

EUROMOD

COUNTRY REPORT



ESTONIA (EE)

2011-2016

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EUROMOD version G4.0



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 28 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.

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The results presented in this report are derived using EUROMOD version G4.0. EUROMOD is continually being improved and the results presented here may not match those that would be obtained with later versions of EUROMOD. For more information, see:
<https://www.euromod.ac.uk>

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INTRODUCTION

This country report gives an overview of the Estonian country component of EUROMOD. The report presents the basic information on the Estonian tax-benefit system valid in 2011-16 (as of 30th June in corresponding year), it explains which taxes and benefits are simulated in EUROMOD, together with the key aspects of implementation, and how well the model represents actual income distribution and monetary aggregates.

The current Estonian country model uses European Union Survey of Income and Living Conditions 2012 (EU-SILC), complemented with a few extra variables from the Estonian Social Survey (Eesti Sotsiaaluuring, EE-SILC) 2012, which is a more detailed national version of the SILC survey from where the EU-SILC variables are derived.

The report adds to and builds on the seven earlier reports:

- i. Lüpsik, Paulus and Võrk (2008), which covered the 2005 policies based on the Estonian Household Budget Survey 2005.
- ii. Võrk, Paulus and Lüpsik (2010), which covered policy years 2005-2008 based on three datasets (besides HBS 2005 also EU-SILC 2006 and EE-SILC 2006).
- iii. Võrk and Paulus (2011), which covered policy years 2006-2009 based on two datasets (EU-SILC 2007 and EE-SILC 2007).
- iv. Võrk and Paulus (2012), which covered policy years 2007-2011 based on two datasets (EU-SILC 2008 and EE-SILC 2008).
- v. Võrk and Paulus (2013), which covered policy years 2008-2012 based on two datasets (EU-SILC 2008 and EE-SILC 2008).
- vi. Võrk and Paulus (2014), which covered policy years 2009-2013 based on a single combined dataset (EU-SILC 2010 with some merged variables from EE-SILC 2010)
- vii. Võrk, Paulus and Leppik (2015), which covered policy years 2011-2015 based on a single combined dataset (EU-SILC 2012 with some merged variables from EE-SILC 2012).

The current report uses the same combined dataset of EU-SILC 2012 and EE-SILC 2012 as the previous report (Võrk, Paulus, Leppik (2015), updating information on policy rules as well as validation results. No changes have been made in the structure of the report compared to Võrk, Paulus and Leppik (2015).

1. BASIC INFORMATION

1.1 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 tax revenues 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 1st January – 31st December. Taxes and benefits are not indexed, with the exception of state pensions, which are indexed to the weighted average of inflation

and social tax revenues, though further ad hoc pension increases are also common. Indexation takes place on 1st April every year. The tax system and other benefits are changed only in ad hoc manner, usually in the beginning of the year, though there have been also some occasional exceptions (e.g. changes in family benefits taking effect in July and September). Changes in indirect taxes have taken place more frequently, often within a year. Some thresholds of benefits (i.e. minimum or maximum levels) are linked to the minimum wage or average contribution base in the previous year. In addition, some parameters of benefit formulae are linked to past relative or absolute poverty lines.

- In 2014 and 2015, the statutory pension age was 63 for men and 62.5 for women (rounded to 63 in EUROMOD). For women it increased also to 63 in 2016. Furthermore, in 2010, the pension age was set to increase to 65 by 2026 for both sexes by 3-month steps. For those born between 1953 and 1961 the retirement age will depend on their birth year.
- Children are obliged to attend school from age 7 and until they acquire basic education or reach the age of 17.
 - Dependent children for family benefits, including means-tested 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 under 18. One of the parents may deduct an additional tax allowance from his or her income in the period of taxation depending on the number of children.
 - For means-tested family benefits, modified OECD equivalence scale is used. In this calculation a child is defined as aged under 14.
- 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. For social assistance purposes, single adult household is a household with a single adult and dependents aged under 18.
- The income tax system is an individual system, though a married couple may also file a joint tax report if they wish (which is beneficial if one has unused tax allowances which they could share then). Income tax liability 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 on a monthly basis to calculate withholding income tax. In order to make use of other allowances and deductions these have to be claimed in the following year (by 31st March) when filing the tax report. The latter determines the final tax liability, taking into account tax already withheld. Overall, there are relatively few allowances and deductions in the system. Different income sources are taxed uniformly, except private pensions which have a lower income tax rate.
- The means-tested benefit system assesses entitlement according to household income. Household consists of persons living together and sharing their income and expenditures. Income is assessed either on a monthly basis (in the case of subsistence benefits) or based on the average income in the previous three months (in the case of means-tested family benefits). Nearly all income sources are taken into account. Assets are taken into account in an ad hoc manner.
- The 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.

Employers pay also part of the unemployment insurance contributions. There are a few additional social contributions paid by employees: employees' part of the unemployment insurance contributions and contributions to the mandatory pension scheme.

1.2 Social Benefits

1.2.1 Pensions

The Estonian pension system is based on three pillars: state pension insurance (the 1st pillar) – a pay-as-you-go scheme; a mandatory funded pension scheme (the 2nd pillar); and a supplementary (voluntary) funded pension scheme (the 3rd pillar). The first pillar provides protection against the risks of old age, disability and survivorship, and comprises two separate tiers: a) residence-based national pensions and b) employment-based old-age, work incapacity and survivors' pensions. The mandatory funded pension scheme covers the risks of old-age and survivorship, the voluntary funded pension scheme covers the risks of old-age, disability and survivorship. All pensions are taxable with income tax, but an additional tax-free pension allowance applies.

The old-age pension from the state pension system (*riiklik vanaduspension*) 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 31st December 1998); and an insurance element applying to periods after 1st January 1999. The pension components are indexed annually by an arithmetic weighted average of annual increases of consumer prices and social tax revenues, ad hoc increases are also allowed.

Additional old-age pensions from the mandatory funded pension scheme (*kohustuslik kogumispension*) depend on total contributions over the working career and yields of pension funds. When people reach the pension age they can withdraw their accumulated assets. Currently, the accumulated assets are rather small as the scheme only started in 2002.

National pension (*rahvapension*) is a flat-rate minimum guaranteed pension for those persons who do not fulfil the minimum length of service requirement to be eligible for old-age pensions or pension for incapacity for work, or in the case of survivor's pension a provider did not fulfil the length of service requirement.

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

Deferred old-age pension (*edasiliikatud vanaduspension*): A type of state old-age pension. Pension is increased by 0.9 per cent for every month that exceeds the statutory pension age.

Old age pension under favourable conditions (*soodustingimustel vanaduspension*): 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 under hazardous or hard working conditions (defined by categories of professions) for a certain period of time have the right to retire up to ten years before the legal pension age. The value of a year of pensionable service is also increased, the size depending on the profession.

Superannuated pension (*väljateenitud aastate pension*): For specific professions (e.g. police officers, pilots, seamen, artists etc.) pension is available before normal retirement age, given that they have the 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 old-age pension. In additions, there are a few special occupational pensions (e.g. judges, chancellor of justice, army, etc.), regulated by special acts.

Pension for incapacity to work (*töövõimetuspension*) or disability pension: is granted to people aged 16 and above who are declared permanently incapacitated for work with the 40 to 100 per cent loss of the capacity for work, and who have the required length of service, which depends on the age of the person. The pension depends on the same three components as the state old-age pension, but also on the extent of person's work incapacity. There is no restriction on work and full accumulation with earnings is possible. Upon attaining the pension age, the person is transferred to old-age pension.

Due to the work ability reform that is taking effect since January 2016 there will be a new work ability allowance (*töövõimetoetus*) that will gradually replace the pension for incapacity to work. The sum of the new allowance depends whether the person has partial or no work ability and on the amount of simultaneous labour market earnings. Assessment of ability to work for new entrants starts from July 2016. Those who are currently receiving pension for incapacity for work are gradually transferred to the new benefit scheme from January 2017.

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. The pension depends on rights to the old-age pension earned by the provider and the number of family members. There are lower limits to pensions.

1.2.2 Benefits for families with children

There are various forms of support for families with children.

- 1) Universal family benefits that mainly depend on the age and number of children.
- 2) A means-tested family benefit (*vajaduspõhine peretoetus*) that depends both on the household income and the number of children.
- 3) 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.
- 4) Tax allowances and deductions depending on the number of children or expenditures on children. These are described in detail below where we discuss income taxation.
- 5) Benefits and services provided by local municipalities – additional birth grants, additional social assistance benefits, child's school allowance (at the beginning of the school year), etc.
- 6) Special benefits for disabled children.
- 7) 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 as they are not simulated in EUROMOD.

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)*.¹ If a person is entitled to several types of family benefits, these benefits are usually determined and disbursed simultaneously. 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 and non means-tested.

Child allowance (*lapsetoetus*): a non means-tested benefit per dependent child per month. The amount depends on the number of children in the family.

Single parent child allowance (*üksikvanema lapse toetus*): a non means-tested benefit, paid as a supplement to the child allowance. Single parents are the parents of resident dependent children whose birth registration certificate does not have an entry concerning the father.

Childcare allowance (*lapsehooldustasu*): a non means-tested monthly benefit 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. Since 1st January 2009 if a parent receives parental benefits then the parent cannot receive the child care allowance also for any other children.

Allowance for a parent raising 7 or more children (*7 ja enamalapselise pere vanema toetus*): It is a special monthly allowance for the parent of seven or more children. From July 2017 there will be a new scheme of large family benefit with two tiers: 200 EUR per month for families with three to six children and 370 EUR per month for families with at least seven children.

Conscript's child allowance (*ajateenija lapse toetus*) is a monthly allowance applicable to the child whose parent serves in the Estonian Defence Forces in case the child receives child allowance.

Foster care allowance (*eestkostel või perekonnas hooldamisel oleva lapse toetus*) is paid for a child who is raised by foster parents, and who receives child allowance payments.

Childbirth allowance (*sünnitoetus*). 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.

Adoption allowance (*lapsendamistoetus*). An adoptive parent has the right to receive adoption allowance, if childbirth allowance has not been paid to the family for the same child earlier.

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.

Means-tested family benefit (*vajaduspõhine peretoetus*) is a monthly benefit that is paid to households with children whose average income during previous three months is below a certain threshold or who receive the subsistence benefit.

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 an 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 a delivery with complications,

¹ Note that from 1st January 2017, this will be replaced by the *Family Benefits Act (Perehüvitiste seadus)*.

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. The entitlement is based on her average gross income taxed with social tax (i.e. earnings) in the previous calendar year. It is subject to the income tax.

Parental benefit (*vanemahüvitis*) compensates for labour income not received by stay-at-home parent after a child birth. The size of the benefit is calculated according to the applicant's average gross income taxed with social tax (i.e. earnings) in the previous calendar year. Partial accumulation with labour earnings allowed. Duration is up to 18 months. The parental benefit is subject to income tax.

1.2.3 Unemployment benefits and social assistance benefits

Unemployment insurance benefit (*töötuskindlustushüvitis*) is a benefit financed from the unemployment insurance contributions. The level of the UI benefit depends on the previous average gross earnings with an upper ceiling and a floor. The maximum duration of benefits ranges from 180 to 360 days, depending on the length of contribution period. In order to receive an unemployment insurance benefit, additional requirements have to be met, such as being involuntarily unemployed, being registered as unemployed and looking actively for a job. UI benefit is subject to income tax.

Unemployment allowance (*töötutoetus*) is a flat rate benefit for those who do not fulfil the eligibility criteria for UI benefit (e.g. students, persons who terminated their previous employment voluntarily) 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 in order to receive UA benefits. Additional activity criteria must be fulfilled. 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. Maximum duration is generally 270 days.

Severance payments (*koondamishüvitis*): 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 entitlement depends on previous work record and ranges from 1 to 3 months' salary.

There are also **training allowances (*stipendium*)** and **transport and accommodation allowances (*sõidu- ja majutustoetus*)** for the unemployed that are meant to cover actual costs of participation in active labour market measures (training, work practice). These are not strictly benefits and therefore not included in EUROMOD.

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. Duration is unlimited, but granted and renewed on a monthly basis.

Annual refund to low-paid employees (*madala sissetulekuga töötava isiku iga-aastane tagasimakse*) is a new benefit scheme in force since January 2016 and its first pay-outs will be delivered in spring 2017 on the basis of submitted tax report for 2016. It is an annual non-taxable income support for low-paid workers to tackle in-work poverty, create incentives for people who are out of the labour market to enter/return and move to full-time employment, and also to facilitate declared employment relationships. People who are at least 18 years old residents of Estonia and have been in full-time employment for at least six months in the previous calendar year are considered to be eligible for the benefit if their annual taxable income is smaller than the ratio of annual benefit rate divided by 0.35. The entitlement is calculated according to the

recipient's annual taxable income, final tax liability (limits the maximum amount of benefit), months in work and the annual benefit rate, which is established for every year in the State Budget Act. The sum of benefit is proportional to the months spent in the employment in the previous year.

1.2.4 Social benefits for the disabled

The **social benefits paid to people with disabilities** (*puuetega inimeste sotsiaaltoetused*) depend on the extent of their disability, divided into three categories: moderate, severe and profound. The degree of severity of disability and the necessity for additional expenses due to the disability of a person is established taking into account restrictions on participation in daily activity and social life and the need for personal assistance, guidance or supervision. There are several different benefits: **disabled child allowance, the disability allowance for a person of working age, the disability allowance for a person of retirement age, disabled parent's allowance, a rehabilitation allowance, an education allowance, an in-service training allowance, and a work allowance.** The benefits are calculated on the basis of the rate of social benefits for disabled persons. Benefits are non-taxable. It often accumulates with pension for incapacity to work (*töövõimetuspension*) and old-age pension (*vanaduspension*). Since 1st January 2016, the administration of rehabilitation allowance and work-related allowance moved from the Estonian National Insurance Board to the Unemployment Insurance Fund as part of the Work Ability Reform.

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.

1.2.5 Health insurance benefits

Health insurance benefits (*ravikindlustushüvitis*) are regulated by the *Health Insurance Act* (*Ravikindlustuse seadus*) and compensate the insured persons for the cost of disease prevention and treatment, the cost of medicines and medical appliances and provide benefits for temporary incapacity for work and other benefits. Insured persons are residents for whom the social tax is paid by their employer, the state or by themselves if self-employed (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. Health insurance benefit is either in kind (health service, necessary medicinal products or medical device), or in cash. Health insurance benefits in cash are the following.

Benefits for temporary incapacity for work (*ajutise töövõimetuse hüvitis*) provide an earnings-related benefit for periods of absence from work due to illness or for caring for another person. The types of benefit for temporary incapacity for work are: **sickness benefit; maternity benefit** (see above); **adoption benefit** and **care benefit**. The benefits for incapacity for work are calculated on the basis of the insured person's income (on which the social tax was paid during the previous year). The replacement rate and duration of benefits varies.

Adult dental care benefit (*täiskasvanute hambaraviteenuse hüvitis*) compensates for some groups (such as old-age pensioners, work incapacity pensioners, pregnant women and mothers of children up to 1 year of age and those having greater need for dental treatment because of sickness) a certain amount of their dental treatment and dentures.

Supplementary benefit for pharmaceuticals (*täiendav ravimihüvitis*) is for those people who have high expenditures on medical products.

1.2.6 Local benefits

According to the *Local Government Organisation Act (Kohaliku omavalitsuse korralduse seadus)* local municipalities can provide local benefits to their residents. Local benefits vary largely across municipalities, differing by type, amounts, application conditions etc. Ainsaar *et al* (2004) showed that the majority of the municipalities give family and child support related local benefits. The most common are benefits for birth support, in addition emergency support, large family benefits etc are present in many municipalities.

