed	321	330	386	334	296	1.1%	1.0%	1.3%	1.1%	0.9%
Of which state contributions	433	670	1,445	1,653	1,458	1.5%	2.0%	4.7%	5.5%	4.7%
Employees additional contribution to the funded scheme	1,018	1,241	589	452	0	3.5%	3.7%	1.9%	1.5%	0.0%
Funded pillar pension contributions total (state transfers+employees' contributions)	3,054	3,722	1,786	575	1,086	10.5%	11.1%	5.9%	1.9%	3.5%
Unemployment insurance contributions (employees and employers part)	666	750	1,807	2,806	3,031	2.3%	2.2%	5.9%	9.4%	9.7%

Source: Social Tax – Statistics Estonia, online-database; Contributions to the pension scheme – Estonian National Social Insurance Board, annual revenue data, and Estonian Tax and Customs Board, annual tax revenue data; Unemployment Insurance Contributions - Unemployment Insurance Fund;

\* - own calculations

## 1.5 Taxes

### 1.5.1 Personal Income Tax (tulumaks)

Estonia applies a flat rate system to the personal income tax. Different income sources are taxed uniformly. The single tax rate is applied on all labour and personal capital income (capital gains, royalties etc).

The personal income tax (PIT) system is an individual system, but a married couple may also file a joint tax report if they wish (beneficial if one has unused tax allowances which the other one could claim for).

In 2006, the tax rate was 23% and the annual basic allowance 24,000 EEK or 2,000 EEK per month. See Table 19 for rates and amounts in later years.

In addition to basic allowance, there are additional allowances:

- 1) **Increased basic allowance in case of children** is applicable in case of two or more children in family in 2007. One resident parent (or guardian of a child or other person) who





maintains two or more underage children may deduct additional basic allowance from his or her income in the period of taxation for each child of up to 17 years of age. The allowance is applicable for the second and each subsequent child in the amount exceeding the taxable income of the child. The allowance can be used from the year in which the child is born, a guardian is appointed for him/her or the maintenance obligation arises until the year in which the child attains 17 years of age (inclusive). This means that in the tax period, where the child gets 18, the additional allowance is not applicable. The eligibility condition does not set that the parent has to be married, however only one parent can make use of such allowance. Note that in 2005 it was only applicable to the third and the following child, but it was extended to the second child in 2006, to the first child in 2008 and back to the second child in 2009.

- 2) **Pension allowance.** If a resident person receives a pension paid by the Estonian state or a mandatory funded pension, an additional allowance can be deducted from the income of the person in the amount of those pensions but not more than 36,000 EEK (2,304 EUR since 2011) during a year or 3,000 EEK per month. This is usually applied monthly.
- 3) **Sickness allowance.** In cases where a resident person receives a compensation for an accident at work or an occupational disease, an additional allowance can be deducted from the income of the person in the amount of that compensation but not more than 12,000 EEK (768 EUR since 2011) during a period of taxation. However, if compensation for an accident at work or an occupational disease is paid as insurance indemnity, increased basic allowance does not apply.

In order to make use of the additional child allowances and deductions these have to be declared in the following year when filing the tax report. Therefore, there is difference between taxes withheld and taxes paid after filing tax report. There are some income sources on which income tax is immediately withheld when they are paid out (wages and salaries, unemployment insurance benefits, parental benefits, etc). Final tax liability is based on the tax report after the tax year has ended (taking into account tax already withheld). Usually, most people get refund due to additional tax deductions and allowances.

Liability of income tax is based on annual income and allowances are referred to in annual terms, although 1/12 of the annual basic allowance is usually applied monthly to calculate withholding income tax. Also usually additional allowance for pensions is applied monthly.

The tax rate and the amount of basic allowance have changed during recent years (see the table below).

Table 19. Income tax parameters 2007-12

	2007	2008	2009	2010	2011	2012
Income tax rate	22%	21%	21%	21%	21%	21%
Basic allowance per month (EEK)	2,000	2,250	2,250	2,250	144 EUR	144 EUR
Additional allowances per month per child starting from ... child	2nd	1st	2nd	2nd	2 <sup>nd</sup>	2 <sup>nd</sup>
Pension allowance per month (EEK)	3,000	3,000	3,000	3,000	192 EUR	192 EUR

In addition to allowances, a person's taxable income can be reduced with several tax deductions:

- Compulsory unemployment insurance contribution payments



- Contributions to compulsory funded pension scheme
- Contributions to voluntary pension system to certain extent
- Housing loan interest payments
- Training expenses (from 1<sup>st</sup> January 2010 interest payments of study loans are excluded)
- Alimony or maintenance support
- Certain donations and trade union entrance and membership fees (abolished since 1<sup>st</sup> January 2010)

The concise overview of exemptions for the personal income tax is presented in Table 20.

Table 20. Allowances and deductions from personal income tax, 2007

Allowance/deduction	%, sum or limit in a year	Description
Basic allowance	24,000 EEK in 2007 (see Table above for changes)	
Allowance in case of children	In amount by which taxable income of the child is lower than the basic allowance	If 2 or more children, for 2 <sup>nd</sup> and each subsequent child under the age of 17. Applicable for one parent (see Table above for changes)
Pension allowance	Pension amount, but max 36,000 EEK	Pensions (state or mandatory funded) not taxable up to this level.
Sickness allowance	Compensation amount, but max 12,000 EEK	Compensation for an accident at work or an occupational disease (not insurance) deducted from the taxable income
Alimony or maintenance support paid	100%	Only if income tax paid by the recipient.
Housing loan or lease interest payments*	100%	Only interest payments for the main house or apartment
Training expenses *	100%	One under 26 years old person's schooling/training expenses in registered educational establishment
Gifts, donations and trade union entrance and membership fees*	100%; entrance & membership fees max 2% of taxable income less economic activity related costs in case of self-employed, maintenance, housing loan interest and training expenditure deductions and basic allowances; general limit for gifts, donations and fees is 5% of the aforementioned sum	Payments etc to certain private and all public institutions. Entrance and membership fees.
Insurance premiums and acquisition of pension fund units	100%, max 15% of taxable sum (and, since 2012, no more than 6,000 EUR annually), less economic activity related costs in case of self-employed	Payments to voluntary pension scheme
Unemployment insurance contribution	100%	All payments to unemployment insurance fund
Contributions to mandatory funded pension	100%	The compulsory payments to pension fund
Additional child birth allowance by employer	Max 5/12 of the basic allowance rate	Birth allowance is paid voluntarily by employer



\*Note: from 2005 the maximum annual limit for these deductions summed up is 50,000 EEK (3,196 EUR in 2011 and 1,920 EUR in 2012) per taxpayer and not more than 50% of taxable income (less economic activity related costs in case of self-employed).

Other deductions:

- 1) **Compulsory unemployment insurance contribution payments** (1% of the gross wage in 2005, 0.6% in 2006-2008 etc) and **contributions to compulsory funded pension scheme** (2% of the gross wage) are fully deductible (see also Figure 1 in section 1.4).
- 2) **Insurance contributions and acquisition of pension fund units.** The part of the insurance contributions paid during the period of taxation under an insurance contract for a supplementary funded pension (*täiendav kogumispension*), the purpose of which is to ensure the payment of the insured sum as a pension, can be deducted from taxable income to a certain extent. This also applies to amounts paid to acquire units of a voluntary pension fund except when fund units are changed or recalled and for the acquiring costs of these units. A negative change which occurs in a technical provision established on the basis of an insurance contract with a view to securing a supplementary funded pension and which is due to deduction of the amounts charged for a certain insurance cover are added to the taxable income of a private person.

The deductions related to insurance contributions and supplementary pension fund unit payments during one period of taxation are limited to 15% of the taxpayer's income of the same period of taxation (and, since 2012, no more than 6,000 EUR annually), after all certified expenses incurred by a taxpayer in relation to business are deducted. If spouses present one declaration, the allowance cannot exceed 15% of the sum of spouse's income.

- 3) **Housing loan (or lease) interest payments** for the period of taxation if they are paid to the financial institution in order to acquire a house or apartment or a plot of land for building a house for personal use or for his/her spouse, parents or children. The same conditions apply in case of reconstruction, expansion and building works. The deduction is available for only one loan object per person. A parent who is raising a child alone and who has taken parental leave during a period of taxation can deduct the exemption during more than one taxation period.
- 4) **Training expenses** are deductible for the person him/herself or a person of less than 26 years of age or if no such training expenses are incurred, the training expenses of one permanent resident of Estonia of less than 26 years of age. Parents can also deduct the interest expenses of the student loan (abolished in 2010). In case the educational expenditures are made using scholarship that is exempt from income tax, the deduction could not be used. The legal condition for applying the deduction requires that the training expense have to be certified expenses incurred for studying at a state or local government educational establishment, a university in public law, a private school which holds a training licence or has been positively accredited with regard to the given study programme, or a foreign educational establishment of equal status with the aforementioned, or for studying on fee-charging courses organised by such educational establishments.
- 5) **Alimony or maintenance support** a person has paid from his/her income to another person. This kind of payment is set by the court order or agreement with respect to the *Family Act (Perekonnaseadus)*.
- 6) **Gifts, donations and trade union entrance and membership fees** which have been given or paid to persons included in the special list specified in the *Income Tax Act (Tulumaksuseadus)* – non-governmental organisations (NGOs) and foundations, church institutions or to a state or local government scientific, cultural, sports, educational or social welfare institution, a manager of a protected area, a university in public law or a political party. Gifts and donations may be given in monetary or non-monetary form, however, the



cost of a non-monetary gift or donation is the market price of the property, and in the case of sale of the property at a preferential price, the cost of the gift or donation is the difference between the market price and selling price of the property.

The amount of the trade union entrance and membership fees deductions cannot exceed 2% of the taxpayer's income after deductions of all aforementioned exemptions. The maximum deduction of gifts and donations and the trade union entrance and membership fees can be 5% of the taxpayer's income after deductions of all in previous points mentioned exemptions.

- 7) Income tax is not charged on **childbirth benefit** (*sünnitustoetus*) paid voluntarily by the employer to the employee or public servant, in an amount not exceeding 5/12 of the basic exemption.

The income tax deductions provided for housing loan interests, gifts-donations and training costs are altogether limited to 50,000 EEK (3,196 EUR in 2011, and 1,920 EUR in 2012) per taxpayer during a period of taxation, and not more than 50% of the taxpayer's income of the same period of taxation, less economic activity related costs in case of self-employed.

If a resident taxpayer has received income from abroad during a period of taxation, all income derived from abroad is included in the taxable income of the person and income tax paid or withheld on such income abroad is deducted from the income tax to be paid. Income tax is calculated separately for income derived in Estonia and for income derived in each foreign country. Income tax paid in a foreign country on income which is not subject to tax in Estonia is not taken into account.

### **Taxation of self-employed**

Taxable income from self-employment is equal to income from self-employment less related costs minus special allowances for the agricultural income, and minus social insurance contributions, except contributions to the funded pension scheme. The latter can be deducted from other source of incomes.

Taxable business income is derived on individual basis.

### **1.5.2 Land tax (maamaks)**

**Land taxes** (*maamaks*): there is a number of personal property taxes applied, however, these are in most cases local taxes, providing relatively small revenue and not affecting private budgets considerably. The highest share of total property tax revenue is collected by land tax, which is essentially a state tax based on the assessed value of land and paid by the land owner. The rate of land tax is established by the local government council annually in the range of 0.1-2.5% of the assessed value of land. The collected tax revenue is directed into the respective local government budget.

### **1.5.3 Value Added Tax (käibemaks) and excise taxes (aktsiisimaksud)**

**Value Added Tax** (*käibemaks*): The standard rate of VAT was stable between 1992-2007 at 18%. There are a few goods and services that have a reduced rate 0% (for exports mainly) or 5% or are exempt from VAT.

In 2005 and 2006 a 5% reduced rate applies, for example, to books (excluding books for education); medicines and medical equipment; funeral requisites and services; organisation of performances and concerts by a state, municipal or private performing arts; heat, peat, fuel briquettes, coal or firewood sold to private persons for personal use.



From the 1<sup>st</sup> of July 2007 the reduced VAT rate for the following items was abolished and replaced with the basic rate of 18%: heat, peat, fuel briquettes, coal or firewood sold to private persons for personal use.

Since 1<sup>st</sup> January 2009 reduced rate was increased to 9% and reduced rate for organisation of performances and concerts by a state, municipal or private performing arts was abolished. Since 1<sup>st</sup> June 2010 the normal VAT rate was increased to 20%.

The VAT is not imposed on, for example: postal services; health services; pre-school, basic, secondary and higher education; certain financial and insurance services

**Excise taxes** (*aktsiisimaksud*): excise duties are set for alcohol, tobacco, fuel and packages. In recent years several excise tax rates have been raised, both to raise tax revenues and to meet the EU requirements. For more information on indirect taxes and excise taxes see Lüpsik, Paulus, and Võrk (2006).

#### 1.5.4 Scope and scale of taxes

Table 21 shows the share of tax-payers in the population. Table 22 shows the structure of the tax revenues. We have included also social tax in the tables as it is usually considered together with other direct taxes in government statistics.

In 2006 about 52.1% of the population earned wages on which income tax was withheld. About 45.4% of the population submitted income declaration in 2006. And about 57.9% of the population paid social tax (or employers or state paid by them).

The revenue from social tax is the largest, about one third. This is followed by VAT, about 29% of the revenue. Personal income tax was 18.8% in 2006 and corporate income tax was 4.9% of the tax revenues. The share of other taxes is negligible. The share of income taxes has declined, compared to 2003, because marginal tax rate has declined.

Table 21. Taxes: taxpayers (as % of population)

	2007	2008	2009	2010	2011
Social tax (employees, self-employed, or covered by state)	59.4%	58.9%	56.9%	55.7%	55.2%
Income tax total	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Income tax on wages	53.4%	52.4%	47.4%	45.2%	46.1%
Income tax (people who submitted declarations)	47.6%	50.0%	48.4%	45.9%	48.0%
Land Tax	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>

Notes: Submitting tax declarations is not always obligatory.

*n/a* – not available

Source: Estonian Tax and Customs Board, various press releases; Estonian National Social Insurance Board, various press releases.



Table 22. Taxes: revenue

	2007	2008	2009	2010	2011
<b>Annual revenue (mln EEK)</b>	<b>78,295</b>	<b>82,796</b>	<b>74,602</b>	<b>73,473</b>	<b>78,645</b>
<b>Direct taxes</b>					
Personal Income tax (budget revenue)	14,640	15,816	12,336	12,149	13,058
PIT (withheld)	15,457	16,834	14,400	13,649	14,289
PIT (final for this year)	14,439	14,771	12,899	12,418	13,129
Corporate Income tax	4,084	4,166	4,010	3,032	3,146
Land tax	552	755	755	803	805
Social tax	27,268	31,299	28,084	26,562	28,186
<b>Indirect taxes</b>					
Value added tax	22,304	20,548	18,809	19,531	21,018
Excises	8,195	8,971	9,818	10,425	11,218
Other central government taxes (gambling tax, heavy vehicle tax, customs duty,	<b>1,082</b>	<b>1,056</b>	<b>641</b>	<b>750</b>	<b>815</b>
Other local taxes (sales tax, advertising tax, etc)	<b>170</b>	<b>185</b>	<b>148</b>	<b>223</b>	<b>399</b>
<b>Structure (%)</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Direct taxes</b>					
Personal Income tax (budget revenue)	18.7%	19.1%	16.5%	16.5%	18.4%
PIT (withheld)	19.7%	20.3%	19.3%	18.6%	19.8%
PIT (final for this year)	18.4%	17.8%	17.3%	16.9%	19.2%
Corporate Income tax	5.2%	5.0%	5.4%	4.1%	4.7%
Land tax	0.7%	0.9%	1.0%	1.1%	1.0%
Social tax	34.8%	37.8%	37.6%	36.2%	34.3%
<b>Indirect taxes</b>					
Value added tax	28.5%	24.8%	25.2%	26.6%	27.8%
Excises	10.5%	10.8%	13.2%	14.2%	12.3%
Other central government taxes (gambling tax, heavy vehicle tax, customs duty,	1.4%	1.3%	0.9%	1.0%	1.3%
Other local taxes (sales tax, advertising tax, etc)	0.2%	0.2%	0.2%	0.3%	0.2%

Notes: Tax revenues both for central government and local government. Final income tax includes net payments after declaration is submitted. Withheld income tax is calculated based on current revenues and adjusted with additional net payments. Social tax is also included in this table as it is usually considered as a tax in Estonia.

Source: Statistics Estonia, online-database; withheld income tax – reports of the Estonian Tax and Customs Board, own calculations.

## 1.6 Minimum wage

The national minimum wage was first agreed in 1992 in a tripartite agreement. Since 2002, the minimum wage has been set in annual bipartite agreements between the Estonian Trade Union Confederation (*Eesti Ametiühingute Keskliit*) and the Estonian Employers' Confederation (*Eesti Tööandjate Keskliit*), and then brought into effect by a government decree. Its value is set on an hourly and a monthly basis, assuming a full time job.

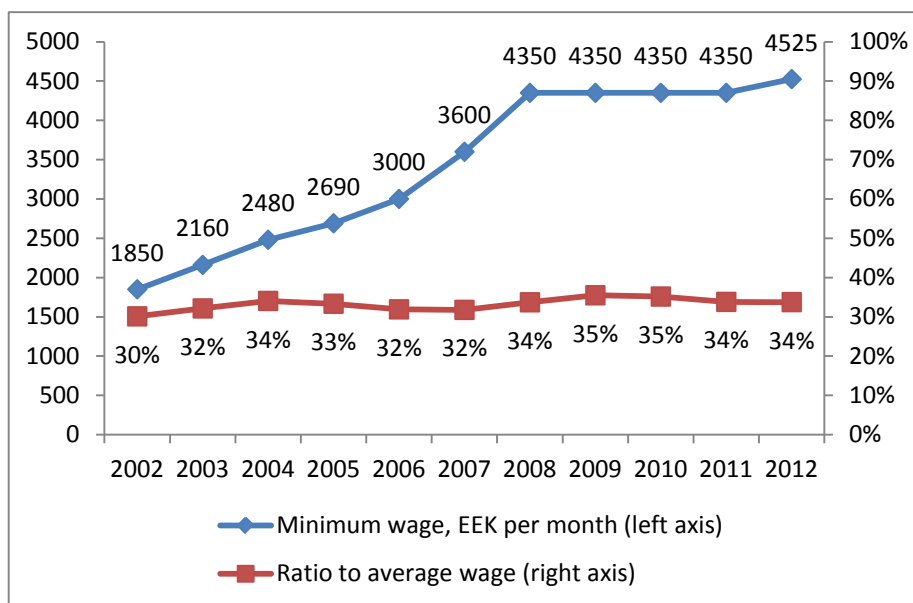


In 2001, the Estonian Trade Union Confederation and the Estonian Employers’ Confederation concluded an agreement on the long-term principles establishing the increase in the minimum wage rate up to 2008. According to this agreement, the minimum wage should represent 41% of the national full-time average wage by 2008. In reality it has remained around 30-33%. Only when the average wage declined due to the current economic crisis, the share of minimum wage has increased reaching 36% of average wage in 2009 (see Figure below).

Minimum wage applies nationwide to all employees, but several sectors may have additional negotiations between representatives of employees and employers to agree on a more favourable wage policy affecting particular occupations.

For example, in the transport sector the Estonian Transport and Road Workers’ Trade Union negotiates minimum wages. The Estonian Employees’ Unions’ Confederation and the government negotiate the minimum wages of highly educated workers in third-level education, science and culture. A minimum wage for police, border guard and rescue service officials is negotiated between the Confederation of Trade Unions of State and the Local Government Employees and the Estonian Ministry of the Interior. In health care, minimum wages for nurses and doctors are negotiated between their trade unions, hospital organizations and the government.

Figure 3. Minimum wage in Estonia 2002-2012



Note: 2011-2012 ratios are forecasts.

Source: Estonian Trade Union Confederation, Estonian Employers’ Confederation, Statistics Estonia, Ministry of Finance, own calculations.