1.3 Social contributions

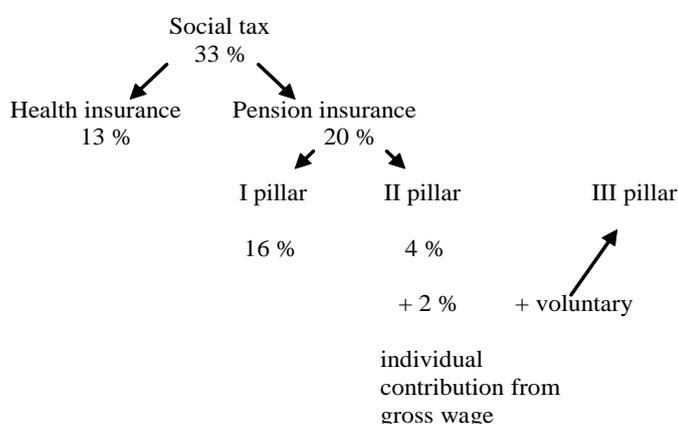
Social insurance contributions finance pensions, health care, and unemployment insurance benefits. Previous contributions determine the eligibility and amount of contributory benefits (unemployment insurance benefits, maternity benefits, incapacity to work benefits, pensions).

Social tax (*sotsiaalmaks*) is paid by employers and self-employed and funds state pension insurance and health insurance. Tax rate is 33% and the tax base is gross wage. 13% is transferred into the Estonian Health Insurance Fund and 20% transferred into pension insurance schemes. From 2017 the contributions to the health insurance will be 12.5% and from 2018 onwards 12%. The social tax rate declines to 32.5% and 32%, respectively.

In case the person participates in the funded pension insurance scheme (the so-called 2nd 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 2nd pillar (see Figure 1 below). Employee may also contribute to the voluntary pension schemes (3rd pillar) which can be deducted from the income tax base up to a certain limit. There were temporary changes in funded pension contributions in 2009-2010 and 2014-2017.

There is a minimum monthly base for social tax calculation, set by the *State Budget Act (Riigieelarve seadus)*. There is no upper ceiling of social contributions, except for self-employed. For certain inactive groups of people (e.g. parents on maternity leave, registered unemployed, military service, etc.) the state pays the social tax, based on the minimum social tax base in most cases, 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.

Figure 1. Social tax and contributions to pension schemes, 2016



Voluntary private pension contributions (3rd 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.

Unemployment insurance contributions (*töötuskindlustusmakse*) form a compulsory insurance scheme that covers an employee in case of becoming unemployed, collective closing or insolvency of the employer, and an employer in case of collective redundancies. Unemployment insurance contributions are 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 the 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 unemployment insurance contribution rates are usually set annually.

1.4 Taxes

Personal income tax (*füüsilise isiku tulumaks*) is paid on personal income. The base of the income tax is relatively broad. The main exceptions are various child benefits and social assistance benefits. Different income sources are taxed uniformly (with a few exceptions). The personal income tax system is an individual system, though married couples may also file a joint tax report if they wish (to share tax allowances). There are several allowances and deductions, which are discussed in detail in Section 2.7. The main tax allowances apply to the withholding tax as well, the rest can be claimed in the following year when filing the tax report. Therefore, there is often a difference between taxes withheld and taxes paid after filing a tax report. Taxable income from **self-employment** is equal to gross 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 total income a self-employed person has. Taxable business income is derived on individual basis.

Land tax (*maamaks*): a state tax received in full amount by local municipalities. The amount of land tax is calculated by multiplying the taxable price of the land by the land tax rate. The rate of land tax is established by the local government council annually in the range of 0.1-2.5%. Land tax is paid by the owner of the land, in certain cases also by the user of the land. There are several allowances (e.g. for homeowners, pensioners).

Value Added Tax (*käibemaks*): the standard rate in Estonia is 20% of the taxable value of a good or service, and reduced rates (9% and 0%) apply to specific services and goods.

Excise taxes (*aktsiisimaksud*): excise duties are set for alcohol, tobacco, electricity, fuel and non-alcoholic beverage packages. In recent years, several excise tax rates have been raised, both to raise tax revenues and to influence consumers' behaviour.

There are a few other minor taxes (tax on gambling, tax on heavy vehicles, customs duties, local taxes), which provide a relatively small share of revenue and do not affect household budgets considerably.

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 in EUROMOD. Some are beyond its scope entirely and are neither included in the EUROMOD database nor in its output income variables (e.g. indirect taxes). 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 2.1 and 2.2 classify each of the main tax-benefit instruments (and some minor ones introduced above) into one of these three groups and provide 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 using the most recent dataset of combined EU-SILC and national SILC data. Information on earlier input datasets for the Estonian model can be found in earlier country reports.

Most of the benefits that are simulated in EUROMOD are universal family benefits that depend on the number of children and their age. Also, the subsistence benefit and the means-tested family benefit, as a support of last resort, are 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 common assumptions across countries.

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 a few cases, they can be easily calculated.

For the income tax, both final tax liabilities and withheld tax amounts are calculated. The final tax liability takes into account additional deductions that can only be applied in the annual tax declaration. Annual refund of income tax for low-paid employees is also simulated. This decreases total final tax burden, and is not counted as a benefit.

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

Table 2.1 Simulation of benefits in EUROMOD

Benefit	Model variable	2011	2012	2013	2014	2015	2016	Comments
Unemployment insurance benefit (<i>töötuskindlustushüvitis</i>)	bunct_s	PS	PS	PS	PS	PS	PS	Eligibility from data
Unemployment allowance (<i>töötutoetus</i>)	bunnc_s	PS	PS	PS	PS	PS	PS	Eligibility from data
Severance payments (<i>koondamishüvitis</i>)	yunsv	I	I	I	I	I	I	No data on full contribution history
Paid sick leave	bhl	I	I	I	I	I	I	No data on contribution history and health

Benefit	Model variable	2011	2012	2013	2014	2015	2016	Comments
Disability pension (<i>töövõimetuspension</i>)	pdi	I	I	I	I	I	I	No data on contribution history, no exact data on health status. Changes in 2017.
Social benefits paid to people with disabilities		IA	IA	IA	IA	IA	IA	No exact data on health status. Income is part of “other benefits” (bsals) or disability pension (pdi).
Old age pension (<i>vanaduspension</i>)	poa00	I	I	I	I	I	I	No data on contribution history
National pension (minimum old age pension, <i>rahvapension</i>)		IA	IA	IA	IA	IA	IA	No data, part of other pensions
Survivors' pension	psu	I	I	I	I	I	I	No data on contribution history
Maternity benefit (<i>sünnitushüvitis</i>)	bmapr	I	I	I	I	I	I	No data on contribution history
Parental benefit (<i>vanemahüvitis</i>)	bmact	I	I	I	I	I	I	No data on contribution history. No data which parent receives benefits
Childcare allowance (<i>lapsehooldustasu</i>)	bcc00_s	S	S	S	S	S	S	
Child allowance (<i>lapsetoetus</i>)	bch00_s	S	S	S	S	S	S	
Single parent child allowance (<i>üksikvanema lapsetoetus</i>)	bchlp	IA	IA	IA	IA	IA	IA	No data on the birth certificate of the child, or not included separately
Childbirth allowance (<i>sünnitoetus</i>)	bchba_s	S	S	S	S	S	S	
Large family parent allowance (<i>seitsme- ja enamalapselise pere vanema toetus</i>)	bcclg_s	S	S	S	S	S	S	
Means-tested family benefit (<i>vajaduspõhine peretoetus</i>)	bsach_s	-	-	S	S	S	S	
Subsistence benefit (<i>toimetulekutoetus</i>)	bsa00_s	S	S	S	S	S	S	
Scholarships and grants (<i>õppetoetused ja stipendiumid</i>)	bed	I	I	I	I	I	I	No data on grades
Other benefits (not explicitly stated in the data set)	bsals	IA	IA	IA	IA	IA	IA	Various small benefits are not directly simulated, as there is no information in the data; they are aggregated in “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; “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 2.2 Simulation of taxes and social contributions in EUROMOD

Taxes and social contributions	Model variable	Treatment in EUROMOD						Why not fully simulated?
		2011	2012	2013	2014	2015	2016	
Employer's social insurance contributions	ils_sicer							
Unemployment insurance contributions	tscerui_s	S	S	S	S	S	S	
Pension insurance contributions (1st pillar and the transfer to the 2nd)	tscerpi_s ttferpi_s	S	S	S	S	S	S	
Health insurance contributions	tscerhl_s	S	S	S	S	S	S	
Employee social insurance contributions	ils_sicee							
III pension pillar		I	I	I	I	I	I	Voluntary size of contributions
Unemployment insurance contributions	tsceeu_s	S	S	S	S	S	S	
Funded pension insurance contributions (2nd pillar)	tpceepi_s	S	S	S	S	S	S	
Self-employed social insurance contributions	ils_sicse							
Health insurance contributions	tscsehl_s	S	S	S	S	S	S	
Pension insurance contributions (1st pillar and the transfer to the 2nd)	tscsepi_s ttfsepi_s	S	S	S	S	S	S	
Funded pension insurance contributions (2nd pillar)	tpcsepi_s	S	S	S	S	S	S	
Contributions paid on social benefits by the central government	ils_sicct							
Health insurance contributions for those receiving unemployed benefits	tsccth_s	S	S	S	S	S	S	

Health and pension insurance contributions (the 1st pillar) for those receiving parental benefit, childcare allowance or large family parental allowance	tscctpi_s tsccthl_s	S	S	S	S	S	S	
Pension insurance contributions (the 2nd pillar) for those receiving parental benefit	tpcctpi_s	S	S	S	S	S	S	
Income Tax (final)	tin_s	S	S	S	S	S	S	
Withholding income tax	tinwh_s	S	S	S	S	S	S	
Refund to low-paid employees	tinrf_s							S
Land tax	tpr	I	I	I	I	I	I	No information on value of land or tax rates
Other local taxes		E	E	E	E	E	E	
Indirect taxes		E	E	E	E	E	E	No information on consumption expenditures

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

The structural changes in the period 2009-2015 were the introduction of the means-tested family benefit in 2013, a minor change in its eligibility criteria in 2014 (all households that receive the subsistence benefit are also eligible for needs-based family benefits), a temporary reduction of employee funded pension contribution rates in 2009-11 and an increase in 2014-2017. The main changes in 2016 were the introduction of annual refund to low-paid employees in 2016 (despite the first pay-outs being made in 2017, to reflect the accrual accounting method of taxes and benefits), the detachment of the child tax allowance from the basic tax allowance and fixing its level independently, and the introduction of an additional category of deductible expenses (20% of rental income) affecting the final liability of income tax. Other changes were parametric, such as changes in tax allowances, benefit amounts, and tax and contribution rates.

2.2 Order of simulation and interdependencies

Table 2.3 shows the order in which the main elements of the Estonian system in 2011-2016 are simulated. Policies, which are included into the model, but not used in the EUROMOD baseline simulations are marked as “*off*”. Policies, which are not applicable in a specific year are marked as “n/a”. The spine structure is largely the same for all six years.

The Estonian policy simulations start with the minimum wage (switched off in the baseline). Family benefits and unemployment benefits are simulated next, as credited social contributions depend on these and some benefits are taxable. After the benefits, we simulate employee and

employer social insurance contributions. The contributions are deducted from the income tax base and therefore need to be simulated before the personal income tax.

More specifically, there are the following dependencies between the instruments:

- Minimum wage (if switched on) affects employment earnings which is the basis for employer and employee SIC, income tax, subsistence benefit, means-tested family benefit, and annual refund to low-paid employees.
- 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 benefits and family benefits (child care benefits, parental benefits) social insurance contributions are 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.
- The subsistence benefit and the means-tested family benefit depend on income net of employee SIC and withholding income tax. Most of benefits are also included in the means-test.
- The upper limit of annual refund to low-paid employees is a final liability of income tax and although the benefit itself is not taxable, it is considered included in the means-test for the subsistence benefit and means-tested family benefit.

Table 2.3 EUROMOD spine: order of simulation

Policy	2011	2012	2013	2014	2015	2016	Description
SetDefault_ee	on	on	on	on	on	on	DEF: default values for variables
UAA_ee	switch	switch	switch	switch	switch	switch	SWITCH: Uprating by Average Adjustment (ON=uprating by averages; OFF=uprating by statutory indexation)
Uprate_ee	on	on	on	on	on	on	DEF: uprating factors
ConstDef_ee	on	on	on	on	on	on	DEF: constants
ILDef_ee	on	on	on	on	on	on	DEF: income concepts
TUDef_ee	on	on	on	on	on	on	DEF: assessment units
BTA_ee	switch	switch	switch	switch	switch	switch	SWITCH: Benefit Take-up Adjustments (ON=non take-up; OFF=full take up)
FYA_ee	n/a	n/a	switch	n/a	n/a	n/a	SWITCH: Full Year Adjustments, i.e. model annual policies instead of 30th June (switch on/off to apply)
yem_ee*	off	off	off	off	off	off	DEF: minimum wage
neg_ee	on	on	on	on	on	on	DEF: recode negative incomes (e.g. self-employment income) to zero
bch00_ee	on	on	on	on	on	on	BEN: child allowance (lapsetoetus)
bchl_g_ee**	n/a	n/a	n/a	n/a	n/a	n/a	BEN: allowance for families with 3+ children (kolme- ja enamalapselise pere toetus)
bched_ee***	n/a	n/a	n/a	n/a	n/a	n/a	BEN: school allowance (koolitoetus)

Policy	2011	2012	2013	2014	2015	2016	Description
bchba_ee	on	on	on	on	on	on	BEN: childbirth allowance (sünnitoetus)
bcc00_ee	on	on	on	on	on	on	BEN: childcare allowance (lapsehooldustasu)
bcclg_ee	on	on	on	on	on	on	BEN: parental allowance for families with 7+ children (seitsme- ja enamalapselise pere vanema toetus)
bunct_ee	on	on	on	on	on	on	BEN: unemployment insurance benefit (töötuskindlustushüvitis)
bunnc_ee	on	on	on	on	on	on	BEN: unemployment assistance benefit (töötua abiraha)
tscer_ee	on	on	on	on	on	on	SIC: employer social insurance contributions
tsct_ee	on	on	on	on	on	on	SIC: credited social insurance contributions
tscee_ee	on	on	on	on	on	on	SIC: employee social insurance contributions
tintaag_ee	on	on	on	on	on	on	TAX: allowance for self-employment income from agriculture (applicable to income tax and self-employed SIC)
tsese_ee	on	on	on	on	on	on	SIC: self-employed social insurance contributions
tinwh_ee	on	on	on	on	on	on	TAX: withholding income tax (jooksvalt kinnipeetud tulumaks, current liability)
tin_ee	on	on	on	on	on	on	TAX: income tax (deklaratsioonijärgne ehk lõplik maksukohustus, final liability)
tinrf_ee	n/a	n/a	n/a	n/a	n/a	on	TAX: refund to low-paid employees (madalalpalgalistele suunatud tagasimakse)
bsa00_ee	on	on	on	on	on	on	BEN: subsistence benefit (incl. housing component) (toimetulekutoetus)
bsach_ee	n/a	n/a	on	on	on	on	BEN: subsistence benefit for families with children (vajaduspõhine lapsetoetus)

* Simulated but switched off in the baseline.