Estimations on how many workers receive an income at the level of the minimum wage vary significantly. For 2007 the Estonian Trade Union Confederation has proposed about 70,000 workers, the Estonian Employers’ Confederation estimates 15,000 workers, Statistics Estonia calculates about 40,000 workers.<sup>3</sup>

<sup>3</sup> Karu, M. Nurmela, K. (2008) “Social partners reach agreement on minimum wage for 2008.” European Industrial Relations Observatory on-line.

<http://www.eurofound.europa.eu/eiro/2007/12/articles/ee0712019i.htm>





The level on minimum wage influences also various benefits and social security contributions. For example minimum level on parental benefits for previously employed parents cannot be smaller than the minimum wage. The minimum social tax base for self-employed or for the state contributions on behalf of various social groups (see Table 16 above) cannot be smaller than the minimum wage (in the previous year) since 2009. Minimum wage influences also upper ceiling of the social tax of the self-employed.

If needed, to predict the long-run level of the minimum wage, we propose to keep its value around 34% of predicted average wage.





## 2. SIMULATION OF TAXES AND BENEFITS IN EUROMOD

### 2.1 Scope of simulation

Not all the taxes and benefits mentioned in the previous section are simulated by EUROMOD. Some are beyond its scope entirely and are neither included in the EUROMOD database nor in its output income variables. Others are not possible to simulate accurately with the available data. They are included in the database and may be chosen as components of output variables, but the rules governing them may not be changed by the model. Tables 23 and 24 classify each of the main tax-benefit instruments (and some minor ones introduced above) into one of these three groups and provides a brief explanation as to why the instrument is not fully simulated if this is the case. In the following tables we present information on EUROMOD for two data sets: EU SILC data (EUSILC) and national version of SILC (EESILC). While the scope of simulation is the same, simulation results vary somewhat due to differences in input datasets. Information on the household budget survey (HBS) can be found in the earlier report by Vörk, Paulus and Lüpsik (2010).

Most of the benefits that are simulated in EUROMOD are universal family benefits that depend on the number of children and their age. Also, subsistence benefit, as a support of a last resort, is simulated, although using several simplifications. With the exception of unemployment benefits, other benefits that depend on contribution history, like various pensions and health insurance benefits, are not simulated, because the contribution history is not available in the dataset. Although the same is true for unemployment benefits these are simulated using several assumptions, for example the information on eligibility for particular benefit is derived from the observed receipt of the benefit.

All labour taxes and social insurance contributions are simulated. As social contributions (social tax, unemployment insurance contributions) are proportional to gross labour earnings, except in few cases, they are easily simulated. Also, participation in the funded pension scheme is simulated for EUSILC.

Income tax is calculated as both withholding income tax and final income tax. The final income tax takes into account possible additional deductions that are used on annual basis and can be applied after submitting the income declaration.

Other taxes, such as capital income tax, land tax, or indirect taxes, are not simulated in the current version of the model as there is little or no data for that purpose or outside EUROMOD scope.



Table 23. Simulation of benefits in EUROMOD

Benefit	EUSILC	EESILC	Comments
Unemployment insurance benefit ( <i>töötuskindlustushüvitis</i> )	PS	PS	Contribution history is assumed
Unemployment allowance ( <i>töötutoetus</i> )	PS	PS	Eligibility (partly) taken from data, size of the unemployment benefit
Unemployment retraining allowance	E	E	
Redundancy compensation ( <i>koondamishüvitis</i> )	IS	I	
Paid sick leave	I	I	No data on contribution history and health
Disability pension ( <i>töövõimetuspension</i> )	I	I	No data on contribution history, no exact data on health status
Disability care allowance	IA	IA	No exact data on health status, Income is part of the “other benefits” or disability pension.
Old age pension ( <i>vanaduspension</i> )	I	I	No data on contribution history
National pension (minimum old age pension, <i>rahvapension</i> )	IA	IA	No data on contribution history, or not included No data, part of other pensions
Old age pension from abroad	IA	IA	No data on contribution history, or not included
Survivors' pension	I	I	No data on contribution history
Maternity benefit ( <i>sünnitushüvitis</i> )	IS	I	No data on contribution history
Parental benefit ( <i>vanemahüvitis</i> )	IS	I	No data on contribution history
Childcare allowance ( <i>lapsehooldustasu</i> )	S	S	
Child allowance ( <i>lapsetoetus</i> )	S	S	
Single parent child allowance ( <i>üksikvanema lapsetoetus</i> )	IA	IA	No data on father in the birth certificate of the child, or not included separately
Large family allowance (3+/triplets) ( <i>3 ja enama lapse/kolmikute toetus</i> )	S	S	Abolished since 1 July 2007
Childbirth allowance ( <i>sünnitoetus</i> )	S	S	
School allowance ( <i>koolitoetus</i> )	S	S	Abolished since 2009
Large family parent allowance ( <i>seitsme- ja enamalapselise pere vanema toetus</i> )	S	S	
Subsistence benefit ( <i>toimetulekutoetus</i> )	S	S	
Scholarships and grants ( <i>õppetoetused ja stipendiumid</i> )	I	I	No data on grades
Other benefits (not explicitly stated in the data set)	I	I	Various small benefits are not directly simulated, as there is no information in the data; they are aggregated under “other social assistance”

Notes: “-”: policy did not exist in that year; “E”: *excluded* from the model as it is neither included in the micro-data nor simulated; “I”: *included* in the micro-data but not simulated; “IA”: *included* in the micro-data (in an *aggregate* income variable) but not simulated; “IS”: *included* in the micro-data (*split* from an aggregate income variable) but not simulated; “PS” *partially simulated* as some of its relevant rules are not simulated; “S” *simulated* although some minor or very specific rules may not be simulated.



Table 24. Simulation of taxes and social contributions in EUROMOD

	EUSILC	EESILC
<b>Taxes and social contributions</b>		
<b>Employer's total social insurance contributions</b>	S	S
Unemployment insurance contributions	S	S
III pillar	I	I
Pension insurance contributions (1st pillar), part of the social tax	S	S
Pension insurance contributions (2nd pillar) - transferred from the 1st pillar	S	S
Health insurance contributions	S	S
<b>Employee total social insurance contributions</b>	S	S
Unemployment insurance contributions	S	S
Funded pension insurance contributions (2nd pillar)	S	S
<b>Self-employed social insurance contributions</b>	S	S
Health insurance contributions	S	S
Pension insurance contributions (1st pillar)	S	S
Funded pension insurance contributions (2nd pillar) - transferred from the 1st pillar	S	S
Funded pension insurance contributions (2nd pillar)	S	S
<b>Contributions paid on social benefits by the central government</b>		
Health insurance contributions for those receiving unemployed benefits	S	S
Health and pension insurance contributions (the 1st pillar) for those receiving parental benefit, childcare allowance or large family parental allowance	S	S
Pension insurance contributions (the 2nd pillar) for those receiving parental benefit	S	S
<b>Income Tax (final)</b>	S	S
Withholding income tax	S	S
Land tax	I	I
Other local taxes	E	E

Notes: “-”: policy did not exist in that year; “E”: *excluded* from the model as it is neither included in the micro-data nor simulated; “I”: *included* in the micro-data but not simulated; “PS” *partially simulated* as some of its relevant rules are not simulated; “S” *simulated* although some minor or very specific rules may not be simulated



## 2.2 Simulated policies and order of simulation

### 2.2.1 Simulated policies

The model allows simulating changes in the tax rates and contribution rates, changes in tax deductions and allowances, family benefits, and major rules for subsistence benefit. See the order of simulation below.

### 2.2.2 Order of simulation and interdependencies

The following table shows the order in which the main elements of the Estonian system are simulated.

Table 25. EUROMOD Spine: order of simulation, 2007-2012

	Description
1.	Default values for variables
2.	Definition of uprating factors
3.	Definition of constants
4.	Definition of income lists
5.	Definition of assessment units
6.	Employment adjustments*
7.	Minimum wage ( <i>alampalk</i> )*
8.	Recoding of negative self-employment income to zero
9.	Child allowance ( <i>lapsetoetus</i> )
10.	Large family allowance ( <i>kolme- ja enamalapselise pere toetus</i> )**
11.	School allowance ( <i>koolitoetus</i> )***
12.	Childbirth allowance ( <i>sünnitoetus</i> )
13.	Childcare allowance ( <i>lapsehooldustasu</i> )
14.	Large family parent allowance ( <i>seitsme- ja enamalapselise pere vanema toetus</i> )
15.	Unemployment insurance benefit ( <i>töötuskindlustushüvitis</i> )
16.	Unemployment allowance ( <i>töötu abiraha</i> )
17.	Employer social insurance contributions
18.	Credited social insurance contributions
19.	Employee social insurance contributions
20.	Income tax allowance for self-employment income from agriculture
21.	Self-employed social insurance contributions
22.	Withholding income tax ( <i>jooksvalt kinnipeetud tulumaks</i> )
23.	Final personal income tax ( <i>tulumaks</i> )
24.	Subsistence benefit ( <i>toimetulekutoetus</i> )
25.	Output policies

\* Simulated but switched off in the baseline.

\*\* Simulated for 2006-2007 in the model (was abolished from 1<sup>st</sup> July 2007).

\*\*\* Simulated for 2006-2008 in the model (was abolished from 2009).



There are the following dependencies between the instruments:

- Introduction of new unemployed in 2009-2012 (if switched on) affects unemployment benefits as well as gross earnings and, hence, all labour taxes and subsistence benefits.
- Minimum wage (if switched on) affects employment earnings which is the basis for employer and employee SIC, income tax and subsistence benefit.
- Unemployment insurance benefit is subject to income tax (unlike all other simulated benefits).
- The duration of unemployment allowance is dependent on the duration of unemployment insurance benefit.
- On behalf of the recipients of unemployment insurance and assistance benefits and family benefits (child care benefits, parental benefits) social insurance contributions paid by the government (either for health care or pensions or both).
- An income tax allowance for self-employment income from agriculture also applies to the tax base for self-employed social insurance contributions.
- Employee and self-employed social insurance contributions are deductible from the income tax base. Employee SIC both from the tax base for withholding and final income tax, self-employed SIC only from the latter.
- Subsistence benefit is means-tested and depends on the income net of employee SIC and withholding income tax. Most of benefits are also included in the means-test.

### **2.2.3 Policy constants**

Policy parameters used in more than one policy are defined as constants. They are tax rates, tax allowances, social insurance contribution rates, upper and lower ceilings for social insurance contributions, minimum tax base, and pension age. Their values may vary over the period 2007-2012. Some of them are given on monthly and some yearly basis, exactly as defined in legislation.



Table 26. Policy constants

Name	Period	Abbreviation	Policies where used
Monthly minimum wage	m	\$Minwage	minimum wage, social insurance contributions by self-employed, unemployment allowance
Official pension age (males)	-	\$PensionAgeMale	unemployment benefits and employee unemployment insurance contributions
Official pension age (females)	-	\$PensionAgeFemale	unemployment benefits and employee unemployment insurance contributions
Child Allowance Rate (CAR) – base amount for child benefits	m	\$CB_Base	child allowances
Childcare Allowance Rate (CCR) - base amount for childcare benefits	m	\$CC_Base	childcare benefits
SIC minimum base	m	\$SIC_MinBase	social insurance contributions by employer, self-employed and state
SIC rate for the pension contributions (the 1st pillar)	-	\$SIC_RatePension1	social insurance contributions by employer, self-employed and state
SIC rate for the pension contributions (the 2nd pillar)	-	\$SIC_RatePension2	social insurance contributions by employer, self-employed and state
SIC rate for the pension contributions (transferable from the 1st to the 2 <sup>nd</sup> pillar)	-	\$SIC_RatePension1to2	social insurance contributions by employer, self-employed and state
SIC rate for the health contributions	-	\$SIC_RateHealth	social insurance contributions by employer, self-employed and state
Amount of basic allowance for income tax	y	\$IT_BasicAlw	withholding income tax and final income tax
Amount of pension allowance for income tax	y	\$IT_PensionAlw	withholding income tax and final income tax
Income tax rate	-	\$IT_StdRate	withholding income tax and final income tax
Reduced income tax rate for private pensions	-	\$IT_LowRate	withholding income tax and final income tax
Amount of unemployment allowance	d	\$UAB_amount	unemployment benefits

Notes: “m”: monthly; “y”: yearly; “-”:non applicable



## 2.3 Social benefits

### 2.3.1 Unemployment insurance benefit (töötuskindlustushüvitis)

- *Brief description*

Unemployment insurance (UI) benefit depends on previous earnings and is financed from statutory unemployment insurance contributions (see section [1.3.3](#) for details). In 2006, UI benefit could be received for 180 days, since 2007 for 270 days and since 2010 for 360 days (given that duration depends on accrued months of employment since 2002).

- *Definitions and eligibility conditions*

The unit of analysis is an individual person. Eligible are persons aged from 16 to old-age pension age and not receiving old age pension. To be eligible for UI benefit a person should register as unemployed in the public employment service and needs to have worked and made contributions for at least 12 months during the previous 24 months (36 months since 1<sup>st</sup> January 2007).

- *Benefit amount*

During the first 100 calendar days of unemployment the replacement rate is 50% of the previous gross earnings and afterwards it falls to 40%. The gross earnings refer to the average daily gross earnings of the previous calendar year, subject to an upper limit of three times average taxable wages in the previous calendar year. In 2007, this meant that the benefit could not exceed 11,598 EEK per month in the case of 50% replacement rate. The limit has been higher in subsequent years - see Table 10 in section [1.3.3](#).

- *EUROMOD notes*

Effectively, this benefit is only partly simulated using the information about actual receipt. But rather than simply using the observed receipt as part of the eligibility criteria, all eligibility rules in full detail are covered. However, as not all required information (e.g. work history) is available several assumptions are made, among else considering some rules automatically fulfilled for those in receipt. This approach is chosen so that the benefit can be also modelled for those currently employed if needed (e.g. to simulate their entitlement if they become unemployed, for replacement rates calculations).

Unemployment duration ( $lunmy\_s$ ) is set equal to the maximum of observed unemployment duration ( $lunmy$ ) and observed benefit receipt ( $bunctmy$ ). If modelling unemployment benefit for those currently employed, unemployment duration is set equal to the reported number of months in employment in the current year ( $liwmy$ ), once contribution history (see the next step) is modelled. It is effectively also assumed that unemployment spells start in the reference year. Simulated unemployment duration is also used for unemployment allowance calculations.

Modelled contribution history is based on the reported number of months in employment ( $liwmy$ ), controlling for the total number of months in work ( $liwwh$ ).

- For those currently employed ( $lnu > 0$ ), this is used.
- For those currently unemployed ( $lunmy\_s > 0$ ) and in receipt ( $bunct > 0$ ), this is set at least equal to the minimum qualifying period.
- For those currently unemployed ( $lunmy\_s > 0$ ) and not in receipt ( $bunct = 0$ ), this is set to zero.





At this point, working age people who are unemployed ( $lunmy\_s > 0$ ), have sufficient contribution history, do not receive old age pension and are not self-employed (i.e. have employment earnings or no self-employment status) are considered eligible. It is assumed that all of them are involuntary unemployed and capable and available for work (there is a variable in the SILC data identifying the latter but only filled in for those currently unemployed).

Benefit duration ( $bunctmy\_s$ ) is calculated according to the rules above, using modelled contribution history, while also controlling for the unemployment duration ( $lunmy\_s$ ). For currently employed, a further cap is imposed corresponding roughly to the average duration observed in administrative sources (and national SILC data).

Benefit entitlement is calculated based on previous earnings and benefit duration, subject to the lower and upper thresholds. For those currently employed, current earnings are used. For those currently unemployed and in receipt, previous earnings are used which have been imputed by reversing unemployment insurance benefit rules. For those currently unemployed and not in receipt, imputed wage is used. Finally, benefit amount is adjusted with the number of months in receipt ( $bunctmy\_s$ ). (When applying upper daily threshold to previous gross earnings, we assume that there is 30.38 days per month, i.e. 4.34 weeks per month).

### 2.3.2 Unemployment allowance (töötü abiraha/töötutoetus)

- *Brief description*

Unemployment allowance is paid to those people who do not qualify for unemployment insurance benefit or the period of UI benefit has ended. In 2007, UI benefit could be received for 180 days, since 2007 for 270 days and since 2010 for 360 days. UA benefits can be received until the end of the period of 270 days.

- *Definitions and eligibility conditions*

The unit of analysis is an individual person. Eligible are persons aged from 16 to old-age pension age and not receiving old age pension. The person must have been employed or engaged in activity equal to work for at least 180 days during the 12 months prior to filing an application with an employment office. Benefit is suspended for 10 days if the person refuses an offer of suitable work or does not show up at the Public Employment Service (PES) at a fixed date for the first time. Benefit is stopped if the person refuses an offer of suitable work or does not show up at the PES at a fixed date for the second time. Unemployment allowance is formally income tested: only the unemployed whose income is below the unemployment allowance are entitled to the benefits. It is not known in practice if and how this income test is followed, and we have switched it off in the baseline simulation.

- *Benefit amount*

Flat rate of 400 EEK per month in 2005-2006, 1,000 EEK since 2007 (32.90 EEK per day), since 2011 2.11 EUR per day. It is non-taxable.

- *EUROMOD notes*

Similar to unemployment insurance benefit, unemployment allowance is effectively only partly simulated using the information about actual receipt but this is done indirectly by assuming those in receipt fulfil certain eligibility criteria.

Work history for simulating the eligibility of unemployment allowance is modelled in complete analogy to unemployment insurance benefit. The eligibility rule differs as self-employed are not



excluded from this benefit, while students are, and additionally there is also an income condition – income from other sources (market income, maternity benefit, parental allowance for families with 7+ children) must be below the benefit amount. The simulation of the income test is, however, only applied to those currently employed (i.e. new unemployed) and, therefore, not part of the baseline.

Benefit amount is simply based on a daily flat rate. However, the number of months in receipt is calculated as the difference between maximum duration (i.e. nine months) less simulated unemployment insurance benefit duration, also subject to unemployment duration. For currently employed, a further cap is imposed corresponding roughly to the average duration observed in administrative sources (and national SILC data). Finally, benefit amount is adjusted with the number of months in receipt (bunncmy\_s).

### 2.3.3 Child allowance

- *Brief description*

Child allowance is a monthly universal non-means-tested non-taxable benefit paid to families with children below an age limit.

- *Definitions, eligibility conditions and income test*

The unit of analysis for all child and childcare benefits is the family consisting of the head, spouse or cohabitant partner and children under 16 years or under 19 years if studying at basic, upper secondary or vocational school. There is no income test. Eligible children living in the household, but without parents (i.e. so-called “loose children”), are also counted as dependent children.

- *Benefit amount*

The benefit is paid monthly to one of the parents, based on the number of eligible children. The amount per child is two times the Child Allowance Rate (CAR, equal to 150 EEK since 2005), resulting in 300 EEK per month. Since 1<sup>st</sup> July 2007 quarterly allowances for families with three or more children were merged with monthly child allowances and the former were abolished. Since 1<sup>st</sup> July 2007 the third and any consequent child receives 6 x CAR (900 EEK) per month.

- *EUROMOD notes*

Note that we have monthly and quarterly family benefits, but the age variable is recorded as of at the end of income year in all three datasets (HBS data, the EUSILC and EESILC datasets), therefore, we do not know how many months exactly children are eligible for. We have chosen to oversimulate the benefit by assuming eligibility for the whole year when reaching the age limit, i.e. also including the age limits like 16 and 19 in case of child allowance, instead of undersimulating (assuming no eligibility for the year when reaching the age limit) as this seems to better match corresponding age profiles and the aggregate results are more similar to register data.



### 2.3.4 Allowance for families with 3 or more children (kolme- ja enamalapselise pere toetus)

- *Brief description*

Allowance for families with 3 or more children was a quarterly universal non-means-tested non-taxable benefit paid to families where there are three or more children below an age limit, valid until 1<sup>st</sup> July 2007.

- *Definitions*

The unit of analysis is the same as for child allowance (see above [2.3.3](#)).

- *Eligibility conditions*

At least three children must be below an age limit.

- *Benefit amount*

The benefit is paid quarterly to one of the parents, based on the number of eligible children in the household. The amount per child is a multiple of CAR, depending on the number of children in the family and year.

Table 27. Benefit amount

Period	2005	1/1/2006-31/6/2007	Since 1/7/2007
<b>Formula</b>	3 children: 1 x CAR (150 EEK) 4 or 5 children: 2 x CAR (300 EEK) 6 or more: 2.5 x CAR (375 EEK)	3 children: 2 x CAR 4 or more: 3 x CAR	Abolished

### 2.3.5 School allowance (koolitoetus)

- *Brief description*

School allowance is an annual universal non-means-tested non-taxable benefit paid to families where there are school-age children to help them with the start of the school year. It was paid out in August, in general. It was abolished from 1<sup>st</sup> January 2009.

- *Definitions and eligibility conditions*

The unit of analysis is the same as for child allowance (see above [2.3.3](#)), except that the child must be enrolled at school.

- *Benefit amount*

The benefit is paid once in a year to one of the parents, based on the number of eligible children in the household. The amount is three times child allowance rate.



### 2.3.6 Childbirth allowance (sünnitoetus)

- *Brief description*

One of the parents has the right to receive childbirth allowance. An adoptive parent, guardian or caregiver has the right to receive childbirth allowance, if childbirth allowance has not been paid for the same child earlier, but we do not have that information.

- *Benefit amount*

The benefit is paid in case of childbirth. Since 2006 the benefit is 5,000 EEK for all children, since 2011 320 EUR.

In 2005 the amount was 25 times CAR for the first birth and 20 times CAR in case of the second and later births. In case of a multiple birth, childbirth allowance was also paid at 25 times CAR for each born child.

- *EUROMOD notes*

Also, an adoptive parent, guardian or caregiver has the right to receive childbirth allowance, if childbirth allowance has not been paid for the same child earlier, but this information is not available from the underlying datasets.

### 2.3.7 Childcare allowance (lapsehooldustasu)

- *Brief description*

Childcare allowance is an additional benefit targeted for young children. It is a monthly universal non-means-tested non-taxable benefit paid to families where there are young children.

- *Definitions and eligibility conditions*

The unit of analysis is the same as for child allowance (see above [2.3.3](#)). The benefit is paid to one of the parents based on the number of children up to 3 years old and aged 3-8 years. It is not paid for a child due to whom a parent receives maternity benefit or parental benefit (we assume that these payments are related to children up to 1 year old). There is an additional element for every child up to one year of age.

Since 2009 the childcare allowance is not paid for the parent who receives parental benefit for any of the eligible children.

- *Benefit amount*

The benefit is paid monthly to one of the parents. The amount is 1/2 of the Childcare Allowance Rate (CCR, equal to 1,200 EEK in 2007-2010 and 76.7 EUR since 2011) for every child up to 3 years old, 1/4 of the CCR for each eligible child from 3 to 8 years of age. Additionally, 100 EEK for every child up to one year of age if the parent is not eligible for parental benefits. Since 2006 the additional benefit is effectively non-existent as parental benefit was extended to 14 month.

- *EUROMOD notes*

The benefit is allocated to the same person in the household who is receiving maternity benefit to avoid that social tax paid by the state on behalf of the person in the maternity leave is counted twice. If there is no one receiving maternity benefit it is assigned to the head of unit.



### 2.3.8 Parental allowance for families with 7 or more children (7 ja enamalapselise pere vanema toetus)

- *Brief description*

This allowance is targeted to families with very large number of children. It is a monthly universal non-means-tested non-taxable benefit.

- *Definitions and eligibility conditions*

The unit of analysis is the same as for child allowance (see above [2.3.3](#)). There must be at least seven eligible children in the family.

- *Benefit amount*

In 2005 the benefit is the two times CCR, in 2006 2.1 times CCR, since 2007 2.2 times CCR.

### 2.3.9 Subsistence benefit (toimetulekutoetus)

- *Brief description*

Subsistence benefit is a means-tested social assistance benefit that should guarantee a minimum income to all residents after paying for minimum housing costs.

- *Definitions*

The unit of analysis is a household. Households whose income after payment for housing expenses, calculated according to certain general criteria and specific rules set by municipalities, is below the subsistence level are entitled to these benefits.

Duration is unlimited, but granted and renewed on monthly basis. Municipalities have the right to refuse the payment of benefits to people in working age and capable for work, but who do not study or work, and who have repeatedly refused to accept suitable work. Means-test is based on current disposable income (i.e. net of withholding income tax). Certain types of income are not counted as an household income, for example, family allowance for families with three or more children, social benefits for disabled persons, one-off benefits (e.g. birth grant, funeral grant), training stipends.

**Household subsistence level** is calculated as follows. It is summed over the household members, with 100% of the subsistence rate for the head of household and 80% for any other household member. The subsistence rate was 750 EEK in 2005-2006, 900 EEK in 2007, 1,000 EEK in 2008-2010 and 76.70 EUR in 2011 and 2012.

The “norm-space” of the household is derived as following. First, the norm-space is 18m<sup>2</sup> per person in the household plus additionally 15m<sup>2</sup> per household (15 + 18 x number of persons in unit). In case the number of rooms used equals the number of persons living in this dwelling permanently, and the actual living space exceeds the norm area then this actual living space is taken as a norm-space. If the area of the apartment is smaller than the norm-space, then the actual area is taken as a basis for calculations. For a single pensioner applying for subsistence benefit, the norm-space can be up to 51m<sup>2</sup>.

#### **Income list**

Income for the subsistence benefit is calculated using all current income except a few irregular benefits, such as childbirth allowance (*siinmitoetus*), school allowance (*koolitoetus*), other social



assistance or benefits for the disabled, large family allowance (*kolme- ja enamalapselise pere toetus*) and subsistence benefit itself. It is based on income net of withholding income tax. Only positive income from self-employment is included.

- **Benefit amount**

The general rule for subsistence benefit is the following:

$$B = \max(L - (Y - C); 0)$$

B = subsistence benefit;

L = subsistence level, which is 100% of the subsistence rate, which is set annually by the government, for the head of household and 80% of the subsistence rate for each subsequent person in the household;

C = actual costs related to the dwelling (excluding mortgage interests) that do not exceed maximum limits set by the local government and which are calculated for “norm-space”;

Y = household income according to the income definition for the subsistence benefit purpose.

There is an additional supplement 200 EEK (15 EUR since 2011) if the household is entitled to subsistence benefit and there is only one adult in the household and all other household members are younger than 18.

- **EUROMOD notes**

#### ***Imputation of housing costs***

In reality all housing costs for “norm-space” depend on the detailed rules by municipalities. In our case we approximate the actual costs related to dwelling with actual costs proportional to housing size, applying an upper limit to avoid unreasonably large housing costs. We currently use three times the average actual housing cost from registry data, which was 725 EEK per month in 2005 and has increased thereafter (822 in 2006, 910 in 2007, 1,097 in 2008, 1,205 in 2009, 1241 in 2010, 84 EUR on 2011, 91 EUR in 2012).

Total housing cost variable includes also mortgage interest payments which hence must be deducted here. Note that while housing costs in EUSILC and EESILC data refer to the average monthly costs of the interview year then mortgage interest payments refer to annual figures of the income year. Either because of this or recalling errors total monthly housing costs are sometimes smaller than monthly mortgage interest payments and in these cases we have scaled up the housing costs to the level of mortgage interest payments.

#### ***Non take-up***

Finally we model benefit non take-up by assuming that very small sums are not claimed. Based on actual receipt data, we have set the threshold at 200 EEK per month since 2006 and 10% of the current income. By current income we consider all income components (except the benefit itself) net of the withholding income tax. It also excludes self-employed social insurance contributions.

## **2.4 Social contributions**

Social contributions are paid by employees, employers and self-employed. Social insurance is highly centralised, contributions are formally either taxes (*social tax*) or otherwise rates set by laws.



### 2.4.1 Employee social contributions

Employees pay from their gross wage their part of the unemployment insurance contributions (unless they are at the pensionable age or receiving old-age pension) and a contribution to the funded pension scheme, which is optional for certain age groups.

#### *Unemployment insurance contributions*

Only employees who have not reached the legal pension age (different for males and females) and not receiving old age pension are obliged to pay unemployment insurance contributions.

Unemployment insurance contributions are calculated as a fixed percentage of the gross employment income. The contribution rates have changed over the years (see the following table).

Table 28. Unemployment insurance contribution rates

	2005	2006	2007	2008	1 June 2009	1 August 2009
Employers	0.5%	0.3%	0.3%	0.3%	1%	1.4%
Employees	1%	0.6%	0.6%	0.6%	2%	2.8%

Note: there were no changes in 2010-12.

#### *Pension contributions to the funded scheme*

Contributions are calculated as 2% of the gross employment income for those who participate in the scheme. Note that in 1<sup>st</sup> July 2009 – 31<sup>st</sup> December 2010 the contributions to the funded scheme were suspended. Persons with ten years from retirement (born 1954 or later) could, upon submitting a relevant application, resume individual contributions (2%) from 1<sup>st</sup> January 2010, in which case also state contributions on account of social tax (4%) are transferred. Other age groups could also continue to pay individual contributions (2%) from 1<sup>st</sup> January 2010, but no contributions from social tax are transferred (i.e. the scheme applied is 2+0%). For any other participant of the funded scheme (i.e. persons not opting for voluntary continuation of individual contributions), contributions to the funded scheme are gradually resumed from 2011, when a 1+2% scheme is applied, and from 2012 in full amount of 2+4%.

- *EUROMOD notes*

In the EESILC data the information on the contributions to the funded pension scheme is directly available and hence we know who participates in the scheme. In the EUSILC data we do not have information on the participation in the funded pension scheme. Therefore the participation is simulated in the raw dataset using gender-age specific participation rates from the EESILC dataset. The participation rate is then randomly simulated in the gender-age-income group for EUSILC data. For years 2009-2011 we have simulated continuation of contributions using gender-age specific shares of contributors from the register data. (See section 3.3.5 for details).

The following table shows the simulation of contributions based on the actual (EESILC) or simulated (EUSILC) indicator of participation (*lpm*), simulated indicator of continuation of contributions (*lpm01*) in 2010 and 2011, birth year (*dag*), employment income (*yem*) and relevant contribution rates.





Table 29. Contributions to the funded pension scheme in 2009-2012

Person's decision on individual contributions (simulated) Year	Born 1942-1954		Born 1955 or later	
	Continues	Suspends	Continues	Suspends
2009 1 <sup>st</sup> January - 31 <sup>st</sup> May	2+4			
2009 1 <sup>st</sup> June - 31 <sup>st</sup> December	0+0			
2010	2+4	0+0	2+0	0+0
2011	2+4	1+2	2+2	1+2
2012	2+4			

Note: the first number shows employee's contribution rate and the second number shows employer's contribution rate.

We do not simulate voluntary contributions to the private pension funds (i.e. payments into the 3<sup>rd</sup> pillar), but take them from the data.

#### 2.4.2 Employer social contributions

Employers pay social tax, which is divided into health insurance part and pension insurance part. The latter is further divided into state pension scheme and compulsory funded pension scheme for those employees who have joined the funded pension scheme. Employers also pay their part of the unemployment insurance contributions. Central government pays social tax, either total or health insurance part, on certain social benefits (see section [2.4.4](#) for more details).

##### *Pension contributions*

Pension contributions to the first pillar (the PAYG scheme) are 20% of the employment income, minus transfers to the funded pension scheme. The latter is 4 percentage points (out of 20%) for those participating in the funded scheme. (See Table 29 previous section [2.4.1](#) above.)

##### *Health insurance contributions*

The total health insurance contributions are calculated as 13% of gross employment earnings,.

##### *Unemployment insurance contributions*

Unemployment insurance contributions amount to a fixed percentage (0.3% in 2007, see the table in section [2.4.1](#) above) of employment income.

##### *Total contributions*

Total employer contributions equal:

- contributions to the pension insurance (1<sup>st</sup> pillar) +
- transfers to the funded scheme (2<sup>nd</sup> pillar) +
- contributions to the health insurance +
- contributions to the unemployment insurance



Note that the first three are included in 'social tax' in the national statistics.

### 2.4.3 Self-employed social contributions

Self-employed pay social tax (pension and health insurance contributions) and contributions to the funded pension scheme. They do not pay unemployment insurance contributions.

Until 2006, advance payments of self-employed contributions were deductible from the contribution base. Since 2007, instead the contribution base is calculated as gross income from self-employment divided by 1.33 (contributions to the pension insurance and health insurance). Effectively, the liability remains the same, but the system is somewhat simpler without having to pay all contributions in advance. Gross income from self-employment is income after deducting related expenses less the tax allowance on income from agriculture.

Self-employed are subject to minimum contribution base, unless they are receiving state pensions or the central government is already paying minimum contributions due to certain benefits. Also, social insurance contributions paid by employers for self-employed receive earnings can be offset against the minimum obligation. Finally, there is also an upper annual limit to social contributions base, which is 15 times the annual legal minimum wage (648,000 EEK in 2007, larger in later years, see the following table).

Table 30. Upper and lower limit of social tax base for self-employed 2007-2012

	2007	2008	2009	2010	2011	2012
Minimum monthly social tax base (EEK)	2,000	2,700	2,700	4,350	278.02 (EUR)	278.02 (EUR)
Minimum monthly wage (EEK)	3,600	4,350	4,350	4,350	278.02 (EUR)	290 (EUR)
Upper annual limit of social tax base (EEK) (15 times minimum wage)	648,000	783,000	783,000	783,000	50,043.6 (EUR)	52,200 (EUR)

#### *Pension insurance contributions*

Participation in the funded pension scheme and calculation of the contributions to the state pension scheme and funded pension scheme are the same as for employees.

Contributions to the funded pension scheme have two parts: one is 4% of the contribution base transferred from the social tax and additional 2% funded pension insurance contributions if the person participates in the funded pension scheme. Altogether, a self-employed person therefore directly contributes 6% to himself.

Therefore contribution to the state pension scheme amount to 20% of the contribution base less transfer to the funded pension scheme:

*Health insurance contributions* amount to 13% of the contribution base.

#### *Total self-employed social insurance contributions*

contributions to the pension insurance (1<sup>st</sup> pillar) +

contributions to the health insurance +



“transfers” to the funded scheme (2<sup>nd</sup> pillar) +  
contributions to the funded scheme (2<sup>nd</sup> pillar)

Note again that the first three are included in 'social tax' in the national statistics, and two latter are included in funded pension contributions in the national statistics.

- **EUROMOD notes**

Depending on the dataset the definition of self-employed is slightly different. In the EUSILC data the self-employed are those either with employees, without employees or family worker. In HBS data the self-employed are those who had stated in the survey data that their status in employment belongs to the category “Self-employed, farmer without hired workers, freelancer”.

Also, only HBS database has enough information to simulate tax allowance on income from agriculture. As with general income tax base, income from non-registered self-employment activity (available in EUSIC and EESILC) is assumed to be not reported and, hence, not included in the contribution base. Gross values are directly taken from the data, relying on Statistics Estonia calculations to be correct.

#### 2.4.4 Government social contributions

Government pays social contributions on certain minimum base (2,000 EEK per month in 2007, larger in later years, see table in previous section) determined each year with the government budget for those receiving either childcare allowance (*lapsehooldustasu*), large family parent allowance (*seitsme- ja enamalapselise pere vanema toetus*), parental benefit (*vanemahiivitis*) or unemployment allowance. There are some other minor categories which are not included in the model (see section [1.4](#) above).

Government pays both health care insurance and pension insurance part on the minimum base for those receiving childcare allowance, large family parent allowance, or parental benefit and only health care insurance part for those receiving unemployment allowances. Unemployment insurance fund pays health care insurance contributions for those receiving unemployment insurance benefits and the base is equal to the benefits (hence can be smaller or larger than the minimum base).

There are extra pension insurance contributions, paid by the central government, to the 2<sup>nd</sup> pillar for those receiving parental benefit. They are calculated as 1% of the maternity benefit for each related child.

#### 2.5 Personal income tax

Here we distinguish between withholding income tax and income tax liability based on the final tax report. Withholding income tax is required for simulating subsistence benefit which is means-tested based on current net income. Tax base for withholding tax is narrower than for the final tax liability, e.g. it does not include income from self-employment, rent, royalties, etc.



### 2.5.1 Tax unit

Withholding income tax is applied at the individual level, however, for the final tax liability married couples are allowed to submit a joint declaration. Large family additional tax allowance is for families with children aged up to 17.

### 2.5.2 Exemptions

The following income sources are non taxable: all family benefits (except parental benefit), unemployment allowance, unemployment retraining benefit, subsistence benefit, scholarships and grants, voluntary maintenance payments and investment income. The latter includes interests, which are non-taxed if received from an EU financial institution, and dividends, on which firms pay only corporate income tax in Estonia.

### 2.5.3 Tax allowances

Firstly, basic allowance, which equals 24,000 EEK per year (2,000 EEK per month) in 2006 and was increased in 2008 (2,250 EEK) and rounded to 144 EUR (per month) since 2011.

Secondly, pension allowance, which equals 36,000 EEK per year (3,000 EEK per month) in 2005 and later years (192 EUR per month since 2011). Pension allowance is applicable only to state pensions (i.e. old-age, disability and survivors' pensions) and can be claimed jointly only if both spouses receive state pensions.

Thirdly, an additional allowance for families depending on the number of children aged up to 17, equal to the basic allowance (i.e. 24,000 EEK per year in 2006, see Table 19 in section [1.5.1](#) for other years) less the taxable income of the children. In 2005 it was applicable for the third and each subsequent child less the taxable income of that child. In 2006 it was extended to the second child and in 2008 to the first child. In 2009 it was reversed and applied again only from the second child.

There is also a sickness allowance for compensation for an accident at work or an occupational disease and allowance for tax-free childbirth benefit paid by employer (see section [1.5.1](#) for details), but they are of little importance.

Finally, there is tax allowance for self-employment income from agriculture (reduces liability both for income tax and self-employed SIC).

All allowances are non-refundable, i.e. their value cannot be larger than income tax base.

### 2.5.4 Tax deductions

First, contributions to the unemployment insurance fund and to the funded pension scheme as well as alimony or maintenance payments are fully deductible from taxable income.

Second, the following expenses can be deducted from taxable income, but no more than 50% of taxable income or 50,000 EEK per year (3,196 EUR in 2011 and 1,920 EUR since 2012): housing loan interest payments, education expenses, donations and trade unions membership fees. The latter two are also subject to separate upper limits (as a percentage of taxable income).

Note that deductions of interest payments of study loans, which are part of the training expenses, and donations and trade union membership fees were abolished from 1<sup>st</sup> January 2010.



Third, pension contributions to the 3<sup>rd</sup> pillar (i.e. voluntary funded scheme) can be deducted from taxable income but no more than 15% of taxable income. In 2012 an additional ceiling of 6,000 EUR was introduced.

### **2.5.5 Tax base**

Income tax base is calculated as taxable incomes (see section [2.5.2](#) for exemptions) less allowances and deductions.

#### ***Withholding income tax***

Incomes subject to withholding income tax are grouped into two:

- 1) incomes for which the basic allowance is not taken into account: sickness benefit and maternity benefit paid (by the Estonian Health Insurance Fund) and royalties.
- 2) incomes for which the basic allowance is usually taken into account: disability pension, old-age pension, survivors' pension, parental benefit, unemployment insurance benefit, employment income, severance payments, taxable maintenance payments received (i.e. alimony), less alimony payments made and simulated social security contributions by employees.

In case of pensions, also pension allowance is taken into account.

There is a single income tax rate (24% in 2005, 23% in 2006, 22% 2007, 21% since 2008), with the exception of 10% tax rate on private pensions.

Withholding income tax is a sum of three components:

- a) income tax on the items that take into account basic allowance and pension allowance,
- b) income tax on the items that do not take into account tax allowances,
- c) income tax on the private pensions.

#### ***Final income tax***

Compared to withhold income tax, final income tax takes into account several additional aspects:

- 1) tax base includes income from self-employment,
- 2) married couples may submit a joint declaration,
- 3) there is an additional allowance for families with children,
- 4) there are deductible expenditures (education expenses, mortgage interest payments, contributions to the voluntary pension funds).

#### **Income from self-employment**

Taxable income from self-employment is equal to income from self-employment less related expenses (directly available in EUSILC and EESILC), and minus social insurance contributions, except contributions to the funded pension scheme. The latter can be deducted only from other source of incomes. Taxable business income is derived on individual basis.