** Simulated for 2005-2007 in the model (was abolished from 1st July 2007).

*** Simulated for 2005-2008 in the model (was abolished from 2009).

2.3 Policy constants

Main policy parameters are defined as constants in a separate module. These include benefit amounts, tax and contribution rates, tax allowances, various upper and lower thresholds, and pension age. Their values usually vary over time. Some of them are specified on a monthly and some on a yearly basis, corresponding to how they are defined in legislation. In addition, there are changes in the currency of monetary values as Estonia changed from krown to euro on 1st January 2011.

Table 2.4 Simulation of taxes and social contributions in EUROMOD

Name	Period	Abbreviation	Policies where used
Qualifying period for UA: min number of months in work	-	\$UAB_QperMin	unemployment assistance benefit
Qualifying period for UA: over last ... months	-	\$UAB_QperTot	unemployment assistance benefit
Qualifying period for UI: min number of months in work	-	\$UI_QperMin	unemployment insurance benefit
Qualifying period for UI: over last ... months	-	\$UI_QperTot	unemployment insurance benefit
Minimum wage	m	\$Minwage	minimum wage, social insurance contributions by self-employed, unemployment allowance
Lagged minimum wage	m	\$MinWage_lag1	unemployment insurance benefit
Amount of unemployment allowance (UA)	m/d	\$UAB_amount	unemployment insurance benefits and unemployment allowance

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Name	Period	Abbreviation	Policies where used
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
Child allowance: first child	m	\$CB_Ch1	child allowances
Child allowance: second child	m	\$CB_Ch2	child allowances
Child allowance: third+ child	m	\$CB_Ch3plus	child allowances
Multiplier for parental allowance for large families	-	\$BCCLG_Mult	parental allowance for families with 7+ children
Amount of birth allowance	y	\$BA_amount	birth allowance
Average taxable wage in the previous calendar year	d	\$UI_AvEarn	unemployment insurance benefit
Minimum level of UI benefit		\$UI_LowLim	unemployment insurance benefit
Main amount of subsistence benefit	m	\$SA_AmountMain	subsistence benefit
Additional amount of subsistence benefit	m	\$SA_AmountExtra	subsistence benefit
Average housing costs	m	\$SA_AvHhCost	subsistence benefit
Take-up threshold for subsistence benefit	m	\$SA_TakeUpLim	subsistence benefit
Means-test threshold of subsistence benefit for families with children	m	\$SACH_threshold	subsistence benefit for families with children
Subsistence benefit for families with children: amount for families with 1 child	m	\$SACH_Ch1	subsistence benefit for families with children
Subsistence benefit for families with children: amount for families with 2+ children	m	\$SACH_Ch2plus	subsistence benefit for families with children
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 nd 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
SIC rate for the pension contributions (the 2nd pillar) for those on maternity leave	-	\$SICCT_RateMatLeave	social insurance contributions by state (credited contributions)
Employer SIC rate for the unemployment insurance contributions	-	\$SICER_RateUI	social insurance contributions by employer
Employee SIC rate for the unemployment insurance contributions	-	\$SICEE_RateUI	social insurance contributions by employee
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

Name	Period	Abbreviation	Policies where used
Amount of basic allowance for income tax	y	\$IT_BasicAlw	withholding income tax and final income tax
Child allowance for income tax, for each child from Nth	-	\$IT_ChildAlwMult	final income tax
Amount of child allowance for income tax	y	\$IT_ChildAlw	final income tax
Amount of pension allowance for income tax	y	\$IT_PensionAlw	withholding income tax and final income tax
Upper limit on voluntary pension contributions for income tax, amount	y	\$IT_PensUpLimAmount	final income tax
Upper limit for voluntary pension contributions for income tax, rate	-	\$IT_PensUpLimRate	final income tax
Upper limit on deductible expenditure for income tax, amount	y	\$IT_ExpUpLimAmount	final income tax
Upper limit on deductible expenditure for income tax, rate	-	\$IT_ExpUpLimRate	final income tax
Agriculture allowance for income tax	y	\$IT_AgriAlw	self-employed tax allowance, final income tax
Benefit rate of the refund to low-paid employees	m	\$TINRF_rate	Refund to low-paid employees
Withdrawal rate of the refund to low-paid employees	-	\$TINRF_wdr_rate	Refund to low-paid employees
Maternity pay: average taxable earnings (t-2)	m	\$MP_AvEarn	extra pension insurance contributions (2nd pillar) for those receiving parental benefit

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

2.4 Policy switches

There are three switches used in the Estonian model.² First, a switch for choosing between uprating (non-simulated) public pensions (UAA_ee) according to changes in average amounts (switch set to *on*) or statutory indexation (switch set to *off*, the default). Second, a switch for controlling benefit take-up modelling (BTA_ee). If the switch is set to *on* then partial take-up is applied (the default), otherwise full take-up is assumed. Another switch (FYA_ee) allows one to choose between modelling policies as of 30th June (switch set to *off*, the default) and modelling annual policies (switch set to *on*), which takes into account within-year policy changes.

2.5 Social benefits

2.5.1 Unemployment insurance benefit (bunct_ee)

- **Brief description**

Unemployment insurance (UI) benefit (*töötuskindlustushüvitis*) is a benefit for the unemployed and it depends on previous earnings and contributions to the insurance scheme.

² Policy switches are denoted with ‘switch’ in the policy spine (for a given policy year), while their default values (*on* or *off*) are set in a separate dialogue box in the model.

- *Definitions and eligibility conditions*

The unit of analysis is an individual person. To be considered eligible, a person must be involuntarily unemployed, aged from 16 to the retirement age and not receiving old age pension (which is possible in the case of early retirement), have worked and made contributions for at least 12 months during the previous 36 months, registered as unemployed and looking actively for a job. UI benefit is 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 Service (PES) at a fixed date. As persons receiving old-age pension or those older than the 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.

- *Benefit amount*

During the first 100 calendar days of unemployment the replacement rate is 50% of the previous gross earnings and 40% afterwards. The gross earnings refer to the average daily gross earnings of the person in the previous calendar year, subject to an upper limit of three times average taxable wages in the previous calendar year. 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, while the last three months are disregarded. There was no lower limit for the benefit in 2005 and 2006; from 1st January 2007 to 31st June 2009 it was 1,000 EEK; since 1st 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 were paid up to 180 days since the contribution period could not exceed five years as the accumulation only started from January 2002. Since 2007 it can be up to 270 days and since 2010 up to 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 2.5 Overview of unemployment benefits; in 2005-2016

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unemployment insurance benefits												
Maximum duration (days)	180	180	270	270	270	360	360	360	360	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	Less than 5 years		Less than 55 months								Less than 60 months	
270 days	5-10 years		56-110 month								60-120 months	
360 days	10 or more years		110 or more months								120 or more months	
Basis for benefit entitlement	Person's average earnings in the last 12 months		Person's average earnings in the first 9 months over the preceding 12 months									
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)	562 EEK	630 EEK	748 EEK	885 EEK	1,015 EEK	894 EEK	60.46 EUR	63.99 EUR	68.07 EUR	75.87 EUR	77.34 EUR	85.2 EUR
Minimum benefit	None		UA benefit				50% MW of previous year					
Unemployment allowance												
Maximum duration (days)	270	270	270	270	270	270	270	270	270	270	270	270
Amount daily benefit (EUR)	14.3 EEK	14.3 EEK	32.9 EEK	32.9 EEK	32.9 EEK	32.9 EEK	2.11 EUR	2.11 EUR	3.27 EUR	3.62 EUR	4.01 EUR	4.41 EUR
Required contribution period (days)	180	180	180	180	180	180	180	180	180	180	180	180
Eligible period for contribution (months)	12	12	12	12	12	12	12	12	12	12	12	12

Source: Unemployment Insurance Fund; various legal acts.

- **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 and some rules are considered 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, e.g. for replacement rates calculations).³

Simulated unemployment duration (*lunmy_s*) is set equal to the maximum of observed unemployment duration (*lunmy*) and observed benefit receipt (*bunctmy*). It is effectively assumed that unemployment spells start in the reference year. Simulated unemployment duration is also used for unemployment allowance calculations. With regards to the minimum qualifying contribution period, those currently unemployed and in receipt are assumed to satisfy it, while those currently unemployed and not in receipt are assumed to have not passed it.

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 determined according to the rules above, using modelled contribution history, while also controlling for the unemployment duration (*lunmy_s*).

Benefit entitlement is calculated based on previous earnings (or alternatively on imputed wage) and benefit duration, subject to the lower and upper thresholds. 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, the entitlement is set to zero. Finally, benefit amount is adjusted with the number of months in receipt (*bunctmy_s*).

2.5.2 Unemployment allowance (*bunnc_ee*)

- **Brief description**

Unemployment allowance (*töötutoetus*) is paid to those people who do not qualify for unemployment insurance benefit or the period of UI benefit has ended. In 2009, UI benefit could be received 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. To be considered eligible, a person must be unemployed, aged from 16 to the retirement age and not receiving old age pension, must have been employed or engaged in activity equivalent to working 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

³ Employment changes are modelled in combination with a specific add-on tool and are not part of the baseline simulations.

allowance is formally income tested: only the unemployed whose income is below the unemployment allowance are entitled to the benefits.

- ***Benefit amount***

Flat rate of 32.90 EEK per day in 2009-2010, 2.11 EUR per day in 2011-2012, 3.27 EUR per day in 2013, 3.62 EUR in 2014, 4.01 EUR in 2015 and 4.41 EUR per day in 2016. 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 the unemployment insurance benefit. The eligibility rule differs as self-employed are not excluded from the UA benefit. 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 UA benefit amount. As it is not known if and how this income test is followed in practice, it is not applied to those observed in receipt in the baseline simulations.

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, taking overall unemployment duration also into account. Finally, benefit amount is adjusted with the number of months in receipt (`bunncmy_s`).

2.5.3 Child allowance (`bch00_ee`)

- ***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 was linked to the Child Allowance Rate (CAR) until 2014, which was equal to 150 EEK until 2010 and 9.59 EUR in 2011-2014. The benefit was two times CAR for the first and second child and 6 x CAR for the third and any consequent child in 2009-2013. Since 1st July 2013 the benefit was 8 x CAR for the third and any consequent. Note that this additional increase of 2 x CAR was not included in the means test of subsistence benefits or means tested family benefits. Since 2015 the child allowance was unlinked from the CAR: the benefit was set to 45 EUR for the first and second child and 100 EUR for the third and any consequent child per month. In 2016 the amount for the first two children was raised to 50 EUR per month.

Table 2.6 Overview of state family benefits, in 2009-2016

Benefit	Frequency	Unit	Basic formula in 30th of June 2009 (and changes in 2009-2016)
Childbirth allowance	Lump sum	Family	5,000 EEK (320 EUR since 2011)
Adoption benefit	Lump sum	Family	5,000 EEK (320 EUR since 2011)
Child allowance	Monthly	Per child	1 st and 2 nd child 2 x CAR; 3 rd and more 6 x CAR (8 x CAR since 1 July 2013), since 2015 a flat rate benefit. In 2015, 45 EUR for the first and second child and 100 EUR for the third and any consequent child. In 2016 the amount for the first two children was raised to 50 EUR per month
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
Allowance for one parent of a family with 7 and more children	Monthly	Family	2.2 x CCR
Single parent child allowance	Monthly	Per child	2 x CAR
Allowance for a child in guardianship or in foster care	Monthly	Per child	240 EUR
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 2009-2010 and 9.59 EUR since 2011); CCR – Childcare allowance rate (1,200 EEK in 2009-2010 and 76.7 EUR since 2011).

- ***EUROMOD notes***

Note that we have monthly family benefits, while the age variable is recorded as of at the end of income year, 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 the case of child allowance, instead of undersimulating (assuming no eligibility for the year when reaching the age limit) as this results in a better match with corresponding age profiles and the aggregate results from the register data.

2.5.4 Allowance for families with 3 or more children (bchlg_ee)

- ***Brief description***

Allowance for families with 3 or more children (*kolme- ja enamalapselise pere toetus*) was a quarterly universal non-means-tested non-taxable benefit paid to families where there were three or more children below an age limit. This was abolished as a separate instrument on 1st July 2007, when it was effectively incorporated in the main child allowance. Further details can be found in earlier country reports.

2.5.5 School allowance (bched_ee)

- ***Brief description***

School allowance (*koolitoetus*) was an annual universal non-means-tested non-taxable benefit paid to families with children in the compulsory schooling age to help them with the start of the school year. It was paid out in August, in general. It was abolished from 1st January 2009. Further details can be found in earlier country reports.

2.5.6 Childbirth allowance (bchba_ee)

- *Brief description*

One of the parents has the right to receive childbirth allowance (*sünnitoetus*). 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.

- *Benefit amount*

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

- *EUROMOD notes*

There is no information about the status of being an adoptive parent, guardian or caregiver in the underlying datasets.

2.5.7 Childcare allowance (bcc00_ee)

- *Brief description*

Childcare allowance (*lapsehooldustasu*) is a monthly universal non-means-tested non-taxable benefit paid to families with young children.

- *Definitions and eligibility conditions*

The unit of analysis is the same as for child allowance (see above [2.5.3](#)). 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. A parent is not eligible if she (or he) is receiving the parental benefit for any of the eligible children (before 2009 the child related to the maternity or parental benefit were excluded). There is an additional element for every child up to one year of age.

- *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 2009-2010 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 (6.43 EUR) 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 months and, therefore, not simulated from 2006 onwards in EUROMOD.

- *EUROMOD notes*

The benefit is allocated to the same person in the household who is receiving the 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.

2.5.8 Parental allowance for families with 7 or more children (bcclg_ee)

- *Brief description*

The allowance (*7 ja enamalapselise pere vanema toetus*) is targeted to families with a very large number of children. It is a monthly universal non-means-tested and non-taxable benefit. From July 2017 there will be a new large family benefit with two tiers: 200 EUR per month for families with three to six children and 370 EUR per month for families with at least seven children.

- **Definitions and eligibility conditions**

The unit of analysis is the same as for child allowance (see above [2.5.3](#)). There must be at least seven eligible children in the family.

- **Benefit amount**

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

2.5.9 Subsistence benefit (bsa00_ee)

- **Brief description**

Subsistence benefit (*toimetulekutoetus*) 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 a 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. The means-testing is based on household net income in the previous month (or average in the last 6 months if not receiving income on regular basis). Certain types of income are disregarded, 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, assigning 100% of the subsistence rate for the head of household and 80% for any other household member. Since 2015 the weights are as follows: first adult and children 100% and additional adults 80%. The subsistence rate was 750 EEK in 2005-2006, 900 EEK in 2007, 1,000 EEK in 2008-2010, 76.70 EUR in 2011-2013, 90 EUR in 2014-2015 and 130 EUR since 2016.

The “norm-space” of the household is derived as follows. First, the norm-space is 18m² per person in the household plus additionally 15m² per household (i.e. 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 the actual living space is used instead. If the area of the apartment is smaller than the norm-space, then the actual area is also taken as a basis for calculations. For a single pensioner applying for subsistence benefit, the norm-space can be up to 51m².