- ***EUROMOD notes***

Due to data limitations we cannot simulate sickness allowance, child birth allowance and deductions related to donations and trade union membership fees. In EUSILC and EESILC data



we cannot separate agricultural income and hence cannot simulate the tax allowance for self-employment income from agriculture.

We also consider benefits received from abroad untaxed (where available), assuming they have been taxed in the foreign country already.

Simulation of large family tax allowance is partly optimised by assigning it to the spouse with highest taxable income (before applying the allowance itself).

## 2.6 Minimum wage

- *Brief description*

Monthly and hourly minimum wage is set in annual bipartite agreements between the Estonian Trade Union Confederation and the Estonian Employers' Confederation, and then brought into effect by a government decree. Minimum wage applies nationwide to all employees. Several sectors may have additional negotiations between representatives of employees and employers to agree on a more favourable wage policy affecting particular occupations, but the latter is not simulated.

- *Definitions and eligibility conditions*

The unit of analysis is individual. If the actual wage is less than minimum wage then wage is replaced with minimum hourly wage times actual working hours.

- *Amount*

Amount is a flat-rate sum per month. 3,000 EEK in 2006, 3,600 EEK in 2007, 4,350 EEK in 2008-2010, 278.02 EUR in 2011 and 290 EUR in 2012.

- *EUROMOD notes*

Monthly income from employment (taking into account the number of months in work) is set equal to minimum wage (proportional to hours worked) if the income from employment is less than minimum wage, but positive, and if working hours are less than or equal to 40 hours per week. We do not apply the minimum wage correction when a person earns more than a monthly minimum wage, but its hourly wage is still less than a minimum wage.



### 3. DATA

#### 3.1 General description<sup>4</sup>

There are currently three different Estonian datasets available as input data for EUROMOD:

- 1) Estonia Social Survey 2006, 2007 and 2008 (*Eesti Sotsiaaluuring 2006, 2007, 2008 - EESILC*), which is a national version of EU SILC data and which was used by the Statistics Estonia to construct the EUSILC database;
- 2) European Union Survey of Living Conditions (EUSILC) 2006, 2007 and 2008 data for Estonia;
- 3) Household Budget Survey 2005 (*Eesti leibkonna eelarve uuring - HBS*).

The Household Budget Survey 2005 was discussed in detail in previous country reports, see Lüksik, Paulus and Võrk (2008) and Võrk, Paulus and Lüksik (2010), and we do not cover it in this report. The report Võrk, Paulus and Lüksik (2010) included overview of the EESILC 2006 and EUSILC 2006 datasets and Võrk and Paulus (2011) included overview of the EESILC 2007 and EUSILC 2007 datasets. In this report we focus on EESILC 2008 and EUSILC 2008 datasets.

The Estonia Social Survey (EESILC) started in 2004 by Statistics Estonia with the goal of measuring the income and living conditions of Estonians, and through them the problematic areas of the society — poverty, inequality and social exclusion.<sup>5</sup> Before EESILC was launched in 2004, incomes, and poverty and inequality indicators on the basis thereof, had been calculated by using the data from the Household Budget Survey.

The EESILC survey offers a possibility to measure such complex social processes as persistent poverty and the various levels of deprivation. In Estonia, the survey is the official source of income statistics and social exclusion indicators. The survey is the Estonian branch of a pan-European survey of income and living conditions called the EU-SILC (European Union (EU) Statistics on Income and Living Conditions) coordinated by the Statistical Office of the European Communities Eurostat. Statistics Estonia collects data within the framework of EU-SILC, domestically called the Estonian Social Survey (*Eesti Sotsiaaluuring*). In addition to the input for Eurostat's variables, many questions from Estonian domestic consumers are included in the survey. Estonian national databases are also compiled based on the results of this survey and are every year delivered to national users. The EESILC data are used by Estonian educational institutions (universities, institutes) and ministries (mainly the Ministry of Social Affairs). (Statistics Estonia 2010)

Only private Estonian households are included in EESILC. Household is the group of persons living in the common main dwelling (at the same address) and share joint financial and/or food resources and whose members consider themselves to be members of one household. Household can also consist of one member only. Members of the household are not necessarily related by

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<sup>4</sup> This section includes word to word extracts from the following publications by Statistics Estonia:

a) "EU-SILC 2006 in Estonia: Final Quality Report". Tallinn 2008.

b) "Eesti Sotsiaaluuring. Estonian Social Survey. Metoodikakogumik. Methodological Report". Tallinn 2010.

<sup>5</sup> In the following text we use abbreviation EESILC, although the more common abbreviation of the survey is "ESS" in Estonia.





blood or marriage. A household consists of one or more benefit units (or "families"), e.g. a couple together with any dependent children.

People living permanently (over six months) in collective households and in institutions, amounting to about 1% of the population of Estonia, are excluded from the survey. Institutions are for instance orphanages, nursing homes, retirement homes, prisons, convents, barracks and so on.

The survey is cross-sectional with rotating panels. In EESILC each year, around 5,500 households and 13,500 persons are interviewed, and they are divided between four panels. Three panels are in the survey from the previous years and one is a first-timer. As the 2008 wave was the fifth round of EU-SILC in Estonia, the sample comprised of four different parts that had entered to the survey in different years. See Statistics Estonia (2009) for details.

In EUROMOD we use the cross-sectional information of the survey. The initial sample size is not identical for the national version and EU version of the survey, because the EU-SILC includes 90 observations with already full-record imputations, which are missing from the national version of the data.

Table 31. EUROMOD database descriptions

	National EU-SILC	Eurostat EU-SILC
Abbreviation	EESILC	EUSILC
Original name	Eesti Sotsiaaluuring (Estonian Social Survey)	European Union Survey of Income and Living Conditions
Provider	Eesti Statistikaamet (Statistics Estonia)	Eurostat
Year of collection	2008	
Period of collection	February - June 2008	
Income reference period	Jan 2007 - Dec 2007, annual income, housing expenditures on 2008, monthly	
Sampling	Stratified systematic sampling	
Unit of assessment	Spending unit	
Coverage	Households living permanently in Estonia. Persons living in collective households are excluded	
Sample size	6,147 households	
Accepted households into the database	4744 households	
Final sample	4,744 households 13,032 individuals	
Complete personal interviews	10,761	
Children up to 15, who are not interviewed	2,181	
Number of interviews with full-record imputation	90	
Number of individuals with full information	10,761	10,851
Children born in 2008	33	
Final number of persons used in EUROMOD	12,999	

Source: Statistics Estonia (2009) "EU-SILC 2008 in Estonia: Intermediate Quality Report", Tallinn; own calculations



In preparing the datasets we imputed missing data also for the national version of the SILC using best guesses or default imputation rules by the EUROMOD core team. In the end we had identical number of observations available for both datasets. After exclusion of 33 newborns from the final datasets we ended up with 12,999 persons and 4,744 households in both datasets.

Both in the HBS and in the SILC stratified unequal probability sampling of households was used. See Lüksik, Paulus and Võrk (2008) for the HBS methodology for details and Statistics Estonia (2010) for the EESILC /EUSILC methodology.

Technically the original data sets include several files. National version of the SILC consists of three files, and EU-SILC consists of four files (see Annex 1). For EUROMOD purposes the net-to-gross transformation of income variables is carried out, if necessary, and then data files are merged into a single file keeping only variables necessary in EUROMOD.

The SILC survey is comprised of the household and personal interviews, conducted by using two different questionnaires: the household questionnaire and the personal questionnaire. The household interview is carried out with a grown-up household member who knows the household the best. Personal questionnaires are filled out for all household members aged 15 or more.

## 3.2 Sample quality and weights

### 3.2.1 Sample size and non-response

In EESILC the minimum effective sample size to be interviewed for cross-section analysis was set 3,500 households and 7,750 persons aged 16 or over by Statistics Estonia. The actual planned sample size was greater in order to take into account the impact of various factors that may reduce the precision of evaluation.

In 2008 6,022 households were selected into the sample, with household split-offs 6,147 households. 4,744 valid household responses were received.

On personal level, the share of complete personal interviews within the households accepted for the database was 99.2% – or 10,761 interviews of the possible 10,851. Income data for the remaining 90 persons who did not complete a personal interview was imputed by closest neighbour full record imputation and is available in the EUSILC version of the data. In the national SILC version 10,761 interviews are included.

Table 32. Sample size, frame error and non-response

	<b>EESILC 2008</b>
Initial sample	6,022
Split-offs	125
Final sample size	6,147
Household could not be contacted	597 (9.7%)
Household was contacted	5,550 (90.3%)
Household was contacted, but could not be interviewed	793
Household questionnaire completed	4,757
Interview rejected	13
Accepted and included in the database	4,744

Source: See previous table



### 3.2.2 Weights and item non-response

The datasets include weights to take into account sampling probabilities and also to compensate for frame errors and the non-response. In the EESILC data weights are calculated both for cross-sectional and longitudinal data. The sub-samples (or panels) are weighted independently and combined thereafter. The weighting scheme for EESILC is governed by the procedures worked out for EU-SILC. (For weights of HBS data see the previous report Lüssik, Paulus and Võrk 2008).

The weights for EESILC data are calculated on the basis of design weights derived from inclusion probabilities. The weights, which are first adjusted to compensate for the bias caused by non-response, and then calibrated to the population data, are used in calculating the final estimates. In the first years of the survey, post-stratification was used to compensate for non-response. Since 2006, a logistic regression model, which describes non-response, has been used.

The final estimations are calculated by using the weights calibrated on the basis of demographic data in order to diminish the bias caused by non-response and frame errors. In the calibration process, the weights are corrected to make the population distributions calculated with the help of weights as close as possible to the demographic data known from other sources. Gender and age groups as well as distribution of households by county and degree of urbanisation are used in calibration for the purpose of correcting the bias. Technically, the calibration is done with the program *Bascula*. For details of the weighting procedure see also Statistics Estonia (2010).

Personal cross-sectional weight of a person (RB050 in the EU-SILC) is equal to the cross-sectional weight DB090 of its household.

Table 33. Descriptive Statistics of the Grossing-up weight in EESILC 2008

Weight variable in the original dataset	<i>lk_kaal</i> (EESILC)/ <i>db090</i> (EUSILC)
Number of households with positive values	4,744
Mean	123.101
Median	97.33
Maximum	954.14
Minimum	1.63
Max/Min	585.68
Decile 1 (10% cut point)	35.20
Decile 9 (90% cut point)	240.42
Dec 9 / Dec1	6.83

Source: Own calculations

### 3.3 Imputations, data adjustments and assumptions

#### 3.3.1 Time period

In the SILC income and expenditure refer to the previous calendar year, with the exception of housing costs which refer to the current monthly average estimated by the household.

When using SILC data the annual income and expenditure are available, and, in EESILC, also information on how many months it was received, while some of the other socio-economic variables (e.g. education, marital status) refer to the survey week. As EUROMOD uses monthly data as an input the annual income and expenditure are divided by twelve.



### 3.3.2 Data adjustment

In the EESILC data missing values have been imputed, if necessary. Most of the imputations have been done by Statistics Estonia. See the EU-SILC 2008 quality report tables 2.11-2.13 for number of observations that were imputed for major variables. A few remaining imputations were done jointly by the authors and they are described in detail in the Data Requirement Document (DRD).

In the EESILC questionnaire income components are collected as net by default, but with questions concerning wages and salaries, income from rental, income earned by children or income from self-employment, the respondent may choose if he/she wants to report net or gross amounts. All reported incomes are converted into both net and gross incomes by using algorithms deduced from tax laws by Statistics Estonia. As we had access to both national and EU version of SILC data and comparing net and gross values, discovered a few mistakes in the gross-net conversions of the Statistics Estonia and in few instances corrected these mistakes. This may have caused slight discrepancy between disposable income of individual households in the original dataset and EUROMOD input dataset, but with minor overall impact on income distribution.

By default the EU version of the SILC (EUSILC) has all values in gross (but less detailed), while the national version has (additional) detailed benefit information but mostly with net values. Both net and gross incomes of household members are aggregated to household level by using formulas provided by Eurostat. The national version of the SILC survey includes much more detailed information than EU version as many income variables are aggregated in the latter.

One difference between EESILC and EUSILC is the initial number of completed interviews available to researchers. The EUSILC data have 90 more observations which are constructed from full-record imputation (indicated by the value of variable RB250 equal to 14), while these imputations are not included in the national dataset. For these households the imputed household aggregate income (HY010) is larger than the recorded sum of its components in the national dataset.

### 3.3.3 Calculation of income and under-reporting

The main topic of the EESILC survey is the income of the residents of Estonia. EESILC uses the previous year's income for calculating indicators of living standards and welfare, following the income definition of the Canberra working group for calculating household members' incomes. Disposable (net) income is defined as the sum of incomes from wage labour, self-employment, property income, social transfers, regular inter-household cash transfers received, production for own consumption, and receipts for tax adjustment from which regular inter-household cash transfers paid, taxes on wealth and repayments for tax adjustment have been subtracted.

The EESILC household questionnaire provides information on the following components of household's total disposable income: the subsistence benefit and child benefits, incomes earned by younger than 15 year-olds, monetary and non-monetary support received from other households, alimony, monetary and non-monetary support from non-state organisations, income from rental of property or land, income from sale of real estate or stocks, income from production for own consumption. The personal questionnaire provides information on the following: monetary and non-monetary income from wage labour, income from registered and unregistered entrepreneurship, property income from bonds, shares and savings, social benefits received and payments from insurance schemes.



For our purposes we have split some of the EUSILC variables into components to allow their simulation or apply different tax-benefit rules to them.

### 3.3.4 Imputations and net-to-gross conversions by Statistics Estonia

Statistics Estonia has imputed missing values for several variables in SILC. We focus here on income variables. The following uses word-to-work extracts from the quality report of 2007 SILC data by Statistics Estonia (Statistics Estonia 2008b). The 2008 quality report (Statistics Estonia 2009) does not provide any further details about the imputation rules, so we expect them to be unchanged.

According to the quality report of 2007 SILC data, several options were used to impute missing values. For some households and persons the values of previous year were used to impute missing values. Data of earlier year was used only if household or person received particular kind of income in that year and analysis showed that these two incomes are sufficiently closely related. For some variables, values of previous year were corrected to take into account trends present in the data. If missing value could not be imputed with data from previous year, the following methods were used:

- Logical deduction of value, based on other data in questionnaire;
- Imputation with median or average, when only single values were missing;
- When exact value was missing but respondent provided an interval, the values was imputed with hot-deck method within this interval;
- Random regression with IVEware.

For some income variables having highly skewed distribution, imputation was conducted on the log-scale. In general, empirical bounds of values present in the dataset were used in IVEware to bound imputed values. For some income components, amount per month was imputed and then converted into amount per year.

#### Net to gross conversions by Statistics Estonia

If an income component was collected only net (SILC variables PY020, PY080, PY090, PY100, PY110, PY120, HY050, HY140, HY145), then first missing net values were imputed and then converted to gross using net/gross conversion algorithm, where necessary. Respectively, if an income component was collected only gross (SILC variables PY035, PY130, PY140, HY060, HY070, HY080, HY090, HY120, HY130), then first missing gross values were imputed and then converted to net. For income components, which were collected both net and gross (SILC variables PY010, PY050, HY040, HY110), the procedure was as follows. If only gross value was obtained, it was first converted to net using gross/net conversion algorithm. If both net and gross value were obtained, the net value was used, since it was believed that people knew this value better. Missing net values were imputed using IVEware. Gross components of EU-SILC variables were obtained with net/gross conversion algorithm. In this way, when only gross value was obtained, a value recorded in gross component was equal to the collected gross value, since net/gross and gross/net algorithm are in accordance with each other. Also, it allowed basing both net and gross recorded values on the same collected value. Net/gross and gross/net conversion algorithms were based on national tax system. Full details of the imputations are given in the EUSILC final quality report (Statistics Estonia 2008b).



## Imputed rent

Imputed rent must be computed for those households that are either the owners of their living space or use it without a rental fee. In SILC 2007 the calculation of imputed rent was done in three steps by Statistics Estonia.

- 1) Finding the best model of square-meter price of the accommodations. Square-meter price model was estimated separately for detached houses (including semidetached and terraced houses) and apartments. Model was fitted on the database of real estate transactions in Estonia in 2006, containing 4,682 transaction records. Square-metre price of a detached house was modelled, using the following explanatory variables: county group (4 groups), level of urbanisation (capital city, big towns, small towns, rural areas), quality of accommodations (poor, satisfactory, good), area, interaction of county group and urbanisation level, interaction of quality and urbanisation level. Square-meter price of an apartment was modelled, using the following explanatory variables: county group, level of urbanisation, quality of accommodations, number of rooms (1, 2, 3, 4+), area, interaction of county group and urbanisation level.
- 2) Applying the model to SILC data. The square-meter price models were applied to all households.
- 3) Computation of imputed rent, based on the total price of accommodations. The calculation formula for imputed rent is the following:

$$(\text{annual rent}) = (\text{price of the accommodations}) \times (\text{smoothed Euribor})$$

Price of the accommodations was multiplied by the mean value of Euribor. For example, for SILC 2007 (income year 2006) the mean value was calculated over the period 1<sup>st</sup> January 1999 – 31<sup>st</sup> December 2006, which was equal to 3.239%.

## Company cars

In the personal questionnaire, each employee was requested to report whether he or she had an option to use a company car for private ends during the previous calendar year or not. Those reporting the use were further asked to indicate the number of months the car was used, as well as the make, model and year of issue of the car. Since there is no reliable information on used care prices in Estonia, the construction of depreciation model was not possible and the conversion using tax rules was used instead. For each person reporting a benefit from the company car, the special benefit tax paid by the employer on the use of the car is recorded.

### 3.3.5 Additional imputations and net-to-gross conversions by country team

Further imputations of missing data, additional variables or gross values were required in order to apply similar tax benefits rules to all three datasets (HBS, EESILC, EUSILC).

#### *Participation in the funded pension scheme*

Participation in a compulsory funded pension scheme (the second pillar) is compulsory for new entrants to the labour market (born 1983 or later), but voluntary for employees who were in the labour market in 2002 when the scheme was introduced. Cohorts born in 1941 or before (i.e. those beyond pension age at the time of the reform) were not allowed to join the scheme.

We do not have information on the participation in the funded pension scheme in the EU version of the SILC, but we have the information on participation and actual contributions in the



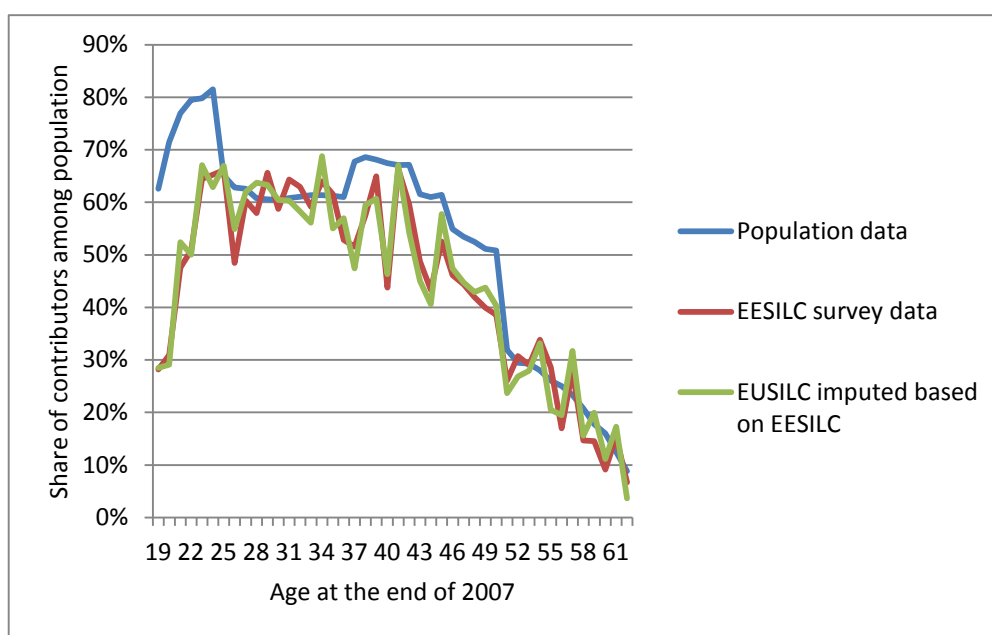
national version of the SILC. We calculated participation rates from the EESILC data in age-gender and income decile of the gross earnings (PY010G) where the person belongs to:

$$\text{Share of contributors}_{\text{age, gender, decile}} = \frac{\text{Contributed in 2007}_{\text{age, gender, decile}}}{\text{Total number of persons in 2007}_{\text{age, gender, decile}}}$$

In EUSILC we simulated contribution status based on these group-specific contribution rates by drawing a uniformly distributed random number from the 0-1 interval (this is done in Stata and can be reproduced as the seed number is fixed). If the resulting number is lower than the corresponding share of contributors the person is assigned a value 1, otherwise value 0.

The contribution rates according to the pension registry, in EESILC survey and imputed values in EUSILC within age groups are given in the following figure. Comparison of population data and EESILC survey shows that younger age groups have lower share of contributors especially among younger age groups, about 30 percentage point difference in age group 19-24. Those age groups either do not report their labour income in EESILC, and therefore they are not asked about their contribution to the second pillar in the survey, or they do not know that their contributions to the funded pension scheme are withheld from their earnings.

Figure 4. Share of contributors to the compulsory funded pension scheme in different datasets in 2007



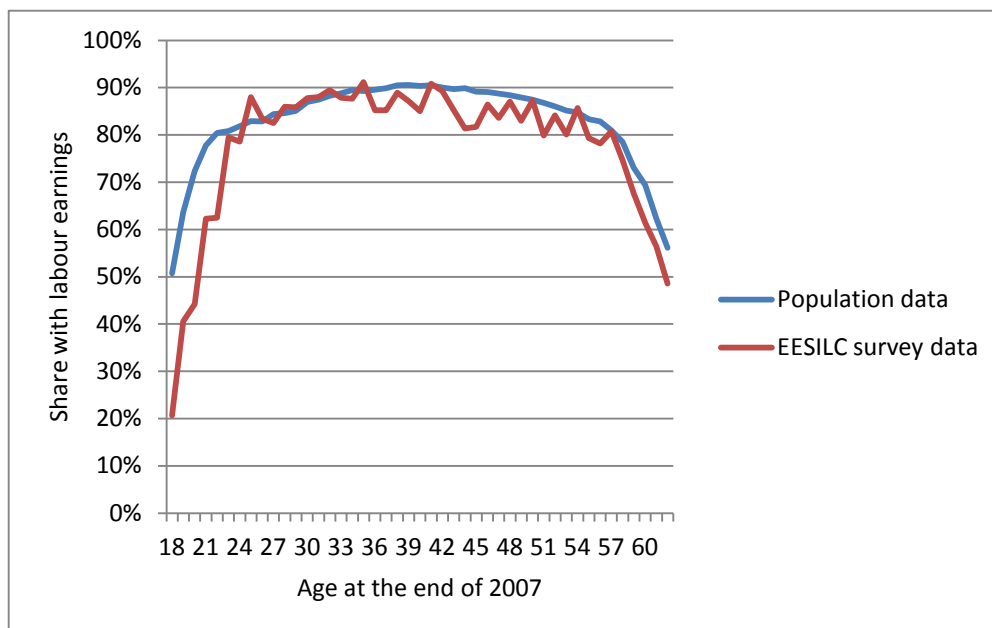
Source: EESILC and EUSILC data, Estonian Pension Registry data, own calculations.

Comparison of presence of labour earnings in the registry data and survey data suggests that both reasons are present. For younger age groups (19-22) not reporting income is more likely. For older age groups not knowing that contributions have been withheld seems to be more relevant.





Figure 5. Share of people with positive labour earnings in different datasets in 2007



Note: EESILC and EUSILC yield identical results, therefore only EESILC is presented  
 Source: EESILC and EUSILC data, Estonian Pension Registry data, own calculations.

We keep the share of contributors in age-gender-income decile groups constant as they were in 2007. In 2008-2010 some cohorts still had a last chance to voluntarily join the system and start contributions in the following year. 31<sup>st</sup> October 2008 was the deadline for those born in 1974–1976, 31<sup>st</sup> October 2009 for those born in 1977–1979 and, finally, 31<sup>st</sup> of October 2010 for those born in 1980–1982. Register data shows that about 6-9% of people born in 1974-1982 joined the second pillar in 2008-2010. We do not simulate this increase in participation rates of those cohorts during 2008-2010, only changes that arise from temporary suspension of contributions (see the next section on simulation of suspension decision) or when employment status changes (see the next section on simulation of employment status change).

### *Continuation of contributions to the funded pension scheme in 2010 and 2011*

Contributions to the funded pension scheme were temporarily suspended by default since 1<sup>st</sup> June 2009 until the end of 2010, and partly suspended in 2011. People had an option to continue with their contributions since 1<sup>st</sup> January 2010 (see Table 34 below). Therefore to simulate policy years 2010 and 2011 one needs to model first who continued to contribute to the funded pension scheme.



Table 34. Contribution rates to the funded pension scheme in 2010-2011, %

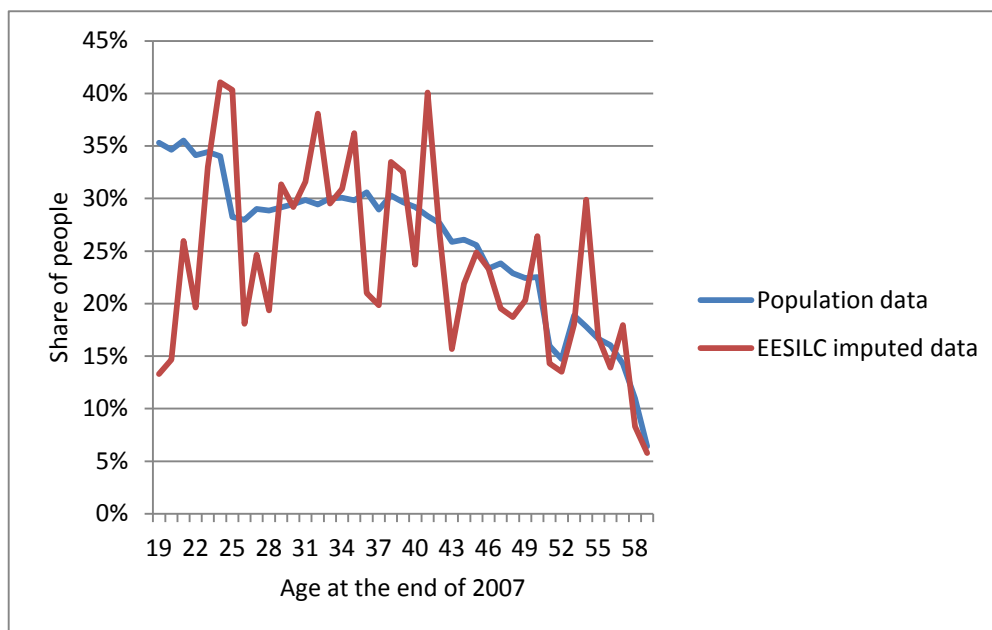
Person's decision on individual contributions Year	Born 1942-1954		Born 1955 - ...	
	Continues	Suspends	Continues	Suspends
2009 1 <sup>st</sup> January - 31 <sup>st</sup> May	2+4			
2009 1 <sup>st</sup> June - 31 <sup>st</sup> December	0+0			
2010	2+4	0+0	2+0	0+0
2011	2+4	1+2	2+2	1+2

Note: The first number refers to individual contributions and the second number refers to state transfers from the social tax.

Based on the Estonian Pension Register anonymous individual level data that covers all people in Estonia that have any social tax record since 1999, we calculated the proportion of people who continued their contributions in each group of age, gender and labour earnings decile. The latter refers to 2007 earnings.

$$\text{Share of contributors in 2010}_{\text{age, gender, decile}} = \frac{\text{Continued contributions in 2010}_{\text{age, gender, 2007 decile}}}{\text{Total number of persons in 2010}_{\text{age, gender, 2007decile}}}$$

Figure 6. Share of actual and simulated contributors to the funded pension scheme in 2010



Source: EESILC and EUSILC data, Estonian Pension Registry data, own calculations.



### *Family benefits*

Taxable and non-taxable benefits were separately available in the EESILC data, but not for the EUSILC data. For family benefits the major task with the EUSILC data was the separation of parental benefit and maternity benefit, which both are taxable, and universal family benefits, which are non-taxable.

We simulated major universal family benefits in the EUSILC and subtracted them from the total sum of family benefits.

The rest was divided into two: 26% went to maternity benefits (temporary sickness benefit in case of pregnancy) and 74% went to parental benefits. If there were no children younger than two then all family benefits were assigned to universal family benefits. We also used information on children born in 2008 as that indicated possible maternity benefits in 2007. Note that those benefits which cannot be simulated (for example, single parent benefits) are implicitly included in maternity and parental benefits.

The family benefits were assigned to the mother (or father if mother missing) of the child or the child herself if no parent was in the household.

Table 35. Comparison of assumptions for family benefits

<b>Variable</b>	<b>EESILC</b>	<b>EUSILC</b>
General remark	Four different family benefit categories available	Single aggregated family benefit variable available
Other family benefits (universal family benefits and local benefits), non-taxable	Total sum available.	Simulated the sum of the major universal benefits (child allowance, child care allowance, school allowance, large family allowances)
Parental benefit, taxable	Available in net. Gross amount imputed by backward calculation	Not separately available. Imputed: 74% of gap between the total family benefits and simulated universal family benefits was assigned to parental benefits if there was a child younger than 2
Maternity benefit, taxable	Available in net. Gross amount imputed by backward calculation	Not separately available. Imputed: 26% of gap between the total family benefits and simulated universal family benefits was assigned to parental benefits if there was a child younger than 2
Adoption benefit, taxable	Available in net. Gross amount imputed by backward calculation. Three households in 2008. The amounts were merged with maternity benefits.	Not separately available. Ignored.
Months received	Not available, assumed maximum possible number of months	Not available, assumed maximum possible number of months



### *Unemployment benefits*

The national SILC version distinguishes between redundancy benefits, unemployment insurance benefits and other unemployment benefits (including unemployment allowances). In the EUSILC data they are all merged together as unemployment benefits. We decided to exclude redundancy benefits from the unemployment benefit and consider them similarly with labour market earnings. Note also that in the original data only that part of the redundancy benefits is included in disposable income that was spent in 2007, while we include the whole income received.

We also needed to separate unemployment allowance and unemployment insurance benefit, as these are treated differently for the purpose of income tax. The unemployment allowance is a flat-rate benefit equal to 32.9 EEK per day in 2007.

In the EUSILC data we set all observations with unemployment benefits larger than a certain amount as redundancy benefits. The cut-off points were taken from the national version of the SILC and calculated conditional on unemployment duration in the income year. Similarly all small values were set as unemployment allowance. Intermediate values were then set as unemployment insurance benefits. See DRD for exact values.

Table 36. Comparison of assumptions for unemployment benefits

Variable	EESILC	EUSILC
Redundancy benefit, taxable	Available in net. Gross amount imputed by backward calculation.	Not separately available. All observations with unemployment benefits larger than a certain values were set as redundancy benefits
Unemployment allowance, non-taxable	Available in net. Includes retraining and/or transport allowance	Not separately available. All observations with unemployment benefits smaller than a certain value were set as unemployment allowances
Unemployment retraining allowance, transport allowance non-taxable	Not available (included in previous item)	Not available (included in previous item)
Unemployment insurance benefit, taxable	Available in net. Gross amount imputed by backward calculation	Not separately available. Calculated as total unemployment benefits less redundancy benefits and unemployment allowances
Start-up benefit, non-taxable	Available, but not considered as a part of unemployment benefits	Not available. Not considered as a part of unemployment benefits
Months received	Available	Not available

### *Pension benefits*

Pensions are well covered and with sufficient detail in both datasets.

Statistics Estonia includes under old-age pension also disability pensions when the person is older than the formal retirement age, because according to the Estonian pension legislation disability pensions are converted to old-age pensions after statutory pension age. Statistics



Estonia also includes a lump-sum benefit paid by employer at the time of retirement under old-age pensions, however, this benefit is very rare in Estonia.

Table 37. Comparison of assumptions for pension benefits

Variable	EESILC	EUSILC
Old-age pensions	Available both in gross and net. We use gross amounts. Includes one-time benefit paid by employer at the retirement.	Available in gross. Includes one-time benefit paid by employer at the retirement
Disability pensions	Available in net. Gross assumed to be equal to net.	Available in gross
Survivor's pensions	Available both in gross and net.	Available in gross
Months each benefit was received	Available	Not available

### *Social assistance benefits*

Social assistance benefits consist of two categories: subsistence benefits and other social assistance benefits. Although subsistence benefits are considered as housing benefits in the EUSILC data, as they include a component related to housing costs, in EUROMOD it is reclassified as social assistance benefits. They are all non-taxable, therefore no net-gross imputations is needed. Subsistence benefits may include additional subsistence benefits (*täiendav toimetulekutoetus*) that are not related to formal rules but based on ad hoc decisions by local municipalities.

Table 38. Comparison of assumptions for social assistance benefits

Variable	EESILC	EUSILC
Subsistence benefits, non-taxable	Available in net. Gross equals net.	Available in gross. Gross equals net.
Other social benefits, assume non-taxable	Available in net, available at personal level	Available in gross, available at household level
Months received	Not available, set at 6 months	Not available, set at 6 months

### *Temporary sickness benefits*

Temporary health insurance benefits are similarly recorded in both datasets. Note that in administrative data maternity benefits are also part of temporary sickness benefits, but in our data they are kept separately.



Table 39. Comparison of assumptions for sickness benefits

Variable	EESILC	EUSILC
Sickness benefits, taxable	Available both in net and gross	Available in gross.
Months received	Calculated from days received	Not available

### *Education benefits*

Education benefits are recorded in different detail in different datasets, but as they are all non-taxable and they cannot be simulated, they are all aggregated into one variable.

Table 40. Comparison of assumptions for education benefits

Variable	EESILC	EUSILC
Study grant, non-taxable, State study stipend	Available in net. Separate variables are aggregated into one variable	Available in net as one variable
Months received	Not available	Not available

In the HBS data we have also imputed values for study loans. See the earlier report Lüksik, Paulus and Võrk 2008 for details.

### *Income from self-employment*

Income from self-employment was split into two categories: income from registered entrepreneurship, which is assumed to be taxable with income tax and social tax, and income from non-registered entrepreneurship, which is assumed to be non-taxable.

Table 41. Comparison of assumptions for income from self-employment

Variable	EESILC	EUSILC
Total income from self-employment	Available in gross.	Available in gross.
Income from non-registered self-employment	Available in net. Gross assumed to be equal to net.	Not available. Imputed: 44% of total income from self-employment is allocated as income from non-registered income
Income from registered self-employment	Available in net. Gross calculated as a difference between total gross income from self-employment less income from non-registered self-employment.	Not available. Imputed: calculated as a difference between total gross income from self-employment less income from non-registered self-employment.



### *Imputation of new unemployed*

In order to account for labour market changes, there are also additional variables imputed marking new unemployed and employed in 2008-2011 (with separate dummy variables for each year). 2011 employment statuses are also used for 2012. This has been done on the basis of Eurostat LFS information showing relative increase in employment rate by age, gender and education since 2007 and the year in question. The new unemployed (employed) in EUROMOD dataset have been chosen randomly within a corresponding cell of employed (unemployed) people aged 15-74 so that the same relative change in employment rate is reached. An employed person is defined as the one with either employment or self-employment income, ignoring those who also reported having an unemployment spell in the income reference period or in receipt of unemployment benefit as well as students (unless had been also working full year). All related variable adjustments for new unemployed are done in EUROMOD (in the 'policy' called `empl_ee`).

The derivation of other variables needed for EUROMOD is described in the DRDs. Generally the standard approach provided by the Essex team was applied.

### **3.3.6 Imputations of gross incomes**

The gross and net values of EESILC and EUSILC are imputed by Statistics Estonia. In all datasets gross incomes are imputed using the inversion of rules, unless responders preferred to answer gross amounts. Estonia has a constant marginal income tax rate, which makes inversion straightforward in most cases, but additional assumptions may be required regarding application of income tax allowances.

In a few cases the gross values for EESILC data are imputed by the national team, when we needed to split some benefit groups into individual benefits, such as in case of family benefits and unemployment benefits. Because we had not access to all imputation rules that Statistics Estonia used in their net-to-gross conversions, in a few cases our aggregated gross income and those calculated by Statistics Estonia may not fully coincide. But we expect the difference to be small.

### **3.3.7 Updating factors**

To use the model for years later than 2007 income year we have provided updating factors. In most cases the update factors are from regular statistics (such as growth of the average wage) or registry data (for example, growth of the average old-age pension).

For pensions we use actual increase of average pensions, for benefits that depend on earnings, we use growth rate of the average wage in previous year, for many other benefits and expenditures we used CPI. See the following table for the overview of which updating factors have been used for different variables (and see DRD for the values of updating factors).

Table 42. Updating factors

Variable	Variable label	Update factor
default		Growth of CPI; predicted growth of CPI for 2012
bch	Benefit/pension: child:	Aggregate
bch00	Benefit/pension: child: basic	Simulated, otherwise default
bchab	Benefit/pension: child: abroad	No change in benefits
bchba	Benefit/pension: child: birth/adoption	Simulated, otherwise no change





Variable	Variable label	Update factor
bchlp	Benefit/pension: child: lone parent	No change in benefits
bed	Benefit/pension : education	Growth of CPI; predicted growth of CPI for 2012
bfa	Benefit/pension : family	Aggregate
bhl	Benefit/pension : health	Growth of average wage last year
bmaab	Benefit/pension: maternity: abroad	No change in benefits
bmact	Benefit/pension : maternity: contributory	Growth of average wage last year
bmapr	Benefit/pension : maternity: pregnancy	Growth of average wage last year
bsa	Benefit/pension : social assistance	Aggregate
bsa00	Benefit/pension : social assistance: basic	Simulated, otherwise default
bsals	Benefit/pension : social assistance	Growth of CPI; predicted growth of CPI for 2012
bun	Benefit/pension : unemployment	Aggregate
bunct	Benefit/pension : unemployment: contributory	Growth of average wage last year
bunnc	Benefit: unemployment : non-contributory	No change in benefits
buntr	Benefit: unemployment : training	No change in benefits
pdi	Benefit/pension : disability	Growth of average disability pension
poa00	Benefit/pension : old age: basic	Growth of average old-age pension
psu	Benefit/pension : survivors	Growth of average survivor's pension
tpr	Tax : property tax	Growth of land tax revenues
xhc	Expenditure : housing cost	
xhcmomi	Expenditure : housing cost : mortgage payment : mortgage interest	Estonian Tax and Customs Board: Average declared mortgage interests amount
xhcot	Expenditure : housing cost : other	Growth of housing costs in CPI (excl. mortgage interests) ; predicted growth of housing costs in CPI based on actual October 2012 data and summer 2012 forecast by the Ministry of Finance
xhcert	Expenditure : housing cost : rent	Growth of average rent in Tallinn in a two-living-room apartment until 2009; growth of average rent in Tallinn
xmp	Expenditure : maintenance payment	Growth of average wage; predicted growth of average wage for 2012
yem	Income : employment	Growth of average wage; predicted growth of average wage for 2012
yfb	Income : fringe benefits	Growth of average wage; predicted growth of average wage for 2012
yy	Income : investment	Aggregate
yydv	Income : investment: dividends	Average declared income from selling assets (Estonian Tax and Customs Board) ; predicted growth of average wage for 2012
yyit	Income : investment: interests	Average declared income from other sources (Estonian Tax and Customs Board) ; predicted growth of average wage for 2012
yyot	Income : investment: other	Average declared income from selling other assets (Estonian Tax and Customs Board) ; predicted growth of average wage for 2012
yot	Income : other	Growth of average wage; predicted growth of average wage for 2012
ypp	Income : private pension	Growth of CPI; predicted growth of CPI



Variable	Variable label	Update factor
ypr	Income : property	for 2012
yprro	Income : property: royalties	Aggregate
yprrt	Income : property: rent	Growth of CPI; predicted growth of CPI for 2012
yprt	Income : property: rent	Growth of average rent in Tallinn in a two-living-room apartment
ypt	Income : private transfers	Growth of average wage; predicted growth of average wage for 2012
ypt	Income : private transfers	Growth of average wage; predicted growth of average wage for 2012
yptmpnt	Income : private transfers : maintenance payment : non-taxable	Growth of average wage; predicted growth of average wage for 2012
yptmptx	Income : private transfers : maintenance payment : taxable	Growth of average wage; predicted growth of average wage for 2012
yse	Income : self employment	Growth of average wage; predicted growth of average wage for 2012
yseag	Income : self employment : agriculture	Growth of average wage; predicted growth of average wage for 2012
yseana	Income : self employment : non-registered activity	Growth of average wage; predicted growth of average wage for 2012
ysera	Income : self employment : registered activity	Growth of average wage; predicted growth of average wage for 2012

Notes: predicted growth of CPI and average wage for 2012 is from the summer forecast of the Estonian Ministry of Finance, 31 August 2012 (<http://www.fin.ee/?id=263>)



## 4. VALIDATION

### 4.1 Aggregate Validation

In this section we present the validation results from our model. First we compare how well the survey represents actual aggregate data. This is followed by an analysis how updated 2007 income data match 2008-2012 data. After that we present simulation validation results both for income aggregates and the number of benefit recipients and tax payers. In our default approach the simulation of minimum wage is switched off, the non-take up of marginal subsistence benefits is switched on, and income-testing of unemployment allowances is switched off. We present also the results using other assumptions, most importantly with changing labour market structure during 2008-2012. Section 4.2 includes distributional statistics, such as income deciles and poverty measures within socio-economic groups.