Income list

Income for the subsistence benefit is calculated using all current income except a few irregular benefits, such as childbirth allowance, other social assistance or benefits for the disabled, school allowance and large family allowance (both abolished by 2009). Since 2013 means-tested family benefits and the extra amount of child benefits for the third and subsequent children that was introduced on 1st of July 2013 (2 x CAR) are also excluded from the means test. Income concept refers effectively to 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 (see above);

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 practice, housings costs for “norm-space” depend further on the detailed rules by municipalities. In our case we approximate these with actual costs related to dwelling in proportion to housing size and applying an upper limit to avoid unreasonably large housing costs. We currently use the average actual (or predicted) housing cost from registry data as a ceiling, which was 1,205 EEK per month in 2009 and has increased thereafter (1,241 EEK in 2010, 84 EUR on 2011, 91 EUR in 2012, 108 EUR in 2013, 111 EUR in 2014, 115 EUR in 2015 and 2016).

Total housing cost variable includes also mortgage interest payments which hence must be deducted here. Note that while housing costs in EU-SILC 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 recall 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.

Means-testing

EUROMOD underlying datasets lack information on income specifically in the previous calendar month (or average in last 6 months). Instead, the model operates with average monthly incomes derived from annual figures.

Since 2015 children’s weight in the formula is equal to the 100% (instead of 80%), i.e. weights are: first adult=1; children=1 and additional adults = 0.8.

Non take-up

Benefit non take-up is modelled 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 2009 (and 12 EUR since 2011).

2.5.10 Means-tested family benefit (bsach_ee)

- **Brief description**

Means-tested family benefit (*vajaduspõhine peretoetus*) is a monthly benefit that is paid to households with children whose average income in the previous three months is below a certain threshold.

- **Definitions**

The unit of analysis is a household. Households whose income is below the income level of the means-tested family benefits and who have children eligible to child benefits are entitled to means-tested family benefits. Means-testing is based on current disposable income (i.e. net of withholding income tax). Income is calculated using the same income components as for the subsistence benefit (see 2.5.9).

The income level of the means-tested family benefit is established in the annual state budget and is linked to the relative poverty level two years earlier (e.g. in 2013 the relative poverty level of 2011 is used). Incomes are equivalised with the modified OECD scale, which is also used for relative poverty calculations. (The weights are: first adult=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.)

In 2013 the income level of the means-tested family benefit was 280 EUR per month for the first household member, 140 EUR for any additional adult (older than 13) and 84 EUR for every child under 14. In 2015 the threshold for the first household member was 329 EUR and in 2016 358 EUR per month. Since 2014 all households with children that receive the subsistence benefit are eligible for needs-based family benefit.

- **Benefit amount and duration**

Benefit amount depends on the number of eligible children in the family. In 2013-2014, the benefit was equal to 1 x Child Allowance Rate (CAR), 9.59 EUR, if there was one child in the household, and 2 x CAR (19.18 EUR) if there were two or more children in the household. Since 2015 the means-tested family benefit for a household with one child is 45 EUR and 90 EUR for households with at least two children.

Duration is unlimited, but granted and renewed every three months.

- **EUROMOD notes**

Means-testing

EUROMOD underlying datasets lack information on income specifically in the previous 3 months. Instead, the model operates with average monthly incomes derived from annual figures.

Non take-up

We do not model benefit non take-up. As the benefit was introduced only in the second half of 2013, no appropriate information about its take-up is yet available.

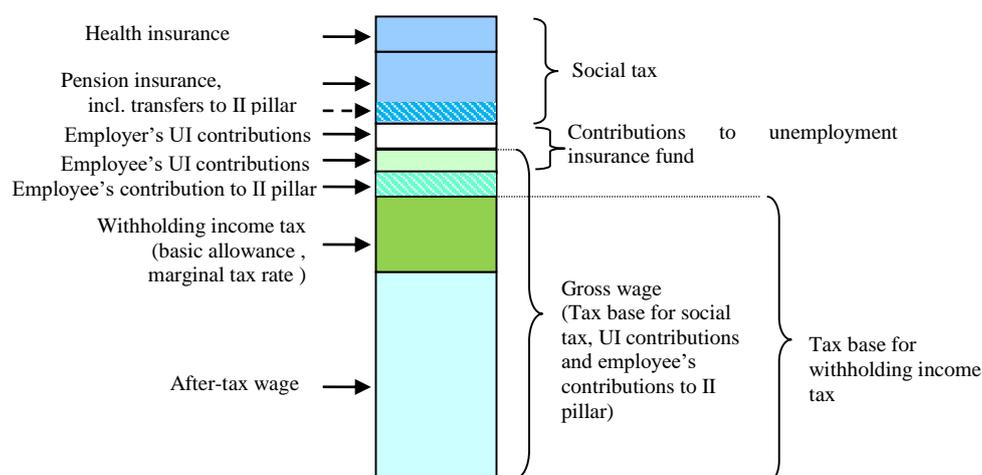
2.6 Social contributions

Social contributions are paid by employees, employers and self-employed. Social insurance is highly centralised, and the main contributions are formally named as a tax (*social tax*).

2.6.1 Employee social contributions (tscee_ee)

Employees and employers pay social contributions as a fixed percentage of gross wages (see Figure 2 for a schematic definition of the gross wage and other direct taxes on wages). The calculation of social contributions for self-employed is discussed in detail in Section 2.6.3.

Figure 2. Schematic composition of tax base of social contributions



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

Unemployment insurance contributions (tsceei_s)

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

Table 2.6 Unemployment insurance contribution rates

	2005	2006-2009 (May)	2009 (June-July)	2009 (Aug)-2012	2013-2014	2015-2016
Employers	0.5%	0.3%	1%	1.4%	1%	0.8%
Employees	1%	0.6%	2%	2.8%	2%	1.6%

Pension contributions to the funded scheme (tpceepi_s)

Contributions are calculated as 2% of the gross employment income for those who participate in the scheme. Note that between 1st July 2009 – 31st 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 1st January 2010, in which case also state contributions from the social tax (4%) were transferred. Other age groups could also continue to pay individual contributions (2%) from 1st January 2010, but no contributions from social tax were 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 were gradually resumed from 2011, when a 1+2% scheme is applied, and from 2012 in full amount of 2+4%.

For 2014–2017, there is a compensation mechanism that will transfer additional social tax revenues to the funded scheme. By 15 September 2013, people who had joined the second pillar

had an option to increase their contributions. About 106,000 people (approx. 16%) increased their contributions to 3% of gross wage (from usual 2%) and the share of social tax transferred to the funded scheme will increase from 4% to 6% of gross wage. The transfers to the funded scheme increased to 6% also for those 180,000 people who continued their contributions in 2010-2011, but did not choose to raise their contributions in 2014-2017.

- **EUROMOD notes**

In the national SILC 2012 dataset the information on making contributions to the funded pension scheme in 2011 is available for those only who are employed (variable *lpm*). We have merged this information directly to the EU-SILC dataset. For those who were not employed and whose participation information was missing we randomly simulated age-gender averages in the input data. In addition, the continuation of contributions in 2010-2011 and an increase of contributions in 2014-2017 was randomly assigned based on the register data of the Estonian National Social Insurance Board when preparing input data.

The following table shows the simulation of contributions based on the actual indicator of participation (*lpm*), the continuation of payments in 2010 (*lpm01*), an increase of contributions in 2014 (*lpm02*), birth year (*dag*) and relevant contribution rates.

Table 2.8 Contributions to the funded pension scheme in 2009-2017, % of employment income

Person's decision on individual contributions (variable <i>lpm01</i>) Year	Born 1942-1954		Born 1955 or later	
	Continues	Suspends	Continues	Suspends
2009 1 st January - 31 st May	2+4			
2009 1 st June - 31 st December	0+0			
2010	2+4	0+0	2+0	0+0
2011	2+4	1+2	2+2	1+2
2012-2013	2+4			
2014-2017	2+4	2+4	2+6	2+4
2014-2017* (option to increase contributions – variable <i>lpm02</i>)	-	3+6		

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 3rd pillar), using observed values from the data instead.

2.6.2 Employer social contributions (tscer_ee)

Employers pay the social tax, which is divided into a health insurance part and a pension insurance part. The latter is further allocated between the 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 the social tax, either total or health insurance part, on certain social benefits (see section 2.6.4 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 (variable `tferpi_s` in the EURMOD). The latter is 4-6 percentage points (out of 20%) for those participating in the funded scheme. (See section 2.6.1 above.)

Health insurance contributions

The total health insurance contributions are calculated as 13% of gross employment earnings until the end of 2016. From 2017 the contributions will be 12.5% and from 2018 onwards 12%.

Unemployment insurance contributions

Unemployment insurance contributions amount to a fixed percentage (0.3-1.4% in 2009 and 1% in 2013-2014 and 0.8% in 2015-2016, see the table in section 2.6.1 above) of employment income.

Total contributions

Total employer contributions equal contributions to the pension insurance/1st pillar (`tscerpi_s`) + transfers to the funded scheme/2nd pillar (`ttferpi_s`) + contributions to the health insurance (`tscerhl_s`) + contributions to the unemployment insurance (`tscerui_s`).

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

2.6.3 Self-employed social contributions (`tscse_ee`)

Self-employed pay the 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 a minimum contribution base, unless they are receiving state pensions or the central government is already paying minimum contributions due to certain benefits. Also, this can be offset against social insurance contributions paid by employers for self-employed also undertaking paid employment. Finally, there is an upper annual limit to the social contributions base, which is 15 times the annual legal minimum wage (77,400 EUR in 2016, see the following table for earlier years).

Table 2.7 Upper and lower limit of social tax base for self-employed 2011-2016, EUR

	2011	2012	2013	2014	2015	2016
Minimum monthly social tax base	278.02	278.02	290	320	355	390
Minimum monthly wage	278.02	290	320	355	390	430
Upper annual limit of social tax base (15 times minimum wage)	50,043.6	52,200	57,600	63,900	70,200	77,400

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% for himself. The contribution to the state pension scheme amounts to 20% of the contribution base less a transfer to the funded pension scheme:

Health insurance contributions amount to 13% of the contribution base until the end of 2016. From 2017 the contributions will be 12.5% and from 2018 onwards 12%.

Total contributions

Total self-employed contributions equal to contributions to the pension insurance/1st pillar (tscsepi_s) + contributions to the health insurance (tscsehl_s) + “transfers” to the funded scheme/2nd pillar (ttfsepi_s) + contributions to the funded scheme/2nd pillar (tpcsepi_s).

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 EU-SILC 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 EU-SILC and EE-SILC) is assumed to be not reported and, hence, not included in the contribution base.

2.6.4 Credited contributions (tsct_ee)

Government pays social contributions on a certain minimum base (see table 2.7 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 (*vanemahüvitis*) or unemployment allowance. There are some other minor categories which are not included in the model.

Government pays both the health care insurance (tsccthl_s) and the pension insurance part (tscctpi_s) on the minimum base for those receiving childcare allowance, large family parent allowance, or parental benefit and only the 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 (tpcctpi_s), paid by the central government, to the 2nd pillar for those receiving parental benefit. These are calculated as 1% of the maternity benefit for each related child until 2012. Since 1st January 2013, the government pays 4% of the average taxable wage two years ago (744.73 EUR in 2013, 792.75 EUR in 2014, 849.65 EUR in 2015 and 908.12 EUR in 2016) for each child under three years old and born after 1st January 2013.

2.7 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 and means-tested family benefits which are 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, and only the main tax allowances are taken into account.

2.7.1 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. A dependent child for the tax allowance purposes is defined as aged up to 17.

2.7.2 Exemptions

The following income sources are non-taxable: all family benefits (except parental benefit), unemployment allowance, unemployment retraining benefit, subsistence benefit, annual refund for low-paid employees, 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.

2.7.3 Tax allowances

Firstly, basic allowance, which equalled 2,250 EEK in 2009, rounded to 144 EUR (per month) in 2011-2014, further increased to 154 EUR in 2015 and to 170 EUR in 2016. See also the following table.

Table 2.8. Income tax parameters 2011-16

	2011	2012	2013	2014	2015	2016
Income tax rate	21%	21%	21%	21%	20%	20%
Basic allowance per month, EUR	144	144	144	144	154	170
Additional allowances per month per child starting from ... child	2 nd					
Child allowance per month, EUR						154
Pension allowance per month, EUR	192	192	192	210	220	225

Secondly, pension allowance, which equalled 36,000 EEK per year (3,000 EEK per month) in 2009, 192 EUR per month in 2011-2013, 210 EUR in 2014, 220 EUR in 2015 and 225 EUR in 2016. 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, which amount per child (from the 2nd onwards – since 2009) equals to the basic allowance (see the table above) less the taxable income of the children. From 2016 onwards, the amount of the additional child allowance was detached from the basic allowance and fixed at the level of basic allowance in 2015, i.e. the child allowance per each child from the 2nd onwards is 154 EUR per month in 2016.

There is also a sickness allowance for compensation for an accident at work or an occupational disease and an allowance for tax-free childbirth benefit paid by employer, but these are of little importance and not simulated in the EUROMOD.

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

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

2.7.4 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, 1,920 EUR in 2012-2015 and 1,200 EUR since 2016): housing loan interest payments, education expenses, donations and trade unions membership fees. The latter two were also subject to separate upper limits (as a percentage of taxable income until 2010).

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

Third, pension contributions to the 3rd pillar (i.e. voluntary funded scheme) can be deducted from taxable income, in the amount up to 15% of taxable income. In 2012 an additional annual ceiling of 6,000 EUR was introduced.

Fourth, 20% of rental income can be deducted from taxable income since 2016 as it is considered to reflect owner's costs related to renting. It is not a subject to the upper limit of deductible expenses (1,200 EUR in 2016) or any other ceiling.

- ***EUROMOD notes***

We do not have data on donations and trade unions membership fees and these are excluded.

2.7.5 Tax base

Income tax base is calculated as taxable incomes (see section 2.7.2 for exemptions) less allowances and deductions.

Withholding income tax

Incomes subject to withholding income tax can be 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 social security contributions by employees.

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

There is a single income tax rate (24% in 2005, 23% in 2006, 22% 2007, 21% in 2008-2014 and 20% in 2015-2016), with the exception of 10% tax rate on private pensions.

Withholding income tax is a sum of three components:

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

Final income tax

Compared to the 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, part of rental income).

Income from self-employment

Taxable income from self-employment is equal to income from self-employment less related expenses (directly available in EU-SILC and EE-SILC), and minus social insurance contributions, except contributions to the funded pension scheme. The latter can be deducted from total income. 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 EU-SILC and EE-SILC data we cannot separate agricultural income and hence cannot simulate the tax allowance for self-employment income from agriculture.

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

2.7.6 Annual refund to low-paid employees (tinrf_ee)

- ***Brief description***

Annual refund to low-paid employees (*madala sissetulekuga töötava isiku iga-aastane tagasimakse*) is a non-taxable benefit paid once a year to people with low pay. People can apply for it when submitting a tax report of the previous calendar year.

- **Definitions and eligibility conditions**

The unit of analysis is an individual person and to be considered eligible for the refund he/she must be at least 18 years old resident of Estonia. The person must have been in full-time employment for at least six months in the previous calendar year with an annual taxable income smaller than the ratio of annual refund rate divided by the benefit withdrawal rate (0.35 in 2016).

People who have been occupied with several non-full-time jobs are also considered to be eligible if their workload in aggregate term meets the full-time condition (with exceptions for people with reduced work ability, who can work part-time and still be eligible for the refund).

- **Amount of the refund**

The sum of the refund depends on the annual taxable income, final income tax liability (limits the maximum amount of benefit), months in work, a refund rate and a withdrawal rate. The benefit rate is established for every year in the State Budget Act and for 2016 it is stipulated at 228 EUR per month. The refund rate must not be lower than the latest absolute poverty line calculated by the Statistics Estonia. The withdrawal rate is set at 0.35. The formula used for calculating the sum of tax refund for a single full-time worker can be written as follows:

$$\text{Tax refund} = \max\{\min[(\text{refund rate} * 12 - \text{annual taxable income} * \text{withdrawal rate}) / 12 * \text{number of months in work}; \text{annual paid income tax}]; 0\}$$

The upper limit of the refund is person's final income tax liability. As income increases then the refund increases too. After certain point, a further increase in income results in the decreasing sum of refund until to the income level equals the refund rate divided by the withdrawal rate (0.35). The sum of refund is adjusted to the number of months the person was in full-time employment in the previous year.

In the case of joint declarations, individual upper limits applicable to each spouse are determined on the basis of final joint tax liability which is allocated in proportion to person's taxable income to the total joint taxable income (taking into account certain allowances).

- **EUROMOD notes**

The formula above is re-arranged as follows for implementation

$$\text{Tax refund per month} = \max\{\min[(\text{refund rate} - \text{taxable income per month} * \text{withdrawal rate}) / 12 * \text{number of months in work}; \text{paid income tax per month}]; 0\}$$

Due to the accrual accounting method in the national accounting, the refund is already included in the 2016 policy year in EUROMOD (the first pay-outs will be in spring 2017).

Eligibility conditions applied in EUROMOD do not cover specific conditions for people with reduced ability to work (in terms of full-time employment requirement), and it is also not possible to check whether people have been employed/worked at least under one employment contract per month (and at least for six months in the previous year).

In the case of joint declarations, the individual upper limit of the refund is calculated as a proportion of final tax liability where the proportion is defined as his/her positive taxable income to the total positive taxable income (without applying any allowances).

Although the refund is not taxable, it is included in the means tests for the subsistence benefit and needs-based family benefit.

2.8 Minimum wage

- *Brief description*

Monthly and hourly minimum wage is set by 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 these are 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. 4,350 EEK in 2009-2010, 278.02 EUR in 2011, 290 EUR in 2012, 320 EUR in 2013, 355 EUR in 2014, 390 EUR in 2015 and 430 EUR in 2016.

- *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.

Minimum wage adjustments are not applied in the baseline simulations.

3. DATA

3.1 General description

There are currently four types of Estonian datasets available as input data for EUROMOD:

- 1) European Union Survey of Living Conditions (EU-SILC) 2006, 2007, and 2008 data for Estonia;
- 2) Estonia Social Survey 2006, 2007 and 2008 (*Eesti Sotsiaaluuring 2006, 2007, 2008 – EE-SILC*), which is a national version of EU-SILC data and which was used by the Statistics Estonia to construct the EU-SILC database;
- 3) EU-SILC 2010 and 2012 datasets that have been supplemented with a few detailed income variables and labour market information from the EE-SILC 2010 and 2012 database (with the permission of Eurostat and Statistics Estonia).
- 4) 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. Võrk, Paulus and Lüksik (2010) included an overview of the EE-SILC 2006 and EU-SILC 2006 datasets; Võrk and Paulus (2011) included an overview of the EE-SILC 2007 and EU-SILC 2007 datasets; Võrk and Paulus (2012) included an overview of the EE-SILC 2008 and EU-

SILC 2008 datasets; Vörk and Paulus (2014) included an overview of the combined EU-SILC 2010 and EE-SILC 2010 datasets; and Vörk, Paulus and Leppik (2015) covered combined EU-SILC and EE-SILC 2012 dataset.

This section of the report replicates Vörk, Paulus and Leppik (2015) as there have not been any major changes in the source data compared to that report.

Table 3.1 EUROMOD database description

EUROMOD database	EE_2012_c2
Original name	EU-SILC (UDB_c12p_v12-1)
Provider	Eurostat (and Statistics Estonia)
Year of collection	2012
Period of collection	February-May
Income reference period	2011
Sample size	14,257 individuals 5,433 households

For an overview of sampling methods, response rate and other quality indicators of the data and imputations carried out by Statistics Estonia see the quality report by Statistics Estonia (2014).⁴

3.2 Data adjustment

The EU-SILC database has the same number of individuals and households as the national version, but includes less detailed information on income components. Therefore some additional variables were merged from the national version. (An almost exact match of individuals was achieved using household income, birth year, gender, number of people in household, order of persons in the household, personal gross earnings, and health status.)

The variables merged from the national dataset are the following:

- a) whether a person has joined the compulsory funded pension scheme (II pillar);
- b) each family benefit separately (maternity benefits, parental benefits, child allowances, child care allowances, single parent child allowance, foster parent benefit, other family benefits paid by municipalities, maintenance allowance);
- c) subsistence benefit, separately from other social assistance benefits;
- d) separately unemployment insurance benefit, unemployment allowance, severance payments, other unemployment benefits, as well as the number of months in receipt of unemployment insurance benefit and unemployment allowance;
- e) an indicator for persons registered as self-employed;
- f) the number of rooms and the size of the residence area in square meters.

Adjustments to variables are kept to a minimum. In a few cases implausibly high (observed) values of unemployment allowance benefits were assigned to unemployment insurance benefits. We also kept one observation with an implausibly high value of child allowance for large families, because we use simulated values in the model.

In order to guarantee consistency between demographic variables and income variables which refer to the previous year (and on which EUROMOD simulation are based), all children born between the end of the income reference period and the date of interview have been dropped from

⁴ Statistics Estonia (2014) SILC_ESQRS_A_EE_2012_0000. National Reference Metadata in ESS Standard for Quality Reports Structure (ESQRSSI), retrieved on 31 July 2015 at <http://ec.europa.eu/eurostat/web/income-and-living-conditions/quality/national-quality-reports>, <https://circabc.europa.eu/sd/a/6e6367f2-4336-432c-84b7-fea446fe5318/SILC-ESQRS-EE-2012.zip>

the sample. In EU-SILC 2012 there were 47 such children. No adjustments to the weights have been done.

3.3 Imputations and assumptions

3.3.1 Time period

Income and expenditure information in SILC refer to the previous calendar year, with the exception of housing costs which refer to the current monthly average as estimated by the household. As EUROMOD uses (average) monthly data as an input, all annual incomes and expenditure are divided by twelve. Simulations of short term benefits (e.g. unemployment benefits) also take into account how many months particular income source was received (if available). Note that some socio-economic variables (e.g. education, marital status) refer to the survey week.

3.3.2 Gross incomes

In the SILC data missing values have been imputed, if necessary. Most of the imputations have been done by Statistics Estonia. See the EU-SILC 2012 quality report Section 2.5.5 for the imputation procedure. A few remaining imputations were done jointly by the authors and they are described in detail in the Data Requirement Document (DRD), following the templates prepared by the EUROMOD core team as closely as possible.

In the national SILC questionnaire, most income components are collected in net terms by default. Regarding wages and salaries, income from rental, income earned by children and 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.

By default the Eurostat version of the SILC (EU-SILC) has all values in gross terms (though at more aggregated level), while the national version has (additional) detailed benefit information but mostly with net values. The income variables that were merged from the EE-SILC database were converted to gross values by inverting the tax rules (backward calculations).

3.3.3 Disaggregation of harmonized variables

We have merged disaggregated benefits from the national SILC data; hence, no further disaggregation was needed.

The housing benefit variable in the EU-SILC includes the subsistence benefit (as it has a component related to housing costs) and other social assistance benefits. In EUROMOD these are 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.

3.3.4 Additional imputations and net-to-gross conversions by country team

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

Financial capital asset variable was imputed based on the UDB variable on investment income and the average yield (1.63% in 2011), which was estimated drawing on the structure of investment income in the national SILC and assumptions on their average yields.

Size of flat/house in square meters, which is needed for simulation of the subsistence benefit, were merged from the national SILC.

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 the pension age at the time of the reform) were not allowed to join the scheme. Participation in the funded pension scheme is compulsory from the age of 18.

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 of those employed in the national version of the SILC, which was merged with the EU-SILC data set (*lpm*). The participation decision was simulated for unemployed and inactive people, applying the same proportions by age and gender groups. More specifically, a uniformly distributed random number from the 0-1 interval was drawn (in Stata with a fixed seed number): if the resulting number was lower than the corresponding share of contributors the person was assigned a value 1, otherwise value 0.

The continuation of contributions to the funded pension scheme in 2010-11 (variable *lpm01*), and an increase in contributions in 2014-17 (variable *lpm02*) were simulated by randomly assigning people into these groups. The proportions by age, gender and labour earnings decile were derived from the microdata of the Estonian National Social Insurance Board.

Table 3.2 Distribution of people according to their decision to increase contributions to the second pillar and the contribution rates (in parentheses)

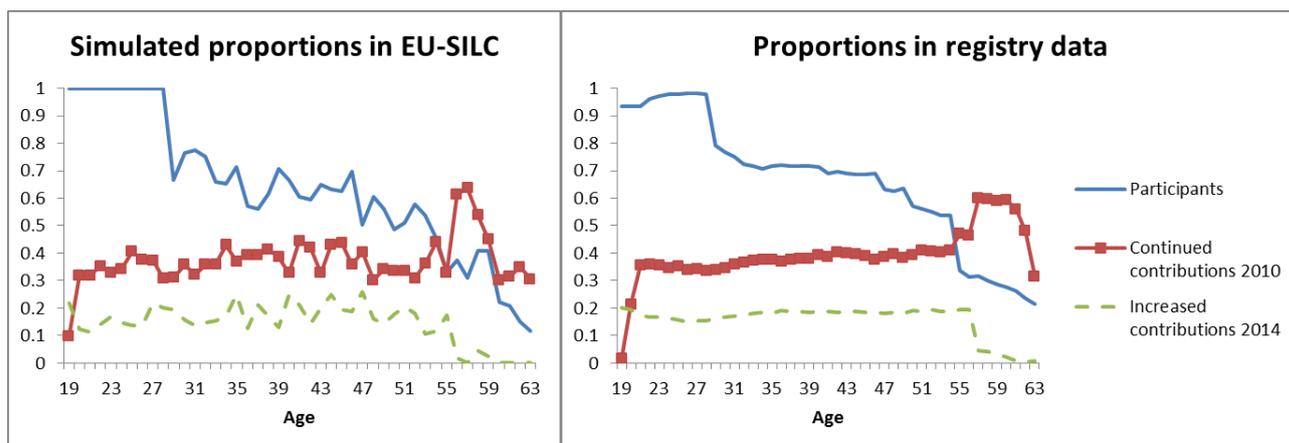
Did the person increase contributions in 2014-2017? (variable <i>lpm02</i> in EUROMOD) Did the person continue paying own contributions in 2010-2011? (variable <i>lpm01</i> in EUROMOD)	Yes	No	Total
Yes	40,410 (3+6)	179,943 (2+6)	220,353
No	65,730 (3+6)	359,929 (2+4)	425,659
Total	106,140	539,872	646,012

Source: Ministry of Finance.

Based on the Estonian Pension Register anonymous individual level data that cover 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 in 2011.

The resulting proportions are described in Figure 3. The proportion of those who continued contributions in 2010 and increased in 2014-2015 is underestimated with SILC data. It means that for employed people net disposable income is slightly oversimulated.

Figure 3. Simulated and actual proportions of population in EU-SILC data and registry data



Source: Estonian National Social Insurance Board microdata, own simulations.

3.4 Updating

To account for any mismatch between the income reference period and the policy year, updating factors are used. Each monetary variable (i.e. each income component) is updated so as to account for changes in the non-simulated variables that have taken place between the income reference year of the data and the year of the simulated tax-benefit system. Updating factors for market incomes are generally based on changes in the average value of an income component between the income reference year of the data and the policy year. In case no data were available, official forecasts of prices or average wages is used. Benefit and tax variables (public pensions, in particular) are updated on the basis of statutory indexation to capture policy effects and changes in average values (or movements in prices) are used as alternatives when such information is not available. For detailed information about the construction of each updating factor as well as the sources that have been used, see Annex 1.

As a rule, updating factors are provided for all income components present in the input dataset. Note however that in the case of income components also simulated in the model, the simulated amounts are used in the baseline rather than updated original variables in the dataset. This facilitates the use of the model in cases when the user wishes to disregard a particular simulated variable.

4. VALIDATION

4.1 Aggregate Validation

EUROMOD results are validated against external benchmarks. Detailed comparisons of the number of people receiving a given income component and total annual amounts are shown in Annex 3. Both market incomes and non-simulated taxes and benefits in the input dataset as well as simulated taxes and benefits are validated against external official data. The main discrepancies between EUROMOD results and external benchmarks are discussed in the following subsections. Factors that may explain the observed differences are also discussed.

4.1.1 Components of disposable income

The definition of disposable income in EUROMOD follows closely EU-SILC definition. The minor differences are outlined in the following table. Note that disposable income in EUROMOD is constructed using simulated components whenever possible and, hence, the values of two disposable income concepts are not identical.

Table 4.1 Components of disposable income

	EUROMOD 2011	EU-SILC 2011
	ils_dispy	HY020
Employee cash or near cash income	+	+
Employer's social insurance contribution	0	0
Company car	0	+
Contributions to individual private pension plans	0	0
Cash benefits or losses from self-employment	+	+
Pension from individual private plans	+	0
Unemployment benefits	+	+
Old-age benefits	+	+
Survivor' benefits	+	+
Sickness benefits	+	+
Disability benefits	+	+
Education-related allowances	+	+
Income from rental of a property or land	+	+
Family/children related allowances	+	+
Social exclusion not elsewhere classified	+	+
Housing allowances	+	+
Regular inter-household cash transfer received	+	+
Interests, dividends, etc.	+	+
Income received by people aged under 16	+	+
Regular taxes on wealth	-	-
Regular inter-household cash transfer paid	-	-
Tax on income and social contributions	-	-
Repayments/receipts for tax adjustment	+	+

Note: repayments/receipts for tax adjustment in EU-SILC can also relate to income received before the income reference period, while the simulated variable in EUROMOD refers strictly to the income reference period.

4.1.2 Validation of incomes inputted into the simulation

Macrovalidation tables are included in Annex 3. Simulations are done using policy rules valid as of 30th June (i.e. FYA_ee is not switched on).

In the base year, 2011, the number of employed in the SILC data matches closely the number of employed from the Labour Force Survey (97%) (see Table 4.2 in the Annex), for the number of unemployed the ratio is lower, 86%. As the labour market situation has continuously improved since 2011 and EUROMOD baseline scenarios do not make adjustments for employment changes, the employment number is further underestimated for 2012-2016. The opposite is true for the number of unemployed, which is overestimated for 2012-2016.

The number of individuals with employment income is well estimated (ratio 1.00 2011) in the data compared to those who pay income tax on labour earnings (see Table 4.3 in the Annex 3).

The number of people with income from registered self-employment is severely underestimated (about 69% coverage in 2011), compared to data from income tax returns.

Survey data overestimate the number of individuals receiving private pension (about 1.5 times in 2011), but this might be due to sampling variation as the actual number is relatively small (about 2,300 people in 2011 according to the annual tax return summaries). The number of households with rent income in SILC is 4.2 times higher than the number of people declaring rent income in 2011, which can be an indication of underdeclaring of rent income. Indeed, the number of people declaring rent income has increased from 3,200 to 5,200 in 2011-2014.

There are many people receiving investment income in the dataset, but the majority receives only interest on bank deposits. Unfortunately, there is no good external information available. There are also no external statistics available for income received by people aged under 16 and regular inter-household cash transfers (both received and paid).