#### 4.1.1 Non-simulated incomes

To check how well the Estonian Social Survey (EESILC), which is the basis also for EUSILC, represents actual aggregate data, we compare income components (wages and various benefits) between the EESILC and administrative sources (see the table below). Remember from Section 3 that the difference between the two SILC datasets is small. EUSILC includes a few more imputed values on income variables, which are available in the EESILC database.

Table 43. Comparison of expenditures on wages and benefits in the SILC and administrative data, 2007

Income type	Administrative statistics (mln EEK)	EESILC (mln EEK)	Ratio (EESILC/ Register)	EUSILC (mln EEK)	Ratio (EUSILC/ Register)
Wages and salaries	87,689*	84,041	0.96	84,753	0.97
Self-employed income	964**	733	0.76	717	0.74
Pensions (old-age, survivor, disability)	14,612	14,470	0.99	14,546	1.00
Total benefits to families with children	3,113	3,158	1.01	3,157	1.01
State family benefits	1,540	1,489	0.97		
Maternity benefits	460	435	0.95		
Parental benefit ( <i>vanemahüvitis</i> )	1,113	1,233	1.11		
Subsistence benefit ( <i>toimetulekutoetus</i> <i>toimetulekupiirini</i> )	95	59	0.62	59	0.62
Unemployment benefits <sup>+</sup> ( <i>töötushüvitis</i> )					
.. excl. redundancy payments	143	83	0.58		
.. incl. redundancy payments	172			145	0.84
Sickness benefits	1,467	425	0.29	428	0.29
Other social assistance	n/a	37		64	
All cash benefits	20,747	18,232	0.88	18,397	0.89

Notes: \* from National Accounts; \*\* from tax reports; <sup>+</sup> administrative statistics do not include redundancy payments by employers and payments in case of employer's bankruptcy.

Sources: EESILC and EUSILC data, own calculations; Statistics Estonia on-line database.



EESILC covers 96% of wages and salaries when compared to the National Accounts Statistics (97% for EUSILC data) and 75% of self-employed income compared to tax reports. When comparing all cash benefits from ESSPROS data and all aggregated cash benefits from EESILC, the overall ratio is 88%. This may seem rather high but is due to good coverage of pensions, state family benefits and parental benefits. Pensions and benefits for children are rather well represented, but other benefits are underrepresented: unemployment benefits (including unemployment insurance benefits and unemployment allowances) 58%, subsistence benefit 62%, and sickness benefits 29%. Compared to 2006 we see an improvement in the coverage of maternity benefits, subsistence benefits, but decline in sickness benefits.

Table 44. Comparison of expenditures on wages and benefits in the SILC and administrative data 2005-2007

Income type	Ratio (EESILC/ Register, 2007)	Ratio (EESILC/ Register, 2006)	Ratio (EESILC/ Register, 2005)
Wages and salaries	0.96	0.97	0.99
Pensions (old-age, survivor, disability)	0.99	0.98	1.02
State family benefits total (peretoetused)	0.97	0.95	0.88
Maternity benefits	0.95	0.65	0.84
Parental benefit (vanemahüvitis)	1.11	1.00	0.99
Subsistence benefit (toimetulekutoetus toimetulekupiirini)	0.62	0.37	0.37
Unemployment benefits (töötushüvitis), excl. redundancy payments	0.58	0.61	0.47
Sickness benefits	0.29	0.34	0.34
All cash benefits	0.88	0.87	0.89

Notes: see previous table

Sources: EESILC, own calculations; Statistics Estonia on-line database.

Table 45. EUROMOD validation: actual and predicted wage bill (mln EEK), 2007-2012

	2007	2008	2009	2010	2011	2012
Wage bill from national accounts (mln EEK)	87,689	97,378	83,356	80,561	85,995	
Wage bill from EESILC (2008-2012 updated)	84,041	95,722	90,924	91,907	97,319	102,773
Ratio (EESILC/National accounts)	0.96	0.98	1.09	1.14	1.13	
Wage bill from EUSILC (2008-2012 updated)	84,753	96,534	91,694	92,686	98,144	103,645
Ratio (EUSILC/National accounts)	0.97	0.99	1.10	1.15	1.14	
Wage bill from EESILC (2008-2012 updated and simulated new unemployed for 2008 - 2012)	84,041	95,820	84,016	81,684	91,041	96,143
Ratio (EESILC/National accounts)	0.96	0.98	1.01	1.01	1.06	
Wage bill from EUSILC (2008-2012 updated and simulated new unemployed for 2008- 2012)	84,753	96,452	83,843	81,846	91,178	96,288
Ratio (EUSILC/National accounts)	0.97	0.99	1.01	1.02	1.06	

Source: Statistics Estonia, own simulations



We may conclude that universal benefits are well covered in the dataset, but means tested benefits (subsistence benefit) and replacement incomes (unemployment income, sickness benefits) are underrepresented.

Next we evaluate how well updated 2007 income data match actual data up to 2012 (see Table 45). As the period of 2007-2012 was characterised by a boom in 2008, then a recession starting in 2009 and recovery since 2011, using constant socio-economic structure for the whole period creates considerable prediction errors. Therefore, as an option, it is possible to adjust unemployment and employment in EUROMOD.

First, we compare aggregate wage bill from national accounts and registry data in 2008-2011. In our baseline scenario where only uprating is applied without modelling any changes in employment or unemployment, the total wage bill is oversimulated by 13-14% in 2011. If also the increase in unemployment is modelled the aggregate predicted wage bill is much more precise in 2009-2011 (about 6% oversimulation in 2011).

Below we present validation results from our baseline simulation with constant unemployment. In many cases, we present also results when we adjust for unemployment changes.

Table 46 and Table 47 present the ratios of non-simulated benefits in the survey data and registry data. Additional absolute numbers are presented in Annex 2.

Comparison of the data sources with registry data shows that old-age pensions are well covered in both datasets during the period 2007-2011, this is because the number of old-age pensioners simply does not change so quickly. On the other hand, as the number of disability pensioners has increased steadily in 2007-2011, we underpredict the number of disability pensioners and, hence, pensions. Survivor pensions and pensioners are already initially underrepresented in the data and this characterises also the following years.

Unemployment benefits are underrepresented in the data and as unemployment started to increase at the end of 2008, without employment adjustments, we can predict less than 10% of total unemployment benefits for 2009 and 2010, and about 16% in 2011.

The gap between parental and maternity benefits, on the one hand, and registry data on the other hand increases as in reality birth rates increased, while population remains unchanged in the model, and the duration of parental benefits was increased (i.e. number of eligible parents increased) which remains unchanged in our uprating process.

Subsistence benefits are underrepresented already in 2007 data and as recipients of subsistence benefits increase together with unemployment, uprating alone would lead to severe prediction error for 2009-2011.



Table 46. EUROMOD validation: ratio of the expenditure on non-simulated benefits in survey data and registry data, 2007-2011

	EUSILC					EESILC				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Old-age pensions (excl. pensions from abroad)	1.01	1.00	0.98	0.95	0.95	1.01	1.00	0.97	0.95	0.94
Disability pensions	0.89	0.84	0.76	0.70	0.64	0.89	0.83	0.76	0.69	0.64
Survivors pensions	0.72	0.74	0.77	0.79	0.85	0.72	0.74	0.77	0.79	0.85
Unemployment benefits, incl:	0.62	0.35	0.08	0.08	0.16	0.63	0.35	0.08	0.08	0.16
Unemployment insurance benefits	0.76	0.36	0.07	0.07	0.16	0.74	0.35	0.07	0.07	0.15
Unemployment allowance	0.37	0.29	0.10	0.12	0.19	0.43	0.34	0.12	0.14	0.22
Parental benefit*	0.97	0.70	0.62	0.52	0.53	1.11	0.80	0.71	0.59	0.60
Maternity benefits	0.81	0.77	0.77	0.86	1.01	0.95	0.90	0.90	1.00	1.18
Sickness benefits (without maternity benefits)**	0.29	0.29	0.38	0.79	0.73	0.29	0.28	0.38	0.78	0.72
Subsistence benefits	0.62	0.72	0.36	0.21	0.19	0.62	0.72	0.36	0.21	0.19

Source: Statistics Estonia, own simulations

Notes: Cells in grey are the same for EUSILC and EESILC; other benefits have differences due to imputing single benefits from aggregated variables in EUSILC.

\* - lower coverage in 2008-2011 is both due to increased birth rates and increased duration of parental benefits, neither of which is modelled in Euromod

\*\* - higher coverage in 2009 and 2011 is due to change in health insurance benefits in 2009, which is not modelled in Euromod.



Table 47. EUROMOD validation: recipients of non-simulated benefits in the survey data and registry data, 2007-2011

	EUSILC					EESILC				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Old-age pensions (excl. pensions from abroad)*	1.01	1.00	0.98	0.95	0.95	1.01	1.00	0.97	0.95	0.94
Disability pensions	0.89	0.84	0.76	0.70	0.64	0.89	0.83	0.76	0.69	0.64
Survivors pensions	0.72	0.74	0.77	0.79	0.85	0.72	0.74	0.77	0.79	0.85
Unemployment benefits, incl:	0.62	0.35	0.08	0.08	0.16	0.63	0.35	0.08	0.08	0.16
Unemployment insurance benefits	0.76	0.36	0.07	0.07	0.16	0.74	0.35	0.07	0.07	0.15
Unemployment allowance	0.37	0.29	0.10	0.12	0.19	0.43	0.34	0.12	0.14	0.22
Parental benefit**	0.97	0.70	0.62	0.52	0.53	1.11	0.80	0.71	0.59	0.60
Maternity benefits	0.81	0.77	0.77	0.86	1.01	0.95	0.90	0.90	1.00	1.18
Sickness benefits (without maternity benefits)***	0.29	0.29	0.38	0.79	0.73	0.29	0.28	0.38	0.78	0.72
Subsistence benefits****	0.62	0.72	0.36	0.21	0.19	0.62	0.72	0.36	0.21	0.19

Source: Statistics Estonia, own simulations

Notes: Cells in grey are the same for EUSILC and EESILC

\* - includes also various occupational pensions and national pension.

\*\* - Here registry data is only new cases, but survey data includes all payments. When also all payments are considered in the registry data then the EUSILC and EESILC cover about 129% and 104% of cases in 2007.

\*\*\*- annual number of compensations for illness or injury divided by 12

\*\*\*\* - households

#### 4.1.2 Simulated income tax

Withheld income tax revenues are simulated at 98% level using EUSILC or EESILC data in 2007 (see Table 48) and final income tax at 100%. This is in accordance with the coverage of wage and salaries, which was about 96% in the EESILC.

Number of simulated taxpayers is slightly larger (about 10%) than in the registry in 2007, but this is to be expected as registry numbers include only those who had submitted the declaration.





Table 48. EUROMOD validation: income tax, 2007-2012, with and without changing labour market structure

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated tax revenues (mld EEK)</b>												
A. Constant labour market structure												
Withheld PIT	15.2	16.7	15.8	15.7	16.8	17.9	15.1	16.6	15.7	15.6	16.7	17.8
Final PIT	14.4	15.1	15.1	15.1	16.1	17.2	14.4	15.0	15.0	15.0	16.0	17.1
B. Changing labour market structure												
Withheld PIT	15.1	16.6	14.6	14.0	15.7	16.7	15.2	16.7	14.5	14.0	15.6	16.7
Final PIT	14.4	15.0	13.9	13.3	15.0	16.0	14.4	15.1	13.8	13.3	14.9	15.9
<b>Comparison of revenues with register data: simulated values / actual values</b>												
A. Constant labour market structure												
Withheld PIT	0.98	0.99	1.10	1.15	1.17	1.27	0.98	0.99	1.09	1.15	1.17	1.27
Final PIT	1.00	1.02	1.17	1.21	1.23	n/a	0.99	1.01	1.16	1.21	1.22	n/a
B. Changing labour market structure												
Withheld PIT	0.98	0.99	1.02	1.03	1.10	1.19	0.98	0.99	1.01	1.02	1.09	1.19
Final PIT	0.99	1.02	1.08	1.07	1.14	n/a	1.00	1.02	1.07	1.07	1.13	n/a
<b>Simulated taxpayers (thousand)</b>												
A. Constant labour market structure												
Withheld PIT	680	700	710	712	713	728	671	692	703	705	705	721
Final PIT	705	715	736	737	740	755	698	706	729	731	732	748
B. Changing labour market structure												
Withheld PIT	680	703	677	655	678	694	671	695	670	649	671	687
Final PIT	705	719	701	678	703	718	698	711	692	671	695	711
<b>Comparison of taxpayers with register data: simulated values / actual values</b>												
A. Constant labour market structure												
Withheld PIT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Final PIT	1.10	1.07	1.13	1.17	1.15	n/a	1.09	1.05	1.12	1.17	1.14	n/a
B. Changing labour market structure												
Withheld PIT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Final PIT	1.10	1.07	1.08	1.08	1.09	n/a	1.09	1.06	1.07	1.07	1.08	n/a

Source: Ministry of Finance, own calculations and simulations

Notes: the register data provides cumulative number of taxpayers

\* - total number of persons with withheld income tax

\*\* - number of persons submitting declarations

If we do not account for changing labour market structure then we considerably oversimulate all labour taxes and social contributions for years 2009-2011, because of the actual drop in employment. Revenues from income tax are oversimulated by 22-23% in 2011. When we use increased number of unemployed in



our simulations then oversimulation is considerably reduced (from 23% to 13% in 2011 for EESILC data and from 21% to 7% for EUSILC data) in case of final income tax and from 17% to 9-10% in case of withheld income tax.

#### 4.1.3 Simulated social contributions

Overall about 103-104% of social contributions are simulated in 2007 (Table 49). This is mainly determined by the simulation of the social tax, the largest component of the contributions. Similar to income tax simulations we oversimulate social contributions about 20% by 2010-2011 if we keep unemployment rates unchanged. Contributions by self-employed are undersimulated in 2007, because they are severely underrepresented in the survey data (about 50% coverage in 2007).

On the other hand, the contributions from the state budget are oversimulated 9% in 2007 and severely undersimulated in 2009-2010. The latter is due to the increased number of unemployed which is kept constant in our base scenario), whose health insurance contributions are covered from the state budget.

Also, as participants to the funded scheme have increased in 2008 we undersimulate contributions to the funded scheme. In 2009, we do not simulate any contributions (as of 30<sup>th</sup> June 2009) given that actual contributions were stopped since 1<sup>st</sup> May.

We oversimulate unemployment insurance contributions by 10%-12% in 2007-2008 and about 46-47% in 2009, because in 2009 the contribution rates were increased twice, but we apply the highest rates valid in 30<sup>th</sup> June to the whole year.

Table 49. EUROMOD validation of the base scenario: social contributions (mln EEK), 2007-2012, simulated values and relative to actual data

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Social Tax (employers, self-employed, state)	28.6	32.7	31.6	31.9	33.7	35.6	28.4	32.5	31.3	31.6	33.4	35.2
Of which health care	11.3	12.9	12.5	12.6	13.3	14.0	11.2	12.8	12.4	12.5	13.2	13.9
Of which pension	17.3	19.8	19.1	19.3	20.4	21.5	17.2	19.7	19.0	19.2	20.2	21.3
to the funded pension scheme	2.0	2.2	0.0	0.1	1.2	2.4	2.0	2.3	0.0	0.1	1.2	2.4
Of which social tax of self-employed (health, pension)	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3
Of which social tax paid by state (health, pension)	0.5	0.6	1.0	1.0	1.0	1.0	0.5	0.6	1.0	1.0	1.0	1.0
Employees additional contribution to the funded pension scheme	1.0	1.1	0.0	0.5	0.9	1.2	1.0	1.1	0.0	0.6	0.9	1.2



Total contributions to the funded pension scheme	3.0	3.4	0.0	0.7	2.1	3.6	3.0	3.4	0.0	0.7	2.1	3.6
Unemployment insurance contributions*	0.7	0.8	2.7	3.8	4.0	4.2	0.7	0.8	2.6	3.7	3.9	4.2
Employers' part	0.3	0.3	0.9	1.3	1.4	1.5	0.3	0.3	0.9	1.3	1.4	1.4
Employees' part	0.5	0.5	1.7	2.5	2.6	2.8	0.5	0.5	1.7	2.4	2.6	2.7
Total social contribution	30.4	34.7	34.3	36.2	38.6	41.0	30.1	34.4	34.0	35.9	38.3	40.6
<b>Comparison of revenues with register data: simulated values / actual values</b>												
Social Tax (employers, self-employed, state)	1.05	1.05	1.13	1.20	1.20	n/a	1.04	1.04	1.12	1.19	1.19	n/a
Of which health care	1.05	1.04	1.10	1.17	1.17	n/a	1.04	1.04	1.09	1.16	1.16	n/a
Of which pension	1.05	1.05	1.14	1.23	1.21	n/a	1.04	1.04	1.13	1.21	1.20	n/a
to the funded pension scheme	0.97	0.90	0.00	0.88	1.10	n/a	0.97	0.91	0.00	1.02	1.12	n/a
Of which social tax of self-employed (health, pension)	0.61	0.75	0.88	1.02	1.17	n/a	0.67	0.79	0.85	0.98	1.12	n/a
Of which social tax paid by state (health, pension)	1.08	0.94	0.70	0.61	0.69	n/a	1.08	0.94	0.68	0.60	0.68	n/a
Employees additional contribution to the funded pension scheme	0.97	0.90	0.00	1.22	1.04	n/a	0.97	0.91	0.00	1.27	1.06	n/a
Total contributions to the funded pension scheme	0.97	0.90	0.00	1.14	1.07	n/a	0.97	0.91	0.00	1.21	1.09	n/a
Unemployment insurance contributions*	1.11	1.12	1.47	1.34	1.31	n/a	1.10	1.11	1.46	1.33	1.30	n/a
Employers' part	1.09	1.10	1.45	1.32	1.31	n/a	1.08	1.09	1.44	1.31	1.30	n/a
Employees' part	1.11	1.13	1.48	1.35	1.32	n/a	1.11	1.12	1.47	1.34	1.30	n/a
Total social contribution	1.05	1.04	1.12	1.22	1.20	n/a	1.04	1.03	1.11	1.21	1.19	n/a

Source: Statistics Estonia, Ministry of Finance, own calculations and simulations

Notes: Contributions to the funded pension scheme (both employer and employee) part are included in the funded pension contributions in the national statistics.

In 2009 the unemployment insurance contribution rates were raised within the year. On 1<sup>st</sup> June 2009 they were increased to 2% and 1% and on 1<sup>st</sup> August 2009 to 2.8% and 1.4%.

When we adjust the number of unemployed in our simulations then oversimulation is reduced (Table 50). Oversimulation of social tax reduces from 20% to 12% and of unemployment insurance contributions from 31% to 22% in 2011.