Average employment income is 99% of the average wage of a full-time worker in 2011 as published by Statistics Estonia and similar (98-99%) in the following years (see Table 4.4). At the aggregate level, the SILC data cover 103% of employment income in 2011, about 85% of registered self-employment income, and about one third of private pensions. Total rent income is about two times higher than in the tax reports in 2011, but only 1.3 times higher in 2014.

Among non-simulated benefits, public pensions (old-age pensions, disability pensions, survivors pensions) are well covered in the dataset (see Table 4.5 and 4.6 in Annex 3). However, as the number of old age pensioners and especially disability pensioners has increased steadily in 2011-2016, we underpredict the number of those pensioners in later years. On the other hand, the number of survivor pensioners, which slightly decreased in 2011-2016, is initially underestimated but the coverage of the data improves for later years. The aggregate amount of old-age pensions in the SILC data is 98% of the register data. The aggregate amount of disability pensions and survivor pensions are more underestimated – 93% and 91% coverage in 2011.

The number of recipients and total amount of means tested benefits (subsistence benefit) and some replacement incomes (unemployment income, sickness benefits) are underrepresented in the data. The number of recipients of maternity benefits is overestimated by a quarter, but there is also a measurement problem. The total amount of maternity benefits is overestimated by 5-10%.

The number of recipients of parental benefits is larger in the SILC data than in the external data, because external data measure recipients at the end of year, while EUROMOD data provide cumulative estimates. The total amount of parental benefits is higher in the base year by 24%.

Sickness benefits are strongly underrepresented in the SILC data in 2011. These are usually small amounts and people may leave them unreported or mix them up with employment income. Note also that external data measure the total number of sickness cases, which is larger than the number of people on sick leave, as captured in the SILC data.

Severance pay is overestimated though this is at least partly due to external statistics including additional related payments (e.g. collective redundancy payments). For a relatively small-scale benefit, the single parent child allowance is underrepresented in SILC (half of recipients and 2/3 of expenditure). Similarly, foster care allowance benefit is underrepresented in SILC (about one quarter of recipients and expenditure). For other minor benefits (maintenance allowance, local child benefits etc), there is no external information available.

The aggregate amount of the land tax is underrepresented, about 1/3 of the revenues, but there is a comparability issue, as registry data include also land tax revenues from enterprise sector.

4.1.3 Validation of outputted (simulated) incomes

The total amount of child allowances, childcare allowances and childbirth allowances are simulated reasonably well (see Table 4.7 and 4.8), which is expected as these depend only on the age and number of children. Large family parent allowances are oversimulated, but this is due to the sampling variation, as there are very few households, who are eligible for the benefit.

The unemployment insurance benefit and the unemployment allowance are undersimulated in 2011, 54% of the registry data in both cases, as the number of recipients of unemployment benefits is smaller in the SILC data. Total amount of the subsistence benefit is oversimulated 1.19 times in 2011. In later years it is oversimulated even more, because of improving labour market conditions.

In the baseline, the non take-up of subsistence benefits is modelled by assuming that very small entitlements are not claimed. It does not affect much the total expenditure on subsistence benefits (it reduces the expenditures by 0.1-0.3%), neither the inequality measures, but it does reduce the simulated number of households receiving subsistence benefits by 3-6% in different years.

Aggregate amounts of withheld personal income tax and both components of social tax are oversimulated about 10-20% in 2011. UI contributions are oversimulated in 2011 (ratio = 119%).

4.2 Income distribution

All income distribution results presented here are computed for individuals according to their household disposable income (HDI) equivalised by the modified OECD equivalence scale. HDI is calculated as the sum of all income sources of all household members net of income tax and social insurance contributions. The OECD equivalence scales are: first adult=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.

4.2.1 Income inequality

The main discrepancy between the income distribution indicators in EUROMOD and external statistics (i.e. Eurostat calculations using original EUSILC data) lies in the oversimulation of the share of income of the first decile and the undersimulation of the second and third deciles (see Table 4.9 in Annex 3). In 2011, the simulated share of income is 3% higher than in the original dataset in the first decile and 3% smaller in the second and third decile. The other deciles are less affected (within 1-2% difference). The resulting Gini index and ratio of quintiles (S80/S20) are higher by 1% than in the original dataset.

The median income itself is about 6% higher and mean income 5% higher in the simulated data than in the original dataset in 2011.

As subsistence benefits, which influence the income of the first decile, are underrepresented in the original EU-SILC dataset, but oversimulated in EUROMOD then the “true” income inequality can be expected to lie between the two estimates.

4.2.2 Poverty rates

The simulated relative poverty rates in 2011 are close to those calculated with the original dataset (see Table 4.10 in Annex 3). The largest discrepancy (ratio of poverty rates = 1.04) arises when the total poverty rate is evaluated at the 60% of median household disposable income. In all other cases the discrepancies are smaller.

Regarding age, the poverty rate is overestimated for age group 65+ years (simulated 19.4% vs 17.2% in the EU-SILC data). Differences are smaller for other age groups.

4.3 Validation of minimum wage

Minimum wage adjustments (which are not part of the baseline simulations) would influence the results very little. Although these would increase labour earnings and reduce subsistence benefits, the effect is no more than 1%. (See Table 4.11 in Annex 3).

4.4 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.
- Estonian model assumes full tax compliance.
- Direct taxes and pension and health contributions are well simulated, but unemployment insurance contributions are oversimulated.
- Universal family benefits are simulated relatively well and pensions are recorded in the datasets reasonably well.
- The oversimulation of the subsistence benefit is partly due to annual incomes which do not allow capturing the seasonal nature of subsistence benefits. Assuming full take-up of the subsistence benefit in simulations would result in even higher income at the bottom of the income distribution compared to the original dataset. Hence, we suggest that the subsistence benefit is simulated in combination with partial take-up modelling to reduce the extent of oversimulation.
- Imputed value of financial assets is rather unreliable.
- As the Estonian economy was affected by a severe crisis in 2009-2011 and went through a recovery in 2012-2016, assuming a constant labour market structure of 2011 for later years causes discrepancy between simulated and actual figures. Therefore, modelling of employment changes would improve the simulation results of social contributions, tax revenues, and unemployment benefits.

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ANNEX 1: UPRATING FACTORS

Table 1. Up-rating factors

Variable	Variable label	Update factor	Factor reference name
afc	Assets: financial capital	Growth of CPI	\$f_cpi
bch	Benefit/pension: child:	Aggregate	
bcc00	Benefit/pension: child care: basic	Statutory indexation	\$f_bcc00
bcclg	Benefit/pension: child care: large family	Statutory indexation	\$f_bcclg
bch00	Benefit/pension: child: basic	Statutory indexation	\$f_bch00
bchab	Benefit/pension: child: abroad	No uprating	1
bcham	Benefit/pension: child: unpaid alimony	No change in benefits	1
bchba	Benefit/pension: child: birth/adoption	Statutory indexation	\$f_bchba
bchlp	Benefit/pension: child: lone parent	Statutory indexation	\$f_bchlp
bchot	Benefit/pension: child: other	No change in benefits	1
bed	Benefit/pension : education	Growth of CPI	\$f_cpi
bfa	Benefit/pension : family	Aggregate	
bfafp	Benefit/pension : family: foster parent	No change in benefits	1
bhl	Benefit/pension : health	Growth of average wage last year	\$f_yemlag1
bmaab	Benefit/pension: maternity: abroad	No uprating	1
bmact	Benefit/pension : maternity: contributory	Growth of average wage last year	\$f_yemlag1
bmapr	Benefit/pension : maternity: pregnancy	Growth of average wage last year	\$f_yemlag1
bsa	Benefit/pension : social assistance	Aggregate	
bsa00	Benefit/pension : social assistance: basic	Simulated, otherwise Growth of CPI	\$f_cpi
bsals	Benefit/pension : social assistance	Growth of CPI	\$f_cpi
bun	Benefit/pension : unemployment	Aggregate	
bunct	Benefit/pension : unemployment: contributory	Growth of average wage last year	\$f_yemlag1
bunnc	Benefit: unemployment : non-contributory	Statutory indexation	\$f_bunnc
bunot	Benefit: unemployment : other	No change in benefits	1
buntr	Benefit: unemployment : training	Statutory indexation	\$f_buntr
kfb	In kind: fringe benefits	Growth of average wage	\$f_yem
kfbcc	In kind: fringe benefits: company car	Growth of average wage	\$f_yem
kivho	In kind: imputed value: housing	Growth of CPI	\$f_cpi
pdi	Benefit/pension : disability	Statutory indexation (alternatively: growth of average pension)	\$f_ipens (or \$f_pdi)
poa00	Benefit/pension : old age: basic	Statutory indexation (alternatively: growth of average pension)	\$f_ipens (or \$f_poa00)
poaab	Pension : old age: abroad	No change in benefits	1
psu	Benefit/pension : survivors	Statutory indexation (alternatively: growth of average pension)	\$f_ipens (or \$f_psu)
tad	Tax: repayments	No uprating	1
tin	Tax: income tax	No uprating	1
tis	Tax: income tax and social insurance contributions	No uprating	1
tpr	Tax : property tax	Growth of land tax revenues	\$f_tpr
tpceepi	Tax : comp prvt ctrb : employee : pension insurance	Growth of average wage	\$f_yem
xed	Expenditure: education	Simulated, otherwise growth of CPI	\$f_cpi
xhc	Expenditure : housing cost	Aggregate	

Variable	Variable label	Update factor	Factor reference name
xhcmomi	Expenditure : housing cost : mortgage payment : mortgage interest	Estonian Tax and Customs Board: Average declared mortgage interests amount	\$f_xhcmomi
xhcot	Expenditure : housing cost : other	Growth of housing costs in CPI (excl. mortgage interests)	\$f_xhcot
xhcert	Expenditure : housing cost : rent	Growth of average rent in Tallinn	\$f_xhcert
xmp	Expenditure : maintenance payment	Growth of average wage	\$f_yem
xpp	Expenditure: private pensions	Growth of average wage	\$f_yem
yds	Income: disposable	No uprating	1
ydses_o	Income: disposable: equivalised: original SILC	No uprating	1
yem	Income : employment	Growth of average wage	\$f_yem
yem00	Income : employment: main	Growth of average wage	\$f_yem
yempv	Income : employment: previous	Growth of average wage last year	\$f_yemlag1
yivwg	Income : imputed value: wage	Growth of average wage	\$f_yem
yyi	Income : investment	Aggregate	
yyidv	Income : investment: dividends	Average declared income from selling assets; predicted growth of average wage for 2013	\$f_yiidv
yyiit	Income : investment: interests	Average declared income from other sources; predicted growth of average wage for 2013	\$f_yiit
yyiot	Income : investment: other	Average declared income from selling other assets; predicted growth of average wage for 2013	\$f_yiyot
yot	Income : other	Growth of average wage	\$f_yem
ypp	Income : private pension	Growth of CPI	\$f_cpi
ypr	Income : property	Aggregate	
yprro	Income : property: royalties	Growth of CPI	\$f_cpi
yprrt	Income : property: rent	Growth of average rent in Tallinn in a two-living-room apartment	\$f_xhcert
ypt	Income : private transfers	Growth of average wage	\$f_yem
yptmpnt	Income : private transfers : maintenance payment : non-taxable	Growth of average wage	\$f_yem
yptmptx	Income : private transfers : maintenance payment : taxable	Growth of average wage	\$f_yem
yse	Income : self employment	Growth of average wage	\$f_yem
yseag	Income : self employment : agriculture	Growth of average wage	\$f_yem
ysebs	Income : self employment : business	Growth of average wage	\$f_yem
ysena	Income : self employment : non-registered activity	Growth of average wage	\$f_yem
ysera	Income : self employment : registered activity	Growth of average wage	\$f_yem
yunsv	Income: unemployment: severance pay	Growth of average wage	\$f_yem

Note: non-simulated variables only used for validation are (generally) not uprated.

Table 2. Sources of update factors

Factor name	ref.	Name	Source
\$f_cpi		Growth of CPI	Statistics Estonia, online database, table IA001 2000-2015; 2016 forecast by Ministry of Finance, Spring 2016
\$f_xhcot		Growth of housing costs in CPI (excl. mortgage interests)	Statistics Estonia, online database, table IA001 2000-2015; 2016 CPI forecast by Ministry of Finance, Spring 2016
\$f_yem		Growth of average wage	Statistics Estonia, online database, table PA5211 (2008-), 2016 forecast by Ministry of Finance, Spring 2016
\$f_yemlagl		Growth of average wage last year	see \$f_yem
\$f_yiydv		Average declared income from selling assets; predicted growth of average wage for 2013	Estonian Tax and Customs Board, 2006-2014 average declared income from selling assets ("Kasu väärtpaberite võõrandamisest (Rida 6.1)"-"Kahju väärtpaberite võõrandamisest (Rida 6.1)"); 2015-2016 predicted wage growth
\$f_yiyit		Average declared income from other sources	Estonian Tax and Customs Board, 2006-2014 average declared income from other sources assets ("Muu maksustatav tulu (palk,litsents,intress,elatis jm.) (Rida 7.1)"); 2015-2016 wage growth
\$f_yiyot		Average declared income from selling other assets	Estonian Tax and Customs Board, 2006-2014 average declared income from selling other assets ("Kasu muu vara võõrandamisest (Rida 6.3)"); 2015-2016 wage growth
\$f_xhcrct		Growth of average rent in Tallinn in a two-living-room apartment until 2009; growth of average rent in Tallinn	Statistics Estonia, online database, table KV131, average rent in Tallinn in a two-living-room apartment (2003-2009); Extrapolated by the average rent of m2 in Tallinn according to average rent in Tallinn in June every year by database www.kv.ee (2010-2015); 2016 CPI
\$f_xhcmomi		Estonian Tax and Customs Board: Average declared mortgage interests amount	ETCB, average declared mortgage interests per declaration. 2015-2016 kept constant at the 2014 level
\$f_tpr		Growth of land tax revenues	Statistics Estonia, online database, table RR02, land tax revenues; 2016 kept constant
\$f_poa00, \$f_pdi, \$f_psu		Growth of average pension	Statistics Estonia, online database, table SK110: Riiklik pensionikindlustus; 2016 statutory indexation
\$f_ipens		Growth of pension index	Government decrees (statutory indexation)
\$f_bchba, \$f_bch00, \$f_bcc00, \$f_bcclg, \$f_bchlp, \$f_bunnc, \$f_buntr		Statutory indexation	Government degrees

ANNEX 2: POLICY EFFECTS IN 2015-16

Preliminary: Indexation based on projected HICP for 2016⁵

Table 1 and Figure 1 show the effect of 2016 policies on mean equivalised household disposable income by income component and income decile group. The effect is estimated as a difference between simulated household net income under the 2016 tax-benefit policies (deflating monetary parameters by projected Harmonized Index of Consumer Prices, HICP) and net incomes simulated under 2015 policies, as a percentage of mean equivalised household disposable income in 2015.

In comparison to 2015 policies, (deflated) 2016 policies increase mean household income by 2.2% in total and the overall pattern is strongly progressive, i.e. lower income groups gain more in relative terms. About one third of the total gain is due to increased public pensions which were indexed by 5.7% in 2016 compared to only 0.9% annual inflation rate.⁶ The distribution of gains of pension increase across income groups largely reflects where public pensioners are located in the income distribution (i.e. primarily in the first four decile groups). The second largest contributor in overall terms, also about one third of the total gain, was the reduction of the direct taxes, stemming both from the increased income tax basic allowance and annual tax refund for low-paid workers. (Note that the refund will take place in 2017 in practice, but as it relates to 2016 earnings it is added to 2016 disposable income in our simulations). The distribution of these gains favours lower income deciles in relative terms, but middle income deciles in absolute terms. The third largest contributor was an increase in non-means tested benefits, mainly child benefits and above-inflation increase in parental benefits. The distributional impact of non-means tested benefits is neutral. There are also notable gains from means-tested benefits for the first decile group (8.3%) due to an above-inflation increase in the base amount of the social assistance benefit (*toimetulekutoetus*) (from €90 to €130). The social assistance benefit contributes 70% of the income increase for the bottom decile group. Finally, there is a small income-decreasing effect from social insurance contributions of self-employed, related to an increase in the minimum base of contributions.