 Table 50. EUROMOD validation with increased unemployment: social contributions, 2007-2012, simulated contributions and relative to actual data

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Social Tax (employers, self-employed, state)	28.6	32.7	29.4	28.7	31.6	33.3	28.4	32.5	29.3	28.6	31.5	33.2
Of which health care	11.3	12.9	11.8	11.5	12.6	13.2	11.2	12.8	11.8	11.5	12.5	13.2
Of which pension	17.3	19.8	17.6	17.1	19.0	20.0	17.2	19.7	17.6	17.1	19.0	20.0
to the funded pension scheme	2.0	2.2	0.0	0.1	1.1	2.2	2.0	2.2	0.0	0.1	1.1	2.3
Of which social tax of self-employed (health, pension)	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3
Of which social tax paid by state (health, pension)	0.5	0.7	1.4	1.4	1.2	1.2	0.5	0.7	1.3	1.3	1.1	1.1
Employees additional contribution to the funded pension scheme	1.0	1.1	0.0	0.5	0.8	1.1	1.0	1.1	0.0	0.5	0.8	1.1
Total contributions to the funded pension scheme	3.0	3.3	0.0	0.6	1.9	3.3	3.0	3.3	0.0	0.6	2.0	3.4
Unemployment insurance contributions*	0.7	0.8	2.4	3.3	3.7	3.9	0.7	0.8	2.4	3.3	3.7	3.9
Employers' part	0.3	0.3	0.8	1.1	1.3	1.3	0.3	0.3	0.8	1.1	1.3	1.3
Employees' part	0.5	0.5	1.6	2.2	2.4	2.6	0.5	0.5	1.6	2.2	2.4	2.6
Total social contribution	30.4	34.7	31.8	32.5	36.1	38.3	30.1	34.5	31.8	32.4	36.0	38.2
<b>Comparison of revenues with register data: simulated values / actual values</b>												
Social Tax (employers, self-employed, state)	1.05	1.05	1.05	1.08	1.12	n/a	1.04	1.04	1.04	1.08	1.12	n/a
Of which health care	1.05	1.05	1.04	1.07	1.11	n/a	1.04	1.04	1.04	1.06	1.10	n/a
Of which pension	1.05	1.05	1.05	1.09	1.13	n/a	1.04	1.04	1.05	1.08	1.13	n/a
to the funded pension scheme	0.97	0.89	0.00	0.82	1.02	n/a	0.97	0.90	0.00	0.91	1.05	n/a
Of which social tax of self-employed (health, pension)	0.61	0.73	0.83	0.90	1.09	n/a	0.67	0.78	0.75	0.83	1.02	n/a
Of which social tax paid by state (health, pension)	1.08	1.00	0.94	0.83	0.81	n/a	1.08	0.98	0.91	0.81	0.77	n/a



Employees additional contribution to the funded pension scheme	0.97	0.89	0.00	1.08	0.96	n/a	0.97	0.90	0.00	1.13	0.99	n/a
Total contributions to the funded pension scheme	0.97	0.89	0.00	1.02	1.00	n/a	0.97	0.90	0.00	1.08	1.02	n/a
Unemployment insurance contributions	1.11	1.12	1.34	1.18	1.22	n/a	1.10	1.11	1.35	1.18	1.22	n/a
Employers' part	1.09	1.10	1.33	1.16	1.22	n/a	1.08	1.09	1.33	1.16	1.22	n/a
Employees' part	1.11	1.13	1.35	1.19	1.22	n/a	1.11	1.12	1.36	1.19	1.22	n/a
Total social contribution	1.05	1.04	1.04	1.09	1.13	n/a	1.04	1.04	1.04	1.09	1.12	n/a

Source: Statistics Estonia, Ministry of Finance, own calculations and simulations

Notes: Contributions to the funded pension scheme (both employer and employee part) are included in the funded pension contributions in the national statistics. Contributions by the self-employed include all self-employed who have submitted the tax declaration, which means that they must have paid social tax at least on the minimum amount.

Table 51. EUROMOD validation: contributors of social contributions, 2007-2012, simulated values and relative to actual data

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated contributors</b>												
A. Constant labour market structure												
Social Tax (employers, self-employed, state)	730	730	730	730	730	730	717	717	717	717	717	717
UI contributions (employees' part)	634	634	634	634	634	634	628	628	628	628	628	628
Contributions by the self-employed	24	24	25	25	25	25	22	23	23	23	23	23
B. Changing labour market structure												
Social Tax (employers, self-employed, state)	730	734	714	691	702	702	717	722	701	679	689	689
Unemployment insurance contributions (employees' part)	634	635	583	562	590	590	628	630	580	558	587	587
Contributions by the self-employed	24	23	23	22	23	23	22	22	20	19	21	21
<b>Comparison with register data: simulated values / actual values</b>												
A. Constant labour market structure												



Social Tax (employers, self- employed, state)	0.92	0.92	0.96	0.98	0.99	n/a	0.90	0.91	0.94	0.96	0.97	n/a
Unemployment insurance contributions (employees' part)	0.96	0.97	1.07	1.12	1.09	n/a	0.95	0.96	1.06	1.11	1.08	n/a
Contributions by the self-employed	0.50	0.55	0.66	0.81	0.84	n/a	0.47	0.51	0.62	0.76	0.79	n/a
B. Changing labour market structure												
Social Tax (employers, self- employed, state)	0.92	0.93	0.94	0.93	0.95	n/a	0.90	0.91	0.92	0.91	0.93	n/a
Unemployment insurance contributions (employees' part)	0.96	0.97	0.99	0.99	1.02	n/a	0.95	0.96	0.98	0.98	1.01	n/a
Contributions by the self-employed	0.50	0.53	0.61	0.72	0.79	n/a	0.47	0.50	0.54	0.63	0.71	n/a

Source: Statistics Estonia, Ministry of Finance, own calculations and simulations

Notes: Contributions to the funded pension scheme (both employer and employee part) are included in the funded pension contributions in the national statistics. Contributions by the self-employed include all self-employed who have submitted the tax declaration with non-zero income, which means that they must have paid social tax at least on the minimum amount.

#### 4.1.4 Simulated social benefits

- *Family benefits*

Expenditures on universal family benefits are simulated reasonably well, around 98% when we compare the benefits included in the model (child allowance, child care allowance, school allowance, childbirth allowance, large family allowance, large family parent allowance). We do not simulate and do not have separately available single parent's child allowance, foster care allowance, and many other small benefits. Therefore we simulate about 90% of income from universal family benefits.

Child allowance (*lapsetoetus*), the largest of universal family benefits, is simulated at 92% in 2007. Child care allowance (*lapsehooldustasu*), the second largest of these benefits, is slightly oversimulated (4% in EUSILC and 9% in EESILC in 2007). A small difference between two datasets comes from the interdependence between child care allowance and parental benefits, which are imputed for the EUSILC data, but were available for EESILC data.

Small benefit groups, such as large family parent allowance, have some problems with precision, but their impact on overall expenditures is relatively small.

Some of the changes in coverage over the years 2008-2011 are due to changing number of children and their age structure, which we keep constant for years 2007-2012.



Table 52. EUROMOD validation: universal family benefits, 2007-2011, simulated expenditure relative to actual data

	EUSILC					EESILC				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Child allowance	0.92*	1.01	1.03	1.04	1.05	0.92	1.01	1.03	1.04	1.05
Large family allowance	1.90*					1.90				
School allowance	1.04	1.09				1.02	1.06			
Childbirth allowance	1.00	0.97	0.98	0.99	1.02	1.00	0.97	0.98	0.99	1.02
Childcare allowance	1.04	1.14	0.71	0.70	0.70	1.09	1.19	0.91	0.90	0.90
Large family parent allowance**	2.53	2.69	2.81	2.93	3.26	2.53	2.69	2.81	2.93	3.26
All child benefits included in the model	0.98	1.04	0.98	0.99	1.00	0.99	1.05	1.01	1.02	1.03
All child benefits paid from the state budget	0.90	0.93	0.88	0.89	0.90	0.91	0.94	0.91	0.92	0.93

Source: Statistics Estonia, own calculations and simulations

Notes: \* - large family allowances were merged with child allowances since 1<sup>st</sup> July 2007, but in our model we simulate it for the full year.

\*\* The number of parents receiving large family parent allowance is very small

Furthermore, in 2009-2011 we undersimulate child care allowances, because in 2009 some components of child care allowances were made dependent on not receiving parental benefits. Due to data limitations we need to assume that parental benefit was received for the whole year, which leads to undersimulation of child care benefits. As in EUSILC data parental benefits are oversimulated, therefore child care allowance is undersimulated even more.

As all the benefits are universal and depend only on the number and age of children, the share of simulated recipients follows the similar pattern to expenditures (see Table 53).

Table 53. EUROMOD validation: universal family benefits, 2007-2011, simulated recipients relative to actual data

	EUSILC					EESILC				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Child allowance	1.00	1.02	1.03	1.05	1.06	1.00	1.02	1.03	1.05	1.06
Large family allowance	0.93					0.93				
School allowance	1.04	1.09				1.02	1.06			
Childbirth allowance	1.00	0.97	0.98	0.99	1.02	1.00	0.97	0.98	0.99	1.02
Childcare allowance	1.03	1.10	0.78	0.78	0.77	1.06	1.14	0.95	0.95	0.94
Large family parent allowance	2.51	2.62	2.66	2.92	2.97	2.51	2.62	2.66	2.92	2.97

Source: Statistics Estonia, own calculations and simulations





Simulated expenditures and benefit recipients are presented in Annex 2. Note that the only minor discrepancy between EUSILC and EESILC is related to the simulation of child care allowance, where EUSILC has slightly smaller number of recipients, because the number depends on parental benefits, which is partly imputed in EUSILC.

- **Unemployment benefits**

Simulation of unemployment insurance benefits and unemployment allowances is the most complicated task. First, unemployment benefit recipients are underestimated already in the survey data. Only about 60% of benefit expenditures and 30% of receivers are covered in 2007, the base year. Therefore a simulation which (partly) relies on the observed receipt cannot have much better coverage. Furthermore, additional assumptions are needed such as on contribution history, replacement rates, duration of unemployment insurance benefits and unemployment allowances.

The baseline simulations, which do not take into account the income test of unemployment allowances, cover only about half of expenditures and 30% of recipients. For the following years, undersimulation is even more severe, because actual unemployment increased, while it is kept constant in the model.

The means-tested income condition of unemployment allowances would cause even lower number of recipients, because we need to use average monthly income, which may overestimate actual income during the months when the person is eligible to the unemployment allowances. Therefore it is switched off in the baseline.

Table 54. EUROMOD validation: unemployment benefits, 2007-2012, simulated expenditure relative to actual data

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Expenditures (million EEK)</b>												
A. Constant labour market structure												
Unemployment benefits total	77	87	96	98	100	104	75	85	93	91	93	97
Unemployment insurance benefits	53	63	71	74	75	79	52	62	71	69	70	75
Unemployment allowance	24	24	24	24	25	25	22	22	22	22	23	23
B. Changing labour market structure												
Unemployment benefits total	77	255	1,259	1,209	661	694	75	191	1,126	1,178	566	594
Unemployment insurance benefits	53	216	1,099	1,062	584	617	52	160	979	1,037	501	529
Unemployment allowance	24	40	160	147	77	77	22	31	147	141	65	65
<b>Comparison of expenditures with register data: simulated values / actual values</b>												



A. Constant labour market structure												
Unemployment benefits total	0.54	0.30	0.06	0.07	0.15	n/a	0.52	0.29	0.06	0.07	0.14	n/a
Unemployment insurance benefits	0.58	0.28	0.05	0.06	0.13	n/a	0.58	0.27	0.05	0.06	0.12	n/a
Unemployment allowance	0.47	0.37	0.13	0.15	0.24	n/a	0.43	0.34	0.12	0.14	0.22	n/a
B. Changing labour market structure												
Unemployment benefits total	0.54	0.87	0.84	0.86	0.98	n/a	0.52	0.65	0.75	0.84	0.83	n/a
Unemployment insurance benefits	0.58	0.95	0.83	0.85	1.01	n/a	0.58	0.70	0.74	0.83	0.87	n/a
Unemployment allowance	0.47	0.60	0.87	0.92	0.76	n/a	0.43	0.48	0.80	0.89	0.64	n/a

Source: Statistics Estonia, own calculations and simulations

When we adjust unemployment in our simulations for years 2008-2011 then the model is considerably more precise, but we still tend to undersimulate both recipients and expenditure of unemployment benefits.

Table 55. EUROMOD validation: unemployment benefit recipient, 2007-2012, simulated recipients relative to actual data

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Number of recipients</b>												
A. Constant labour market structure												
Unemployment insurance benefits	2,539	2,539	2,539	2,539	2,539	2,539	3,414	3,414	3,414	3,414	3,414	3,414
Unemployment allowance	4,467	4,467	4,467	4,467	4,467	4,467	4,140	4,140	4,140	4,140	4,140	4,140
B. Changing labour market structure												
Unemployment insurance benefits	2,539	7,454	38,215	38,985	19,850	19,850	3,414	7,313	36,942	39,116	18,843	18,843
Unemployment allowance	4,467	8,631	37,266	38,131	19,292	19,292	4,140	7,316	35,300	37,684	17,047	17,047
<b>Comparison of recipients with register data: simulated values / actual values</b>												
A. Constant labour market structure												
Unemployment insurance benefits	0.32	0.16	0.04	0.04	0.08	n/a	0.43	0.22	0.06	0.06	0.11	n/a
Unemployment allowance	0.25	0.19	0.10	0.10	0.15	n/a	0.23	0.18	0.09	0.09	0.14	n/a



B. Changing labour market structure												
Unemployment insurance benefits	0.32	0.48	0.66	0.64	0.62	n/a	0.43	0.47	0.64	0.64	0.59	n/a
Unemployment allowance	0.25	0.37	0.80	0.82	0.63	n/a	0.23	0.31	0.76	0.81	0.56	n/a

Source: Statistics Estonia, own calculations and simulations

- **Subsistence benefit**

We oversimulate total income from subsistence benefits by 150% in 2007 and even more in 2008, while less in 2009 and 2010 if we do not take into account increased unemployment (Table 57). The simulated average amount per household per application is similar to the one in external statistics - no oversimulation in 2007 with EUSILC data and 5% oversimulation with EESILC data (see Table 58).

The number of different households who receive subsistence benefits is only slightly oversimulated (5-8% in 2007) when compared to total number of different households who have received subsistence benefits during a year with our simulated values.

However, when we compare our average number of households per month who receive subsistence benefits with average number of applications per month according to registry data then it shows that we considerably oversimulate it (124% or 133% in 2007 with EUSILC and EESILC data, respectively). And this leads to oversimulation of total expenditures.

There may be several reasons of oversimulation. Partly it is related to simplified rules that we use for calculating housing costs. We use average housing costs, while in reality seasonal variation of housing costs and hence eligibility for subsistence benefits is very important. Many households receive subsistence benefits only for winter months, but in our annual dataset we are not able to model this pattern without additional ad hoc assumptions on the duration of payment of subsistence benefits.

Also, there may be additional job search requirements, not taken into account in the model. Namely, local governments have the right to refuse the payment of benefits to people in working age and capable for work, but who do not study or work, and who have repeatedly refused to accept suitable work.

Table 56. EUROMOD validation: average actual and simulated subsistence benefits, 2007

	EUSILC	EESILC
Simulated baseline* (EEK)	1,314	1,381
Simulated with full take-up (EEK)	1,204	1,208
<b>Ratio to actual</b> (i.e. 1,312 EEK - average benefit of applications, registry data)		
Baseline*	1.00	1.05
With full take up	0.92	0.92

Notes: \* - baseline includes simulated non-take up. If the simulated benefit is less than 200 EEK per month in 2007-2012 or 10% of current income.



We take into account benefit non take-up in our baseline scenario, because in practice, we would expect that very small amounts of benefits are not taken up. In our baseline simulation we assume that if the simulated benefit is smaller than 200 EEK per month in 2007 or less than 10% of the household's disposable income the benefit is not applied for. Application of the threshold reduces expenditures by 2%, and recipients by 15% in 2007, indicating that we have many households with potentially very small amounts of subsistence benefits. Based on average amounts of the benefits this lower threshold is justified, as resulting mean values are closer to the actual mean values.

Table 57. EUROMOD validation, baseline: subsistence benefits, 2007-2012

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Benefits (mln EEK)</b>												
Baseline*	214	227	234	239	305	315	233	252	266	268	342	351
Non-take up switched off	217	229	235	241	313	321	239	256	268	270	348	358
Registry data	95	89	178	320	372		95	89	178	320	372	
<b>Compared with registry data: Simulated value / actual value</b>												
Baseline*	2.25	2.55	1.31	0.75	0.82	n/a	2.45	2.82	1.49	0.84	0.92	n/a
Non-take up switched off	2.27	2.57	1.32	0.75	0.84	n/a	2.51	2.87	1.50	0.84	0.94	n/a
<b>Total number of recipients (households)</b>												
Baseline*	13,559	12,719	12,885	12,932	14,293	14,423	14,062	13,193	14,100	14,042	15,840	15,641
Non-take up switched off	14,987	13,957	13,640	13,688	18,066	17,576	16,455	15,309	15,035	15,022	18,513	18,429
Registry data (total number of different households)	12,972	11,391	20,149	n/a	24,332	n/a	12,972	11,391	20,149	n/a	24,332	n/a
Registry data (average number of applications per month)	6,045	4,966	8,902	13,760	n/a	n/a	6,045	4,966	8,902	13,760	n/a	n/a
<b>Comparison of recipients with register data (total number of recipients): simulated values / actual values</b>												
Baseline*	1.05	1.12	0.64	n/a	0.59	n/a	1.08	1.16	0.70	n/a	0.65	n/a
Non-take up switched off	1.16	1.23	0.68	n/a	0.74	n/a	1.27	1.34	0.75	n/a	0.76	n/a
<b>Comparison of recipients with register data (average number of applications per month): simulated values / actual values</b>												
Baseline*	2.24	2.56	1.45	0.94	n/a	n/a	2.33	2.66	1.58	1.02	n/a	n/a
Non-take up switched off	2.48	2.81	1.53	0.99	n/a	n/a	2.72	3.08	1.69	1.09	n/a	n/a

Notes: \* - baseline includes simulated non-take up. If the simulated benefit is less than 200 EEK per month in 2007-2012 or 10% of household current income.

When we adjust unemployment in our simulations for years 2008-2012 then both recipients and expenditure of subsistence benefits increase considerably compared to 2007. In 2012 the number of households receiving subsistence benefits is 72% larger (91% with EESILC data) and expenditures are 162% larger than in 2007 (181% with EESILC data).



Table 58. EUROMOD validation, with labour market adjustment: subsistence benefits, 2007-2012

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Benefits (mln EEK)</b>												
Baseline*	214	239	379	533	542	560	233	257	416	609	634	655
Non-take up switched off	217	242	385	538	553	569	239	263	423	615	644	667
Registry data	95	89	178	320	372		95	89	178	320	372	
<b>Compared with registry data: simulated value / actual value</b>												
Baseline*	2.25	2.68	2.13	1.66	1.46	n/a	2.45	2.88	2.34	1.90	1.71	n/a
Non-take up switched off	2.27	2.71	2.16	1.68	1.49	n/a	2.51	2.94	2.38	1.92	1.73	n/a
<b>Total number of recipients (households)</b>												
Baseline*	13,559	13,163	20,076	25,111	23,290	23,355	14,062	13,818	22,082	28,788	27,146	26,947
Non-take up switched off	14,987	14,534	22,831	27,540	28,341	27,522	16,455	16,470	24,811	31,765	31,478	31,200
Registry data (total number of different households)	12,972	11,391	20,149	n/a	24,332	n/a	12,972	11,391	20,149	n/a	24,332	n/a
Registry data (average number of applications per month)	6,045	4,966	8,902	13,760	n/a	n/a	6,045	4,966	8,902	13,760	n/a	n/a
<b>Comparison of recipients with register data (total number of recipients): simulated values / actual values</b>												
Baseline*	1.05	1.16	1.00	n/a	0.96	n/a	1.08	1.21	1.10	n/a	1.12	n/a
Non-take up switched off	1.16	1.28	1.13	n/a	1.16	n/a	1.27	1.45	1.23	n/a	1.29	n/a
<b>Comparison of recipients with register data (average number of applications per month): simulated values / actual values</b>												
Baseline*	2.24	2.65	2.26	1.82	n/a	n/a	2.33	2.78	2.48	2.09	n/a	n/a
Non-take up switched off	2.48	2.93	2.56	2.00	n/a	n/a	2.72	3.32	2.79	2.31	n/a	n/a

#### 4.1.5 Impact of minimum wage on taxes, social contributions and subsistence benefits

In this section we give a brief overview of what is the impact of minimum wage policy, if switched on in the model. In our baseline scenario the minimum wage policy is switched off. We present here the results using only EESILC data, as EUSILC gives very similar results.