⁵ Results based on the final HICP will appear in the annual EUROMOD report Effects of tax-benefit policy changes across the income distributions of the EU-28 countries: 2015-16 (updated).

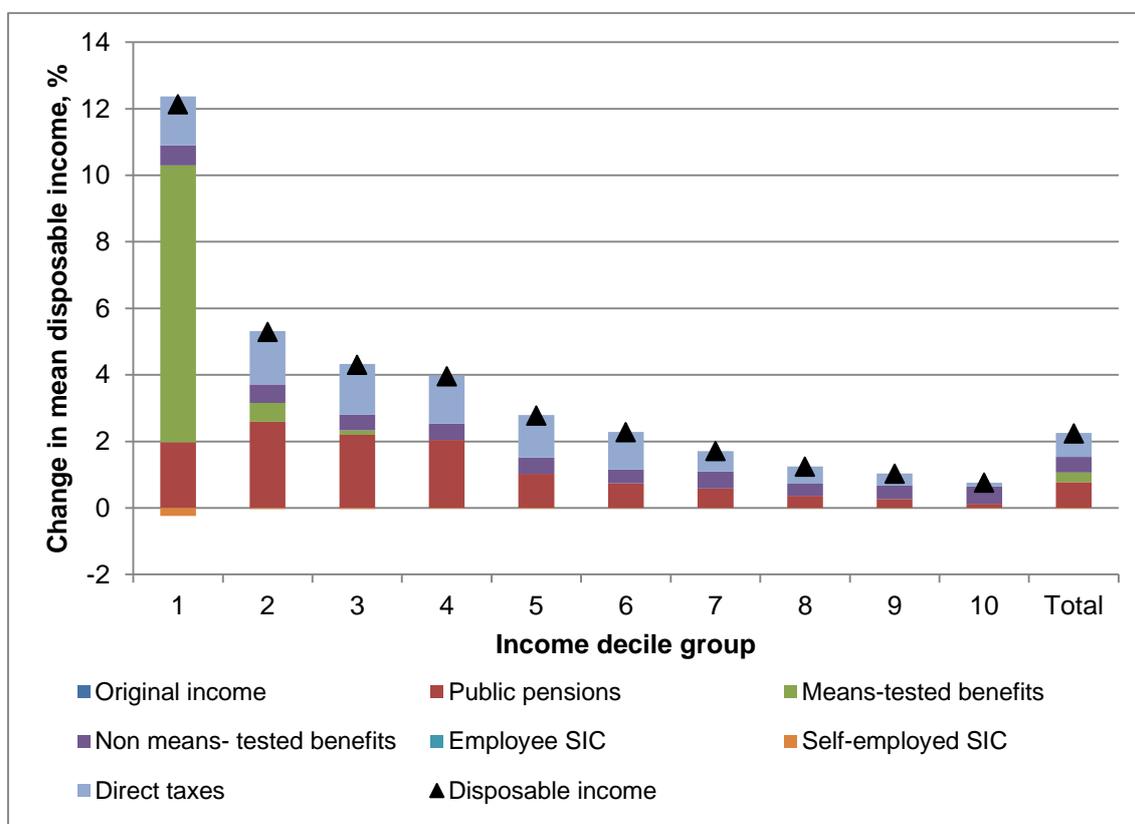
⁶ The indexation of public pensions is largely based on the change in total pension social insurance contributions paid in the previous calendar year.

Table 1: Policy effects in 2015-2016, using the CPI-indexation, %

Decile	Original income	Public pensions	Means-tested benefits	Non means-tested benefits	Employee SIC	Self-employed SIC	Direct taxes	Disposable income
1	0.00	1.97	8.32	0.61	0.00	-0.24	1.47	12.13
2	0.00	2.59	0.57	0.56	0.00	-0.03	1.60	5.29
3	0.00	2.20	0.13	0.47	0.00	-0.03	1.52	4.30
4	0.00	2.04	0.00	0.49	0.00	-0.02	1.44	3.95
5	0.00	1.03	0.00	0.49	0.00	-0.02	1.27	2.77
6	0.00	0.74	0.00	0.43	0.00	-0.01	1.13	2.28
7	0.00	0.58	0.00	0.51	0.00	0.00	0.62	1.71
8	0.00	0.37	0.00	0.36	0.00	-0.01	0.52	1.24
9	0.00	0.27	0.00	0.40	0.00	-0.01	0.36	1.03
10	0.00	0.12	0.00	0.52	0.00	0.00	0.12	0.76
Total	0.00	0.77	0.29	0.47	0.00	-0.02	0.72	2.24

Notes: shown as a percentage change in mean equivalised household disposable income by income component and income decile group. Income decile groups are based on equivalised household disposable income in 2015, using the modified OECD equivalence scale. Each policy system has been applied to the same input data, deflating monetary parameters of 2016 policies by projected Harmonized Index of Consumer Prices (HICP), i.e. 1.009.

Figure 1: Policy effects in 2015-2016, using the CPI-indexation, %



ANNEX 3 VALIDATION STATISTICS

Table 4.2-Number of employed and unemployed

	EUROMOD							External							Ratio						
	2011	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016		
Number of employed	584,239	603,200	614,900	621,300	624,800	640,900	635,200	0.97	0.95	0.94	0.94	0.91	0.92								
Number of unemployed	73,308	84,800	68,500	58,700	49,600	42,300	45,000	0.86	1.07	1.25	1.48	1.73	1.63								

Sources of external statistics:

2011 - 2015: Statistics Estonia, on-line database, table ML330 "Labour status of population aged 15-74 by sex and age group"

2016: Ministry of Finance spring 2016 forecast, own calculations

Table 4.3-Market income in EUROMOD -Number of recipients

	EUROMOD							External							Ratio						
	2011	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016		
Employment income	644,544	645,064	652,970	655,298	669,574	N/A	N/A	1.00	0.99	0.98	0.96	N/A	N/A								
Self-employment income from registered activity	20,385	29,396	28,106	27,291	26,861	N/A	N/A	0.69	0.73	0.75	0.76	N/A	N/A								
Private pensions	3,515	2,333	2,717	3,218	2,848	N/A	N/A	1.51	1.29	1.09	1.23	N/A	N/A								
Rent income	13,326	3,202	3,673	4,018	5,246	N/A	N/A	4.16	3.63	3.32	2.54	N/A	N/A								
Investment income	199,401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Income received by people aged under 16	6,660	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Regular inter-household cash transfers received	26,323	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								
Regular inter-household cash transfers paid	29,576	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A								

Notes:

N/A - not available

EUROMOD: Rent income, investment income - number of households with positive income
cash transfers received and paid - number of households with positive income

Sources of external statistics:

Employment income - total number of payers of income tax on earnings
Ministry of Finance

Self-employment income - total number of self-employed with non-zero revenues
Estonian Tax and Customs Board, annual tax return summaries

Rent income
Estonian Tax and Customs Board, annual tax return summaries

Private pensions
Estonian Tax and Customs Board, annual tax return summaries

Table 4.4-Market income in EUROMOD -Annual amounts (in mil.)

	EUROMOD						External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Average employment income (EUR)	8,880	9,388	10,045	10,637	11,272	11,823	8,937	9,513	10,196	10,897	11,629	N/A	0.99	0.99	0.99	0.98	0.97	N/A
Employment income	5,724	6,051	6,474	6,856	7,266	7,620	5,546	6,021	6,438	6,861	7,328	N/A	1.03	1.01	1.01	1.00	0.99	N/A
Self-employment income from registered activity	57	60	65	68	73	76	67	87	96	83	N/A	N/A	0.85	0.69	0.68	0.83	N/A	N/A
Private pensions	2	2	2	2	2	2	7	10	12	12	N/A	N/A	0.30	0.22	0.20	0.19	N/A	N/A
Rent income	11	13	16	16	18	18	6	8	9	13	N/A	N/A	1.82	1.73	1.78	1.31	N/A	N/A
Investment income	32	31	33	78	83	87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

N/A - not available

Sources of external statistics:

Average employment income - average monthly full-time wage times 12, Statistics Estonia, online database

Employment income - total wage bill in SNA accounts, Statistics Estonia, online database

Self-employment income - total revenue of self-employed of those with positive revenue:

Estonian Tax and Customs Board, annual tax return summaries

Private pensions - Estonian Tax and Customs Board, annual tax return summaries

Rent income - Estonian Tax and Customs Board, annual tax return summaries

Table 4.5-Tax benefit instruments included but not simulated in EUROMOD

-Number of recipients/ payers

	EUROMOD							External							Ratio						
	2011	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016		
Benefits																					
Sickness and injury benefits	95,690	369,076	297,924	330,417	329,753	348,322	N/A	0.26	0.32	0.29	0.29	0.27	N/A								
Maternity benefits	12,357	10,012	9,770	9,677	9,969	10,383	N/A	1.23	1.26	1.28	1.24	1.19	N/A								
Parental benefit	38,131	19,004	17,706	17,345	16,881	17,066	N/A	2.01	2.15	2.20	2.26	2.23	N/A								
Old-age pensions	288,091	298,767	300,540	301,434	304,087	304,334	305,299	0.96	0.96	0.96	0.95	0.95	0.94								
Disability pensions	88,280	82,590	90,093	94,418	94,325	95,480	97,459	1.07	0.98	0.93	0.94	0.92	0.91								
Survivor pensions	7,328	10,828	9,953	9,060	8,214	7,578	7,094	0.68	0.74	0.81	0.89	0.97	1.03								
Single parent child allowance	12,317	22,223	21,106	20,010	19,035	17,848	N/A	0.55	0.58	0.62	0.65	0.69	N/A								
Maintenance allowance	244	N/A	508	380	405	416	N/A	N/A	0.48	0.64	0.60	0.59	N/A								
Foster care allowance	499	1,880	1,807	1,783	1,745	1,672	N/A	0.27	0.28	0.28	0.29	0.30	N/A								
Local child benefits	17,594	N/A	N/A	N/A	N/A	N/A	N/A														
Scholarships and grants	36,243	N/A	N/A	N/A	N/A	N/A	N/A														
Severance pay (UIF data)	14,012	8,640	8,458	8,035	7,944	8,662	N/A	1.62	1.66	1.74	1.76	1.62	N/A								
Other (minor) social benefits	9,343	N/A	N/A	N/A	N/A	N/A	N/A														
Taxes and Social Insurance contributions																					
Property tax	334,553	N/A	N/A	N/A	N/A	N/A	N/A														

Notes: N/A - not available

Sources of external statistics: Sickness and injury benefits, maternity benefits, single parent child allowance - total number of different cases

Statistics Estonia, online database

Parental benefit - end of year; Statistics Estonia, online database

Old-age pensions - beginning of year, includes superannuated pensions; Statistics Estonia, online database

Disability pensions - beginning of year; Statistics Estonia, online database

Survivor pensions - beginning of year; Statistics Estonia, online database

Parental benefits - end of the year; Estonian Social Insurance Board

Foster care allowance - number of different cases; Statistics Estonia, online database

Table 4.6-Tax benefit instruments included but not simulated in EUROMOD
-Annual amounts (in mil.)

	EUROMOD						External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Benefits																		
Sickness and injury benefits	31.7	33.6	35.5	38.0	40.2	42.6	49.6	52.1	60.4	66.0	74.7	N/A	0.64	0.64	0.59	0.57	0.54	N/A
Maternity benefits	33.2	35.2	37.2	39.8	42.1	44.7	31.1	32.2	33.7	37.9	42.3	N/A	1.07	1.09	1.10	1.05	1.00	N/A
Parental benefit	215.4	228.1	241.2	258.1	273.3	289.6	173.3	159.5	157.3	165.0	179.0	N/A	1.24	1.43	1.53	1.56	1.53	N/A
Old-age pensions	1,073.8	1,121.1	1,177.1	1,245.4	1,323.9	1,398.9	1,097.3	1,144.0	1,204.0	1,271.1	1,354.8	N/A	0.98	0.98	0.98	0.98	0.98	N/A
Disability pensions	175.7	183.5	192.7	203.8	216.7	228.9	189.2	204.3	211.6	226.0	244.5	N/A	0.93	0.90	0.91	0.90	0.89	N/A
Survivor pensions	12.1	12.7	13.3	14.1	15.0	15.8	13.4	12.6	12.0	11.7	11.7	N/A	0.91	1.00	1.11	1.20	1.27	N/A
Single parent child allowance	3.2	3.2	3.2	3.2	3.2	3.2	5.3	5.0	4.8	4.5	4.3	N/A	0.61	0.64	0.68	0.71	0.76	N/A
Maintenance allowance	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	N/A	0.10	0.07	0.09	0.09	0.08	N/A
Foster care allowance	1.1	1.1	1.1	1.1	1.1	1.1	4.5	4.3	4.2	4.1	5.0	N/A	0.25	0.26	0.27	0.27	0.23	N/A
Local child benefits	3.5	3.5	3.5	3.5	3.5	3.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scholarships and grants	32.0	33.3	34.2	34.2	34.0	34.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Severance pay (UIF data)	21.5	22.7	24.3	25.7	27.3	28.6	11.6	11.9	12.9	13.1	14.5	N/A	1.85	1.90	1.89	1.96	1.88	N/A
Other (minor) social benefits	4.1	4.2	4.4	4.4	4.3	4.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Taxes and Social Insurance contributions																		
Property tax	17.0	19.4	18.9	19.5	19.2	19.2	51.5	58.6	57.2	59.0	58.0	N/A	0.33	0.33	0.33	0.33	0.33	N/A

Notes: N/A - not available

Sources of external statistics:

Sickness and injury benefits, maternity benefits - Statistics Estonia, online database

Parental benefit, single parent child allowances - Estonian National Social Insurance Board (Sotsiaalkindlustusamet), annual statistical reports "Sotsiaalkindlustus"

Old-age pensions - includes superannuated pensions; ENSIB (Sotsiaalkindlustusamet), annual statistical reports, own calculations

Disability pensions - ENSIB (Sotsiaalkindlustusamet), annual statistical reports, own calculations

Survivor pensions - ENSIB (Sotsiaalkindlustusamet), annual statistical reports, own calculations

Property tax - land tax, includes tax paid by legal entities; Statistics Estonia, on-line database

Maintenance allowance - Estonian National Social Insurance Board

Severance pay - Estonian Unemployment Insurance Fund

Foster care allowance - number of different cases; Statistics Estonia, online database

Table 4.7-Tax benefit instruments simulated in EUROMOD -Number of recipients/ payers