Minimum wage condition affects 2.3% of people with positive labour earnings in 2007. On average it increases the monthly wage of those affected by 493 EEK (unweighted mean).

It increases total earnings of employees by 0.1-0.2% in 2007-2012 (see the following table). Income tax and social contributions are increased by very similar margin. Income from subsistence benefits is decreased by less than one percent.



Table 59. Impact of minimum wage policy on wages, taxes and benefits, EESILC data, ratio of values in two scenarios

	2007	2008	2009	2010	2011	2012
Total employment income (yem)	0.07%	0.11%	0.16%	0.15%	0.10%	0.09%
Income tax (final)	0.07%	0.12%	0.17%	0.16%	0.10%	0.09%
Employer social contributions (for pension, health, unemployment)	0.07%	0.11%	0.16%	0.15%	0.10%	0.09%
Subsistence benefits (bsa00_s)	-0.26%	-0.67%	-0.81%	-0.64%	-0.53%	-0.40%

## 4.2 Income distribution

All income distribution results presented next are computed for individuals according to their household disposable income (HDI) equivalised by the “modified OECD” equivalence scale, if not specified otherwise. HDI are calculated as the sum of all income sources of all household members net of income tax and social insurance contributions. The weights in the OECD equivalence are: first adult=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.

We compare our results with statistics based on the Estonian version of SILC data. Formal estimates of poverty rates, the Gini coefficient and quintile ratio, which Statistics Estonia calculates based on the national version of the SILC, are presented in the following table.

Table 60. Relative poverty rates and income inequality, 2007-2011

	2007	2008	2009	2010	2011
Relative poverty (60% of median equivalent income)					
Total	19.5	19.7	15.8	17.5	17.5
Children (<18)	17.1	20.6	17.3	19.5	17.0
Age group: 0-15	17.1	20.4	16.3	19.4	16.2
Age group: 16-24	15.7	16.8	19.8	22.1	21.4
Age group: 25-49	12.5	14.1	13.1	15.9	14.4
Age group: 50-64	19.5	19.0	18.5	19.5	22.1
Age group: 65+ (Elderly)	39.0	33.9	15.1	13.1	17.2
Males	16.5	17.5	15.4	17.6	16.8
Females	22.0	21.6	16.2	17.4	18.1
Relative poverty 40% of median equivalent income	5.5	5.3	5.4	6.9	6.7
Relative poverty 50% of median equivalent income	11.5	10.2	9.4	10.9	10.9
Relative poverty 70% of median equivalent income	27.8	27.5	25	26.3	26.7
Gini coefficient	0.309	0.314	0.313	0.319	0.326
Income quintile ratio (S80/S20)	5.0	5.0	5.0	5.3	5.4

Notes: Based on national SILC data.

Sources: Statistics Estonia, on-line database, last accessed 20 December 2012



The simulation results are presented in the following tables. The overall relative poverty rate and also poverty rates in different socio-economic groups are equally well simulated with EUSILC and EESILC in 2007. Relative poverty of children (see also Table 62 for age groups), is underpredicted for 2008 and 2010. Regarding the poverty of elderly, we severely oversimulate it for 2009-2011. Many elderly are concentrated around the poverty line and the share of elderly being at risk of poverty are therefore very sensitive to small changes in the poverty line. We overestimate the relative poverty line for 2009-2011 and therefore overestimate the risk of poverty for elderly.

Table 61. EUROMOD validation: simulated relative poverty rates and inequality measures, 2007-2012

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated values</b>												
Total	19.5	18.5	16.7	16.7	17.6	18.4	19.5	18.8	16.9	16.8	17.9	18.5
Children (<19)	17.3	16.6	17.6	17.7	17.5	17.9	16.9	16.5	17.7	17.6	18.0	18.0
Elderly (>64)	39.6	36.1	25.0	24.2	29.5	32.7	39.3	35.9	24.3	23.7	28.9	31.7
Males	16.5	15.7	14.9	14.9	15.2	15.7	16.6	16.1	15.2	15.2	15.8	16.1
Females	22.0	20.9	18.3	18.1	19.6	20.7	22.0	21.0	18.3	18.1	19.8	20.5
Gini coefficient	0.31	0.30	0.30	0.29	0.30	0.30	0.31	0.30	0.29	0.29	0.30	0.30
Income quintile ratio (S80/S20)	4.8	4.7	4.6	4.5	4.6	4.7	4.9	4.7	4.5	4.5	4.6	4.7
<b>Compared with external source (SILC)</b>												
<b>Simulated value/ actual value</b>												
Total	1.00	0.94	1.06	0.95	1.01		1.00	0.95	1.07	0.96	1.03	
Children (<19)	1.01	0.80	1.01	0.91	1.03		0.99	0.80	1.02	0.90	1.06	
Elderly (>64)	1.01	1.07	1.65	1.85	1.71		1.01	1.06	1.61	1.81	1.68	
Males	1.00	0.90	0.97	0.85	0.91		1.00	0.92	0.99	0.86	0.94	
Females	1.00	0.97	1.13	1.04	1.08		1.00	0.97	1.13	1.04	1.09	
Gini coefficient	0.99	0.96	0.95	0.92	0.91		0.99	0.96	0.94	0.92	0.92	
Income quintile ratio (S80/S20)	0.97	0.94	0.92	0.85	0.85		0.97	0.95	0.91	0.85	0.86	

Sources: Statistics Estonia, on-line database, last accessed 20 December 2012

Notes: Computed for individuals according to their household disposable income (HDI) equivalised by the “modified OECD” equivalence scale. HDI are calculated as the sum of all income sources of all household members net of income tax and social insurance contributions. 60% of median equivalent income used as a poverty line. See Table 63 for detailed age groups.

A comparison of simulated relative poverty rates at different poverty levels, confirms that the base year (2007) is well captured, but the model does not perform so well during the following years, especially for the lower part of the income distribution, if the labour market changes are not modelled.





Table 62. EUROMOD validation: simulated relative poverty rates at different poverty levels, 2007-2012

% of median equivalent income	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated values</b>												
40%	5.4	5.2	5.0	4.9	4.9	5.0	5.5	5.2	5.1	5.1	5.1	5.2
50%	11.5	10.3	9.6	9.6	10.0	10.2	11.3	10.4	9.7	9.6	10.1	10.3
60%	19.5	18.5	16.7	16.7	17.6	18.4	19.5	18.8	16.9	16.8	17.9	18.5
70%	27.9	27.1	25.9	25.8	26.4	26.8	27.8	26.9	25.8	25.5	26.5	26.6
<b>Compared with external source (SILC)</b>												
<b>Simulated value/ actual value</b>												
40%	0.99	0.97	0.92	0.71	0.73		1.00	0.98	0.95	0.74	0.77	
50%	1.00	1.00	1.02	0.88	0.91		0.99	1.02	1.03	0.88	0.92	
60%	1.00	0.94	1.06	0.95	1.01		1.00	0.95	1.07	0.96	1.03	
70%	1.00	0.99	1.04	0.98	0.99		1.00	0.98	1.03	0.97	0.99	

Sources: Statistics Estonia, on-line database, last accessed 20 December 2012

Detailed analysis of age groups shows that we slightly undersimulate the poverty among children in the base year 2007. For years 2008-2011 we oversimulate the poverty among elderly and undersimulate for most of other age groups.

Table 63. EUROMOD validation: simulated relative poverty rates by age groups, 2007-2012

Age group	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated values</b>												
0-15	16.5	15.7	16.7	16.9	16.8	17.2	15.9	15.6	16.8	16.9	17.3	17.3
16-24	16.4	16.1	16.4	16.4	16.4	16.4	16.2	16.3	16.8	16.5	16.7	16.6
25-49	12.4	12.2	12.7	12.8	12.8	12.9	12.6	12.7	13.0	13.0	13.3	13.3
50-64	19.3	18.5	17.0	16.9	17.5	18.2	19.8	19.2	17.7	17.6	18.2	18.9
65-	39.6	36.1	25.0	24.2	29.5	32.7	39.3	35.9	24.3	23.7	28.9	31.7
<b>Compared with external source (SILC)</b>												
<b>Simulated value/ actual value</b>												
0-15	0.96	0.77	1.03	0.87	1.04		0.93	0.77	1.03	0.87	1.07	
16-24	1.05	0.96	0.83	0.74	0.77		1.03	0.97	0.85	0.75	0.78	
25-49	0.99	0.86	0.97	0.81	0.89		1.01	0.90	0.99	0.82	0.92	
50-64	0.99	0.97	0.92	0.87	0.79		1.02	1.01	0.96	0.90	0.82	
65-	1.01	1.07	1.65	1.85	1.71		1.01	1.06	1.61	1.81	1.68	

Sources: Statistics Estonia, on-line database, last accessed 20 December 2012



A comparison of equalised annual income levels of different income quintiles and deciles shows that we oversimulate the average equalised income in the first quintile by 2-3% and in the first decile by 6-7%. This is the result of oversimulation of subsistence benefits.

Table 64. EUROMOD validation: actual and simulated average equalised annual income by quintile (EEK), 2007

Quintile	Official statistics (based on SILC data)	Simulated data		Ratio to SILC data	
		EUSILC	EESILC	EUSILC	EESILC
1	38,476	39,641	39,287	1.03	1.02
2	63,349	63,445	63,016	1.00	0.99
3	86,661	86,777	86,202	1.00	0.99
4	115,065	114,844	114,106	1.00	0.99
5	191,869	191,652	191,210	1.00	1.00
Total	99,090	99,238	98,734	1.00	1.00

Sources: Statistics Estonia, on-line database, last accessed 20 December 2011

Table 65. EUROMOD validation: actual and simulated average equalised annual income by decile (EEK), 2007

Decile	Raw SILC data	Simulated data		Ratio to SILC data	
		EUSILC	EESILC	EUSILC	EESILC
1	29,936	32,031	31,699	1.07	1.06
2	47,062	47,261	46,877	1.00	1.00
3	57,870	58,008	57,617	1.00	1.00
4	68,874	68,873	68,407	1.00	0.99
5	80,829	80,921	80,399	1.00	0.99
6	92,548	92,601	92,005	1.00	0.99
7	106,164	106,046	105,129	1.00	0.99
8	124,032	123,661	123,107	1.00	0.99
9	152,021	151,037	150,658	0.99	0.99
10	232,013	232,390	231,640	1.00	1.00
Total	99,090	99,238	98,734	1.00	1.00

Note: There is no formal statistics on the annual income levels by decile, therefore we calculate it ourselves based on national SILC 2008 raw data.

Finally, when we model unemployment changes in our simulations for years 2008-2012 then the overall relative poverty rates (measured at 60% of median equivalent income) do not change much. For the EU-SILC data the poverty rate decreases by 0.3-0.6 percentage point compared to the baseline; for the EE-SILC data the poverty rate differs by -0.4 to +0.3 percentage points. With adjusted unemployment rates, the relative poverty rates of women are slightly lower, because men had slightly higher probabilities to become unemployed. However, the increased unemployment has a large impact on the poverty rates of different age groups (compare tables 63 and 66). The relative poverty rate of younger age groups (0-15, 16-24, 25-49) increases about 2-5 percentage points and of the age group 65+ decreases about 8-12 percentage points.



Comparison of EESILC with actual data suggests that simulation of new unemployed makes the prediction of poverty rates of the age group 16-24, which was most influenced by the increased unemployment, more precise, although still undersimulated. The poverty rate of elderly, which was oversimulated by 65-85% in the baseline, is now only slightly oversimulated in 2009-10 though more so (24%) in 2011.

Table 66. EUROMOD validation with increased unemployment: simulated relative poverty rates, 2007-2012

	EUSILC						EESILC					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
<b>Simulated values</b>												
Overall	19.5	18.4	16.4	16.7	17.4	17.9	19.5	18.4	16.9	17.4	18.2	18.7
Men	16.5	15.5	15.6	16.5	16.1	16.4	16.6	15.5	16.4	17.3	17.0	17.2
Women	22.0	20.9	17.1	16.8	18.5	19.2	22.0	20.9	17.2	17.6	19.2	19.9
0-15	16.5	15.7	20.0	21.2	19.7	19.7	15.9	15.2	19.3	21.0	19.7	19.7
16-24	16.4	15.7	18.4	19.2	17.7	17.7	16.2	15.7	18.1	19.8	18.4	18.3
25-49	12.4	12.2	14.9	15.6	14.8	14.8	12.6	12.2	16.1	17.1	15.8	15.8
50-64	19.3	17.8	15.6	17.4	17.8	18.2	19.8	18.5	16.0	17.0	18.4	18.7
65-	39.6	36.4	15.2	11.8	20.1	22.7	39.3	36.2	16.1	13.4	21.3	23.8
<b>Compared with external source (SILC)</b>												
<b>Simulated value/ actual value</b>												
Overall	1.00	0.93	1.04	0.95	0.99		1.00	0.93	1.07	1.00	1.04	
Men	1.00	0.88	1.01	0.94	0.96		1.00	0.89	1.07	0.98	1.01	
Women	1.00	0.97	1.05	0.97	1.02		1.00	0.97	1.06	1.01	1.06	
0-15	0.96	0.77	1.23	1.09	1.21		0.93	0.75	1.18	1.08	1.22	
16-24	1.05	0.94	0.93	0.87	0.83		1.03	0.93	0.91	0.89	0.86	
25-49	0.99	0.87	1.14	0.98	1.02		1.01	0.87	1.23	1.08	1.10	
50-64	0.99	0.93	0.85	0.89	0.80		1.02	0.97	0.86	0.87	0.83	
65-	1.01	1.07	1.01	0.90	1.17		1.01	1.07	1.06	1.02	1.24	

### 4.3 Summary of “health warnings”

This final section summarises the main findings in terms of particular aspects of the Estonian part of EUROMOD that should be borne in mind when planning appropriate uses of the model and in interpreting results.

- The sample is relatively small. Care should be taken in interpreting results for small sub-groups.
- The weights do not control for differential non-response according to any dimension except region, age and gender.
- Direct taxes and social contributions are equally well simulated using both EESILC and EUSILC data.



- Family benefits are simulated relatively well with all datasets and also pensions are recorded in the datasets reasonably well.
- The simulation of the subsistence benefits is severely oversimulated, because the current model smoothes annual income over the year and the model is not able to capture the seasonal nature of subsistence benefits. Excluding the non take-up of subsistence assistance benefit from simulation results in higher income at the bottom of the income distribution compared to the original dataset. Hence, we suggest that subsistence benefits are simulated in combination with non take-up modelling to reduce the extent of oversimulation.
- The model tries to take into account changes in unemployment in 2008-2012, by allowing the simulation of new unemployed (and employed). It improves the simulation results of social contributions, tax revenues, and unemployment benefits, especially for 2009. But as it is still at the development phase it should be used with caution.
- Simulations results show that despite of EESILC having more detailed data on benefits and some additional variables relevant for tax simulations, EESILC and EUSILC dataset yield very similar results, both in terms of monetary aggregates and income distributions. Therefore for cross-country comparisons it should not matter which of the two datasets to use. On the other hand, if simulation or enhancement of detailed national policies are of interest then EESILC data might be preferential due to the availability of additional variables.



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## ANNEX 1. FILES OF ORIGINAL DATA

Table 67. Initial data files of the EESILC (national version of the SILC)

Original file name	Description
Liikmed.sav	Include general information of household members (age, gender, relationships) and a section of child care
Leibkond.sav	Information on households, where at least one member, aged 16 or older, answered to questions about the household
Isik.sav	Information on persons, aged 16 or older, who answered on questions on household members.

Table 68. Initial data files of the EUSILC

Original file name	Description
UDB_c08p_v08-2(EE).dta	Personal data
UDB_c08h_v08-2(EE).dta	Household data
UDB_c08r_v08-2(EE).dta	Personal register
UDB_c08d_v08-2(EE).dta	Household register



## ANNEX 2. COMPARISON OF SIMULATED DATA AND REGISTRY DATA

Table 69. EUROMOD validation: actual and simulated family benefits (mln EEK), 2007-2012

	Registry data					EUSILC* (EESILC)					
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2012
Total family benefits	1,677	1,715	1,586	1,571	1,546						
Total simulated benefits	1,540	1,540	1,422	1,411	1,392	1,515	1,601	1,392	1,392	1,393	1,393
(EESILC)						1,526	1,612	1,438	1,438	1,489	1,489
Child allowance	1,060	1,125	1,108	1,096	1,078	973	1,136	1,136	1,136	1,137	1,137
Large family allowance	40					76					
School allowance	78	74				81	81				
(EESILC)						79	79				
Childbirth allowance	78	80	80	79	77	78	78	78	78	78	78
Childcare allowance	278	254	229	232	232	290	290	162	162	162	162
(EESILC)						303	303	208	208	208	208
Large family parent allowance	6	6	6	5	5	16	16	16	16	16	16
Other allowances (single parent allowance, ...)	137	175	164	160	154						

Source: Statistics Estonia, own simulations

Notes: \* If the results of EESILC data are different from EUSILC data, the former are presented in the next row





Table 70. EUROMOD validation: actual and simulated family benefits (number of eligible children), 2007-2012

	Registry data (end of the year)					EUSILC* (EESILC)					
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2012
Child allowance	270,087	265,418	261,443	258,695	255,522	270,348	270,348	270,348	270,348	270,348	270,348
Large family allowance	61,468					55,975					
School allowance	172,624	165,452	398	17	6	180,311	180,311				
(EESILC)						175,905	175,905				
Childbirth allowance	15,624	16,070	15,930	15,724	15,361	15,643	15,643	15,643	15,643	15,643	15,643
Childcare allowance	50,331	46,989	40,928	40,629	41,034	51,628	51,628	31,767	31,767	31,767	31,767
(EESILC)						53,384	53,384	38,681	38,681	38,681	38,681
Large family parent allowance	1,429	1,369	1,346	1,227	1,205	3,583	3,583	3,583	3,583	3,583	3,583

Source: Statistics Estonia, own simulations

Notes: \* If the results of EESILC data are different from EUSILC data, the former are presented in the next row



Table 71. EUROMOD validation, : non-simulated benefits (mln EEK), 2007-2012

	Registry data					EUSILC* (EESILC)					
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2012
Old-age pensions (excl. pensions from abroad)*	12,696	15,563	16,691	17,117	17,170	12,865	15,570	16,299	16,309	16,253	16,684
						12,796	15,486	16,211	16,222	16,165	16,594
Disability pensions	1,721	2,220	2,548	2,758	2,960	1,539	1,856	1,937	1,924	1,892	1,938
						1,533	1,849	1,929	1,917	1,884	1,930
Survivors pensions	196	230	231	233	209	141	170	179	184	179	183
						141	170	179	184	179	183
Unemployment benefits, incl	143	295	1,503	1,403	678	88	103	114	109	110	116
						89	103	114	110	111	116
unemployment insurance benefits	90	228	1,318	1,244	576	69	83	95	90	91	97
						67	81	92	87	88	93
unemployment allowance	52	66	185	159	102	19	19	19	19	19	19
						22	22	22	22	23	23
Parental benefit	1,113	1,867	2,389	2,723	2,711	1,085	1,308	1,490	1,415	1,430	1,514
						1,233	1,486	1,693	1,608	1,625	1,721
Maternity benefits	460	586	661	565	487	372	449	511	485	491	520
						435	525	598	568	574	608
Sickness benefits (without maternity benefits)	1,467	1,801	1,543	709	777	428	515	587	557	563	597
						425	509	542	503	520	551
Subsistence benefits	95	89	178	320	372	59	65	65	67	70	73
						59	65	65	67	70	73

Source: Statistics Estonia, Unemployment Insurance Fund, Ministry of Social Affairs, own simulations

Notes: \* If the results of EESILC data are different from EUSILC data, the former are presented in the next row