	EUROMOD						SILC	Ratio	External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2011	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Benefits																				
Child allowance	257,635	257,635	257,635	257,635	257,635	257,635	173,651	1.48	255,522	252,255	250,775	250,715	252,439	N/A	1.01	1.02	1.03	1.03	1.02	N/A
Childcare allowance	32,937	32,937	32,937	32,937	32,937	32,937	43,579	0.76	41,034	41,581	40,580	40,113	39,680	N/A	0.80	0.79	0.81	0.82	0.83	N/A
Large family parent allowance	1,770	1,770	1,770	1,770	1,770	1,770	220	8.06	1,205	1,161	1,112	1,122	1,050	N/A	1.47	1.52	1.59	1.58	1.69	N/A
Childbirth allowance	15,817	15,817	15,817	15,817	15,817	15,817	18,117	0.87	15,361	13,724	13,641	13,506	13,809	N/A	1.03	1.15	1.16	1.17	1.15	N/A
Unemployment insurance benefit	14,991	14,991	14,991	14,991	14,991	14,991	15,952	0.94	32,104	26,163	27,637	26,216	26,533	N/A	0.47	0.57	0.54	0.57	0.56	N/A
Unemployment allowance	9,713	9,713	9,713	9,713	9,713	9,713	10,591	0.92	30,659	27,307	26,902	24,008	24,791	N/A	0.32	0.36	0.36	0.40	0.39	N/A
Subsistence benefits	22,343	21,799	21,527	22,952	21,609	28,686	13,819	1.62	24,332	21,585	19,320	16,571	14,605	N/A	0.92	1.01	1.11	1.39	1.48	N/A
Means-tested family benefits	0	0	0	19,809	18,296	18,862	0	N/A	N/A	N/A	4,914	5,251	5,952	N/A	N/A	N/A	0.00	3.77	3.07	N/A
Taxes and Social Insurance contributions																				
Personal Income tax (withheld)	662,931	688,920	734,192	742,672	746,380	745,279	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Personal Income tax (final declarations)	698,550	723,803	765,771	772,608	777,145	776,414	0	N/A	643,545	647,729	636,454	666,898	664,793	N/A	1.09	1.12	1.20	1.16	1.17	N/A
Total pension part of the social tax	666,969	666,969	666,969	666,969	666,969	666,969	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total health part of the social tax	672,789	672,789	672,789	672,789	672,789	672,789	0	N/A	568,434	575,277	584,094	600,998	615,333	N/A	1.18	1.17	1.15	1.12	1.09	N/A
Total unemployment insurance contributions	644,544	644,544	644,544	644,544	644,544	644,544	0	N/A	581,600	589,900	592,508	602,600	607,000	N/A	1.11	1.09	1.09	1.07	1.06	N/A
Total pension contributions to the 2nd pillar	412,637	412,637	424,907	424,907	424,907	424,907	0	N/A	379,861	381,536	390,110	398,713	413,169	N/A	1.09	1.08	1.09	1.07	1.03	N/A
Annual refund for low-paid employees	0	0	0	0	0	102,944	0	N/A	N/A	N/A	N/A	N/A	N/A	104,000	N/A	N/A	N/A	N/A	N/A	0.99

Notes:

N/A - not available

In SILC: child allowance, childcare allowance, large family parent allowance - number of households

Child allowance, childcare allowance, large family parent allowance, childbirth allowance - number of children; Statistics Estonia, online database

Unemployment insurance benefit, unemployment allowance - Statistics Estonia, online database

Subsistence benefits - number of different households, Statistics Estonia, online database

Personal Income tax - number of people in tax declarations; Estonian Tax and Customs Board, annual tax return summaries

Total health part of the social tax - number of insured people; Estonian Health Insurance Fund

Total unemployment insurance contributions - number of contributors; Estonian Unemployment Insurance Fund

Total pension contributions to the 2nd pillar - Ministry of Finance, own calculations

Annual refund for low-paid employees - official forecast

Table 4.8-Tax benefit instruments simulated in EUROMOD -Annual amounts (Mil.)

	EUROMOD						SILC						Ratio						External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Benefits																														
Child allowance	68.4	68.4	68.4	72.9	152.1	166.4	64.1	64.1	64.1	64.1	64.1	64.1	1.07	1.07	1.07	1.14	2.37	2.59	68.9	68.5	70.6	73.1	151	N/A	0.99	1.00	0.97	1.00	1.01	N/A
Childcare allowance	12.1	12.1	12.1	12.1	12.1	12.1	13.6	13.6	13.6	13.6	13.6	13.6	0.89	0.89	0.89	0.89	0.89	0.89	14.8	14.7	14.5	14.1	14	N/A	0.81	0.82	0.83	0.86	0.87	N/A
Large family parent allowance	0.4	0.4	0.4	0.4	0.4	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.54	0.54	0.54	0.54	0.54	0.54	0.3	0.3	0.3	0.3	0	N/A	1.44	1.46	1.48	1.53	1.32	N/A
Childbirth allowance	5.2	5.2	5.2	5.2	5.2	5.2	5.9	5.9	5.9	5.9	5.9	5.9	0.88	0.88	0.88	0.88	0.88	0.88	4.9	4.5	4.4	4.4	4	N/A	1.05	1.16	1.17	1.18	1.15	N/A
Unemployment insurance benefit	19.8	22.2	23.4	25.2	26.9	28.7	20.5	21.8	23.0	24.6	26.1	27.6	0.97	1.02	1.02	1.02	1.03	1.04	36.8	33.7	39.6	39.4	40	N/A	0.54	0.66	0.59	0.64	0.68	N/A
Unemployment allowance	3.5	3.5	5.5	6.1	6.7	7.4	2.5	2.5	3.9	4.3	4.7	5.2	1.42	1.42	1.42	1.42	1.42	1.42	6.5	5.7	8.6	8.3	9	N/A	0.54	0.61	0.63	0.73	0.73	N/A
Subsistence benefits	28.3	28.7	30.1	35.4	33.3	54.4	10.0	10.4	10.7	10.7	10.7	10.7	2.82	2.75	2.81	3.30	3.12	5.09	23.8	20.7	18.5	17.1	15	N/A	1.19	1.39	1.63	2.07	2.22	N/A
Means-tested family benefits	0.0	0.0	0.0	3.2	13.9	14.5	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	0.6	3	N/A	N/A	N/A	0.00	5.37	4.03	N/A
Taxes and Social Insurance contributions																														
Personal Income tax (withheld)	1,014.3	1,083.8	1,189.1	1,270.9	1,287.3	1,339.7	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	913.3	1,005.5	1,107.2	1,202.8	1,251	N/A	1.11	1.08	1.07	1.06	1.03	N/A
Personal Income tax (final declarations)	970.5	1,044.9	1,157.4	1,240.0	1,256.5	1,308.1	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	839.1	928.9	1,038.3	1,134.5	1,191	N/A	1.16	1.12	1.11	1.09	1.06	N/A
Total pension part of the social tax	1,196.6	1,262.2	1,349.1	1,431.0	1,519.2	1,596.6	1,197	1,262	1,349	1,431	1,519	1,597	1.00	1.00	1.00	1.00	1.00	1.00	1,076.1	1,160.3	1,245.2	1,344.1	1,441	N/A	1.11	1.09	1.08	1.06	1.05	N/A
Total health part of the social tax	784.4	827.3	884.2	938.1	996.1	1,047.2	784	827	884	938	996	1,047	1.00	1.00	1.00	1.00	1.00	1.00	725.4	772.4	826.0	888.3	951	N/A	1.08	1.07	1.07	1.06	1.05	N/A
Total unemployment insurance contributions	232.0	245.3	187.5	198.5	168.3	176.5	232	245	187	199	168	177	1.00	1.00	1.00	1.00	1.00	1.00	194.4	211.0	167.1	173.6	152	N/A	1.19	1.16	1.12	1.14	1.11	N/A
Total pension contributions to the 2nd pillar	135.7	243.6	277.4	352.5	373.8	392.6	136	244	277	352	374	393	1.00	1.00	1.00	1.00	1.00	1.00	122.4	232.0	263.9	346.1	385	N/A	1.11	1.05	1.05	1.02	0.97	N/A
Annual refund for low-paid employees	0.0	0.0	0.0	0.0	0.0	40.5	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	1.07

Notes: N/A - not available

Source: Child allowance, childcare allowance, large family parent allowance, childbirth allowance - number of children; Statistics Estonia, online database
 Unemployment insurance benefit, unemployment allowance - Estonian Unemployment Insurance Fund, online statistics
 Subsistence benefits - Statistics Estonia, online database
 Personal Income tax (final declarations) - Statistics Estonia, online database, Estonian Tax and Customs Board, on calculations
 Personal Income tax (withheld) - Statistics Estonia, online database, on calculations
 Total health part of the social tax, total pension part of the social tax - Statistics Estonia, online database
 Total unemployment insurance contributions - number of contributors; Estonian Unemployment Insurance Fund
 Total pension contributions to the 2nd pillar - Ministry of Finance, Statistics Estonia, own calculations
 Annual refund for low-paid employees - official forecast

Table 4.9-Distribution of equivalised disposable income

	EUROMOD						External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
D1	3.0	3.0	2.9	3.0	3.1	3.4	2.6	2.6	2.2				1.15	1.14	1.34	N/A	N/A	N/A
D2	4.8	4.7	4.7	4.7	4.7	4.8	4.7	4.7	4.3				1.02	1.01	1.09	N/A	N/A	N/A
D3	5.7	5.8	5.7	5.6	5.6	5.7	5.7	5.7	5.3				1.00	1.01	1.07	N/A	N/A	N/A
D4	6.8	6.7	6.7	6.7	6.7	6.7	6.8	6.7	6.3				1.00	1.00	1.07	N/A	N/A	N/A
D5	7.9	7.9	7.8	7.8	7.8	7.8	7.8	7.8	7.5				1.01	1.01	1.05	N/A	N/A	N/A
D6	9.2	9.1	9.1	9.1	9.1	9.1	9.1	9.0	9.0				1.01	1.02	1.01	N/A	N/A	N/A
D7	10.8	10.8	10.8	10.7	10.7	10.7	10.8	10.5	10.6				1.00	1.03	1.02	N/A	N/A	N/A
D8	12.8	12.7	12.8	12.8	12.7	12.6	12.8	12.7	12.8				1.00	1.00	1.00	N/A	N/A	N/A
D9	15.5	15.5	15.6	15.5	15.6	15.4	15.5	15.8	16.1				1.00	0.98	0.97	N/A	N/A	N/A
D10	23.6	23.7	23.8	24.1	23.9	23.8	24.2	24.6	26.0				0.98	0.96	0.92	N/A	N/A	N/A
Median	6,051	6,326	6,758	7,142	7,744	8,199	5,987	6,663	7,212	7,889			1.01	0.95	0.94	0.91	N/A	N/A
Mean	7,141	7,477	7,976	8,475	9,188	9,737	7,130	8,211	8,820	9,490			1.00	0.91	0.90	0.89	N/A	N/A
Gini	31.6	31.7	31.9	32.1	31.8	31.3	32.5	32.9	35.6	34.8			0.97	0.96	0.90	0.92	N/A	N/A
S80/S20	5.0	5.1	5.2	5.1	5.0	4.8	5.4	5.5	6.5	6.2			0.93	0.93	0.79	0.83	N/A	N/A

Notes: N/A - not available
Sources of external Eurostat, Statistics Estonia, online database

Table 4.10-Poverty rates by gender and age

	EUROMOD						External						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
40% median HDI																		
Total	6.6	6.6	6.8	6.5	5.7	4.6	6.7	7.9	8.2	7.4			0.99	0.84	0.82	0.88	N/A	N/A
Males	7.1	7.1	7.3	7.0	6.3	5.2	7.2	8.9	9.3	8.7			0.99	0.80	0.78	0.81	N/A	N/A
Females	6.2	6.1	6.3	6.1	5.3	4.0	6.2	7.0	7.2	6.3			1.00	0.88	0.87	0.97	N/A	N/A
50% median HDI																		
Total	10.6	10.7	11.1	10.9	10.0	9.5	10.9	12.6	13.4	12.5			0.97	0.85	0.82	0.87	N/A	N/A
Males	11.1	11.1	11.5	11.3	10.5	10.0	11.3	14.0	14.5	13.3			0.98	0.79	0.80	0.85	N/A	N/A
Females	10.2	10.3	10.6	10.4	9.6	9.0	10.4	11.4	12.4	11.8			0.98	0.91	0.86	0.89	N/A	N/A
60% median HDI																		
Total	18.2	18.2	19.1	18.9	19.2	18.5	17.5	20.7	22.1	21.6			1.04	0.88	0.86	0.88	N/A	N/A
Males	17.2	17.3	17.8	17.6	17.5	16.8	16.8	19.8	20.6	19.6			1.03	0.87	0.87	0.90	N/A	N/A
Females	19.0	19.1	20.2	20.0	20.7	20.0	18.1	21.4	23.5	23.3			1.05	0.89	0.86	0.86	N/A	N/A
70% median HDI																		
Total	26.6	26.9	27.3	27.3	27.0	26.4	26.7	29.2	29.0	28.9			1.00	0.92	0.94	0.94	N/A	N/A
Males	23.7	23.8	24.2	24.1	23.8	23.3	24.0	27.3	26.4	26.5			0.99	0.87	0.92	0.91	N/A	N/A
Females	29.2	29.5	30.0	30.0	29.7	29.0	29.0	30.8	31.3	31.0			1.01	0.96	0.96	0.97	N/A	N/A
60% median HDI																		
0-15 years	16.1	16.3	16.8	16.2	14.6	13.3	16.2	18.4	19.8	19.2			1.00	0.88	0.85	0.84	N/A	N/A
16-24 years	22.2	21.9	22.1	22.2	21.9	21.2	21.4	23.3	19.9	20.9			1.04	0.94	1.11	1.06	N/A	N/A
25-49 years	14.8	14.9	15.1	15.0	14.5	13.7	14.4	15.9	17.4	15.8			1.03	0.94	0.87	0.95	N/A	N/A
50-64 years	22.5	22.5	23.1	23.0	23.4	22.7	22.1	24.0	24.8	21.0			1.02	0.94	0.93	1.09	N/A	N/A
65+ years	19.3	19.5	22.8	22.7	26.8	26.9	17.2	27.0	31.8	35.8			1.12	0.72	0.72	0.63	N/A	N/A

Notes: N/A - not available

Sources of external statistics: Statistics Estonia, online database

Table 4.11-Minimum wage validation

	Baseline						Min Wage Incl.						Ratio					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Equivalised disposable income	6,448	6,752	7,200	7,650	8,275	8,769	6,454	6,757	7,207	7,659	8,288	8,789	0.999	0.999	0.999	0.999	0.998	0.998
Employment income	5,724	6,051	6,474	6,856	7,266	7,620	5,731	6,058	6,483	6,868	7,282	7,644	0.999	0.999	0.999	0.998	0.998	0.997
Total income tax	970	1,045	1,157	1,240	1,257	1,308	972	1,046	1,159	1,242	1,259	1,312	0.999	0.999	0.999	0.998	0.998	0.997
Total pension part of the social tax	1,197	1,262	1,349	1,431	1,519	1,597	1,198	1,264	1,351	1,433	1,523	1,601	0.999	0.999	0.999	0.998	0.998	0.997
Total health part of the social tax	784	827	884	938	996	1,047	785	828	885	940	998	1,050	0.999	0.999	0.999	0.998	0.998	0.997
Subsistence benefits	28	29	30	35	33	54	28	29	30	35	33	54	1.002	1.002	1.002	1.003	1.003	1.009
Gini coefficient	31.6	31.7	31.9	32.1	31.8	31.3	31.5	31.6	31.9	32.0	31.8	31.2	1.001	1.001	1.002	1.002	1.002	1.003
Poverty rate (60% median HDI)	18.2	18.2	19.1	18.9	19.2	18.5	18.2	18.3	19.1	18.8	19.0	18.6	1.001	0.998	1.002	1.005	1.012	0.996